



Achieving Value in Healthcare Through Efficiency and Effectiveness

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Executive Summary

Healthcare is changing because of political and societal forces that are demanding increased quality and service at reduced cost. These forces have recently exhibited an added urgency and become a dominant centerpiece of discussion throughout the United States due to the growing demographic demand for healthcare services in the face of a flattened economy and an increasingly globalized environment. Furthermore, healthcare costs represent one of the heaviest burdens on federal and state governments, and affect every individual in direct and indirect ways. In fact, the United States has the highest per capita spending devoted to healthcare of all industrialized nations, but cannot claim the best universal outcomes.

While the United States is inarguably host to one of the most advanced medical systems in the world, it is a system with vast opportunity to improve. Healthcare in America is fighting an epidemic of medical errors, soaring costs, and ineffective service. This white paper addresses two key concepts that will drive better quality, improve service delivery and reduce the cost of healthcare in America efficiency and effectiveness.

Sobering data in the landmark Institute of Medicine work, *To Err is Human*,¹ revealed a staggering number of unnecessary deaths from medical errors. The IOM study sent shock waves throughout the healthcare industry on the importance of changing the way we do our work. The call to make healthcare safer in the United States and abroad opened a new dialogue on a subject that has neither been well understood nor openly discussed. While there may be disagreement on final solutions, the impetus for immediate and urgent healthcare reform is increasingly clear across all political parties and industries.

By explicitly measuring our progress toward clear, definable and measureable goals, we can achieve efficiency and effectiveness, which will create greater value for society. We believe that the foundation of improving quality and enhancing service while decreasing cost demands a focus on, and quantum improvement in, efficiency and effectiveness of the healthcare system. So, where do we start?

Improving value through efficiency and effectiveness

Maximizing value is an operational imperative for any business. Attaining value is often more difficult, especially in the healthcare industry where the complex web of providers and services are frequently disconnected. The premise of this white paper is that the healthcare industry must embrace efficiency and effectiveness by transforming both the way care is delivered and the way it is financed in order to drive maximum value for society.

The National Quality Forum, under its National Priorities Partnership (NPP) program, an initiative that is gaining stature across the healthcare community, developed one approach to achieving value. A diverse coalition of public and private advocates and members of the healthcare system now embrace the notion that healthcare leaders must focus on eliminating harm, reducing waste, decreasing disease burden, and eradicating disparities in access to care. In other words, quality, service and cost are the primary objectives for improving healthcare, which will be accomplished through a focus on efficiency and effectiveness. The NPP program provides a roadmap for moving forward on this front. It established eight national priorities, including:

- Engage patients and their families in managing their health and making decisions about their care.
- Improve the health of the population.
- Improve the safety and reliability of America's healthcare system.
- Ensure patients receive well-coordinated care within and across all healthcare organizations, settings, and levels of care.
- Guarantee appropriate and compassionate care for patients with life-limiting illnesses.
- Eliminate overuse while ensuring the delivery of appropriate care.
- Guarantee equitable access to care for all segments of society.
- Provide infrastructure support to achieving these goals.

The essence of the argument by the National Quality Forum is that by operating with these

Quality, service and cost are the primary objectives for improving healthcare, which will be accomplished through a focus on efficiency and effectiveness.

¹Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (2000). *To Err Is Human*. Institute of Medicine. Washington, D.C. : National Academy Press.

²Health Information Technology Expert Panel Report. (2008). *National Priorities and Goals Aligning Our Efforts to Transform America's Healthcare*. The National Quality Forum, Washington, DC.

eight priorities in mind, we can drive greater value in healthcare. However, improving efficiency and effectiveness can be extended beyond these eight principles to also address problems related to “overuse,” “underuse,” and “misuse” of care. These categories were defined in 1998 by the National Roundtable on Healthcare Quality³. The definition for each area is as follows:

- **Overuse:** a healthcare service provided under circumstances in which its potential for harm exceeds the possible benefit
- **Underuse:** the failure to provide a healthcare service when it would have produced a favorable outcome for a patient.
- **Misuse:** when an appropriate service is selected but a preventable complication occurs and the patient does not receive the full potential benefit of the service.

By avoiding overuse, underuse, and misuse of care, we can achieve increases in the quality of healthcare services. Meeting this objective requires critical, quantitative measurements on the current value derived from care delivery in order to accurately evaluate progress toward fostering efficiency and effectiveness. It has been documented that delivering reliable care with scientifically based guidelines, clinically integrated teamwork, and accountability for outcomes improves quality and decreases cost. Even with an understanding of these key attributes; however, the industry is challenged in offering an effective response. Why?

Obstacles to Value

Two basic obstacles create inherent difficulties for driving value in a healthcare system. First, the current healthcare system maintains a largely uncoordinated, cottage industry model consisting of disparate providers delivering care on a fragmented basis. The move toward a more comprehensive, coordinated care model offers clear advantages, which have been documented throughout the literature. However, in the absence of a binding economic force that aligns financial incentives for

the healthcare industry, the segmented interests impede changes toward a new care delivery model. Therefore, it is critical to alter the existing approach which incentivizes the use of services by the system as whole.

