

# HealthData Management



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COVER PHOTOGRAPH BY ERIN PATRICE O'BRIEN

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# editor's NOTE

## Why we honor women in HIT

TWO TRENDS ARE COMING TOGETHER that pose both challenge and promise for the healthcare information technology industry.

One of those trends is that, in recent years, it's been widely recognized that the nation needs to do a better job of encouraging women to enter the fields of science, technology, engineering and mathematics—known as the STEM professions.

There's growing evidence that there are relatively few women participating in these fields, and research points to a variety of factors—stereotypes, gender bias, and a generally unwelcoming climate of science and engineering departments in colleges and universities.

Now here's the second trend: The demand for technology workers is especially acute in healthcare, among provider organizations as well as the vendors that serve them, according to research from Advisory Board. There's a critical need for personnel, particularly as opportunities mushroom in emerging disciplines such as security, analytics, population health management and precision medicine. It's likely that tens of thousands of new IT workers will be needed within healthcare in the next decade.

It would seem to be a natural fit, then, to encourage women to consider careers in health IT. One way to do so is to highlight women in HIT who are examples of what can be achieved. For example, Sue Schade has become a consistent voice in the industry for increasing the role of women in HIT; Carla Smith of HIMSS is using her position of influence to highlight research demonstrating pay and opportunity inequalities; and Mandi Bishop has become a widely recognized voice for HIT opportunities

through her writings and social media exposure.

Many inequalities in health IT must be fixed to attract more women to the field. Results from past HIMSS surveys, which were compiled and released last year, show that salary inequality exists, and that can



be a barrier to bright females who have many other career options. Other HIMSS data indicates a preponderance of men in top HIT positions. But we hope these inequities can be corrected over time, and that the personalities in this issue, which we highlight starting on Page 16, can

nudge future leaders to make career contributions to the HIT industry.

We also look at the efforts by urgent care centers to embrace technology, specifically telemedicine. More of these chains are turning to the technology to expand their reach and meet demands from consumers for virtual care, writes Linda Perry in an article starting on Page 38.

Medical device security also has been a challenge for providers, who have recognized the immensity of the problem. Now, they're starting to take steps to secure devices and better protect their networks, reports News Editor Joseph Goedert on Page 42.

And on Page 44, Marianne Matthews explores the potential for machine learning to improve diagnostic accuracy in radiology departments, which are now under pressure to prove their value.

*Fred Bazzoli*

Fred Bazzoli  
Editor

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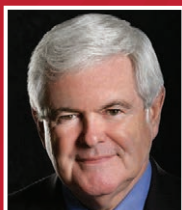
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# NEWSLINE



ONC

## Rucker Takes Helm at ONC

*HIT groups laud his vast experience and say he's well-prepared to head HIT office.*

**P**rovider group reaction was strongly supportive of the selection of Donald Rucker, MD, to lead the Office of the National Coordinator for Health Information Technology. He was named to the post at the end of March.

Rucker has a solid background in leading IT efforts, playing leadership roles in information technology companies, as well as providing care as a clinician at hospitals. He has practiced emergency medicine at Kaiser in California; Beth Israel Deaconess Medical Center in Boston, where he was the first full-time emergency department attending physician; and at the University of Pennsylvania's Penn Presbyterian and Pennsylvania Hospitals. "Don and I have been colleagues for 20 years," says John Halamka, CIO at Boston's Beth Israel Deaconess Medical Center. "He's thoughtful, humble and understands the real-world challenges we face every day ... a great choice" for the position.

Rucker comes to the ONC post from Premise Health, where he has served as chief medical officer and a consultant since Septem-

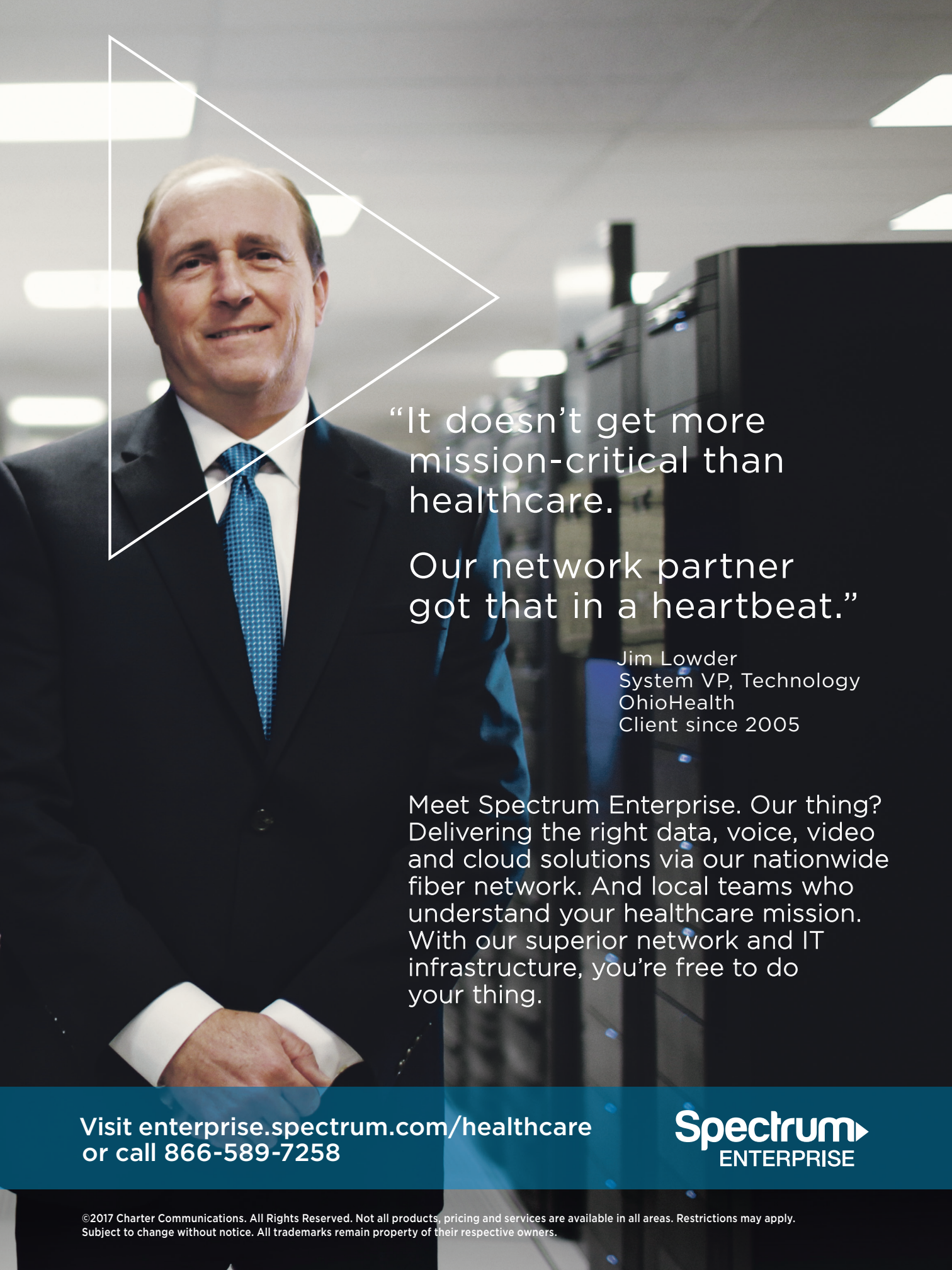
ber 2015. Premise Health is a worksite health and patient engagement company.

Previously, Rucker had a 13-year stint at Siemens Healthcare USA, where he rose to the role of vice president and chief medical officer. John Glaser, currently senior vice president for population health at Cerner, was CEO at Siemens Health Services during Rucker's tenure there, and lauded his choice for the ONC role. "Don has a diverse and extensive career in healthcare information technology," Glaser says. "He has deep knowledge of the care practice, technology and policy challenges we face as we advance the ability of the technology to improve health."

The College of Healthcare Information Management Executives and other healthcare IT industry groups also have been quick to praise Rucker's selection. "Rucker has a provider background as well; understanding health IT from both the vendor and provider perspective should serve him well as head of ONC," says Matthew Weinstock, director of communications at CHIME.

—Fred Bazzoli

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## EHRs

# Med Students to Get EHR Prep on New Training Platform

## HL7 Publishes Release 3 of FHIR

Health Level 7 International has published Release 3 of its Fast Healthcare Interoperability Resources Standard for Trial Use (STU), moving it closer to a normative version of FHIR.

According to HL7, FHIR STU 3 is the “culmination of 18 months of extensive work to incorporate changes and enhancement requests received from implementation partners across the world” including the Argonaut Project, an industry-wide effort to accelerate the development and adoption of the emerging standards framework. Along with the FHIR STU 3, HL7 has published a US Core Implementation Guide, developed in association with the ONC for Health IT.

THE AMERICAN MEDICAL ASSOCIATION and the Regenstrief Institute on April 19 launched a new training platform aimed at ensuring that medical students get real-world experience using electronic health records. Under the AMA’s Accelerating Change in Medical Education initiative, Indiana University School of Medicine received a \$1 million grant to work with the Regenstrief Institute on developing the platform as a way to incorporate EHR training into its curriculum so it could be implemented by other medical schools.

“As part of the AMA’s ongoing efforts to create the medical school of the future, we are announcing the newly

enhanced Regenstrief EHR Clinical Learning Platform,” said AMA Vice President for Medical Education Susan Skochelak, MD. “Our medical schools are very good at preparing students for the basic and clinical sciences that are essential to providing care to our patients. However, many residents and young physicians are coming out of medical school with gaps in their ability to practice in the modern health system.” Skochelak contends that medical education has “not kept pace with the many ways that healthcare has evolved over recent decades.” She notes that “one clear need we have identified is the fact that students are frequently en-

tering residency training without the ability to effectively and efficiently work with EHRs—even though they are one of the primary tools physicians use in everyday practice.”

Blaine Takesue, MD, Regenstrief research scientist and assistant professor of clinical medicine at Indiana University School of Medicine, says the “first-of-its kind” platform uses real patient data, enabling students to “virtually care for patients with multiple, complex health conditions by navigating records, documenting encounters and placing orders within an application similar to the EHRs they will be using in their practices.”

—Greg Slabodkin

## INTEROPERABILITY

# Center Opens to Tackle Interoperability Woes in Healthcare

NASHVILLE IS HOME TO A NEW 16,000-square-foot Center for Medical Interoperability that will be focused on simplifying and advancing health data sharing across technologies and systems. The center is a membership-based organization that includes what is described as the first-of-its-kind testing and certification laboratory for devices and systems, focused on finding solutions to healthcare’s daunting interoperability challenges. Several of the center’s members are based or headquartered in Nashville, including Community Health Systems, HCA Healthcare and Vanderbilt University. “If you walk into

any hospital, they all struggle with getting their devices to work together, getting the devices to work with the EHRs and getting the patient information moving to wherever it needs to go,” says Kerry McDermott, vice president of public policy and communications at the Center for Medical Interoperability. The initial focus of the center will be “inside the hospital” in acute care settings such as the ICU, where patients are “surrounded by dozens of medical devices—each of which knows something valuable about the patient, but we don’t have a streamlined way to aggregate all that data to make it useful for clinicians who need to make

real-time important treatment decisions,” according to McDermott.

The center’s 501(c)(3) cooperative research and development lab, founded with \$10 million in initial funding from the Gary and Mary West Foundation, will be used to develop, test and certify devices and software that meet its goal of developing “vendor-neutral blueprints that enable interoperability within health systems” and support “real-time one-to-many communication, two-way data exchange, plug-and-play integration of devices and systems, the use of standards and the highest level of security.”

—G.S.



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## WIRELESS SENSORS

# Wearable Tech Enables Hospital to Deliver Care at Home

## HHS: 1,800 Breaches Since 2009

Nearly 1,800 large data breaches involving patient information have occurred since 2009, according to an analysis of publicly available data from the Department of Health and Human Services. Researchers examined HHS data for the period from Oct. 21, 2009, through Dec. 31, 2016. What they found is that providers reported more than 1,200 of the reported breaches, while business associates, health plans and healthcare clearinghouses reported the remaining breaches. In addition, 257 breaches during that period were reported by 216 hospitals, with 33 of them suffering more than one breach.

PHYSICIANS IN THE EMERGENCY DEPARTMENT at Brigham and Women's Hospital in Boston are sending some patients back home with medical and technology support in a new "home hospital" program.

Through the program, any necessary medications and equipment go home with the patient, along with a physician and nurse, for at least several hours a day for as long as needed. The clinicians set up everything needed for home treatment and make sure the patient's condition is improving.

