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Wednesday, October 12, 2011
at The Fuqua School of Business

***Third Annual
Medical Innovation and Strategies Conference
Consumer Healthcare & Wireless Technologies:
Connecting to the Consumer with Technology in
Healthcare***

October 12, 2011

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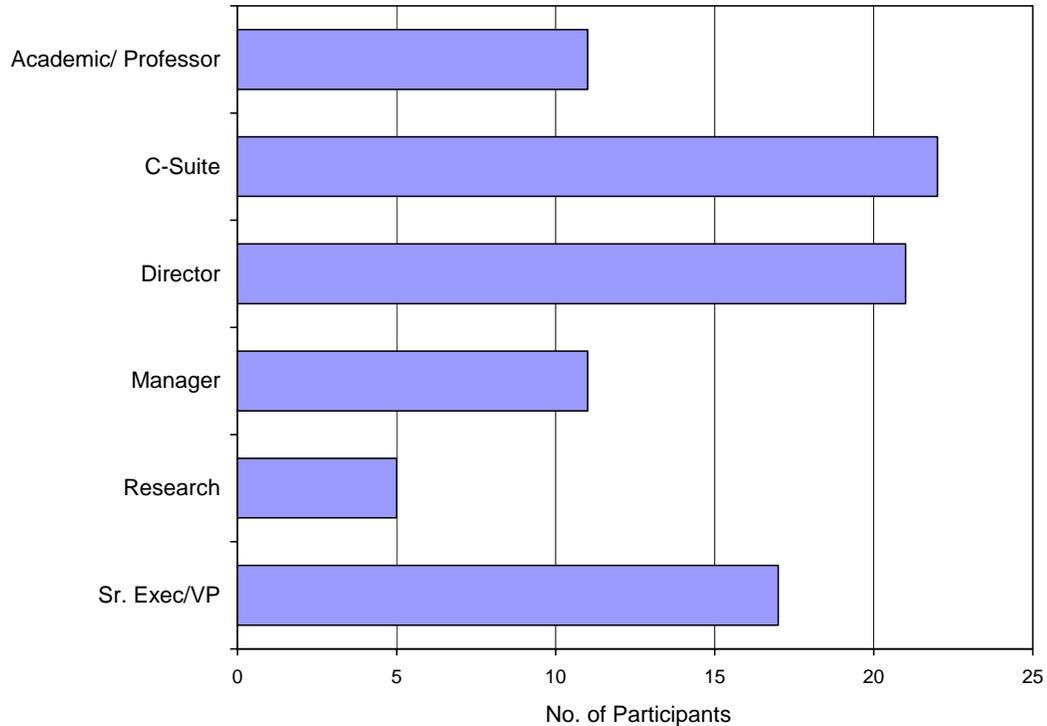
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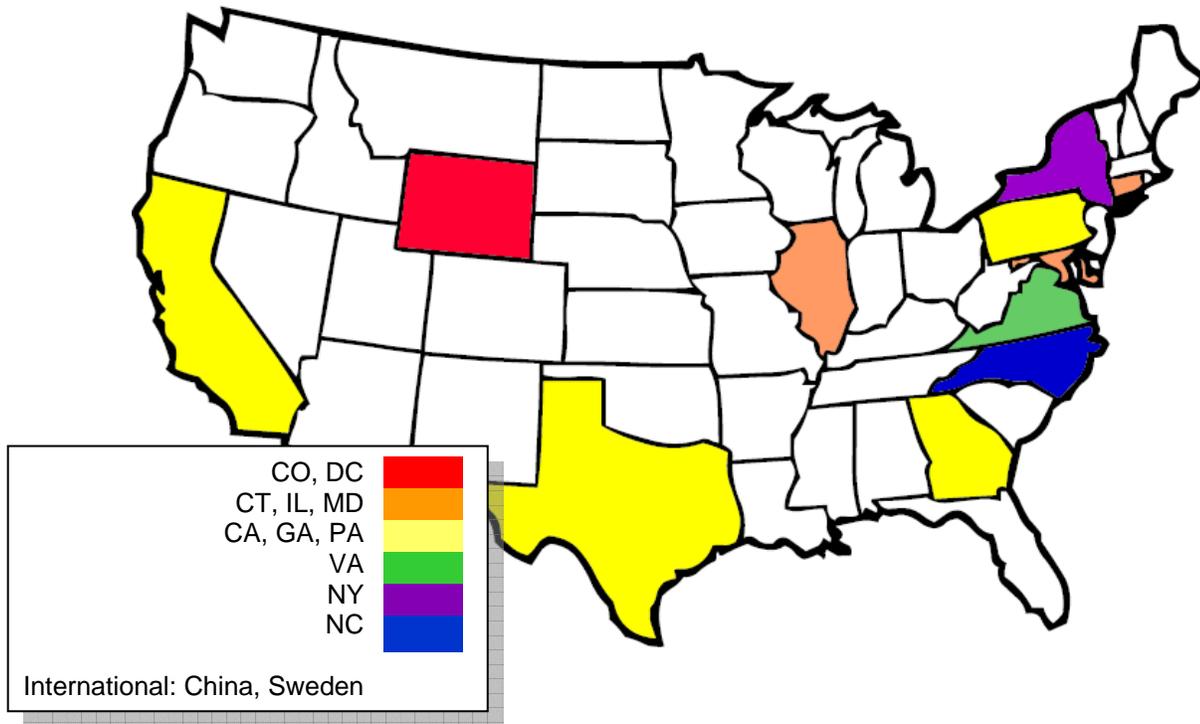
Peter S. Tippet, MD, PhD
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Participant Snapshots