Second, healthcare transformation must focus on changes in health outcomes rather than simply process reformation. A focus on outcomes requires a comprehensive outlook that considers the impact of multiple, inter-related processes within the care delivery methodology. Under the current system, the target of process improvement frequently becomes the “cost” of an individual element of service. In reality, however, the focus on a single element without consideration of the health outcomes results in cost-shifting among the various segments of the industry. For example, in the care of diabetics, insurance companies frequently do not have longitudinal relationships with individual consumers because of shifts in the employer-based model from one insurance company to another. The end result is that preventive services are not emphasized. Physicians are reimbursed more fully for procedures and payments are made for the care of diabetic patients resulting from the performance of interventions rather than one-on-one counseling or deploying support systems helping diabetics to control glucose levels, which have proven to be very effective interventions. Long-term efficiency and effectiveness are not the focus of the existing payment systems. Striving for value requires aligning the interests of the individual consumer, family members, providers, employers, and all members of society who are involved in the healthcare continuum.

The roadmap for addressing these two major impediments to efficiency and effectiveness underpin the eight priorities of the National Priorities Partnership and the guidelines for avoiding overuse, underuse, and misuse of healthcare resources. Moving from a cottage industry model with a focus on healthcare outcomes will clearly help society achieve greater value, but there are many challenges that must first be overcome.



³ (1998). Statement on Quality of Care: The Urgent Need to Improve Healthcare Quality. Institute of Medicine of the National Academies, National Roundtable on Healthcare Quality.

Technological advances within the healthcare industry are altering the very fabric of who, why, where and what services are delivered and – by whom.

To accomplish culture change, we believe that the healthcare system must engage in a multi-disciplinary dialogue, debate and discussion related to efficiency and effectiveness rather than continuing segmented discussions.

Challenges

Multiple challenges and obstacles obstruct the path forward to efficient and effective healthcare. According to scholars Lucian Leape, MD and Donald Berwick, MD (2005)⁴, “the combination of complexity, professional fragmentation, and a tradition of individualism, enhanced by a well-entrenched hierarchical authority structure and diffuse accountability” are formidable barriers to achieving a medical ethos that enhances quality. But, beyond the inherent characteristics of the healthcare industry, other challenges are forcing a reconsideration of our path forward in transforming the American healthcare system.

Health Industry Culture.

The healthcare delivery model has traditionally embraced a guild-oriented, craft-shop model. It is increasingly clear – as noted above – that such an approach impedes our progress and that along with many other industries, healthcare must now adapt to a post-industrial society. Technological advances within the healthcare industry are altering the very fabric of who, why, where and what services are delivered and – by whom. Like all other industries, healthcare must adapt and alter our approach as part of societal changes rather than the wake of these changes.

As an example, it is increasingly clear that a multi-disciplinary approach to care delivery yields better results and outcomes. Yet, without a comprehensive, coordinated care approach based on multiple collaborating care delivery disciplines, we cannot achieve the desired outcome. For example in trauma care, we have learned that a coordinated team of physicians, nurses, trauma specialists and technicians supported by appropriate infrastructure drives a substantial improvement in outcomes for trauma victims. Yet, the same approach of using a coordinated team is not applied to chronic care problems which have been shown to yield substantially better results under such model.

Culture change is difficult; those who are central to leadership within the organization must drive it. To accomplish culture change, we believe that the healthcare system must engage in a multi-disciplinary dialogue, debate and discussion related to efficiency and effectiveness rather than continuing segmented discussions.

Globalization.

While the notion of globalization is used in many contexts and with varying purposes, we refer to the changes in the healthcare landscape, which are driven by the interconnectivity of people around the world more and more. In the context of reforming healthcare delivery through efficiency and effectiveness, globalization holds several implications. First, multinational corporations are extending business operations to all corners of the globe. Increasingly, these corporations demand continuity of service for their employees, regardless of location. Second, there is an increasing recognition that healthcare will become more internationalized like other 21st century enterprises (e.g. media, finance, manufacturing) and is beginning to adopt new, global business delivery models. McKinsey Consulting completed a study in 2006 which outlined the globalization of work along three lines:

- **Transformational** (extract/convert raw materials) – as the first phase of globalization, area which first experienced the changes includes those industries where materials become increasingly scarce within a nation. As an example, the timber and mining industries are comprised of companies where the extraction of raw materials has been globalized by nearly a century.
- **Transactional** (easily scripted or automated functions) – beginning with the dawn of the Internet age, the ability to move defined, back office functions to multiple on-shore and off-shore locations became feasible. Examples include insurance processing and marketing materials development.
- **Tacit** (complex interactions requiring high judgment) – for those areas where information can be created which requires professional interpretation or analysis, we are at the formative stages for developing new services capabilities. In addition to legal services and architectural planning, healthcare examples include remote radiology services and complex, high end laboratory services.

⁴(2005) Five Years After “To Err Is Human”: What Have We Learned? The Commonwealth Fund. Leape, Lucian MD and Berwick, Donald MD.

Knowledge workers are becoming an international resource because the deployment of information technology allows knowledge workers to literally work anywhere. Furthermore, innovation requires attracting the best and brightest talents. Finally, we are at the formative stages of a seeming reverse migration of knowledge workers whereby work will follow the professionals rather than the professionals following the work.⁵ Global service capability is an increasingly important platform used in support of healthcare, a practice that started with a focus on the back office and, has recently begun to shift toward the inclusion of clinical services as well. As an example, a number of leading pediatric hospitals across the world are moving toward sharing data and outcomes on a transparent basis in an effort to increase the value of care. The sharing not only extends across nations but also between nations with different care delivery models. Clearly, over time as the lessons learned become available, our ability to learn from across the world will be an invaluable resource for driving efficiency and effectiveness. Compounding the sharing of information is the evolution of care delivery organizations which are being developed and deployed across multiple geographies and cultures.