Patients favor the approach because they're in familiar surroundings—they get to sleep in their own

beds, rather than share a hospital room with another patient, and get to eat their own food.

Patients in the home hospital program are being continually monitored by the hospital through a large wearable badge affixed to their skin. Called VitalPatch, the technology collects vital signs such as heart rate, respiratory rate, skin temperature, telemetry and how they are sleeping, walking or if they fall.

The device is a product of VitalConnect. It is an adhesive patch with an integrated sensor module that uses electrodes to detect heart rate, a thermistor to detect skin temperature and an accelerometer to detect

motion, among other capabilities.

The home hospital pilot program was launched in late 2016 and will be expanded in a relaunch this summer, says David Levine, MD, a general internist and investigator focusing on digital health and connected care initiatives. In a pilot program, Brigham and Women's Hospital learned how to integrate technology.

Now, the program will grow to support patient-physician video visits along with the addition of community health workers and a handyman for construction of any needed support services, such as handrails or ramps.

—Joseph Goedert

## WIRELESS SENSORS

# Portable Sweat Sensor Able to Diagnose Cystic Fibrosis

RESEARCHERS AT THE STANFORD University School of Medicine, in collaboration with the University of California-Berkeley, have developed a wearable sweat sensor that can diagnose cystic fibrosis, a genetic chronic disease that affects the lungs and digestive system.

Sweat contains valuable information, according to Sam Emaminejad, a former Stanford postdoctoral scholar who is now an assistant professor of electrical engineering at UCLA. Sodium and chloride levels in sweat are diagnostic markers for cystic fibrosis, which causes mucus to build up in the lungs, pancreas and other organs, he says.

"Sweat is a very rich source of information that includes glucose, lactate, sodium and potassium ions," explains Emaminejad. But traditional methods for diagnosing cystic fibrosis require that patients visit a specialized center and sit still while electrodes stimulate sweat glands in their skin.

Emaminejad says the research team's wearable system of flexible sensors and microprocessors is more accessible and does not require patients to sit still for a long time while sweat is gathered in collectors. The portable device, which adheres to the skin, stimulates the sweat glands and then detects the presence of dif-

ferent molecules and ions based on their electrical signals.

The sensor measures the molecular content of the sweat and electronically transmits the data by way of a Bluetooth-enabled cellphone to a cloud-based server for analysis. Work on the device at Stanford University was supported by a National Institutes of Health grant, while work at UC-Berkeley was supported by the National Science Foundation.

But cystic fibrosis is not the only use for the sensor. Emaminejad and his colleagues have also measured glucose levels in sweat, so the device potentially could be used to monitor pre-diabetes and diabetes. —J.G.

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# WASHINGTON

## report

### HITRUST Asks Help of Agencies

THE VALUE OF cyber threat information disseminated by the government can vary dramatically, said Daniel Nutkis, CEO of stakeholder security collaborative HITRUST, in testimony before the House Homeland Security Committee in April. Technical and operational issues surfaced when industry initially started sharing threat data via DHS' Automated Indicator Sharing program (AIS). "They have since been addressed, but we would encourage greater engagement by DHS with AIS participants to ensure alignment with ongoing and future requirements," Nutkis testified. That said, the work of DHS is benefiting the health-care industry, he asserted.



## Decision to Replace VistA Looms

**D**avid Shulkin, MD, the new Secretary of Veterans Affairs, would like to see his agency's information technology needs met by commercial-off-the-shelf software. However, whether that transformation will result in the VA replacing its legacy electronic health record system with a commercial EHR is a decision that Shulkin needs more time to consider. During a House Veteran Affairs Committee hearing in April, Shulkin told lawmakers that he's come to the conclusion that the VA internally "building its own software products and doing its own software development" is not the path forward for the agency. While Shulkin did not mention the VA's decades-old Veterans Health Information Systems and Technology Architecture (VistA) by name, he seemed to hint that the agency would be replacing its legacy EHR with a commercial system.

"The Department of Veterans Affairs is seeking to move to commercial solutions to the greatest extent possible," according to a VA statement in response to a query from *Health Data Management*. "As mentioned in public statements, [Secretary of Veterans Affairs] is committed to a decision on (commercial software) vs. VistA upgrade by July 1, 2017. The time leading up to July will be required to do a full assessment of the options in the context of the Digital Health Platform and work that is still required to make an informed decision."

Shulkin has wasted no time in trying to establish a "change in direction" at the agency when it comes to IT.

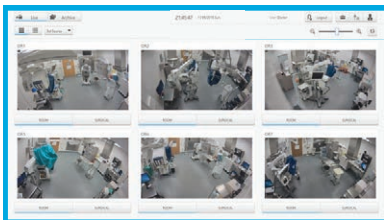
The VA is currently finalizing plans for how to implement a cloud-based Digital Health Platform (DHP), designed to integrate veteran data from agency, military and commercial EHRs—as well as apps, devices and wearables—so that the information is available to providers in real time. As such, DHP is envisioned as the future path for providing next-generation healthcare to millions of the country's veterans.

—Greg Slabodkin

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## PUBLIC HEALTH

### CMS Shares Data to Help with MU Projects

THE CENTERS FOR MEDICARE AND MEDICAID Services has developed a centralized repository for public health, clinical data and specialized registry electronic reporting options to help eligible hospitals and professionals comply with Stage 2 meaningful use requirements. The repository has been anticipated for almost five years. In the agency's final rule for Stage 2 of meaningful use, which was released September 2012, CMS said it would create such a centralized repository. And, in a May 2014 notice, the agency indicated that the database would serve as the "definitive information source" for determining public health agency and registry readiness to receive electronic data associated with MU objectives. Now, the agency has fulfilled its promise to make the information publicly available on its website.

However, according to CMS, the information contained in the centralized repository—collected in September and October 2016—is "not the authoritative source" of all reporting options currently available. In addition, the agency notes that "participation in the repository by public health agencies, clinical data registries and specialized registries is voluntary."

In 2014, the American Hospital Association had

urged CMS to promptly create its website to provide a centralized repository on public health readiness to electronically receive the data hospitals must submit under the meaningful use program.

By establishing a single central repository of information and eliminating multiple individual inquiries to multiple public health agencies and registries, AHA contends that CMS has greatly reduced the burden on providers to acquire accurate public health readiness information.

"This long-awaited tool will help hospitals and physicians understand how ready public health agencies are to receive public health reporting data electronically," says Marie Watteau, AHA's vice president of media relations and digital media. "Public health reporting is a meaningful use requirement, but agencies across the country have varying abilities to accept the data."

To satisfy Stage 2 meaningful use requirements under the Medicare and Medicaid Electronic Health Record Incentive Programs, hospitals must determine the readiness of local public health agencies and registries to receive electronic submissions of public health data, and send data electronically to those agencies and registries that are ready.

—G.S.

## Vendor Adds 4 Years of Fed Claims

FAIR Health, which operates the largest repository holding private health care and dental claims, totaling some 23 billion records, now is adding four recent years of Medicare claims data to its holdings. Last year, CMS designated FAIR Health as a qualified entity to receive Medicare data. Now, the company is one of four vendors certified by CMS to receive claims for Medicare Parts A, B and D. FAIR Health has received all claims for Parts A and B services nationwide from January 2013 through September 2016, as well as all Part D claims from 2013 through 2015. FAIR Health holds private claims dating to 2002.

## VA

### Bill Would Allow Use of Telehealth for Vets

A BILL THAT SEEKS TO REMOVE CURRENT restrictions by allowing VA clinicians to treat veterans via telehealth, regardless of location, is gaining momentum in Congress.

Under current law, VA physicians can only waive state licensing requirements and provide telehealth treatment across state lines if both the veteran and the doctor are located in a federally owned facility. However, the Veterans E-Health & Telemedicine Support (VETS) Act of 2017 removes these barriers and would allow VA health professionals to practice telehealth across state lines, as long as they are qualified and practice within the scope of their authorized federal duties.

In addition, under provisions of the VETS Act, veterans would no longer be required to travel to a VA facility and instead could receive telemedicine treatment from any location, including their home or a community center.

The bill was introduced in late April in the House of

Representatives by Reps. Julia Brownley (D-Calif.) and Glenn Thompson (R-Penn.). A companion bill was introduced in the Senate by Sens. Joni Ernst (R-Iowa) and Mazie Hirono (D-Hawaii).

"The VA has seen tremendous growth and interest in telehealth, and we should continue to find new ways to connect veterans with the providers that they need, no matter their physical location," said Brownley in a written statement. "The VETS Act will empower veterans with more options and greater access to the care that they have earned and deserve."

The proposed legislation has received support from industry groups, including the American Telemedicine Association and Health IT Now, an HIT advocacy group.

"The VETS Act takes commonsense steps to removing artificial barriers standing in the way of veterans' access to healthcare," said Joel White, executive director of Health IT Now.

—G.S.

## IT SAFETY

### Health IT Safety Guides Updated

THE OFFICE OF THE NATIONAL COORDINATOR FOR Health Information Technology has released updated guides to help providers assess the safety and usability of their respective electronic health record systems. First published in January 2014, the ONC Safety Assurance Factors for EHR Resilience (SAFER) guides are voluntary provider self-assessments that take the form of vulnerability checklists as well as evidence-based recommendations and best practices for how to safely use health IT.

Recommended best practices in the SAFER guides help organizations know what to do to optimize the safety and safe use of their EHRs. Specifically, the guides address nine areas—high-priority practices, organizational responsibilities, contingency planning, system configuration, system interfaces, patient identification, computerized provider order entry with

decision support, test results reporting and follow-up, and clinician communication. Each guide contains 10 to 25 recommended practices that can be assessed as fully implemented, partially implemented or not implemented.

"These checklists allow you to work through a really simple format for asking yourself questions about your system as it exists right now," says Rebecca Freeman, ONC's chief nursing officer. "It gives you the chance to systematically identify gaps or hotspots that may need a little attention."

Key updates to the SAFER guides include The Test Results and Follow-up Reporting Guide, which recommends practices to optimize the safety and safe use of the EHR; and The Contingency Planning Guide, which identifies recommended safety practices associated with planned or unplanned EHR unavailability.

—Joseph Goedert

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# MOST POWERFUL WOMEN IN HEALTHCARE IT

**M**any of the Most Powerful Women in Healthcare IT took a wide variety of paths to their current positions of influence within the industry.

For example, Theresa Meadows was a nurse who became involved in selecting an electronic health record at her hospital, then became steeped in the knowledge of how to use it. Soon, she was moving from the clinical world to work exclusively in information technology.

Now, as senior vice president and CIO at Cook Children's Health Care System, she's making an impact on care delivery at her organization, implementing technology that's improving care and patient safety, and assisting front-line clinicians in the process.

The same can be said of Carol Steltenkamp, MD, chief medical information officer for University of Kentucky HealthCare. She started her career in health IT rather innocently. After having practiced pediatrics in a private practice setting, she returned to academic medicine at the University of Kentucky. She went back to school and received her MBA, and it was during those studies that she was exposed to information technology and her passion for its use in healthcare was ignited.

As the first CMIO at the University of Kentucky, she began with the early selection and ultimately the implementation of an electronic health record across the clinical

enterprise at her organization. Steltenkamp then moved beyond her organization, becoming a leader for HIT in the Commonwealth of Kentucky. She was named chair of the Kentucky eHealth Board, a position she still holds today.

Many of the honorees named as the Most Powerful Women in Healthcare IT share a similar story. The vast majority are making a difference beyond their own organizations by contributing to the HIT industry more broadly, by offering their time, knowledge, leadership and overall expertise. Many share an intense interest in mentoring other women to ascend to leadership positions in HIT.

*Health Data Management's* class of 2017 Most Powerful Women in Healthcare IT is its second such annual initiative. It aims to encourage opportunities for women in healthcare IT and honor high-performing executives. *HDM* identified 75 women—hospital executives, thought leaders and HIT vendor executives—who have made significant contributions to the industry. These women will be honored at a May event in Boston.

*HDM* used a nomination process to seek industry participation, requesting those in the field to provide detailed information on possible candidates; editors then reviewed candidate qualifications and also collaborated to nominate those in the industry who merit inclusion in the list; then, they deliberated extensively before making their selections.



**Mary Alice Annecharico**

**Title:** SVP/CIO

**Organization:** Henry Ford Health System

**Years in HIT:** 30

**Previous Positions:** Executive Director of Information Systems at University of Pennsylvania Medical School; Senior Vice President and CIO at University Hospitals

**Significant Achievements:** Annecharico led the implementation of the Epic electronic health record for the acute and post-acute environments. The organization is realizing positive return on investments and enhanced integration.

**Impact on HIT:** Annecharico is a HIMSS Fellow and past editor of the *Journal of Health Information Management*; she is also a current member of the KLAS Advisory Board.