By Title/Category



By Geographic Location



Meeting summary written by Patricia A. French, [Left Lane Communications](#)

Meeting Sponsor: [Verizon](#)

Third Annual Medical Innovation and Strategies Conference: Consumer Healthcare & Wireless Technologies: Connecting to the Consumer with Technology in Health Care

On October 12, 2011, Drs. Kevin Schulman and Gopal Chopra hosted the Third Annual Medical Innovation and Strategies Conference: "Consumer Healthcare & Wireless Technologies: Connecting to the Consumer with Technology in Health Care," at Duke University's Fuqua School of Business.

This year's conference focused on the increasing use of wireless technologies in both the healthcare and non-healthcare arenas. With the increased focus on improving the quality of care, reducing costs while simultaneously increasing positive outcomes for the patient and consumer, our distinguished speakers engaged in conversations on how to successfully reach the consumer, provide greater access to quality care through mobile technologies, how wireless and information technology (IT) are changing models of care, and the roles of risk and innovation in this arena and of the consumer who plays a vital role in this.

Keynote Addresses

Topic: How Are We Reaching Consumers in Healthcare?
Speaker: Peter S. Tippet, MD, PhD, Chief Medical Officer, Vice President of Technology, Verizon Business – Global Services

Topic: Risk: The Price of Innovation
Speaker: Joseph M. Smith, MD, PhD, FACC, Chief Medical Officer, Chief Science Officer, West Wireless Health Institute

Presentations and Panel Discussions

Topic: Panel Discussion: Tech Companies Reaching the Consumer – Both Healthcare and Non-Healthcare Markets
Moderator: Devavrat "Debu" Purohit, MS, PhD, F.M. Kirby Research Fellow, Professor of Marketing, Professor of Business Administration, Duke University Fuqua School of Business
Panelists: Jeff Lee, Chief Executive Officer, Omniscience Mobile
Dwight N. McNeill, PhD, MPH, Global Leader, Business Analytics and Optimization, Healthcare Industry, IBM Corporation
Guy Rachmuth, PhD, President and Chief Executive Officer, HEALTHeME, Inc.