While still at the nascent stage of development, global care delivery also allows consumers in developed countries to bypass domestic treatment in favor of traveling to more cost-efficient areas of the world to receive treatment. The so-called “medical tourism” is spurred by consumers in developed nations seeking a lower cost of service where equivalence in capability can be demonstrated regardless of the location of services. The unlimited global markets created through globalization of medicine have the potential for allowing the developing nations to provide care to as many as 1.6 million Americans who are expected⁶ to leave the continental United States for treatment in 2012. Medical tourism is an indication of the extent to which healthcare in America fails to meet the needs of consumers, who favor care in other countries because of the lack of efficiency and effectiveness. However, it is not simply individuals in developed countries seeking less expensive care. Cross-border care is an increasingly important phenomenon for individuals who want the very best care. Germany and the United States have been the recipients of such consumers of healthcare over the last several decades and the pattern only shows signs of growth.

Changing Demographics and the Healthcare Workforce Model.

Another challenge that is requiring the healthcare system to aggressively pursue efficiency and effectiveness is the changing demographics of the United States. The age of the American population is marked by an increase in the number of elderly, the leading consumers of healthcare services. There are 3 percent more Americans age 65 or older than there were 40 years ago and by the year 2020, there will be an estimated 53.3 percent increase since the year 2000 in the number of Americans aged 65 or older⁷. The demographic shift is accompanied by a dramatic increase in the demand for services especially among the older age groups. This means that society will be increasing spending on healthcare as there are more individuals who need care.

The demographic pattern, however, is not confined to the general population. It also applies to a similar pattern among clinical practitioners. As an example, 37 percent of practicing physicians in the United States are over the age of 55⁸. This cohort of physicians will be entering a period of slowing practice, disability, death or retirement over the next decade. The combination of a general increase in consumption of medical services by an aging American populace coupled with the estimated 32 million Americans⁹ who will now be insured under the Obama Administration’s healthcare reforms is clearly leading to a provider shortage without a change in approach.

Not only will 37 percent of physicians be retiring or slowing their practices in the next decade, but also there has been a shift away from primary care as a career choice among young physicians, which is further exacerbating the problem of care delivery by physicians in the United States. The American Academy of Family Physicians (AAFP) released a study in 2009 on the number of primary care physicians throughout the country¹⁰. The report noted that the number of medical school students entering primary care has dropped an astounding 51.8 percent since 1997. The AAFP predicted a shortage of 40,000 family physicians by 2020 – using the current model of care delivery – and, the prediction of the Academy was made prior to the passage of healthcare reform



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⁵ “A Survey of Talent”, The Economist, October 7, 2006, p. 4.

⁶ Deloitte Center for Health Solutions. (2009). Medical Tourism: Update and Implications. Deloitte L.L.P. Deloitte Development L.L.C.

⁷ “Changing Demographics and the Implications for Physicians, Nurses, and Other Health Workers. US Department of Health and Human Services Bureau of Health Professions.

⁸ Changing Demographics and the Implications for Physicians, Nurses, and Other Health Workers. Department of Health and Human Services Bureau of Health Professions.

⁹ (2007) Facts About Family Medicine. American Academy of Family Physicians.

¹⁰ (2002) National Center for Health Workforce Analysis, Globalization and the Physician Workforce in the United States. US Department of Health and Human Services.



which has only exacerbated the potential problem.

As the healthcare system relies more heavily on primary care physicians to care for our aging population and the increasing number of insured – there is likely to be an insufficient number of such providers to care for people. We believe this escalating problem requires the United States to re-evaluate the workforce model and the approach we take toward training care providers.

Furthermore, roughly 25 percent¹¹ of all practicing physicians in the United States are immigrant physicians with the majority coming from India, Pakistan and the Philippines. In essence, the nation's healthcare system for the last four decades has placed an unparalleled reliance upon foreign trained clinicians for meeting staffing requirements across the board. The ease with which we have relied upon foreign-trained physicians, nurses and other clinicians however is very likely to be interrupted in the coming years. The economic opportunities that exist within the many countries, which have been the traditional source for supplying these clinicians, have mitigated the desire for a move to the United States in recent years. A graduating physician in India has as many – if not more – economic opportunities providing services through his or her birthplace rather than immigrating to the United States. While the United States maintains a certain allure in healthcare because of our leadership role in the science of medicine, there is clearly a blurring of incentives on the economic front. In essence, we have relied on an imported workforce which is no longer a viable alternative rather than addressing better – more efficient and effective – approaches for training the next generation of American medical professionals.

Technology Adoption.

Other American industries have experienced the challenge of

technology adoption as a driving force for change in the past. The industry-wide changes agriculture experienced in the late 1800s hold a striking parallel to the state of healthcare today. At the time, farmers worked as individual members of society and did not share best practices. But, through the efforts of the Cooperative Extension Program, farmers were encouraged to renounce work forms of the time (which were based on tradition) for scientifically developed standards. As an example, in the formative days of deploying the "Coop" Extension Program devastating losses were experienced among cotton farmers due to a boll weevil infestation in the South. Small groups of Southern farmers were early adopters of the new scientific methodologies applied to agriculture and managed to turn a profit on their crops by adopting the change in approach to growing cotton. Seeing the success of early adopters, other farmers soon joined the approach and implemented techniques and methods supported by the U.S. Department of Agriculture (USDA). As a result of these industry-wide reforms in farming, which related to efficiency and effectiveness, we now experience the benefits of the amazing farming surpluses enjoyed through much of the world today. A similar approach is now being suggested for application in the healthcare industry through the adoption of comparative effectiveness research. The lessons from agriculture and its application to healthcare should not be lost on the industry.

