Healthcare Innovation
N E W S

Thought Leaders' Corner

Q. Does Healthcare Rely too Much on Technology and Ignore the Human Element?

Combining technology and the human element in patient care is difficult. Demand for new technologies increases as the public rapidly learns about them. Who has not heard of Da Vinci Robotic surgery? Who would not want a 3D mammogram compared to a traditional one? Healthcare providers constantly learn about new developments and patient care breakthroughs and must filter the information and understand the real use for these technological advances. Combining technology with less contact time per patient visit sets the stage for an ever-decreasing human element in patient care.

Spending extra minutes with a patient might allow me to determine that his back pain stems from a new backpack he uses for work. Instead of ordering an MRI and orthopedic consultation, we discuss a different way to carry his work documents. Any skill not practiced is lost; our profession is losing the ability to introduce the human element into patient care. The results are troubling. Will a patient share that his real fear is a cancer diagnosis because his father died of the disease at the same age? Will I know how to alleviate my patient's worries while ensuring appropriate screening examinations are performed? If my patient mostly sees my back as I enter information into an electronic medical record, will she fill her prescriptions as I instruct, or will I know that she just lost her job and might not have enough money to go to a pharmacy?

The human element makes for better care and creates more affordable care.

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No. Technological innovations in wearable biosensors, low-cost sequencing and detection of genomic alterations and analyses of large data sets will continue to be an integral part of providing better healthcare. However, technology alone will not be a substitute for the compassion clinicians and researchers have for patients, but integrating innovative technologies can help reduce cost, enhance accuracy and provide more comprehensive data analysis. It will lead to more efficient provision of healthcare services and assist in the discovery of important new therapies, while providing more opportunity for clinicians and caregivers to focus on patient communication and gaining a meaningful understanding of patient needs.

From a research perspective, precision medicine, which has been accelerated by technology, has led to disease insights that are yielding exciting new discoveries. It is a powerful approach to research that can change treatment paradigms. These advances are particularly encouraging for those with rare diseases, for which there are few treatment options, and in providing more targeted treatments for illnesses affecting large segments of the population.

The potential for digital health and wearable biosensors in improving all of our lives is only beginning to be explored. If the data from such devices can be appropriately collected, assembled and analyzed, they will provide important insights for caregivers and researchers while empowering patients like never before.

Looking to the future of healthcare technology, we must embrace the promise of better patient care, experience and outcomes. This new world need not come at the expense of human touch.

Tassos Gianakakos
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Thought Leaders' Corner

The short answer is yes. Technology in healthcare has often intruded in the relationships that are so important between doctors and patients. Technology in healthcare must fade into the background and support interactions and improve the quality of care, not just the mechanics of the system. This will help amplify the doctor/patient relationship.

How does technology better incorporate the human element? Designers need to create a less intrusive experience. For example, electronic health records (EHRs) are widely used in hospitals but tend to focus on documenting care and administration. They are an ideal example of a tool developed to work within the system but not to assist people working in that system. Personalization is also key in understanding what is driving people's needs to get care. Instead of having a one-size-fits all approach, industry leaders need to focus on the journey so that technology can help individuals achieve their health goals. We can use technology to tend to the needs of individuals and not force them to attend to the needs of technology.

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Technological advancements in the healthcare industry have largely revolutionized the way patient care is delivered and in some ways, overshadowed the human element.

We live in an age where many operations are performed by robots. Some people even rely on the Internet to diagnose their own ailments in lieu of seeing a doctor. Within Adventist Health System, we utilize state-of-the-art medical technology when caring for patients. This trend, at least on the surface, doesn't seem to be slowing down. However, it begs the question: Will healthcare become too reliant on technology and ignore the human element?

The simple answer, at least in my opinion, is no. Despite the benefits of sophisticated machinery and computerized equipment, person-to-person interaction is at the core of what we do in healthcare. Humans are compassionate and loving and can offer the emotional support needed to connect with patients in their most vulnerable state, which is why I wouldn't be surprised to see an increased demand from patients for more, not less human involvement.