Topic: Presentation: Mobilizing Health Care: Providing Greater Access to Quality Care through Mobile Technologies
Speaker: Richard J. Migliori, MD, Chief Medical Officer, OptumHealth, Inc.; Chief Healthcare Officer, UnitedHealth Group Alliances

Topic: Panel Discussion: Consumer Benefits: How Wireless and IT Are Changing the Care Paradigm
Moderator: Gopal K. Chopra, MD, FRACS, MBA, Adjunct Associate Professor, Duke University Fuqua School of Business
Panelists: Craig Lipset, Head of Clinical Innovation, Worldwide Research & Development, Pfizer
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Nick Van Terheyden, MD, Chief Medical Information Officer, Nuance Communications, Inc.
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Topic: Panel Discussion: Health IT and the Consumer

Moderator: Jeffrey D. Miller, MBA, Chief Executive Officer, North Carolina Health Information Exchange

Panelists: Nancy M. Green, Managing Principal, Healthcare Practice, Verizon Business – Global Services

Rahul Mahadevan, MA, MBA, Director, Electronic Health Records Services, Stanford Hospital & Clinics

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Topic: Panel Discussion: Providers & Payers: What Are Their Consumer Programs and Their Challenges?

Moderator: Kevin A. Schulman, MD, MBA, Professor of Medicine, DUMC; Gregory Mario and Jeremy Mario Professor of Business Administration and Director, Health Sector Management Program, Duke University Fuqua School of Business; Associate Director, DCRI

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Keynote I: How Are We Reaching Consumers in Healthcare?

Speaker: Peter S. Tippet, MD, PhD, Chief Medical Officer, Vice President of Technology, Verizon Business – Global Services

Healthcare as we know it stands to be disintermediated. Most healthcare advice is given by people to people, not through interventions, and most is given simply to reassure. Healthcare information technology (IT) applications (apps) that can facilitate these exchanges will become more important as pressure continues on the healthcare sector to contract.

Government collaborations often aim to aid in the development and implementation of healthcare IT but often fall short. Industry must take the lead, addressing the primary challenges of security, compliance, confidentiality, privacy, usability, and perceived value.

Data breaches of protected health information (PHI) are common and serious. In 2010, covered entities reported 207 breaches affecting at least 500 individuals, for a total of about 5.4 million individuals affected. The most common causes of data breaches in that year were theft; loss of electronic or paper records; unauthorized access to, use, or disclosure of PHI; human error; and improper disposal. Business associates accounted for 40% of all records breached.

Companies such as Verizon are conducting ongoing studies of cybercrimes, analyzing forensic evidence to determine who is stealing sensitive data organizations, how and why this is occurring, and how best to prevent it. Their VERIS framework provides a common language for describing security incidents across industries in a structured, repeatable manner.

In 2005, the President's Information Technology Advisory Committee (PITAC) stated that the government was lagging in applying computer systems and technologies to pressing issues facing the nation. New science devoted to advanced IT could reduce the costs and improve the quality of healthcare, as in other industries.

"...the Federal government has not effectively recognized the strategic significance of computational science in either their organizational structures or their research and educational planning. These inadequacies compromise U.S. scientific leadership, economic competitiveness, and national security."

—President's Information Technology
Advisory Committee

The American Recovery and Reinvestment Act of 2009 (ARRA) required that clinically relevant information be collected, under the Meaningful Use provisions for electronic health records (EHRs). Efforts to comply with these requirements have resulted in the creation of overly complex systems that do not use existing structures or reflect actual workflows. They also do not account for how people use technology now, since the advent of smartphones and other mobile devices.

The challenges facing the use of mobile devices to transmit and store usable PHI are the same as for static machines, with two added issues. The first is the requirement for reliable connectivity. This is particularly important for rural patients and providers, for whom mobile technologies might be a primary means of communication. Continuing advances in mobile devices must address this issue.

The other is the fact that both healthcare professionals and consumers will need to use mobile devices for health management in the future. Providers have been slow to incorporate existing technologies in their practices, however, despite requirements and incentives for adoption. Consumers are even more likely to resist the use of complex, tedious, non-user-friendly applications, especially if they are concerned about privacy and possible identity compromise.