During the early part of the 20th century when agriculture underwent transformational change, technology was the leading agent for re-shaping the industry. The airline industry is another example of change resulting from technology adoption. Travelers can now browse, reserve, purchase, and check-in for travel using mobile devices and applications. The airline industry has evolved along with these new technologies in an effort to exploit the efficiency and effectiveness which technology can

¹¹ (2002) National Center for Health Workforce Analysis, Globalization and the Physician Workforce in the United States. US Department of Health and Human Services.

bring to air travel by providing better, faster service. As a direct result of technology adoption and integration, the airline industry has supported innovations, which have revolutionized the consumer experience – while simultaneously increasing quality, enhancing service and reducing cost. The health industry must replicate the lessons derived from these industrial change models to overcome similar challenges.

The uncertainty and skepticism that faced other industries earlier in the century are similar to what we face today with healthcare reform. Just as the critics of the changes in agriculture expressed concerns about government intervention in industry, we are experiencing similar reactions among various sectors of the healthcare industry to reform initiatives. Through intra-industry cooperation, synchronization of methodologies and aggressive technological adoption, both the agriculture and the airline industries were transformed for the benefit of society. The same potential applies to healthcare. Efforts to set industry-wide standards take the fiscal edge off of the adoption of new technologies and foster greater collaboration within the industry and will facilitate the transition to a world-class medical industry.

Finally, technology is the foundation whereby the healthcare industry can better meet consumer expectations. Across all industries, technology has provided the foundation for interactive and instantaneous availability of transactions, goods, and services in what we now refer to as “m-Services.” By embracing the m-Services model, healthcare consumers, providers, and payers stand to gain from the immediacy and democratizing powers of the Internet. Just as airlines have empowered consumers to book flights on a cell phone or laptop computer, patients can have real-time access to appointment scheduling, medical records and other pertinent information. Again, we use the diabetic patient as an example. Type I diabetes is particularly difficult to manage among the teenage population. First, teenagers – in general – attempt to move toward more independence so they are frequently resistant to outside influences. Yet, we know that influences do occur – often through social media. Therefore, tying a remote glucose monitor to a data base that uses protocols for determining the appropriate glucose level for an individual and, which can send messages to a teenager’s phone by using Twitter – a modification of outcome can occur. There are many, many examples that can be used to exemplify the impact of m-Services on healthcare.

Finally, the government should retain the same role as it has had in the airline industry for healthcare – guaranteeing the safety of the quality, cost and service of the new system by monitoring aggregated data and coordinating national logistics. In essence, a number of important factors are driving requirements for a greater focus on efficiency and effectiveness. So, the question remains – how do we drive capability in fostering efficiency and effectiveness across the healthcare industry?

The Way Forward

The current non-system provides fragmented care without the ability to treat individuals longitudinally. In addition, the lack of coordination perpetuates a system that pays for quantity over quality, resulting in tests, procedures, and appointments that frequently overlap. Ultimately, the lack of efficiency and effectiveness in the delivery of care increases the cost on all fronts – for the patient, the payers, and society at large. By adopting three core principles of: 1) deploying a delivery model that provides comprehensive, coordinated care, 2) integrating existing technologies, and 3) aggressively aligning incentives – the American healthcare system can provide better value with efficiency and effectiveness.

Comprehensive Coordinated Care (C³) Delivery.

As described in Cottage Industry to Postindustrial Care – The Revolution in Healthcare Delivery¹², the current United States healthcare system is essentially a broken, ineffective cottage industry of uncoordinated artisans who balk at standardizing care. Cottage industries across the board are notoriously inefficient, from agriculture to automotive to finance, – as noted previously. The lack of connectivity and focus within the healthcare sector across the multiple cottage-style components fuels wide variations in care and outcomes, and blunts the objective of increasing quality. Thus, it is critical that we reevaluate the way in which our system provides care and do our best to adopt a more comprehensive, coordinated approach to care delivery.

In today’s environment, the value of direct healthcare services remains elusive. Past efforts



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¹² Swenson, Stephen MD, et al. Cottage Industry to Postindustrial Care – The Revolution in Healthcare Delivery. January 20, 2010. The New England Journal of Medicine.



to improve healthcare quality have largely been driven by investments in specific projects. Embedded in this strategy is the false premise that quality will come proportionately to the amount of money spent or, the focus on an individual, specific problem. However, the approach has failed and, instead, led to staggering increases in healthcare costs through unfocused, scattered improvement efforts which are inefficient and ineffective. We must coordinate care to drive better healthcare value.

While multiple models are being considered, two concepts for providing comprehensive, coordinated care include the adoption of the Accountable Care Organization (ACO) and the Primary Care Medical Home (PCMH) models. While discussion and debate is currently ongoing related to the best approach toward implementing these models, several key elements are becoming clearer.