**Pamela Arora**

**Title:** SVP/CIO

**Organization:** Children's Health

**Years in HIT:** 14

**Previous Positions:** Senior Vice President and CIO, UMass Memorial Health Care; Founder and Interim CEO, Liquidagents Healthcare; Various positions and CIO for Perot Systems Corp.; Team Leader, Electronic Data Systems.

**Significant Achievements:** Arora has helped to guide her organization to a leading role among children's hospitals and within the state of Texas. The facility was the first in the state to achieve HIMSS Stage 7 designation on the EMRAM scale. The facility was named a HIMSS Enterprise Davies Award winner.

**Impact on HIT:** She currently serves on the HITRUST board and AAMI board; she recently served on CHIME's board of directors and the CHIME Education Foundation board.



**Kimberly Lynn Baker**

**Title:** Director, NYP Analytics

**Organization:** NewYork-Presbyterian Hospital

**Years in HIT:** 10

**Previous Positions:** Manager, Data Analytics, NewYork-Presbyterian; Project Lead, Data Analytics, NewYork-Presbyterian; Consultant, Health and Public Service, Revenue Cycle Management Practice, Accenture, New York; Grant and Administrative Coordinator, Bipolar Clinic and Research Program, Massachusetts General Hospital

**Significant Achievements:** Baker worked with nursing to create a dashboard that predicts patient falls, catheter-associated urinary tract infections, central line infections and other safety issues.

**Impact on HIT:** Baker works to improve processes and information delivered to people on the front lines of patient care and in operations.



**Angela Burgess**

**Title:** CIO

**Organization:** Randolph Hospital

**Years in HIT:** 9+

**Previous Positions:** Consultant/Senior Consultant, Manager, Healthcare Consulting Division, Premier; Director, Decision and Operations Support, Randolph Hospital; Senior Director, Financial Services, Randolph Hospital

**Significant Achievements:** Burgess led Randolph Health through the selection and implementation of a replacement electronic medical record system. Under her leadership, the organization exceeded its objective by incorporating clinician workflows in every step of the process.

**Impact on HIT:** She has worked closely with vendors to enhance the capabilities of their products. Her team has led development projects for HIT implementations.



**Bobbie Byrne, MD**

**Title:** System Executive Vice President, Chief Medical and Quality Officer

**Organization:** Edward-Elmhurst Health

**Years in HIT:** 16

**Previous Positions:** Senior Vice President, Clinical Solutions, Eclipsys; Consultant, Cap Gemini Ernst & Young; Pediatrician, Evanston Northwestern Healthcare.

**Significant Achievements:** Byrne designed an innovative mechanism to cooperate with DuPage Medical Group, maintaining individual organization's needs while achieving more than \$5 million in savings. She is an architect of Illinois Health Partners backbone for quality and cost analysis and care management, supporting all at-risk insurance products as well as Medicare Shared Savings ACO.

**Impact on HIT:** Completed full implementation on time and on budget, including all inpatient, outpatient, ambulatory clinical, revenue cycle and departmental systems with 16 months from contract signing to hospital go live. She achieved 82 percent physician computer order entry in a community hospital setting in the first week after going live.



**Mitzi Cardenas**

**Title:** SVP, Chief Strategy and Information Officer

**Organization:** Truman Medical Center

**Years in HIT:** 22

**Previous Positions:** Director, Information Systems, Children's Medical Center Dallas; Senior Systems Engineer/Data Standards and Configuration Management Consultant, Axiom Resource Management; Director, Systems Integration, Baptist Health System; Manager, Special Projects, Baptist Health System; Regional Director of Operations, Kinetra LLC/IMS MEDACOM Networks

**Significant Achievements:** Cardenas was instrumental in creating the TMC and ITWorks (now KCOne) Partnership with Cerner. She led a systemwide electronic health record rollout, with significant clinical and financial benefits.

**Impact on HIT:** Cardenas is active in local and state efforts related to the use of technology to improve care while reducing cost. She is currently chair of the AHA Interoperability Workgroup.



### Melinda Costin

**Title:** VP/CIO

**Organization:** JPS Health Network

**Years in HIT:** 33

**Previous Positions:** VP of Strategic Initiatives and Corporate Applications, Baylor Health Care System; Senior Area Leader, HealthLink (an IBM company); VP, HealthLink; CIO, Ellis Hospital; CIO, Missouri Baptist Medical Center

**Significant Achievements:** In her various positions, Costin has led the development and implementation of products that support EHRs, including those in the area of clinical decision support.

**Impact on HIT:** With a career that spans the development of many of the products now common in hospitals, Costin has shared her accumulated knowledge with her colleagues and influenced the growth of healthcare IT.



### Myra Davis

**Title:** SVP/CIO

**Organization:** Texas Children's Hospital

**Years in HIT:** 14

**Previous Positions:** Vice President, IS, Texas Children's Hospital; Assistant Vice President, IS, Texas Children's Hospital; Director, Customer Support, Texas Children's

**Significant Achievements:** Davis launched an enterprise data warehouse, porting data to the EDW over a four-month timeframe. She is partnering with clinical and quality leaders to drive data-based projects that are improving patient outcomes and reducing costs.

**Impact on HIT:** Davis has orchestrated the implementation of a systemwide EHR, electronic data warehouse, data analytics platform and other key IT projects at Texas Children's Hospital.



### Liz Devereux

**Title:** IT Director, Infrastructure Design and Support

**Organization:** Banner Health

**Years in HIT:** 20

**Previous Positions:** Director, Enterprise Virtual Infrastructure, Banner Health, and a variety of other roles within Banner Health

**Significant Achievements:** She helped Banner become an early adopter of the Information Technology Information Library (ITIL) methodology. She worked with radiology, technology management teams and IT professionals to revamp the support model and architecture of picture archiving and communication services (PACS). The PACS centralization reduced the rate of lost patient films to nearly zero.

**Impact on HIT:** Devereux has led a series of IT efforts to reduce operational expenditures, freeing up money for clinical IT projects.



### Tina Esposito

**Title:** Vice President, Information and Technology Innovation

**Organization:** Advocate Health Care

**Years in HIT:** 18

**Previous Positions:** Vice President, Center for Health Information Services; Director, Center for Health Information Services; manager, business analytics; and manager, clinical decision support services, all with Advocate Health Care

**Significant Achievements:** Esposito created a big data technical and analytics platform that interfaces with more than 50 data sources; developed and implemented an enterprise master patient identifier strategy.

**Impact on HIT:** Esposito is advancing the use of analytics and serving as executive leader over the Advocate Cerner Collaborative, which supports the study of the shift to accountable care.



### Nancy A. Evans

**Title:** CIO, Hospitals

**Organization:** Vanderbilt University Medical Center

**Years in HIT:** 40

**Previous Positions:** Various IT roles, responsible for project management and major system implementations at Vanderbilt.

**Significant Achievements:** VUMC announced in December 2015 that it was going to take a unified approach to health IT with a range of applications from HIT vendor Epic, replacing some of VUMC's self-developed clinical systems. Evans was a critical part of the steering/selection committee that picked Epic to be the vendor for VUMC's new electronic health record and revenue cycle system. The organization plans to switch to Epic software in November.

**Impact on HIT:** Evans has played a key HIT role at VUMC, one of the nation's top healthcare/research organizations.



### Beth Grimes

**Title:** Director of Enterprise Data Analytics

**Organization:** Gwinnett Medical Center

**Years in HIT:** 20+

**Previous Positions:** Director of Business Support for Surgical Services, Surgical Information System Administrator for Surgical Services, and other roles, all at Gwinnett Hospital System; Surgical Staff RN, Emory University Hospital.

**Significant Achievements:** Grimes worked with a technology vendor in 2015 to build a business intelligence solution to provide dashboards to users and support the medical center's new intensivist program.

**Impact on HIT:** Data analytics development has been Grimes's focus over the past several years. Development of data governance oversight has improved Gwinnett's methodology and quality control for consistency of data creation across platforms.



### Jessica Grosset

**Title:** Vice Chair for Infrastructure and Operations, Department of Information Technology

**Organization:** Mayo Clinic

**Years in HIT:** 36

**Previous Positions:** Vice Chair for Enterprise IT Applications, Department of Information Technology, Mayo Clinic; Chair, Department of Rochester Information Technology, Mayo Clinic; various other positions for Mayo Clinic.

**Significant Achievements:** For a decade, Grosset headed the IT department for the flagship Rochester campus, overseeing applications, infrastructure and adoption of clinical systems.

**Impact on HIT:** Under Grosset's leadership, Mayo Clinic became essentially paperless long before the majority of community hospitals and physician practices.



### Donna Hart

**Title:** CIO

**Organization:** Cook County Health and Hospitals System

**Years in HIT:** 36

**Previous Positions:** IT Operations Officer and Director of Information Systems, CCHHS; Director of Information Systems and Acting Associate Administrator, Provident Hospital of Cook County; Acting Director of Information Systems, Provident Hospital; Operations Manager, Provident Hospital.

**Significant Achievements:** Hart implemented a Cerner electronic health record system and helped Provident and Stroger hospitals earn \$20 million through the meaningful use program.

**Impact on HIT:** Cook County has attained Stage 6 on the HIMSS Analytics EMRAM for both its hospitals and all ambulatory clinics.



### Maia Hightower

**Title:** Chief Medical Information Officer

**Organization:** University of Iowa Health Care

**Years in HIT:** 2

**Previous Positions:** Associate Medical Director, Stanford Health Care, University HealthCare Alliance; Internal Medicine Primary Care Provider, Stanford Health Care, Associated Internal Medicine, University Medical Group.

**Significant Achievements:** Hightower is leading EMR upgrades, optimization and support, including development of a physician informatics officer team.

**Impact on HIT:** Her professional interests in clinical informatics, clinical decision making and the evolution of medical care have enabled her to help advance the work of clinicians, researchers and educators.



### Liz Johnson

**Title:** CIO, Acute Care Hospitals and Applied Clinical Informatics

**Organization:** Tenet Healthcare

**Years in HIT:** 36

**Previous Positions:** Executive Vice President, Healthlink.

**Significant Achievements:** Johnson provides the strategic vision and tactical planning for all clinical, patient management, imaging, productivity and supply chain systems used across Tenet's acute care hospitals nationwide.

**Impact on HIT:** Johnson has been a key influencer through leadership roles include 2017 Board Chair of the College of Healthcare Information Management Executives, board member for Health Level 7 International, and appointee to the Health Information Technology Standards Committee of ONC from 2009 to 2016.



### Kyle Johnson

**Title:** SVP/CIO

**Organization:** Eastern Maine Healthcare Systems

**Years in HIT:** 30+

**Previous Positions:** Vice President and Chief Analytics and Integration Officer; Vice President, Applications and Infrastructure; Vice President, Applications & Data Warehouse; Vice President, Applications, all for Eastern Maine Healthcare System.

**Significant Achievements:** Johnson is creating data marts, governance, visualization tools and standards in preparation for a data warehouse implementation and has worked on developing the organization's analytics program. She has formulated IT strategy and overseen the execution of a strategy to address organizational priorities.

**Impact on HIT:** Johnson has spent more than 15 years in the analytics space and, prior to her time in the healthcare industry, she understood that the sector would need analytics and data to better manage the business and provide high-quality care for patients.



### Rebecca Kaul

**Title:** Chief Innovation Officer

**Organization:** University of Texas MD Anderson Cancer Center

**Years in HIT:** 16

**Previous Positions:** Healthcare IT Consultant; Chief Innovation Officer and President of the University of Pittsburgh Medical Center's Technology Development Center (UPMC Enterprises); President, A-Life Hospital; Senior Director, Strategic Business Initiatives at UPMC

**Significant Achievements:** She is starting an MD Anderson Innovation Center. Kaul also built a 200-person innovation operation at UPMC. Through the UPMC center, Kaul created several joint ventures and spinoffs for UPMC, including A-Life Hospital, of which she served as president.

**Impact on HIT:** At UPMC, Kaul forged partnerships, invested in startups and created new companies as part of her work with UPMC's innovation center.



### Kara Marx

**Title:** Vice President IT Applications

**Organization:** Sharp HealthCare

**Years in HIT:** 25

**Previous Positions:** VP/CIO at Methodist Hospital Southern California; Associate Partner at IBM; Senior Account Executive, First Consulting Group; Senior Executive New Business Development/Senior Clinical Specialist, Cerner.

**Significant Achievements:** At San Diego's Sharp HealthCare, Marx has spearheaded management of systems that support organizations operations, including application rationalization, telemedicine, mobile app development, innovation, ERP and revenue cycle optimization.

**Impact on HIT:** Marx has more than 25 years' experience optimizing the performance of healthcare organizations with HIT.