As much as possible, then, health-related apps must use intuitive and fun interfaces and natural-language processing if consumers will be expected to use them. Several companies are also working to improve both the regulatory compliance and security of their mobile devices. Public key infrastructure (PKI) might represent a promising approach to authenticating electronic data and transactions.

Other barriers to the evolution of mobile technology in healthcare will require government resolution. First, overregulation should be eased. As an example, faxes containing PHI are legal, but they are slow and unsecured. A text or email message is near-instantaneous and more secure, but these are not legal at present. Several secure universal messaging services now exist that can provide safe, secure, robust, real-time, and compliant healthcare interoperability.

Ideally, there would be one Web-based system representing a collaboration among healthcare providers and the client. The system's presentation layer would consist of a dashboard/portal customized for each type of user; a value-added layer that would include universal identity services, toolkits, apps, a secure virtual private network, and compliance information; and an "exchange" layer, in which patients and their caregivers can enter notes, test findings, etc.

Before such a system can be developed, however, the environment must be created to enable both science in healthcare IT as well as an ecosystem for innovation.

Keynote II: Risk: The Price of Innovation

Speaker: Joseph M. Smith, MD, PhD, FACC, Chief Medical Officer, Chief Science Officer, West Wireless Health Institute

"We are being regulated to death."

—Peter Tippett, MD, PhD

Healthcare costs keep Americans from rising as high as they could, socioeconomically. The amount the U.S. spent on healthcare doubled from 1999 to 2009 and is now 16% of the gross domestic product (GDP). At the same time, we are not getting good value for our money: the infant mortality rate remained unchanged during this interval, and the U.S. life expectancy at birth is below that of more than 30 other countries.

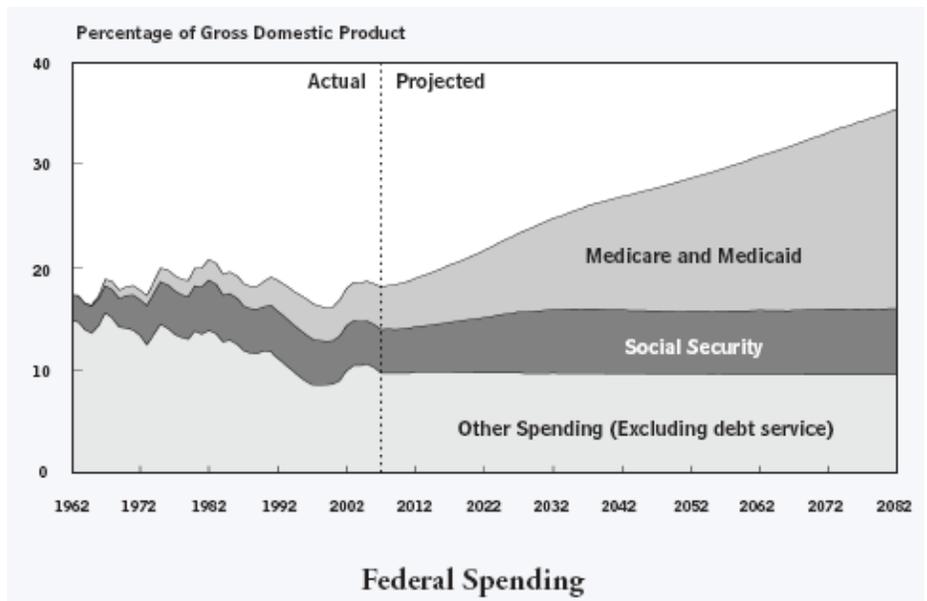
The chronic disease burden is heavy and growing in the U.S. Chronic diseases now account for 96% of Medicare spending, but the number of workers supporting each recipient has dropped from 7 in 1950 to 2.5 today. In addition, we lack the primary care infrastructure to support such a burden. The healthcare system is in crisis, and it will only get worse.

We must replace the current costly, inefficient model of "intermittent rescue" with coordinated, continuous, and cost-effective care. Care must become independent of infrastructure to provide the right treatment when needed at the patient's location, all at lower cost.