ACOs provide a vertically integrated healthcare delivery system, which houses primary care physicians, specialists, hospital services and to a varying degree other healthcare services (e.g. pharmacy, long-term care, extended care, hospice and other care delivery components). The most significant difference between this model and the capitation model of prior decades is that the "organization" is held responsible for the quality and cost of care rather than the individual clinician. Rather than working in a parallel, independent fashion – the organization supports a common approach to governance, operational management, infrastructure, supply chain, decision support, care analytics and financial management. The members of the organization work together and are responsible for the comprehensive, longitudinal health of a designated population, even if treated by another service delivery organization or in another geographic area. Obviously, the details of these plans are continuing to be detailed at the writing of this white paper.

Primary Care Medical Homes (PCMH) similarly offer centralized levels of care; however, in a medical home the patient's primary care provider leads a "team" of health care practitioners. Medical homes have several characteristics in common with ACOs whereby the organization designates a personal physician (or nurse practitioner) for each patient. The physician, who coordinates care for the whole person, integrates services and care across practitioners using an evidence-based approach. Again, a single payment is made to the PCMH for providing comprehensive, coordinated care.

These are two examples of potential models of healthcare delivery going forward, but technological advances are also opening the door for other care delivery models. We offer the example of the "Virtual Care Delivery Organization" which could represent a model for delivery of services similar to what is evolving among other industries. The baseline requirement is acceptance of "standards." Healthcare could move in this direction and, if adopted, such model would radically alter the current framework for how healthcare services are delivered.

By expanding the presence of the ACO, PCMH or virtual care delivery models, healthcare delivery will be better able to maximize efficiency and effectiveness. This will avoid the overuse, underuse, and misuse described earlier which occurs when multiple levels of uncoordinated treatment are provided across a disconnected healthcare system.

Integrate and Adopt Existing Technologies.

The democratization of information is a critical focal point for changing the healthcare system. The Internet has magnified access to information for everyone and, inarguably been the most critical and universally democratizing leap for society in the last several centuries. Healthcare is not exempt from the reach of the Internet. Rather than running to a physician to ask about every headache and rash, individual consumers are able to consult websites, find treatment options and understand care protocols without charge. Trends such as e-Health (i.e. online access to health information and services and mHealth (i.e. mobile access to health information and services) require electronic interoperability and are already gaining widespread use across the industry. By integrating these existing technologies to harness the new health information transparency, we can provide greater value through more effective and efficient care delivery processes.

The Internet is poised to radically alter the way care is given and received. The use of interoperable connectivity can drive care to an individual's home by literally placing information

The democratization of information is a critical focal point for changing the healthcare system.

in the palm of their hand which clearly democratizes medicine. We are moving from an "information theocracy" dominated by physicians who control access to healthcare knowledge to an "information democracy" where individuals can assess knowledge and information on their own, using sources available from throughout the world. Empowering consumers to understand their medical conditions and to self-monitor is an example of how technological implementation will lead to greater efficiency and effectiveness.

The accessibility of records, communication, and an ever-evolving instantaneousness of transaction allows consumers to conduct business virtually. Healthcare is headed in the same direction. While electronic innovation in healthcare will not entirely replace traditional visits to a care provider, a patients' clinical experience can be enhanced or complemented by health information technology similar to the way that social media has enhanced but not replaced face-to-face interaction.

As an example, VirtualDx¹³ is a web site that provides consumers with diagnostic direction on virtually every dermatological problem. With a database of more than 20,000 high-resolution photographs of skin problems, individuals can "compare" their skin affliction with those in the database. Through a series of questions, VirtualDx guides the individual toward diagnostic options, which the consumer can then take to his or her physician. VirtualDx is an example of a growing crop of websites providing e-Health services to enhance and educate participation in healthcare – simply requiring the use of an existing and ubiquitous technology – the Internet.

The commoditization of mobile technologies – particularly those using increasingly ubiquitous smart phones – has opened up a virtual world of telehealth capabilities. Consumers and providers can use any number of mHealth devices and programs, which support consumer engagement in self-care. Services such as remote monitoring and home-based technologies create the opportunity for an alternative model of care delivery, which will curb unnecessary use of medical resources. As an example, using SMS messages, physicians can send automated or customized reminders to individuals to take medications, adjust medication levels, and seek preventive services.