Today's consumer will not allow healthcare to become overly dependent on technology. From a monetary perspective, exercising sound financial stewardship of the precious resources that enable the delivery of quality healthcare will limit our dependence to a large degree.

Furthermore, our ability to utilize technology requires human involvement. People have to program and service the equipment and in many cases operate it. The accuracy of diagnostics depends on humans and our ability to interpret information and make recommendations. The human element cannot be ignored. Because at the end of the day, healthcare begins and ends with people.

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Thought Leaders' Corner

Finding the right balance between technology and the human element is an ongoing challenge in healthcare. One area where this is particularly challenging, and where there has been much discussion, involves the use of EHRs at the point of care. Some point to the potential risk this can have on disrupting the physician patient relationship and the lack of perceived value to clinicians and patients due to the inability to adequately leverage EHR data.

However, in our opinion, there is an enormous opportunity through the use of software that takes into account user-centered design and advanced data analytics to actually find the right balance. Intuitive EHRs that understand clinician workflow can actually minimize a distraction in a face-to-face, clinician/patient interaction, and potentially enhance patient experience by allowing the integration of patient-reported outcomes and delivery of relevant educational information to patients. And, technology that can extract, aggregate and use EHR data to understand outcomes and deliver real-time feedback to a clinician at the point of care has the opportunity to create a true learning health system. The overarching issue is not whether or not we rely too much on technology, but how we can move to leverage it in the right way.

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Tapping Into Young Minds to Drive Technology, Accelerating Health Equity, Improving Health Outcomes

by Garth Graham, M.D., MPH

Technology has the potential to be a powerful equalizer when it comes to bridging the health divide. As many as 91% of Americans own cell phones, 64% of which are smartphones. In addition, 84% of low-income adults have access to a mobile phone, and one in three uses his/her phone to look up health information.[1]

These statistics show that individuals are carrying a potentially powerful health ally in the palm of their hands. This is especially important in thinking about combating health disparities that plague members of underserved communities. Heart disease and diabetes are two of the top 10 causes of death in African-Americans,[2] and diabetes risk is 1.7 times higher among Hispanics compared to non-Hispanic whites.[3]

Up to 80,000 lives[4] could be saved yearly by eliminating population-level, health disparities—making health outcomes more equal across various populations. Mobile technology could empower many individuals from these populations to take charge of their preventive health.

> **"Heart disease and diabetes are two of the top 10 causes of death in African-Americans, and diabetes risk is 1.7 times higher among Hispanics compared to non-Hispanic whites."**

Plugging Into the Brightest Minds Early

The practice of medicine is changing substantially as national policies drive the shift from high-volume to high-value care. In addition, the introduction of digital health technologies centered on smartphones and connected devices, and their rapid adoption by consumers, present significant opportunities for healthcare professionals interested in a career that harnesses technology to inform clinical care at both the patient level and the more macro level across institutions and populations most at risk for chronic disease. However, many healthcare providers (physicians, nurses and administrators) are not necessarily well equipped to take full advantage of this opportunity to leverage technology-enabled solutions in order to improve the healthcare experience and health outcomes.

The digital-native generation that hasn't lived in a world before the Internet and smart phones might help drive innovation and harness the tools of technology to answer what's needed most to close the health divide for both patients and practitioners. Many young trainees coming into a career in healthcare are more comfortable with existing technology and are able to adapt quickly to ever-changing and evolving digital advances. By leveraging, growing and continuing to build upon the skill set of the next generation of healthcare providers, the future of digital health has the potential to expand the way the industry could track clinical care at the patient and population levels in a multitude of ways.