The technology to monitor automobiles continuously has been present for decades. Implementation of similar technology for people has lacked risk capital and a rational business model. Specific success factors to replace current healthcare structures with wireless technologies include cost reductions with demonstrations of improved clinical and economic outcomes.

Perhaps most important are the creation of transparent, timely, and rational regulation and reimbursement policies; safe harbors; and tort reform.

Innovation requires risk, but people often deal with risk irrationally. In many cases, sober analysis yields to emotional concerns. The "media enhancement" of adverse events also biases us against rational decision-making. This has important implications for innovation at the intersection of engineering and medicine.



We also show our irrationality in the risks we do tolerate. Examples include letting children sail around the world by themselves and letting teens drive, especially on weekends. At the same time, we pay dearly to reduce other risks. The cost per life saved by an airbag is \$1.8 million; Medicare would never consider that an approvable, cost-effective "therapy."

Another example of irrationality: Air travel dropped substantially in the year after the 9/11 attack, which resulted in an increase in highway mortality representing more than the number of people killed on 9/11. Another 9/11-related example is the creation and operations of the

Transportation Safety Administration, which do not reflect a rational analysis of risk.

The overemphasis on the *appearance* of safety often leads to excess regulation. As a result, the thriving medical device industry is moving out of the U.S. at the precise time that Americans need jobs. In contrast, the U.S. Food and Drug Administration (FDA) allows, with minimal regulation, the sale of cigarettes, cigars, and chewing tobacco. In other words, consumers are allowed to make choices about these drug-delivery devices, but not others, even if a device simply monitors their weight.

Innovation does not occur without risk, and the current healthcare system is in crisis. Americans are used to making highly personalized, contextual assessments of and decisions around risk. The liberation of information and the democratization and personalization of medicine might be at odds with federal paternalism and central planning. Flawless performance of devices and technologies is an aspiration, but it cannot be an expectation, even less so a regulatory requirement. If cigarette use can be left to the consumer, it seems reasonable that decisions about the use of innovative and imperfect technologies also might be left to the informed patient and physician.

Stakeholders in healthcare should recognize and employ strategies relevant to regulators about risk assessment. For example, regulators are far more likely to rate the risks of interrupting information flow as much higher than either the risk of lacking access to information or the potential benefits of the information.

Panel Discussion: Tech Companies Reaching the Consumer – Both Healthcare and Non-Healthcare Markets

Moderator: Devavrat “Debu” Purohit, MS, PhD, F.M. Kirby Research Fellow, Professor of Marketing, Professor of Business Administration, Duke University Fuqua School of Business

Panelists: Jeff Lee, Chief Executive Officer, Omniscience Mobile
Dwight N. McNeill, PhD, MPH, Global Leader, Business Analytics and Optimization, Healthcare Industry, IBM Corporation
Guy Rachmuth, PhD, President and Chief Executive Officer, HEALTHeME, Inc.

Overview

There are two kinds of innovators. The first are firms that are developing exciting, novel products, and the second are the consumers who are willing to try new things. We will need both for acceleration of the healthcare IT space. In this market, the technology far outpaces the implementation.