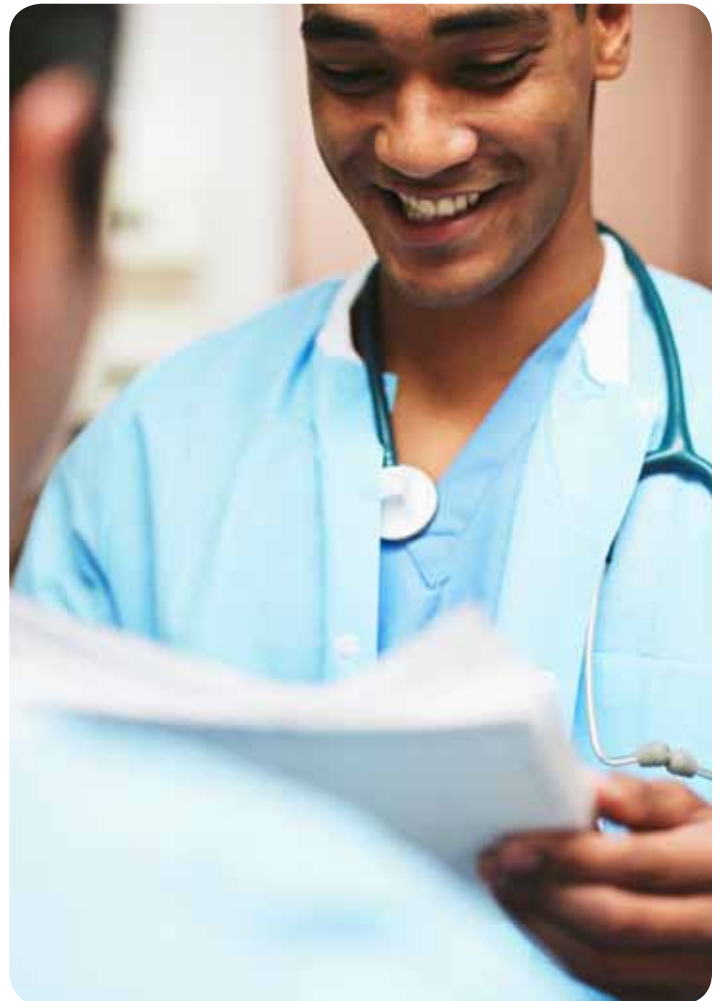
Applications of mHealth technologies also include reverse information flows where data from the individual or the home are transmitted to the physician or healthcare organization for chronic disease management through the monitoring of vital signs, medication management, monitoring of patterns for fall risks or medical emergency, and reminders for care. These examples are by no means an exhaustive list of the potential and existing applications on how technology and mHealth can be used for driving efficiency and effectiveness.

Programs to manage chronic conditions such as diabetes, asthma, and congestive heart failure can also be deployed remotely by qualified providers and their staff. Studies show that if a congestive heart failure patient records their weight in the morning and answers a series of yes-or-no questions, the provider can reasonably predict if the patient is entering into a

state of heart failure in the next 24 – 48 hours¹⁴. Data from the individual transmits automatically to the provider or monitoring center and steps are taken to maintain the individual's condition, representing yet another example of how the implementation of existing technologies is the way forward by making the health system more efficient and effective.

Remote monitoring can also be used to track medication compliance and reduce the frequency of physician visits. More importantly, such devices detect underuse and misuse, which could dramatically lower the estimated total of roughly \$290 billion expended due to improper prescription administration, resulting in re-hospitalizations or preventable fatality¹⁵. Technologically enhanced pill boxes can signal care givers, care centers or the local pharmacy that medication has not been removed within an appropriate window of time and can automatically send reminders in the form of SMS messages, emails, or automated phone messages to the patient or other interested parties.

These examples illustrate how harnessing existing technology to improve medical service clearly moves toward more efficient and effective care. The use of these new and evolving technologies will drive enhanced value in the care delivery process through innovative improvements in quality, cost and



¹³ VirtualDX. (n.d.). Retrieved November 10, 2010, from <http://www.virtualdx.com>

¹⁴ (2006) Myers, Sue PhD, APRN, BC, et al. Impact of Home-Based Monitoring on the Care of Patients with Congestive Heart Failure. *Home Healthcare Management & Practice*. Vol 18, Number 6

¹⁵ (2009). Poor Medication Adherence Costs \$290 Billion A Year. New England Healthcare Institute.

The \$26 billion healthcare information technology investment is upon us in the form of incentives and initiatives that are part of a historic push to digitize the industry.

Building health information exchanges to facilitate the analysis of population-wide health trends will revolutionize the medical field's access to concrete longitudinal data.

Technology is clearly enhancing our social interactions as a human civilization while allowing for greater democracy and freedom of information.

service. Technological progress is inevitable, but more constructively, it is the way forward towards achieving greater healthcare value.

The Obama Administration picked up on the idea originally expressed by President George W. Bush that the foundation for transforming healthcare required an interoperable electronic data system. The American Recovery and Reinvestment Act of 2009 (ARRA), known colloquially as "the stimulus package," created the largest, singular investment in health information technology in the history of the industry. The momentum for transformation injected into healthcare as a result of the stimulus package is creating the foundation for a revolution in how and where healthcare is delivered and by whom. The \$26 billion healthcare information technology investment is upon us in the form of incentives and initiatives that are part of a historic push to digitize the industry.

A 2014 goal has been set for facilitating the use of an electronic health records for people receiving care in the United States. To support the objective, stimulus funding was appropriated for the dramatic expansion of the Office of the National Coordinator (ONC). Tasked with developing a nationwide health technology infrastructure which supports electronic exchange of information, along with companion efforts in the Centers for Medicare and Medicaid Services – are driving dramatic changes in our nation's approach to health information exchange.

Medical professionals have commonly cited financial risk as an impediment for upgrading to electronic health records. With ARRA, Congress has transformed the risk of an investment in information technology infrastructure by incentivizing providers to implement electronic health records. As of 2011, care providers using certified electronic health records will receive the maximum allotted Medicare payments for demonstrating a meaningful use of these technologies.

The Health Information Technology for Economic and Clinical Health Act (HITECH Act) was signed into law on Feb. 17, 2009 as part of the American Recovery and Reinvestment Act (ARRA) of 2009. ARRA is a \$787 billion stimulus package with heavy investments in science, energy, healthcare, and technology. Of the \$787 billion, more than \$180 billion has been set aside for healthcare-related spending, with the intent of creating compelling financial incentives for providers and hospitals to adopt EHRs during the next five years.