### Sheree McFarland

**Title:** CIO

**Organization:** HCA, West Florida Division

**Years in HIT:** 28

**Previous Positions:** IT Division Director, HCA; IT Director, HCA Regional Medical Center, Hudson, Fla.; Director of IT, Lenox Hill Hospital; Consultant, E.C. Murphy, Yuhasz Consulting.

**Significant Achievements:** Coming in as the IT director of one HCA facility in 1996, she now has executive IT responsibilities for 16 hospitals in HCA's West Florida division.

**Impact on HIT:** McFarland has led the organizations in her division to implement electronic health records, while managing a wide range of other tasks for the HCA's West Florida Division. She also is involved in a number of professional associations, particularly CHIME and HIMSS.



### Pamela McNutt

**Title:** SVP/CIO

**Organization:** Methodist Health System

**Years in HIT:** 38

**Previous Positions:** Director of Information Systems, Hermann Hospital; programmer analyst, Whittaker Medicus.

**Significant Achievements:** McNutt, who leads a team of IT and biomedical professionals, helped the organization adopt electronic health records early, as well as gave it experience in implementing patient safety measures and employing steps to hit operational efficiency.

**Impact on HIT:** She is an active participant in activities at the College of Healthcare Information Management Executives, including playing lead roles on its policy committee. She is one of the leading authorities on dissecting HIT regulations and explaining their impact.



### Theresa Meadows

**Title:** SVP/CIO

**Organization:** Cook Children's Health Care System

**Years in HIT:** 24

**Previous Positions:** Regional Director at Ascension Health; Director of Clinical Systems at St. Vincent's Health System; Engagement Manager at McKesson Provider Technologies; Senior Project Manager at WebMD.

**Significant Achievements:** At Cook Children's Health Care System, she developed and implemented a technology strategy to support an integrated delivery network that includes acute care, ambulatory care, home health and its own health plan.

**Impact on HIT:** She was nominated to the Health and Human Services Healthcare Cybersecurity Task Force and given the role of Co-Chair for the Task Force.



### Jamie Nelson

**Title:** SVP and CIO

**Organization:** Hospital for Special Surgery

**Years in HIT:** 34

**Previous Positions:** SVP and CIO, Norwalk Hospital; Vice President of Customer Care at Innovatix; Vice President of Outsourcing Services at First Consulting Group; VP of Information Systems at New York Presbyterian Hospital

**Significant Achievements:** Nelson developed and implemented an IT strategy in support of the HSS strategic roadmap. She led the hospital's decision and implementation process to completely replace its best-of-breed legacy systems with the Epic EMR across inpatient and ambulatory settings for all clinical and revenue cycle applications.

**Impact on HIT:** Nelson's 34-year career has spanned academic medical center, multihospital system and community hospital system settings as well as management consulting and IT outsourcing.



### Doris Peek

**Title:** SVP and CIO

**Organization:** Broward Health

**Years in HIT:** 10+

**Previous Positions:** Medical technologist in the clinical laboratory at Angel Community Hospital in Franklin, N.C.; CIO, Catholic Healthcare East; various positions, Emory University and Grady Hospital, Gwinnett County Hospital and North Fulton Medical

**Significant Achievements:** She has moved Broward Health from Stage 2 on the HIMSS Analytics scale of EHR adoption to Stage 6 in seven years, and the organization attested for EHR meaningful use Stages 1 and 2. As a regional CIO of CHE, Peek standardized ERP, EMR and patient accounting systems, and implemented a standardized practice management system.

**Impact on HIT:** Her greatest contribution, she believes, is not doing IT, but leading change management. "IT requires change through people and I mentored young leaders to become transformational leaders instead of technology managers."



**Jayashree Raman**

**Title:** SVP/CIO

**Organization:** Cooper University Health Care

**Years in HIT:** 34

**Previous Positions:** VP of Healthcare Strategy and CIO, Stanley Healthcare Solutions; VP and CIO, The Reading Hospital and Medical Center; Director of Technical Operations, Reading Hospital; Programmer and Technical Support, Sacred Heart Hospital

**Significant Achievements:** Raman established the data center at Reading Hospital and helped that facility attain Level 6 on the HIMSS Analytics EMRAM. She led efforts to make Stanley Healthcare Solutions' EMEA operations profitable.

**Impact on HIT:** Raman doesn't want technology that has a "shelf life." It must be flexible to adapt to business and clinical needs.



**Gabriela Ramirez Garnica**

**Title:** Corporate Director, Enterprise Analytics, Clinical Analysis and Outcomes

**Organization:** Orlando Health

**Years in HIT:** 16

**Previous Positions:** Corporate Director, Enterprise Analytics, Clinical Analysis and Outcomes; and Corporate Director, Clinical Analysis and Outcomes, Orlando Health; Director, Nemours Clinical Management Program, Nemours Clinical Management Program

**Significant Achievements:** Garnica leads Orlando Health's corporate-wide enterprise data warehouse project. She is accountable to deliver "one source of truth" for accurate information reporting, mining and analysis.

**Impact on HIT:** Because of her work in analytics and data collection, Orlando Health has reduced patient safety and care quality issues.



**Stephanie L. Reel**

**Title:** SVP, Vice Provost and CIO; Assistant Professor in the Division of Health Sciences Informatics

**Organization:** The Johns Hopkins University and Johns Hopkins Medicine

**Years in HIT:** 36

**Previous Positions:** Director of IT, Small Maryland Hospital; Director of IT, Johns Hopkins Hospital, Johns Hopkins Health System; CIO, Johns Hopkins Hospital, John Hopkins Health System; CIO, Johns Hopkins University

**Significant Achievements:** Reel has worked on data center, infrastructure and staff consolidations; designed and deployed shared-service centers; and led resource planning activities for the enterprise.

**Impact on HIT:** Reel has contributed time and effort to the HIT industry, particularly by participating in federal policymaking initiatives.



**Donna Roach**

**Title:** CIO

**Organization:** Via Christi Health

**Years in HIT:** 32

**Previous Positions:** CIO, Ascension Health; VP Information Technology, CIO, Bronson Healthcare Group; Assistant Professor, Rush University Medical Center; CIO, HCISC; CIO, VP, Information Services, Condell Medical Center

**Significant Achievements:** In her current role, Roach is responsible for the information technology department and IT strategy at 12 hospitals and 200+ ambulatory sites in Kansas.

**Impact on HIT:** Roach has sought to use IT to improve care while reducing clinicians' manual, repetitive tasks. In recent years, she's taken on more leadership roles within industry organizations, particularly CHIME and HIMSS. She holds a CHCIO and is a Fellow within HIMSS.



**Betty Jo Rocchio**

**Title:** VP, Perioperative Performance Acceleration

**Organization:** Mercy

**Years in HIT:** 12

**Previous Positions:** Director, Surgical Services, Mount Carmel East Hospital; System Director, Surgical Services, Mount Carmel Health System; Vice President and Chief Nursing Officer, Mount Carmel New Albany Surgical Hospital

**Significant Achievements:** Rocchio designed and implemented a systemwide preference card reorganization and cleanup with an automated, centralized maintenance process that produced savings of \$1.2 million. She created a systemwide Perioperative Business Dashboard that uses productivity metrics to provide transparency to financial, efficiency, cost-per-case data and outcome measures. Utilization of the dashboard has saved \$25.3 million over three years in cost-per-case across the Mercy system.

**Impact on HIT:** Rocchio has complemented and bolstered her experience as a transformative surgical services executive with the successful management of HIT projects. This unique ability to manage both the business and clinical aspects using HIT as an enabler has had a profound influence within the hospitals in which she has served.



**Pamela Saechow**

**Title:** Senior Assistant Vice President for electronic medical record implementation and support

**Organization:** NYC Health + Hospitals

**Years in HIT:** 19

**Previous Positions:** Director of Implementation and Project Management Office, Acute Care Product Manager, Senior Project Manager, Senior Applications Analyst and Pharmacy Technician, all at Sutter Health, Sacramento, Calif.

**Significant Achievements:** Saechow led a successful Epic EHR implementation at Sutter Health, which operates 26 hospitals and 250 medical offices. At NYC Health + Hospitals, she heads a staff of 450 to implement an EHR from Epic throughout the system.

**Impact on HIT:** Saechow came into the high-profile job after years of EHR failure at the health system. Saechow changed the culture to prioritize workflow over technology and to emphasize teamwork and collaboration.



### Pat Skarulis

**Title:** SVP/CIO

**Organization:** Memorial Sloan Kettering Cancer Center

**Years in HIT:** 27

**Previous Positions:** Vice President and CIO, Rush Presbyterian Medical Center; Vice President and CIO, Duke University; Director of Administrative Services and Information Services, Princeton University

**Significant Achievements:** Skarulis came to Rush Presbyterian Medical Center in 1990 and, in 11 years, led the organization through early implementations of clinical systems, laying the foundation for electronic health records. Moving to Sloan Kettering, Skarulis helped engage physicians in a variety of IT initiatives that enabled better care and research.

**Impact on HIT:** Skarulis has played a vocal and leading role in the healthcare IT community, participating in CHIME, HIMSS and other industry initiatives. She was recognized for her contributions with the John Gall Jr. CIO of the Year award in 2008.



### Terri Steinberg, MD

**Title:** SVP, Vice Provost and CIO; Assistant Professor in the Division of Health Sciences Informatics

**Organization:** Christiana Care Health System

**Years in HIT:** 25

**Previous Positions:** Chief Medical Information Officer, Christiana Care Health System; Clinical Systems, Nemours; Product Manager, Siemens Medical Solutions; Physician, SUNY Stony Brook

**Significant Achievements:** At Christiana Care, Steinberg's team was awarded a Health Care Innovation grant to implement a novel IT integration architecture. Steinberg is actively involved in the Delaware Health Information Network.

**Impact on HIT:** As a clinician as well as a software developer, Steinberg has used her experience to guide the optimal implementation of clinical systems in a manner that is well accepted by doctors and nurses. She has lectured and consulted extensively on methods to ensure successful technology adoption by physicians and nurses.



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**Carol Steltenkamp, MD**

**Title:** Chief Medical Information Officer

**Organization:** University of Kentucky HealthCare

**Years in HIT:** NA

**Previous Positions:** Chair Emeritus, HIMSS Board of Directors; Professor of Pediatrics, University of Kentucky College of Medicine; Director, Kentucky Regional Extension Center; Chief Medical Information Officer, University of Kentucky HealthCare

**Significant Achievements:** She is the chairperson of the Kentucky eHealth Network Board, which successfully launched and maintains the Kentucky Health Information Exchange (KHIE).

**Impact on HIT:** Steltenkamp has been a leading volunteer who's filled several executive roles in HIMSS, playing a key role in its growth.



**Joanne Sunquist**

**Title:** SVP/CIO

**Organization:** HealthEast Care System

**Years in HIT:** 21

**Previous Positions:** CIO, Hennepin County Medical Center; Vice President of Information Services, Allina Health; Manager, Andersen Consulting

**Significant Achievements:** Coming to HealthEast in 2013, Sunquist has led an enterprisewide implementation of electronic health records, and a revamp of its overall core vendor strategy. She was able to build off her experiences at Hennepin County Medical Center.

**Impact on HIT:** An active member of CHIME, she was on the CHIME board of trustees from 2007 to 2010, serving in the role of chair in 2009. She has also served in Minnesota as a member of the e-Health Advisory committee.



**Deanna Wise**

**Title:** EVP/CIO

**Organization:** Dignity Health

**Years in HIT:** NA

**Previous Positions:** SVP and CIO, Vanguard Health System; CIO, Maricopa Integrated Health Systems; Director of Application, St. Vincent's Hospital

**Significant Achievements:** At Maricopa Integrated Health System, Wise in-sourced the IT department while cutting costs and increasing customer satisfaction. At Dignity Health, her largest achievement has been developing the strategy and roadmap for implementing the Cerner EHR across the system.

**Impact on HIT:** She's led the push to implement Cerner at Dignity's 40 facilities; so far, some 32 hospitals have reached Stage 6 of HIMSS Analytics' model of EHR adoption. Project completion is expected later this year.



**Dana Alexander**

**Title:** Executive Director

**Organization:** Ernst & Young

**Years in HIT:** 14+

**Previous Positions:** Vice President, Clinical Advisory Services, Divurgent; Vice President, Integrated Care Delivery and Chief Nursing Officer, Caradigm; Vice President and Chief Nursing Officer, GE Healthcare; Senior Consulting Executive, Cerner

**Significant Achievements:** Alexander is working to advance the nursing profession, serving as the voice of nursing at the board level. She also is a thought leader, influencing public policy through advocacy. She promotes careers in healthcare administration.