Discussion topics

- The missing piece in the adoption of healthcare IT is the patient. Healthcare has treated the customer (patient) poorly in the past because they are not, in fact, the customer (governments, employers, insurance companies). Consumer engagement coupled with advanced analytics and personalized apps will result in their buy-in.
- Technologies must reflect human nature to be used consistently and effectively. People want apps that will offer immediate value—such as improving sleep, energy, or weight loss—rather than holding out the possibility of some remote benefit, such as reducing the risk of a chronic disease.
- Recruitment strategies will need to include effective venues such as Facebook, Google AdWords, physicians, and employers. Also, no one technology will speak to all consumers. Some people are data-driven, but not all are. Most people will need conversion of data into meaningful, actionable knowledge, with the human factor (sustained relationship) included to remain engaged.
- The ideal situation would be that a technology would collect a person’s data (either automatically or manually), then summarize it and analyze it in meaningful ways to answer specific questions. Such analytics and customization are becoming more important as healthcare providers are providing less information. Other venues for information exchange are needed.
- From the provider standpoint, patient data should be summarized/analyzed via algorithms to create diagnostic and coaching tools not only for wellness and fitness but also for disease states. However, this capability would bring technology into regulated territory, thus increasing the complexity of development, marketing, and support.
- Technology should be used to make costs, and therefore value, transparent to both the providers and consumers of healthcare resources. In this way, everyone will be aware of the personal and societal outlays and how different providers compare within and between systems. At the moment, there is no immediate incentive to cut costs or unneeded services. Technology can be used to inform and improve decision-making.
- Passive monitoring, such as for pill counts, blood pressure, and gait tracking, can provide value and change behavior. Other apps can facilitate the evolution from awareness to mindfulness, such as the Withings scale. The goal is to have a “coach” present at all times, whether electronic or human.
- Creating a reimbursement model remains a huge issue. Unless people are in a capitated plan, there is no incentive or reimbursement for consumer use of healthcare IT. The Catch-22: Payers, regulators, and legislators will not address reimbursement until evidence emerges supporting use, but until reimbursement issues are addressed, physician-directed adoption of healthcare IT will not occur.

Presentation: Mobilizing Health Care: Providing Greater Access to Quality Care through Mobile Technologies

Speaker: Richard J. Migliori, MD, Chief Medical Officer, OptumHealth, Inc.; Chief Healthcare Officer, UnitedHealth Group Alliances

Overview

Healthcare reform has ushered in an exciting time, with the possibility of introducing access to 30 million more Americans. This opportunity also brings challenges, however. For expanded coverage to be sustained, systems must work efficiently and effectively and offer greater accessibility.

Discussion topics

- The existing shortage of primary care providers will become more acute with the expanded coverage mandated by the Patient Protection and Affordable Coverage Act (PPACA). For technology to assist in this regard, it must first solve meaningful problems related to quality, access, and affordability and then be adopted by individual users as part of their lifestyles (patients) and workflows (providers). Technology is the method, not the endpoint.
- Consumption occurs when people make decisions, which in turn are driven by the access to and interpretation of the most current evidence. Variations in data access and quality are reflected in the variations observed in surgical procedures, the use of and compliance with recommended therapies, and the use of ineffective/harmful treatments. Continuous engagement with high-quality data can reduce variations, improve compliance with recommended treatment, and reduce the use of unneeded and ineffective treatment. We could save \$100 billion per year just through prescriptions being filled as directed, thus preventing downstream complications.
- Technology enables operations at scale and can deepen analytic capabilities. For example, UnitedHealth Group serves 75 million people via relationships with 85% of America's health delivery capacity. Their claims database might be turned into an EHR, which could then be analyzed for trends, prioritization of care, and subtraction analyses against ideal care (errors of omission and commission), which in turn could be used in personal, tailored engagements with providers and patients to close the quality loop. Practices at centers of excellence can be identified and implemented at other centers, and the quality for episodes of care can be measured across all providers.
- Health coaching through consumer empowerment can provide support for symptoms, conditions, access to healthcare, and benefits/claims. When consumers have been offered such support, 25% have changed providers, 30% have decided not to have an initially recommend surgery, and 13% have chosen different treatment.
- We need to move from a "sick care" (reactive) model to a true healthcare (proactive) model. Health portals can improve health by delivering health management programs and tools in a scalable but personal way to consumers and providers. These should include the adoption of multichannel engagements, including mobile apps. On the patient side, it could provide personal information, action plans, and records of achievement. The mobile app could use geotags to identify/rank nearby providers, to whom patients could then send their EHR. Social media tie-ins could engage people through creating challenges, tracking progress, competing, collaborating, community support, and rewards.
- The ultimate goal is to keep people as healthy as they can be through mitigating the risk for preventable admissions, giving them the best information when they *do* need to access the healthcare system, and incorporating consumer and analytic tools into the system so that at the time of decisions, we can respond in informed way.