The funding for the EHR implementation will be administered through Medicare and Medicaid via incentive payments for hospitals and healthcare professionals that implement compliant EHR systems. Hospitals are eligible to receive up to four years of financial incentive payments under Medicare and up to six years of incentive payments under Medicaid beginning on Oct. 1, 2010. Eligible providers can receive up to \$44,000 during five years under Medicare or \$63,750 during six years under Medicaid, beginning on Jan. 1, 2011.

Similarly, the use of interconnected electronic medical record systems can improve the quality of available health services through the creation of comprehensive healthcare databases. ONC is continuing its drive to foster connectivity among consumers, providers, institutions, payers and regulatory groups. Meanwhile, policymakers are beginning to consider the rules, regulations and policies which need to be adopted related to the transparency of data.

Building health information exchanges to facilitate the analysis of population-wide health trends will revolutionize the medical field's access to concrete longitudinal data. These longitudinal databases provide data warehousing, mining, and analytics capability, which supports Predictive Knowledge Management (PKM). PKM is a relatively new phenomenon in healthcare which proactively uses data from multiple disparate sources to understand at a granular level the essential elements of the care delivery process so that outcomes can be improved. PKM provides value-added capability and service for clinicians as a resource for more effectively managing the process, safety, and outcomes of care. It combines operational, business, and clinical data into a common platform so that healthcare organizations can more effectively manage a variety of processes and address critical issues that impinge on their ability to provide care and adjust to market challenges. Furthermore, with the adoption of newer technologies, real-time decision support can be provided to clinicians, which further enhances the value of these tools. Society at-large will benefit from these improvements as care is modified based on a more comprehensive understanding of acute, chronic and population health patterns.

Technology is clearly enhancing our social interactions as a human civilization while allowing for

greater democracy and freedom of information. The technology revolution in healthcare is in the formative stages.

Aggressive Alignment of Incentives.

In addition to changing the way medical treatment is delivered and increasing the use of technology in healthcare, it is important to synchronize two other aspects of care in the United States. Care must be standardized for maximum efficiency and effectiveness, starting with aligning payment methodology with the desired medical outcomes, and by providing clinical treatment which has been proven effective through comparative effectiveness research.

Under the current payment system there is clear misalignment with the intent of enhancing quality at reduced cost. The United States healthcare system essentially pays for volume of treatment rather than necessity and outcome, giving rise to the rather cynical adage among providers that "If you pass a tube, you get a payment." Specifically, improving quality and outcomes must prevent medical errors, eliminate waste, and improve the coordination of care, which, in turn, will lower costs. There are many technical ways to accomplish this mission. It is increasingly clear to health policy experts that in order to create a comprehensive coordinated care platform it is essential to revise our whole approach to health insurance. Specifically, if we are going to be successful at "bending the cost curve," the healthcare system must engage the American public in their own care more effectively.

To foster public engagement, two core principles must be adopted. First, we need to create "incentives" for individuals to alter their behavior and utilization of care service patterns. Second, the focus needs to shift from a procedure-oriented, retrospective "take-care-of-the-problem-once-it-occurs" mentality to an upstream, wellness and disease management philosophy in our care delivery models. While the idea has been prevalent for decades within the healthcare community, the failure to adopt the approach relates to the financial incentives of the current insurance schemes.

Over the last decade we have seen a dramatic increase in the use of co-payments by insurance companies. The intent of the co-payment is to engage individuals in the cost of care by having them pay an out-of-pocket fee for a portion of their care. The original notion was that such payments would discourage the consumption of services that provide little or no added value. The literature, however, suggests that by simply increasing co-payments, individuals actually decrease the use of both high-value and low-value services¹⁶. As an example, studies have shown that if you increase the cost-sharing for medications of asthmatics, the overall cost of care actually increases rather than decreases because consumers either reduce their medications or discontinue them entirely. The end result defeats the whole purpose of preventive medication use for a problem that should largely be managed on an ambulatory basis – and, where individual behavior strongly predicts potential outcomes.

To support value-based insurance design, certain core principles must be applied to insurance models, including: 1) value equals

the clinical benefit achieved for the money spent, 2) healthcare services differ in the benefits they produce; and, 3) the value of healthcare services depends upon the individual who receives them. Simply trying to reduce utilization of care without considering the impact on the individual does little to foster efficiency and effectiveness in healthcare delivery.

Therefore, in the design of such a system, four basic approaches are required for remodeling the healthcare payment system. They include: 1) design the insurance program so that services which are known to be effective are supported and encouraged (e.g. prescribing statins for patients with high cholesterol levels); 2) design the insurance program so that traditional high cost problems are automatically covered (e.g. comprehensive diabetic care); 3) support care delivery programs that actively manage the disease problem (e.g. active, in-home management of congestive heart failure); and, 4) encourage the use of services and programs that are known to be more cost effective (e.g. if you participate in a smoking cessation program your chance of actually stopping smoking is considerably higher).