**Impact on HIT:** Alexander continually builds bridges and leverages professional connections to impact policy and improve quality outcomes and patient safety. She has consistently pushed for patients and consumers.



**Dixie Baker**

**Title:** Senior Partner

**Organization:** Martin, Blanck & Associates

**Years in HIT:** 22

**Previous Positions:** CTO of health and life sciences business, SAIC; served six years on the HIT Standards Committee.

**Significant Achievements:** Baker has recognized expertise in the healthcare industry in data sharing and linking genomic data sets in the health and life sciences; she's a passionate defender of protecting the identity of individuals while using appropriate security.

**Impact on HIT:** Baker is promoting the role of technology to improve the lives of humans, particularly those with rare conditions, as well as brining benefits to researchers and clinicians by incenting them to keep investing in technology. Baker calls upon women contemplating a career in health information technology to be true to themselves. "Choose academic work and experiences relevant to what you want to do. If you aren't sure, find a project out of your comfort zone," she says.



**Marion Ball**

**Title:** Senior Advisor for Healthcare Informatics

**Organization:** IBM Center for Computational Health

**Years in HIT:** 35

**Previous Positions:** Senior Advisor, Research Industry Specialist, Healthcare Informatics, IBM Research; Senior Advisor, Healthcare Informatics, IBM; University of Maryland Baltimore County, Affiliate Professor, Information Systems Department.

**Significant Achievements:** Ball has written and edited 27 books and more than 200 journal publications and book chapters. Among her latest published books are "Health Information Management Systems: Cases, Strategies, and Solutions" (4th edition, 2015) and "The History of Medical Informatics In the United States" (2nd edition, 2016).

**Impact on HIT:** Ball has received numerous academic, national and international awards for her contributions to the field of health informatics. She is the recipient of several HIT industry awards.



### Kelly Barnes

**Title:** Leader of the U.S. Health Industries Practice

**Organization:** PricewaterhouseCoopers

**Years in HIT:** 10

**Previous Positions:** Barnes has spent her entire career at PricewaterhouseCoopers, starting as an auditor in 1988.

**Significant Achievements:** Under Barnes' leadership, PwC announced the launch of DoubleJump Health, an accelerator for consumer health-care applications.

**Impact on HIT:** Barnes' leadership of the PwC healthcare practice began during the lead-up to the passage of the Affordable Care Act, allowing her to set forth a new strategy based on the changing dynamics of the industry. "The money was going to be moving differently, and every time that happens, the game changes," she says.



### Mandi Bishop

**Title:** CEO, Co-Founder

**Organization:** Aloha Knows

**Years in HIT:** 12

**Previous Positions:** Led Dell Healthcare and Life Science's Global Analytics Innovation and Consulting Payer practice; independent consultant to the Blue Cross system.

**Significant Achievements:** Prior to founding Aloha, she led Dell Healthcare and Life Science's Global Analytics Innovation and Consulting Payer practice, driving solutions that touched the lives of more than 100 million patients. She began her career in health data as an independent consultant to the Blue Cross system.

**Impact on HIT:** Bishop is frequently recognized as one of the most influential voices in healthcare IT on social media, and in 2015 was named to Rock Health's Women Role Models in Healthcare.



### Jennifer Covich Bordenick

**Title:** CEO

**Organization:** eHealth Initiative

**Years in HIT:** 20+

**Previous Positions:** Director of Policy and Product Development, National Committee for Quality Assurance; various roles, George Washington University, Medical Center and Health Plan.

**Significant Achievements:** Since 2002, Bordenick has provided leadership for the programs, education and research components of the eHealth Initiative and the foundation that is associated with it.

**Impact on HIT:** Bordenick has helped refine the organization's strategic focus to concentrate on interoperability, data use and access, and clinical and business motivators. Research initiatives by the organization have influenced policy direction in the industry.



### Kate Borten

**Title:** President

**Organization:** Marblehead Group

**Years in HIT:** 20+

**Previous Positions:** Programmer and security lead at Massachusetts General Hospital; CISO at Beth Israel Deaconess Medical Center and CareGroup.

**Significant Achievements:** Borten is a consultant, certified information security professional and a frequent speaker. Borten led the first information security program at Massachusetts General and was the first CISO at Beth Israel Deaconess. In addition, she is the developer of compliance tools.

**Impact on HIT:** Borten is a highly regarded HIPAA security professional with a mission to educate stakeholders. "Information security is a phenomenal career choice for women," she believes.



### Halee S. Fischer-Wright, MD

**Title:** President and CEO

**Organization:** Medical Group Management Association

**Years in HIT:** NA

**Previous Positions:** Chief Medical Officer, St. Anthony North Health Campus, Centura Health, Westminster, Colo.; President, Rose Medical Group, Denver; Consultant, CultureSync, Los Angeles

**Significant Achievements:** Fischer-Wright has positioned MGMA to become a marquee tenant at the Catalyst Health-Tech Innovation Center, slated to open in 2018, as part of strategy for MGMA to become a leading voice in shaping the future of digital health and HIT.

**Impact on HIT:** Through speeches, panel discussions and collaboration with other organizations, Fischer-Wright has worked to raise MGMA's profile and voice in discussions about the role of IT in delivering safe and effective patient care.



### Lynne Thomas Gordon

**Title:** CEO

**Organization:** American Health Information Management Association

**Years in HIT:** 30+

**Previous Positions:** Assistant Vice President, Hospital Operations, Rush University Medical Center and Director of Rush University Medical Center Children's Hospital; Administrator, Houston Medical Center; COO, Children's Hospital of Michigan

**Significant Achievements:** As CEO of AHIMA, she oversaw AHIMA's introduction of information governance for healthcare, including tools such as IGIQ, annual surveys and white papers on IG adoption in healthcare.

**Impact on HIT:** Gordon is leading the largest health information management professional association at a time of great transformation in healthcare, when the way health information is managed, analyzed and secured plays a critical role in the success of national healthcare initiatives.



### Rachel Hall

**Title:** Executive Director, U.S. Health Advisory-Performance Improvement

**Organization:** Ernst & Young

**Years in HIT:** 23

**Previous Positions:** Vice President of Product Management, Global Healthcare Exchange; Senior Associate of Healthcare Point B, Consulting; Associate-Healthcare, Booz Allen Hamilton

**Significant Achievements:** Over the past few years, Hall has brought three solutions to market and trained 150 individuals on their use through methodology training and hands-on experience, and by providing leadership in digital health, health supply chain and population health management.

**Impact on HIT:** Hall is frequently expected to solve what others can't, and is often called upon to resolve clients' challenges that require original and inventive solutions.



### Gwendolyn Lohse

**Title:** Deputy Director

**Organization:** Council for Affordable Quality Healthcare

**Years in HIT:** 16

**Previous Positions:** Manager, Healthcare Practice at PricewaterhouseCoopers; Associate Manager, Johns Hopkins University

**Significant Achievements:** Under her leadership, more than 140 organizations, including health plans, hospitals, health IT vendors, the Centers for Medicare and Medicaid Services, and other healthcare industry leaders, have joined CAQH CORE, a certification program.

**Impact on HIT:** In the regulatory environment, Lohse has served as a key educational expert for those considering whether operating rules should be included in national or state-based regulations.



### Janet Marchibroda

**Title:** Director of Health Innovation Initiative and Executive Director of CEO Council on Health and Innovation

**Organization:** Bipartisan Policy Center

**Years in HIT:** 20+

**Previous Positions:** Chair of BPC's Health Information Technology Initiative; Founding Chief Executive Officer for eHealth Initiative.

**Significant Achievements:** Marchibroda served as chief operating officer of the National Committee for Quality Assurance, a nonprofit, independent organization.

**Impact on HIT:** Marchibroda led stakeholder engagement activities for the National Coordinator for Health IT at the Department of Health and Human Services, impacting several HIT initiatives and policies.



### Meg Marshall

**Title:** Senior Director of Public Policy

**Organization:** Cerner

**Years in HIT:** 21

**Previous Positions:** Vice Chair, Government Affairs Committee, CommonWell Health Alliance; Policy Steering Committee, eHealth Initiative

**Significant Achievements:** Marshall works with Cerner's clients and industry partners to leverage alliances and collaborate on priority issues to influence legislative and regulatory actions. She also works to drive change across healthcare through her involvement and leadership on industry committees, task forces and roundtables.

**Impact on HIT:** Marshall has been a leader in efforts to bring about important policy changes in how IT can enable innovation, efficiency and safety to improve healthcare for consumers.



### Genevieve Morris

**Title:** Senior Director, Health IT Policy

**Organization:** Audacious Inquiry

**Years in HIT:** 13

**Previous Positions:** Director and Senior Associate, Audacious Inquiry; manager, research and programs for health information exchange, eHealth Initiative; project coordinator, Keystone Mercy Health Plan.

**Significant Achievements:** Audacious Inquiry assists ONC in developing and writing policies. She oversees strategic policy for the team and manages its government affairs efforts. She creates reports and develops presentations for the Office of the National Coordinator to inform their decisions, which affect health IT and health information exchange regulations and policy nationwide.

**Impact on HIT:** Morris continues to influence policy through research, focusing on information exchange that will be particularly important for the entire healthcare industry.



### Geeta Nayyar, MD

**Title:** Chief Healthcare and Innovation Officer

**Organization:** Femwell Group Health

**Years in HIT:** 14

**Previous Positions:** Chief Medical Information Officer at AT&T; Principal Medical Officer at Vangent.

**Significant Achievements:** She previously served as Chief Medical Officer of APCO Worldwide, a public affairs and strategic communications firm, where she specialized in advising healthcare clients on health policy issues.

**Impact on HIT:** Nayyar is recognized as a thought leader in the healthcare industry. She is quoted extensively in the media on the topic of health IT. She regularly addresses major industry forums and serves as a member of the advisory board of the Healthcare Information and Management System Society.



### Margaret E. O'Kane

**Title:** President

**Organization:** National Committee for Quality Assurance

**Years in HIT:** 26

**Previous Positions:** Respiratory therapist.

**Significant Achievements:** O'Kane has served as president of the National Committee for Quality Assurance since 1990. She was named Health Person of the Year in 1996 by the *Journal of Medicine & Health*. She received a 1997 Founder's Award from The American College of Medical Quality, recognizing NCQA's efforts to improve managed care quality.

**Impact on HIT:** Under O'Kane's leadership, NCQA developed HEDIS to measure quality. HEDIS is widely used to shape health IT incentives, including meaningful use and measures under the Merit-Based Incentive Payment System.



### Lisa Pettigrew

**Title:** General Manager Healthcare Americas

**Organization:** DXC Technology

**Years in HIT:** 16

**Previous Positions:** CSC General Manager-Global Health; CSC National Director-Health Services Australia; Accenture Partner and Director, Asia Pacific

**Significant Achievements:** Pettigrew launched CSC's Chronic Care Management service, designed to help providers improve the quality of life for seniors with chronic conditions with a capital-free, reimbursement-based payment model.

**Impact on HIT:** Pettigrew has driven a wide range of innovation into healthcare systems that are now moving to value-based care. She has focused on fostering commercial health models to improve patient care and health consumer experiences.



### Rebecca Quammen

**Title:** CEO, Founder

**Organization:** MyConsultQ LLC, Quammen Health Care Consultants

**Years in HIT:** 30+

**Previous Positions:** National executive role, HBOC, now McKesson; Dorenfest & Associates; Adventist Health System

**Significant Achievements:** Quammen has worked with many of the leading academic, for-profit and community hospitals in America, providing expert IS professional, technical and outsourcing services, allowing them to successfully deploy information systems for clinical and business operations.

**Impact on HIT:** Quammen has helped countless physicians, clinicians and care delivery systems deploy technology, infrastructure and electronic health systems. At HBOC, she pioneered a repeatable implementation methodology.



### Sue Schade

**Title:** Principal

**Organization:** StarBridge Advisors

**Years in HIT:** 34

**Previous Positions:** Interim CIO, University Hospitals in Cleveland; CIO, University of Michigan Hospitals and Health Centers; CIO, Brigham and Women's/Faulkner Hospital; Senior Manager, Healthcare IT Practice, Ernst & Young.

**Significant Achievements:** She currently serves as interim CIO at Stony Brook Medicine. She has leveraged new technology in healthcare with lean principles to improve care delivery and efficiency. She also advanced the use of electronic health records in her roles as CIO of various organizations.

**Impact on HIT:** Schade is an active member of both HIMSS and CHIME. She writes a weekly blog and is a frequent speaker committed to developing the next generation of HIT leaders.