Panel Discussion: Consumer Benefits: How Wireless and IT Are Changing the Care Paradigm

Moderator: Gopal K. Chopra, MD, FRACS, MBA, Adjunct Associate Professor, Duke University Fuqua School of Business

Panelists: Craig Lipset, Head of Clinical Innovation, Worldwide Research & Development, Pfizer
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Nick Van Terheyden, MD, Chief Medical Information Officer, Nuance Communications, Inc.

David A. Watson, Chief Operating Officer, MedeAnalytics International

Overview

Cellphones and other mobile devices are the most common technologies used worldwide. Enabling them for healthcare purposes will require designing for the end user (both consumers and care providers), not for the engineering, so that users can solve problems and answer questions relevant to them.

Discussion topics

- Early smartphones relied excessively on using 15" apps (regular Web pages accessed via URL) on 3" screens. As a result, adoption for healthcare lagged because of the poor experience. The development of specific apps tailored to multiple mobile devices and multiple user bases remains critical.
- Expectations have been mismanaged with regard to the application of technologies. For example, speech-recognition technology has been promised as a transformative method since the 1960s, but it is only just beginning to have buy-in from consumers. Voice offers an attractive proposition because it is the universal communicator; any device that uses it will be more intuitive ("show me" instead of "hunt and click"). One way to implement speech-recognition technology might be to launch a free or cost-neutral app on smartphones, with the revenue model linked to the back end.
- Wireless technology has transformed the standard of care for inpatients—for example, from manual spot-checking of vital signs to continuous monitoring and data entry into the patient's EHR via wireless transmission. Such monitoring can allow patients to leave the critical care unit earlier than they might have, saving up to \$25,000/day. Future use cases might include the possibility of early discharge with remote monitoring at home, which might reduce or eliminate the need for daily nurse visits. Patients with chronic disease also might use continuous monitoring, but no reimbursement model exists for this case at present.
- In the future, patients might be able to supply data relevant to their EHR, but workflows must be created for both voice and typed inputs, with filters/screening/algorithms developed to sift data before forwarding critical information to providers. In addition, industries will need to cooperate to develop reliable, interoperable systems (portable medical devices vs. cellphones vs. hospital devices vs. EHRs, in addition to WiFi vs. cellular chipsets). If these hurdles can be overcome, IT can help transform both healthcare and clinical research, changing "subjects/patients" to "participants." Although patients might not care particularly about clinical trials, they do care very much about their diseases and solving problems relevant to their concerns.
- Technologies that will "win" are those that can optimize the interactions between providers and patients without creating extra burdens. For providers, this will mean that apps must carry reimbursement or save time; for consumers, this will mean providing ease of and motivation for use; for data, this will mean providing systemic integration.

Panel Discussion: Health IT and the Consumer

Moderator: Jeffrey D. Miller, MBA , Chief Executive Officer, North Carolina Health Information Exchange

Panelists: Nancy M. Green, Managing Principal, Healthcare Practice, Verizon Business – Global Services

Rahul Mahadevan, MA, MBA, Director, Electronic Health Records Services, Stanford Hospital & Clinics

Keval Mehta, Founder, Chief Executive Officer, Jaargon, Ltd.

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Gina Wilson, MS, Principal, System Strategies

Overview

Consumers have not truly engaged with healthcare IT because they have lacked motivation and options. However, the changing healthcare and reimbursement environments, which continue to shift costs to patients, will force people to take ownership of their care, health, and data. Developing relationships with consumers and providing value will be critical to engaging them in their own healthcare via IT.