The debate on the structure for a new payment methodology is perhaps the most important discussion that must occur sooner rather than later. In many respects, the healthcare system is performing exactly as the incentives are pushing it to perform. Without modifying the incentives, costs will likely continue to escalate. In fact, we would argue that the current course is unsustainable – and, that healthcare, as an industry, has the potential for bankrupting the nation without a change of direction. Several current initiatives may begin to alter the course. At the request of the Secretary of Health and Human Services, the Institute of Medicine (IOM) is conducting a study on variations in healthcare spending and utilization across the country for individuals with Medicare, Medicaid, private insurance, or no insurance. With a goal of eliminating unnecessary variation in Medicare spending, the IOM will offer recommendations for changes to specific Medicare payment systems to promote high-value care, especially for high-volume, high-cost conditions. The IOM may develop a value index based on measures of cost and quality to differentiate high value services. The new Center for Medicare and Medicaid Innovation (CMMI), funded by the Affordable Care Act, will test innovative approaches to care delivery and payment. The ultimate goal is to lower health care costs while improving quality. The Center will bring together committed stakeholders to test and bring to scale effective delivery systems that produce better outcomes and quality for beneficiaries. Another lever the federal government has included in the Accountable Care Act is the formation of the Independent Payment Advisory Board (IPAB) expected in late 2011. The controversial IPAB will submit recommendations to Congress to eliminate waste, reduce costs, and improve access to high quality care with improved outcomes.

Over the past two decades, lawmakers in the US have struggled to address medical effectiveness. Recognizing the need for research on the outcomes of care, Congress and President George Herbert Walker Bush established the Agency for Healthcare Quality and Research (AHQR) with the passage of

¹⁶ Aligning Incentives and Systems: Promoting Synergy Between Value-Based Insurance Design and the Patient Centered Medical Home. Patient-Centered Primary Care Collaborative, 2010 (www.pccpc.net).

Efficiency and effectiveness are hampered because replication and integration of care delivery provided by multiple providers are disconnected. The obsolescence of such an approach defies the obvious.

The looming crisis in the healthcare system requires concerted action by concerned citizens, policymakers, educators and the industry.

By reforming healthcare delivery, implementing appropriate technology, and reshaping the medical establishment which supports efficiency and effectiveness, America can provide the best value in healthcare services for its citizens.

the Omnibus Reconciliation Act of 1989¹⁷. Prior legislative efforts had been aimed at improving the quality, effectiveness, and appropriateness of healthcare developed through the work of preceding agencies. However, with AHQR's expanded stature as an entity equivalent to the National Institute of Health, it focused on promoting health services research and development of clinical practice guidelines. The goal of the agency has been to study effectiveness, outcomes, and appropriateness of care so that society ultimately benefits from improved healthcare value by making sure the most effective and efficient treatments are used as industry-wide best practices. In the Accountable Care Act, Congress created the non-profit Patient Centered Outcomes Research Institute (PCORI) to support comparative effectiveness research with \$10 billion over ten years. This research will focus on effective prevention, diagnosis, treatments, monitoring, and management of diseases, disorders and other health conditions.

Due in large measure to the cottage-style approach to care delivery, the healthcare services currently vary considerably from one physician to another with care delivery frequently customized on the fly by providers and consumers alike. Furthermore, there is an inadequate sharing of information and processes even within a single institution. Efficiency and effectiveness are hampered because replication and integration of care delivery provided by multiple providers are disconnected. The obsolescence of such an approach defies the obvious.

Technological and scientific progress over the past century across industries such as agriculture and aviation as cited above reveals that the use of guidelines and a focus on process improvement drive innovation. Application of these lessons learned can be applied to healthcare in innovative ways, which will save lives while simultaneously maximizing efficiency and effectiveness. Presently, the conundrum continues for finding solutions that produce large-scale improvements in quality and access while curbing rising costs of clinical care. We believe it is directly tied to the payment methodologies used across the nation. Again, the importance of the debate on payment reform becomes the dominant consideration in future policy deliberations.

Through the application of the three core principles of developing and deploying Comprehensive Coordinated Care (C³) organizations, integrating and adopting existing technologies, and, aggressively aligning incentives – the United States healthcare system can realize substantial efficiency and effectiveness outcomes. We must advance the quality of medical treatment in the nation, and meeting the challenge by pursuing these three areas of focus will realize substantial results over the longer term.

Summary

The current disconnect between the various elements of the healthcare system will continue unabated without focusing on the areas described in this white paper. By striving for efficiency and effectiveness, however, the healthcare industry will be able to address the disparities between the cost, the services and the outcomes of care.

The looming crisis in the healthcare system requires concerted action by concerned citizens, policymakers, educators and the industry. As healthcare leaders, we must move the healthcare system toward a more comprehensive, coordinated care model that is sustainable over time. By accelerating new models of care delivery, integrate existing technologies, which ensure interoperability, aligning payment methodologies, and proactively evaluating medical care with comparative effectiveness – the crisis can be averted. The value of care can be maximized by increasing quality, enhancing service and reducing cost through true healthcare delivery reform moving toward a more comprehensive coordinate care model, the implementation of appropriate technology and aggressive standardization of practices. Finally, the financial incentives of the system must be altered to accomplish the objectives outlined in this white paper. From our perspective, the healthcare system is performing exactly to the standards of the payment system. Therefore, a modified approach is an imperative if we are to drive efficiency and effectiveness throughout the healthcare industry.

Now is the time of opportunity for harnessing the economic and social value of healthcare. By reforming healthcare delivery, implementing appropriate technology, and reshaping the medical establishment which supports efficiency and effectiveness, America can provide the best value in healthcare services for its citizens.

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¹⁷ (1989) Omnibus Reconciliation Act. United States Congress.

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