### Vivian Singletary

**Title:** Program Director

**Organization:** Public Health Informatics Institute

**Years in HIT:** 10

**Previous Positions:** Supply Chain Manager, Public Health Analyst and Director of Information Technology Practice at The Task Force for Global Health

**Significant Achievements:** Oversaw the supply chain to deliver more than \$1 billion in antibiotic donations to fight blindness in African and Asian nations. Working with ministries of health to understand their information system needs and determine requirements for a system supporting their work.

**Impact on HIT:** Singletary is developing workforce informatics training programs to help public health professionals advance their agendas for their constituencies.



### Carla Smith

**Title:** Executive Vice President, North America

**Organization:** Healthcare Information and Management Systems Society

**Years in HIT:** 25

**Previous Positions:** CEO of the Center for Healthcare Information Management, named to the role after previously serving as the organization's associate executive director; Director for the Michigan Modernization Service

**Significant Achievements:** Smith helped to establish HIMSS as a major voice and presence in the healthcare sector. She is a key influencer of health laws, including the meaningful use EHR adoption incentive rules, the Affordable Care Act, the Medicare Access and CHIP Reauthorization Act of 2015 and cybersecurity provisions in 2016 legislation.

**Impact on HIT:** Smith serves as a health sector thought leader on the best use of IT as a tool to improve health, and improve the delivery, safety, quality, cost-effectiveness and access to care.



**Lee Ann Stember**

**Title:** President

**Organization:** National Council for Prescription Drug Programs

**Years in HIT:** 36

**Previous Positions:** Board of Directors, WEDI; Advisory Board Member, CoverMyMeds

**Significant Achievements:**

Stember played an important leadership role in improving interoperability, easing the healthcare experience of providers and patients.

**Impact on HIT:** Many of the challenges NCPDP tackled over the past 36 years of Stember's leadership are similar to those faced today by healthcare; the exchange of health information. In its early years, NCPDP standards produced more electronic transactions than MasterCard and Visa combined. E-prescribing was an NCPDP innovation that began in the 1990s, long before EHRs.



**Sheri Stoltenberg**

**Title:** CEO

**Organization:** Stoltenberg Consulting

**Years in HIT:** 30+

**Previous Positions:** Director, Ancillary Systems, Shadyside Hospital; Advisory Installation Director, Shared Medical Systems

**Significant Achievements:** In 1995, Stoltenberg founded Stoltenberg Consulting, a healthcare IT consulting firm. The company employs more than 180 professionals, who have served major providers.

**Impact on HIT:** Stoltenberg is committed to innovation, supporting women in leadership and fostering the knowledge of HIT workers to eliminate healthcare system inefficiencies through reinvented HIT support. She was the first to establish a CHIME education foundation scholarship for CIO career development, to which she pledged \$50,000.



**Sasha TerMaat**

**Title:** Director

**Organization:** Epic

**Years in HIT:** 11

**Previous Positions:** Current Executive Committee Chair, Electronic Health Records Association; Meaningful Use Workgroup Chair, EHRA

**Significant Achievements:**

TerMaat leads Epic users in government advocacy, and leads staff responsible for supporting regulatory initiatives, educating users on programs and their impact. At EHRA, she leads in engaging EHR developers and other stakeholders in accelerating health IT adoption, advancing interoperability and improving the quality and efficiency of care through technology.

**Impact on HIT:** She's now chairing the influential EHRA executive committee, following in the footsteps of other women who have held the role.



**Mariann Yeager**

**Title:** CEO

**Organization:** The Sequoia Project

**Years in HIT:** 25

**Previous Positions:** Nationwide Health Information Network Initiatives, Office of the National Coordinator for Health IT; Certification Program Director, CCHIT; Vice President, Healthcare Practice, TruArx

**Significant Achievements:**

Yeager currently leads The Sequoia Project, the nonprofit home of one of the largest health data sharing networks in America, the eHealth Exchange, and the leading, national-level interoperability framework for trusted exchange between and among networks, Carequality.

**Impact on HIT:** Yeager in public and private roles has been a leading figure in expanding both health IT interoperability capabilities and connectivity capacity nationwide.



**Amy Abernethy, MD**

**Title:** Chief Medical Officer/Chief Scientific Officer and SVP, Oncology

**Organization:** Flatiron Health

**Years in HIT:** 12

**Previous Positions:** Director, Board of Directors, athenahealth; Adjunct Professor of Medicine, Duke University School of Medicine; Professor of Medicine, Duke University School of Medicine

**Significant Achievements:** As Chief Medical Officer and Chief Scientific Officer, Abernethy leads the medical and research vision and strategy for Flatiron Health.

**Impact on HIT:** Abernethy has concentrated on what she calls "the bigger problems in the healthcare system," specifically around "learning healthcare." She drives conversation at the federal level about how real-world data can be used to advance cancer research.



**Susan Arthur**

**Title:** Vice President, Americas Health, Life Sciences and Regulated Industries

**Organization:** DXC Technology

**Years in HIT:** 28

**Previous Positions:** Vice President and General Manager, Americas Health & Life Sciences, Hewlett Packard Enterprise; General Manager, Hewlett Packard Enterprise; General Manager, Electronic Data Systems

**Significant Achievements:** Arthur grew Hewlett Packard's Health & Life Sciences sector across industry segments.

**Impact on HIT:** Arthur and her team are focused on modernizing HIT to help health and life sciences clients who are embracing more collaborative, analytic and data-oriented models to accelerate change and harness the power of technology to deliver better healthcare outcomes. Arthur has taken deliberate steps to mentor women in leadership and women in HIT.



### Lindy Benton

**Title:** CEO and President

**Organization:** Vyne

**Years in HIT:** 30

**Previous Positions:** CEO and President, MEAINEA; Chief Operating Officer, healthcare division, The Sage Group

**Significant Achievements:** Benton is a speaker and activist working to mentor, support and help caregivers understand how to utilize available services to improve patient health.

**Impact on HIT:** At MEAINEA, a company founded to exchange unstructured documentation for dental practices, Benton led efforts to expand this platform and apply the same technology to managing unstructured data for healthcare providers. The company was renamed Vyne in 2016 after acquiring The White Stone Group, a provider of secure healthcare communication management solutions.



### Rebecca Cofinas

**Title:** CEO, Founder

**Organization:** AristaMD

**Years in HIT:** 3

**Previous Positions:** Corporate Vice President, Clinical Operations, Scripps Health; Chief Operating Executive, Scripps Memorial Hospital; Chief Operating Officer, Scripps Green Hospital; Senior Project Manager, Scripps Health

**Significant Achievements:** Cofinas is working through her company on technology that is reducing emergency department visits and hospital admissions by 10 percent or more with the AristaMD platform.

**Impact on HIT:** Driven by a vision to build technology that would empower physicians to collaborate and provide clinically superior and efficient care, Cofinas worked with a technology team to develop AristaMD, which addresses shortcomings in how patients are referred to specialists.



### Bridget Duffy, MD

**Title:** Chief Medical Officer

**Organization:** Vocera Communications

**Years in HIT:** 10

**Previous Positions:** Co-founder and CEO, ExperiaHealth (acquired by Vocera Communications); Chief Experience Officer, The Cleveland Clinic; Medical Director, Medtronic Foundation; Medical Director-Hospitalist Service, Allina Health System/Abbott Northwestern Hospital

**Significant Achievements:** Serving as a clinical and experience advisor, Duffy helps Vocera design the next generation of healthcare innovations that bridge communication gaps, improve care team collaboration and address clinician well-being.

**Impact on HIT:** In 2014, Duffy was listed among the "Top 50 in Digital Healthcare" by Rock Health, a full-service seed fund that supports startups transforming healthcare.



### Bettina Experton, MD

**Title:** CEO, President and Founder

**Organization:** Humetrix

**Years in HIT:** 25

**Previous Positions:** Adjunct Associate Professor of Medicine, University of California at San Diego School of Medicine; Principal Investigator and Director, The San Diego Health Initiative.

**Significant Achievements:** Experton is making ongoing contributions to government policies and standards development in consumer health IT by contributing her expertise in policy creation. Her company is continuing the release of consumer-facing mobile platforms.

**Impact on HIT:** By making it easy for patients to assemble, aggregate, annotate and share their own health records, Experton demonstrates how mobile apps can help patients guard against medical errors and redundant testing.



### Judy Faulkner

**Title:** CEO, Founder

**Organization:** Epic

**Years in HIT:** 40+

**Previous Positions:** Software Developer

**Significant Achievements:** Faulkner has expanded Epic without venture capital or going public. The company's software was built in-house with no acquisitions. It is ranked by healthcare providers as the No. 1 overall healthcare software suite.

**Impact on HIT:** Faulkner founded Epic in 1979 as the original software developer, creating one of the first databases organized around a patient record and designed for clinical information. Epic is now a leading provider of integrated healthcare software.



### Helen Figge

**Title:** Senior Vice President, Global Strategies and Development

**Organization:** LumiraDx USA

**Years in HIT:** 13

**Previous Positions:** Vice President, Global Clinical Integrations Accountable Care Solutions, Alere; Director, Clinical Integrations, Alere; Senior Director, Career Services, Professional Development, HIMSS

**Significant Achievements:** Figge helped to create unique patient engagement opportunities and healthcare best practices that support LumiraDx's health IT solution sets, ultimately facilitating the empowerment and education of healthcare consumers.

**Impact on HIT:** Figge strives to encourage critical thinking of current health IT industry trends. Figge authors, presents, mentors and voices her opinions on critical healthcare issues through various social media venues as well as extensive committee involvement, helping to shape the way healthcare is practiced.



### **Jacquelyn Hunt**

**Title:** Chief Population Health Officer

**Organization:** Enli Health Intelligence

**Years in HIT:** 20

**Previous Positions:** Consultant, Accountable Care Services, Providence Health & Services; CIO and Chief Quality Officer, Bellin Health System; Executive Director, Quality and Care Improvement, Providence Health & Services, Physician Division

**Significant Achievements:** Hunt co-invented Enli CareManager, named "Best in KLAS 2017" for population health management. She directed a health system EMR conversion across three hospitals and nearly 60 ambulatory locations.

**Impact on HIT:** A pharmacist and advocate for evidence-based care, Hunt believes in the potential of HIT to achieve Quadruple Aim of the Institute for Healthcare Improvement.



### **Heidi Jannenga**

**Title:** Co-Founder and President

**Organization:** WebPT

**Years in HIT:** 10

**Previous Positions:** Physical Therapist and Clinic Director, Physiotherapy Associates Tempe Sports Clinic; Physical Therapist and Center Manager, NovaCare

**Significant Achievements:** WebPT is garnering a third of the EMR market share in the rehabilitation therapy industry, and achieving a 99.9 percent customer retention rate. Jannenga is steering WebPT's fast growth.

**Impact on HIT:** Early on, Jannenga recognized the industry's shift to value-based payment and worked with her team to launch WebPT Outcomes, which allows rehabilitation therapists to track, analyze, and optimize patient outcomes and financial results.



### **Nora J. Lissy**

**Title:** Healthcare Director/Subject Matter Expert

**Organization:** Dimensional Insight

**Years in HIT:** 11

**Previous Positions:** Director, Clinical and Financial Decision Support, Baptist Health South Florida; Corporate Manager, Clinical Decision Support IT, Baptist Health South Florida; Corporate Director of Clinical Analysis, WakeMed Health & Hospitals

**Significant Achievements:** As the subject matter expert for healthcare at Dimensional Insight, Lissy, a registered nurse, is involved in every healthcare customer project from pre-sales to post-implementation.

**Impact on HIT:** She has worked at both health systems and a technology vendor to promote the role of business intelligence software in providing information to end users.



### **Mandy Long**

**Title:** Vice President, Product Management

**Organization:** Modernizing Medicine

**Years in HIT:** 9

**Previous Positions:** Vice President, Product Management and HIS Strategy, Experian Health; Install Process Owner and Senior Project Manager, Epic

**Significant Achievements:** Long led a team that launched four products in a single year related to telemedicine, pathology, analytics and practice management.

**Impact on HIT:** In addition to developing and launching software solutions, Long is a champion of HIT usability. She believes that user participation in product development is key to delivering solutions to solve the right problems in the right way at the right time. Long also is passionate about mentoring women.



### **Sarah Muckler**

**Title:** Global Director of Business Development, Health Partners

**Organization:** Microsoft

**Years in HIT:** 18

**Previous Positions:** Worldwide Director of Marketing for Health Industry, Microsoft; Senior Marketing Manager, Global Healthcare Solutions, Symantec; U.S. Senior Marketing Manager and consultant for radiology information systems, acute care, Agfa HealthCare

**Significant Achievements:** Muckler manages a co-selling program to help Microsoft's health-care technology partners sell their products and services to prospective customers, such as health systems.

**Impact on HIT:** Muckler has worked to expand adoption of health information technology, including radiology information systems, billing and scheduling software.