Discussion topics

- The primary responder to health issues is the patient. The government, insurance companies, doctors, and employers obviously have a stake in outcomes, but the person most affected is the consumer. Their involvement with both IT and the healthcare system varies considerably according to education, socioeconomic status, geographic location, and infrastructure environment.
- Identification of market segments is critical, whether selling to third parties or directly to consumers, as is the creation of reimbursement models. Segments might include disabled or elderly persons, families with young children, and people with chronic mental or physical disorders, all of whom might use long-term apps. The general consumer market will include those who are cost-conscious, those already engaged with IT in their daily lives, and those who are interested in personalized medicine.
- Apps that solve problems or provide value have been the most successful. These include apps that speed registration and scheduling and those that, say, identify ingredients in food for subscribers. “Push” technologies also provide value. During the recent cantaloupe recall, news outlets did not report the situation until three people had died, but app subscribers knew about it 8 days earlier.
- The most popular Web sites and apps (Facebook, iTunes) offer “one-stop shopping.” The average American sees 19 physicians alone over a lifetime—they should not have to use a separate app for each one. In addition, the Meaningful Use provisions of PPACA mandate data sharing, so creation of a central health repository is inevitable. Privacy, security, and identity assurances will be critical in this regard.
- If consumers will depend on health information exchanges (HIEs) to be the central repository, they might be waiting until the healthcare industry is more consolidated. This phenomenon occurred with smartphones, which started with numerous operating systems (OS) but now use only iPhone OS, Android, BlackBerry, Palm, and Windows. Consumers who seek healthcare irregularly or in multiple locations, especially internationally, also might not perceive the value of healthcare technologies yet.
- Healthcare IT might look to the music industry, which required a third party (iTunes) to bring music online, via a simple interface, and monetize it. Apple also overcame the ownership, access, and rights issues, which remain unresolved for health data. Finally, Apple knew that people wanted easy access to music, but people are afraid of their health (deteriorating). Healthcare IT will need patient-friendly education about why people should be interested in their health, and should reframe use in terms of increasing access to healthcare—at home, by email, or over Skype, for example.

Panel Discussion: Providers & Payers: What Are Their Consumer Programs and Their Challenges?

Moderator: Kevin A. Schulman, MD, MBA, Professor of Medicine, DUMC; Gregory Mario and Jeremy Mario Professor of Business Administration and Director, Health Sector Management Program, Duke University Fuqua School of Business; Associate Director, DCRI

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Ronald E. Smith II, PharmD, Vice President, Strategic Development, Blue Cross and Blue Shield of North Carolina

Overview

Although the crisis in healthcare costs, the mobility of the population, the fragmentation of care, and increasingly complex regulations have been driving innovations in healthcare IT, implementation of such technology has lagged due to uncertainty in business and reimbursement models. Healthcare organizations must respond to disruptive innovations such as wireless technologies in new, flexible ways to improve quality and reduce costs.

Discussion topics

- Organizations vary in their approaches to internal innovation, according to their available resources, the cultural environment, the sector (academic, industry, government), and their mission. Some might invest substantially in new/streamlined internal systems, or focus on incorporating innovative technologies through acquisitions, or both.
- Several factors are common to organizations that successfully incorporate innovations. First is top-down buy-in regarding its importance—board members and senior management must formally support such efforts, both financially and in human resource terms, and foster a culture of innovation. Boards might need education about trends in industry, governance, and regulations, so they understand the need to innovate. Messages about innovation must be clear throughout the organization. Organizations must also embrace risk when needed and encourage diversity of thought for creative problem-solving.
- IT should be a strategic partner in innovation efforts, and more technology is not always better. Implementation science can help in this regard. An example is the Duke Evidence-based Practice Implementation Center (EPIC), a research, education, and support organization that helps strategic partners implement and monitor evidence-based practices in an effective, sustainable way.
- The structure of many organizations, especially academic centers, is silo-based. Multiple IT teams across multiple budget pools manage separate enterprise systems, with little collaboration and even less strategic planning. Building more horizontal, cross-organizational IT structures will reduce inefficiencies and costs, facilitate innovation, and facilitate strategic planning.
- Regulation is often used as an excuse not to innovate, given the complexity of Stark provisions, ICD-10 revisions, and individual Medicaid systems, to name a few examples. It can be effective to formalize compliance structures and deal with issues directly by laying out cases for innovation to regulators, particularly those that will improve outcomes and reduce costs, such as remote care and methods of contact other than clinic visits.