Within the health sector, there is a full spectrum of digital tools that can be used across the care continuum, from measurement to service access to disease management. It is up to current and future leaders to utilize the data and aggregate results to make an impact on the health of a population. Real-world, daily occurrences, especially in academic or teaching settings, help fuel innovation that can be tested and applied on a broader level. *(continued on page 4)*

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Here are some of the available digital tools:

Measurement	Diagnostic	Treatment	Global
• Sensor sampling in real time • Integration with health data	• Diagnostics • Portable imaging • Biomarker sensing • Clinical decision making	• Dissemination of health information • Chronic disease management • Service access • Remote treatment • Disease surveillance • Prevention and wellness interventions • Remote clinical trials	• Service access • Remote treatment • Dissemination of health information • Disease surveillance • Medication tracking and safety • Disaster support/care • Prevention and wellness interventions

Consumer technology that provides opportunities for engagement bombards today's environment. These opportunities are often thought of as social, but increasingly there are ways for technology to make an impact on people's health and wellness. While there are still challenges to engaging the population through technology to improve health outcomes and enhance health education, there is headway in this area through mobile device use and programs that can be tracked by individuals on their personal devices. Through blending data in the public health and clinical care realms, there is the potential to generate a "learning health system," one in which it is possible to integrate data with public health and clinical care, meet patients and practitioners where they are and ultimately impact the health of a population.

The intersection of youth and innovation is at the center of two fellowship programs aimed at bridging the technology divide. The proposed one-year Fellowship in Healthcare Innovation at the Massachusetts General Hospital Healthcare Trans-formation Lab aims to provide an action-learning experience, along with an introduction to a wide variety of healthcare topics.

Objectives of this fellowship include:

- Provide introduction to topic areas, such as healthcare policy, quality and safety, process improvement, digital health and human-centered design.
- Provide hands-on experience in designing, leading and implementing an innovation project (action-learning experience).
- Develop next-generation healthcare leaders with the skills and passion to drive sustainable healthcare improvements.

Through this program, fellows may also receive mentorship from the local academic and entrepreneurial community through affiliations with Harvard Business School, Massachusetts Institute of Technology, Hacking Medicine Institute, healthcare accelerators and venture capital firms, depending on the specific area of focus chosen by each innovation fellow.

The Health Equity Fellowship at Yale University supports student-developed solutions to address health challenges that affect underserved communities. This fellowship will award students who identify impactful and scalable technological and digital solutions to issues plaguing low-income communities. It also will provide training in areas of social entrepreneurship for the underserved in an effort to better engage local youth and develop life-long skills in design.

In addition, InnovateHealthYale, a social entrepreneur program, will work in partnership with other Yale and community groups to develop a 10-week program for a select group of disadvantaged students (high school juniors and seniors) in New Haven, Conn. These students will identify a challenge in the health and education sectors in their communities and develop a proposal to create a product, program, app or organization to address the challenge. The program will combine didactic instruction, experiential learning and case studies with the outcome being a final, in-person pitch by participants. Teams will consist of a New Haven high school student, two to three Yale students and students who are working on their own social enterprises.

The Future of Innovation in Healthcare

Through these programs and others like it, it is essential for the health field to focus on supporting not only the people that develop the technology, but also, more importantly, the people who are most impacted by it—putting innovation into vision in order to transform lives. Physicians face a number of challenges when it comes to adopting mHealth tools and services, often because these devices tend to be designed for consumers rather than for clinical use. Empowering physicians to incorporate mobile health into their patient care experiences and workflows through treatment, care management, information gathering, diagnosis and prevention plans is a key to success.

A Game Changer for mHealth

Supporting this current generation of students and future healthcare practitioners that are increasingly comfortable with technology helps encourage the integration of social determinants of health into clinical and population health-based care. Tapping into the brightest minds in healthcare during the early stages of their education hopefully will fuel innovation to address the greatest population health needs and help sow the seeds of change for adopting innovation and technology to combat health inequity.

[1] Smith A. "U.S. Smartphone Use in 2015." Pew Research Center. Apr. 1, 2015.
[2] "National Diabetes Fact Sheet, 2011." Centers for Disease Control and Prevention. 2011.
[3] "Diabetes and Hispanic Americans." U.S. Department of Health and Human Services Office of Minority Health. Accessed May 5, 2016.
[4] "Disparities in Health and Health Care: Five Key Questions and Answers." Kaiser Family Foundation. Nov. 30, 2012.

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