### **Helen Waters**

**Title:** Executive Vice President

**Organization:** MEDITECH

**Years in HIT:** 26

**Previous Positions:** Various positions with MEDITECH

**Significant Achievements:** Waters is leveraging her deep understanding of customers' needs and concerns to educate existing customers on products, capabilities, pathways and other corporate initiatives.

**Impact on HIT:** Waters is helping to make strategic decisions that affect MEDITECH's future.



### **Lauren O'Donnell**

**Title:** Global Vice President

**Organization:** IBM Watson Health Life Sciences Industry

**Years in HIT:** 35+

**Previous Positions:** Global General Manager of Life Sciences Industry, IBM; Vice President Healthcare and Life Sciences

**Significant Achievements:** O'Donnell is leading the transformation of patient safety by forging a collaboration with Celgene. The companies want to evolve patient safety from a reactive manual process into a proactive source of safety insight.

**Impact on HIT:** O'Donnell and her team are helping life sciences executives see the impact IBM's offerings can have for both researchers and the patient populations depending on them.

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REVENUE CYCLE MANAGEMENT

HEALTHCARE ORGANIZATIONS:

# Upping the Revenue Cycle Management Ante



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### HEALTHCARE ORGANIZATIONS:

# Upping the Revenue Cycle Management Ante

## Providers look to leverage RCM solutions to succeed in an era of change

The revenue cycle management market is experiencing a growth spurt, according to several reports. Consider the following research findings:

- The worldwide healthcare revenue cycle management market size is poised to surpass \$100 billion by 2024, according to Global Market Insights, Inc.
- The global revenue cycle management market is projected to reach \$80.56 billion by 2021, up from just \$45.52 Billion in 2016 -- a compound annual growth rate of 12.1%, according to MarketsandMarkets.
- The U.S. revenue cycle management market is slated to grow from \$20.5 billion in 2016 to \$40.4 billion by 2021, according to research from MicroMarketMonitor.

While these reports offer various projections, there is no denying that investments in revenue cycle management (RCM) technologies are on the upswing. The market, in fact, is being driven by a variety of factors such as the need to operate under value-based models, comply with new regulations, improve processes, support more patients and, of course, simply stay financially solvent.

Not surprisingly, then, according to a survey of more than 500 revenue cycle professionals conducted by Black Book, 93% of respondents indicated that they will need to replace revenue cycle management, financial and coding technology vendors that have not generated a return on investment by the end of 2017. Only 79% had similar plans at the end of 2015. New or updated systems would lead to better financial health and increased efficiency, according to 94% of healthcare CFOs who participated in the survey.

"As reimbursements come under pressure and costs keep rising, provider CFOs will face unparalleled pressure over the next year to preserve financial solvency, increase productivities in care delivery, implement regulatory mandates and reduce RCM expenses associated with getting paid," Doug Brown, managing partner of Black Book, said in a press release.

Like many other organizations, Sharp HealthCare, a not-for-profit health system, is actively exploring a variety of RCM technology solutions, according to Gerilynn Sevenikar, vice president. The San Diego-based organization is planning to invest in call center phone systems to allow for omni-channel exchanges; customer relationship management tools to track consumer preferences; a care management platform that will make it possible to self-populate the electronic health record with clinical review metrics for patient status and level of care; and business analytics that will display productivity analytics in real time, enabling staff to self-monitor performance. In addition, the organization is partnering with a vendor to apply coding rules, artificial intelligence and machine learning to coded claims to "to ensure complete and accurate coding for compliance and revenue integrity," Sevenikar said.

What's more, Sharp HealthCare is also looking to enhance its relationships with payers through technology. Sevenikar, for example, pointed to a "go-forward" strategy centered on "opening the EHR to our contract payers for concurrent review and presumptive authorization. This involves an understanding with the payer that, in exchange for real time access to the patient EHR, the payer is obligated to reach out to the hospital if they intend to deny a day/stay."

*Continued on A4*

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Aaron Miri, MBA, CHCIO, FHIMSS, Chief Information Officer & Vice President of Government Relations, Imprivata

## **How can healthcare organizations best prepare to succeed under emerging value-based models?**

Organizations are doing a good job in moving from the fee-for-service to the fix payment/bundle payment system by focusing on the entire reimbursement chain that makes up a successful claim. One part of the care team is focused on reducing the length of stay and ensuring good outcomes by preventing readmission. The other part is focused on the accuracy of the stay and, ultimately, on the accuracy of the claim. Organizations can best prepare to succeed by doing both parts of this exercise with extreme diligence and by leveraging technology to help make the job easier. An example is using biometrics at admission and at the point of care to reduce any chance for patient misidentification.

## **How can organizations ensure that their revenue cycle management processes and technologies are capable of providing what's needed to succeed – even if regulations might potentially shift in the future?**

By focusing on the processes and the intake and outtake variation of the patients, healthcare organizations will be able to succeed no matter what the climate. The objective in business is to always mitigate or eliminate the variability. If you have a good, solid process and an evidence-based practice, the rules and regulations can shift all they want, as your organization can adapt to the change. The other aspect is technology; the good thing about technology is that it can be adapted fairly easily to any change that comes down the road.

## **How can healthcare organizations improve the overall patient financial experience?**

Patients must be treated with respect and given informed decision-making power at the point of care. Industry leading organizations are able to give their patients choices prior to their admission to the hospital and engage financial services teams to assist them, in order to achieve maximum reimbursement. In addition, industry leading organizations employ technology, such as biometrics, to streamline the admission process and to virtually eliminate patient misidentification and the need for repeat proofing of a patient's

identity. This focus on process, people, and technology will ultimately lead to a better patient experience and to higher reimbursement.

## **What can healthcare organizations do to improve collections in an era of increased patient financial responsibility?**

It all comes down to informed decision making. Streamline the hospital charge master, in order to be able to provide patients a consolidated bill at the point of admission. By educating the consumers and engaging patient financial services early to determine possible financial assistance, collections could be done prior to admission.

## **How can organizations best integrate data from various systems – both clinical and financial – to support revenue cycle management?**

Most of the time the clinical and the financial modules of the EMR are two standalone databases that connect via a series of interfaces. So first, a true 1:1 mapping must occur to make sure that the data matches both spheres. Second, it is important to understand the charge masters that make up the revenue cycle management world. You need to know why billable materials are built into the system and charged a certain way. This determines how clinical order sets are built, so that when an order requires a certain type of material, that material is charged and subsequently billed to the patient appropriately and with the proper medical necessity to back it up. Lastly, organizations must reconcile the bill and audit continuously, to make sure that the patient is not charged incorrectly.

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*Continued from A2*

### Devil in the denials

While organizations such as Sharp HealthCare are investing in a myriad of RCM solutions, Teresa Jacques, a senior manager in the healthcare practice at Wipfli, an Oakland, Calif.-based consulting company, expects that many healthcare providers will need to zero in on ensuring optimal payment through the use of denial management systems.

“One of the largest challenges for healthcare providers is in the denial management space,” Jacques said. Indeed, 2016 Essentials Brief: RCM Denial Management Study, a report from HIMSS Analytics, corroborates with Jacques’ observations, as it shows that 44% of hospital executives indicated that their organizations currently use a vendor’s denial management solution – and 60% of respondents without a vendor-provided solution were planning to purchase a claims denials management tool in the next seven to twelve months.

Denial management is emerging as a crucial component of RCM simply because it permeates the financial process from beginning to end. “It really starts at the time when the patient presents for service, because if you don’t capture all of the data elements that you need at the time they present then you increase the chances of the bill not getting paid the first time – or maybe never getting paid,” Jacques said.

To that end, a variety of technology solutions can help healthcare organizations improve at each stage across the denial management continuum, according to Jacques. “There are solutions on the front end to help address eligibility and then other analytical solutions that can help identify denial trend categories and then solutions that focus on workflow to help provider organizations work denials more efficiently,” Jacques said.

### Concentrating on consumers

In addition to using technologies to ensure that payers will make good on payments, healthcare organizations are focusing on making sure that consumers come through with payments as well. This is becoming increasingly important as high deductible health plans (HDHP) – where consumers are directly responsible for a larger share of their medical bills – are becoming increasingly common. Indeed, the number of people enrolled in some form of HDHP has risen dramatically since health savings accounts (HSAs) were created in 2003. According to data from the Kaiser Family Foundation employer benefits survey, nearly 30 percent of employees nationwide were covered under HDHP plans with a savings option such as an HSA in 2016.

With Tom Price, MD, taking over as the new Secretary of Health and Human Services, these plans are poised to become even more prevalent. “I think health savings accounts and high-deductible catastrophic coverage are things that make a whole lot of sense for many individuals,” said Price, who is known as an advocate of high deductible plans, which are designed to lower overall costs via free-market mechanisms.

Healthcare organizations, however, are realizing that if “patients are going to be good consumers they need pricing information and typically in today’s environment, they don’t have it,” said James DiGiorgio, president of Applied Knowledge, a consulting company based in Naperville, IL.

As such, the challenge for healthcare organizations is to go beyond simply providing prices from their charge master to providing each patient with an estimate of what they will actually pay.

“Providing a fairly accurate estimate of out-of-pockets expenses is the holy grail for healthcare organizations,” DiGiorgio said.

Jonathan Kaplan, MD, a plastic surgeon at Pacific Heights Plastic Surgery, is seeking to provide this pricing transparency through the use of an online price estimator widget that enables consumers to check pricing for various services in exchange for their contact information. Because so many consumers have high deductible health plans, the widget is being used for not only elective but medical necessary services as well.

The pricing estimator also benefits the medical practice. Because the price estimator requires consumers to enter contact information, the technology generates leads – a benefit to the provider organization that can’t be realized by publishing static pricing lists. In addition, because pricing inquiries are automated, office staff spends less time answering calls and more time on other value added tasks.

Sharp HealthCare’s Sevenikar pointed out that her organization is also proactively providing its patients with pricing information. “

“We contracted with our eligibility verification vendor to provide patients with an out of pocket estimate letter that explains their benefits and how the out of pocket was determined. We also use a propensity to pay calculator to determine the appropriate payment arrangement,” she said. “Every effort is made to be transparent, informative, and fair in determining and collecting patient payments.” ■

# ODH, Inc.



Michael Jarjour is president and CEO at ODH, Inc., a leading provider of behavioral health technology solutions and services. In this role, he oversees ODH's overall operations and drives strategy for its flagship product, Mentrics. Mentrics, a leading-edge behavioral population health management solution using select IBM technologies, transforms the management and economics of behavioral healthcare by delivering comprehensive and predictive insights, enabling a collaborative approach among key stakeholders.

Michael Jarjour, President and CEO, ODH, Inc.

## **How can healthcare organizations best prepare to succeed under emerging value-based models?**

From the outset, payors' and providers' roles must be clearly defined. Goals for outcomes, benchmarks and measurements should be aligned. Too often, misunderstandings can arise after the parties have already engaged in a value-based model regarding exactly what is included in the compensation and how it is measured.

Once defined, both parties must have appropriate infrastructure to track and measure effectiveness of care, providers and other members of the interdisciplinary care team.

Several IT platforms currently available track utilization and cost, evidence-based care quality measures and defined outcomes, providing a fair indication of the effectiveness of the delivery of care.

A top priority for healthcare organizations is to address the complex drivers influencing outcomes by identifying and analyzing integrated data from behavioral and physical health sources, as well as social determinants of care. At ODH, our newer advanced risk models stratify populations by behavioral, physical and comorbid conditions that enable early intervention and improved care to support the transition from volume to value-based care.

## **How can organizations ensure that their revenue cycle management processes and technologies are capable of providing what's needed to succeed – even if regulations might potentially shift in the future?**

Many healthcare providers make the mistake of assuming a fee-for-service accounting platform will effectively support managing risk-based models, and that direct costs can be allocated by fee-for-service accounting principles. That is short-sighted.

A healthcare entity assuming any risk, including value-based compensation, must appreciate that managing the revenue cycle isn't accomplished by applying the established methodologies such as sending a claim, posting payment to an individual account, or writing off uncollected payments.

Provider organizations will want to adopt a risk-bearing approach from end-to-end that measures and supports efficiency, tracks costs on a PMPM or per thousand basis, utilizes robust predictive

models, and combines all clinical care delivery and operations areas. Everyone should work in unison to achieve the goals in an integrated approach, using the same information to guide their efforts.

Integration is crucial. Provider organizations must establish the same technology infrastructure as managed care payors. This means using an integrated population health management system that can forecast financial impact on compensation and outcomes, pinpoint those individuals who may need more resources, and identify poorly performing provider patterns. Payors and providers alike need technology that integrates available data sources to best manage the behavioral, physical and comorbid conditions of their populations to deliver comprehensive, efficient care.

## **How can organizations best integrate data from various systems – both clinical and financial – to support revenue cycle management?**

The industry has made progress in establishing interoperability standards. Promising solutions for addressing data security such as Blockchain are also gaining momentum. But we still have a long way to go in achieving the level of data liquidity and transparency needed to support an efficient revenue cycle process.

Under value-based care, aligning both the clinical and financial experience for a patient is a challenge that the industry must address. A poor financial experience can cast a long shadow over the most positive clinical experience.

The answer is to work with a partner that has the expertise and technologies to integrate data from multiple sources such as in-and-out-of-network claims, prescriptions, emergency room and social factors thereby eliminating a cumbersome, manual data gathering process. Integrating such data into a single registry eliminates spreadsheet tracking by care managers, enabling faster patient care and the attainment of cost and quality goals.

ODH helps organizations realize proper revenue cycle management through comprehensive data integration, advanced risk stratification models and clinical care notifications for both behavioral and physical health.

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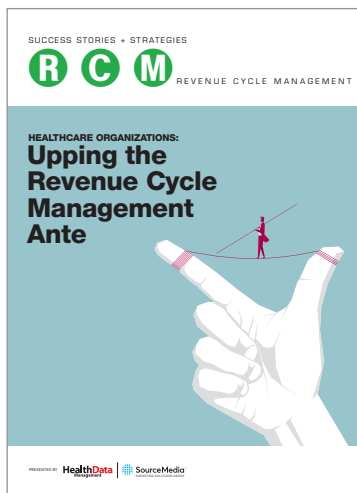
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# URGENT CARE EMBRACES TELEHEALTH

More centers see advantages of virtual services.

*By Linda Wilson*

**U**rgent care providers are slowly adding telemedicine services to their clinical portfolios, seeing them as an opportunity to expand their client base while meeting consumers' need for access to care when and how they want it.

"I think there has been an uptick in interest" in delivering services through telemedicine by center operators, says John Shufeldt, MD, founder and chief executive officer of MeMD, a telemedicine services and technology vendor based in

Scottsdale, Ariz.

"It is all about access. Our goal is to create access for our patients, and access nowadays includes clicking," says Anthony Wallin, MD, medical director of Intermountain Healthcare's 32 urgent care centers, called InstaCare centers.

Urgent care operators also are adding telemedicine services to expand their reach outside their immediate geographic area or to balance patient loads among multiple urgent care centers, according to Shufeldt, who says patients' average drive time to an urgent care center is 12 minutes.

## Expanded capabilities

Through their telemedicine services, urgent care providers typically treat medical conditions that do not require a physical exam, sutures, tests or X-rays. The types of medical problems they treat include common colds and related upper respiratory infections, coughs, skin rashes, lower back pain, allergies and eye infections.

Nonetheless, telemedicine is still a relatively uncommon service among urgent care operators. In the Urgent Care Association of America's 2016 benchmarking survey, only 8 percent of respondents said

Image from gettyimages.com

they offered telemedicine options to their patients.

Many urgent care operators are taking a wait-and-see approach or are dabbling in telemedicine, says John Kulin, DO, a former board member of the association and chief executive officer of Urgent Care Now, which operates three centers in New Jersey and plans to open a fourth center in the state.

In 2017, for example, Urgent Care Now began offering its patients with wounds or concussions the option of a remote follow-up visit, but only after an initial in-office visit. Urgent Care Now's providers often schedule follow-up appointments within 48 hours of an initial in-office visit to make sure patients with wounds or concussions are following their prescribed care regimes. Before Urgent Care Now added a remote option, patients had to return to the urgent care center for those follow-up visits, Kulin says.

## Blended offerings

Doctors Care, which operates 53 urgent care centers in South Carolina, has taken a slightly different tack, embracing telemedicine fully and offering patients two distinct services.

At its six busiest locations, which typically treat 80 to 100 visitors each day, Doctors Care offers patients the option of being seen by a physician remotely using technology set up in an exam room. In those cases, a nurse or medical assistant stays with the patient. Using an all-in-one camera and Bluetooth-enabled otoscopes and stethoscopes, remote physicians can exam eyes, ears, nose, throat and skin.

The second service is a direct-to-consumer telehealth service, called Doctors Care Anywhere. In this service, patients access online visits with physicians through a web interface or an iOS or Android app. Doctors Care Anywhere has expanded the urgent care operator's geographic reach to all 46 counties in South Carolina.

Doctors Care began its foray into tele-

medicine with the on-site service in late 2014 and added the direct-to-consumer service in April 2016. In the past year, it has logged more than 6,300 total telemedicine visits, including 1,300 direct-to-consumer visits.

"We are laser-focused in our market. Our patients expect safe, qualified medical care from us, but they demand convenience," says David Boucher, president and chief operating officer at UCI Medical Affiliates in Columbia, S.C., which provides nonmedical support to Doctors Care and operates the urgent care centers.

With the on-site service, Doctors Care uses a high-definition network and videoconferencing technology from Cisco. It invested about \$25,000 per location for other telemedicine equipment, including computers, monitors and Bluetooth-enabled instruments.

To develop the apps and web interfaces for the direct-to-consumer service, the IT department worked with a web development firm based in Columbia, S.C. While declining to reveal the exact fee, Boucher says Doctors Care paid about \$50,000 for the development work.

Boucher says Doctors Care decided to create the web interface and mobile apps on its own after reviewing proposals from about six prominent telemedicine vendors. "Every proposal was north of \$250,000 down, plus so much per visit," Boucher says. "For us, there was no return on investment. It would take years to recoup even the initial capital outlay."

Doctors Care charges patients \$55 for the direct-to-consumer service, and its usual rates for the on-site service, which it bills to payers. If a physician sends an online patient to a brick-and-mortar center, the patient doesn't pay the \$55 fee. Those cases are rare—so far, the physicians have referred only a dozen patients to an urgent care center.

## EHR interface

When patients initiate a visit with Doctors

Care Anywhere, the demographic and medical information they enter into the mobile app or user interface is transmitted to an electronic health record using HL7 feeds.

Doctors Care uses Cerner's electronic health record for all patients—whether they present for treatment online or at a brick-and-mortar location. "We absolutely wanted to have one master patient index and one EMR," says Boucher.

When Doctors Care launched the on-site service in 2014, it tried for nine months to balance patient loads among its centers by asking physicians at slower locations to also treat patients at busier sites remotely. "We couldn't make it work," Boucher says. Physicians at the slower sites would prioritize patients who walked through their doors over patients waiting to be seen remotely.

As a result, two full-time physicians now provide the on-site and direct-to-consumer telemedicine services from 8:30 a.m. to 8:30 p.m. Monday through Friday.

But two urgent care centers in Georgia—Gwinnett Urgent Care in Suwanee and Lanier Urgent Care in Gainesville—have had a different experience with staffing. They accommodate both virtual and in-clinic visits using the same providers, who alternate between the types of visits, says William Henson, chief operating officer of TRP Management in Gainesville, which provides management services to the two urgent care centers and owns the real estate.

They launched the service a year ago in Gwinnett, where providers treat about 100 patients per day, including five to 10 virtual patients. The Lanier location has been offering telemedicine services since it opened in February, and sees one or two virtual patients per day.

## Patient flow

To ensure that virtual patients are not passed over in favor of in-office patients, Henson says they incorporate both types of visits into a single queue. When a virtual patient logs in for a visit, the receptionist receives a text message. The receptionist opens the telemedicine software, retrieves

the basic demographic information and then reenters that information into the electronic health record from Allscripts. This adds the patient to the clinical queue.

A nurse then triages the virtual patient—just as he or she would with an in-office patient—and either a physician or physician assistant diagnoses and treats the patient. Nurses also transfer the pertinent medical information, such as current medications, from the telemedicine software to the electronic medical record.

The Gwinnett facility has nine exam rooms, including three that are outfitted with telemedicine technology. Lanier has six exam rooms, a dedicated IV room and a dedicated telemedicine room. Both urgent care centers use telemedicine technology from SnapMD in Glendale, Calif.

The providers “go to the queue, and they pull up the next patient” in Allscripts, says Henson. “I was surprised by how well they have adapted to telemedicine.”

At Intermountain Healthcare, the virtual and in-office urgent care services are managed separately.

Intermountain launched its urgent care telemedicine service, Connect Care, in April 2016 with dedicated nurse practitioners and physician assistants. It contracts with American Well in Boston for both telemedicine technology and backup remote providers.

Intermountain’s full-time telemedicine providers treat patients from 7 a.m. to 11 p.m. daily, while American Well’s clinicians cover the overnight hours and provide backup during high-volume times.

Working out of a call center, Intermountain’s staff covers about 80 percent of Connect Care’s patient visits, which totaled more than 6,000 in the program’s first year.

## Business impact

Although Connect Care is managed separately from the InstaCare centers, William Daines, MD, Connect Care’s medical director, says he has an “active working partnership” with the urgent care centers. For example, Wallin and other Intermountain

## 10 TOP URGENT CARE CENTER CHAINS

### Concentra

**300+ clinics in 38 states**

Concentra, a division of Select Medical, provides occupational medicine, urgent care, physical therapy and wellness services.

### MedExpress Urgent Care

**180 sites in 16 states**

MedExpress was acquired in April 2015 by Optum, a division of UnitedHealth Group.

### U.S. HealthWorks

**174 sites in 21 states**

U.S. HealthWorks is a subsidiary of Dignity Health. In addition to urgent care, U.S. HealthWorks also offers occupational medicine, therapy care and specialty services.

### American Family Care and Doctors Express

**163 sites in 25 states**

American Family Care opened its first family care/urgent care clinic in Birmingham, Ala., in 1982. American Family Care acquired Doctors Express in 2013.

### NextCare Urgent Care

**137 sites in 10 states**

The urgent care chain is operated by NextCare Holdings, which also offers occupational medical services.

### FastMed Urgent Care

**109 sites in three states**

FastMed Urgent Care is an owner and operator of urgent care facilities with locations throughout Arizona, North Carolina and Texas.

### Patient First

**67 sites in four states**

Patient First opened its first center in 1981; it’s based in King of Prussia, Pa.

### HCA CareNow

**64 sites in five states**

The chain, operated by HCA, the Nashville, Tenn.-based operator of acute care hospitals, had its beginning in October 2014, when HCA entered an agreement to acquire CareNow.

### CityMD/Premier Care

**57 sites in three states**

The chain operates in the metropolitan area surrounding New York City, and it is expanding operations in Washington state, where it is partnering with CHI Franciscan Health.

### CareSpot Express Healthcare

**54 sites in four states**

CareSpot is operated and managed together with MedPost Urgent Care, with both brands expanding together across the United States to provide immediate medical attention and treatment.

InstaCare physicians help develop clinical guidelines for Connect Care.

But the relationship hasn’t been totally without friction. When Intermountain launched Connect Care, physicians at the InstaCare centers were concerned the new service would take away their patients, but that hasn’t materialized in a noticeable way, Wallin says.

The issue of cannibalization is something Henson in Georgia plans to evaluate by analyzing the data. He says the telemedicine service is profitable from the perspective that the revenues it generates more than cover the cost of providers’ time and SnapMD’s monthly fees. The Gwinnett and Lanier centers charge patients \$50 for each telemedicine visit, unless the virtual service is covered by health insurance.

“Is the increased access going to lead to increased utilization, and is the increased utilization enough to cover missing out on some of the reimbursement for the in-office visits?” Henson says. “That is the experiment we are going through right now to see if that is the case.”

At American Family Care, which plans to launch a telemedicine service in about six months, executives are focused on choosing the right vendor. “We have a ton of different use cases, so we want a platform that is robust enough to handle any use case we can throw at it,” says Anthony Williams, chief information officer at the Birmingham, Ala.-based organization, which has 180 urgent care clinics in 26 states.

He expects to launch the telemedicine service in the urgent care business using HL7 feeds to share data between the telemedicine platform and American Family’s electronic medical record from DocuTAP. The plan would be to work toward tighter, API integration over time, he says.

The fact that urgent care operators are at least dabbling in telemedicine, he notes, is an indication of how treatment for acute, episodic medical issues is evolving among emergency departments, urgent care centers and virtual visits. ■



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# BOOSTING SECURITY FOR DEVICES

Organizations try to close ‘back doors’ to their networks.

*By Joseph Goedert*

**H**ackers have been targeting U.S. healthcare organization for nearly a decade, and now they have turned their attention to a new favorite target—medical devices. And they have a wide variety of devices from which to choose.

Vulnerabilities of medical devices to hacking have become a rising source of concern for healthcare IT executives, who are increasingly looking for ways to defend medical devices on their networks.

More tools and approaches are be-

ing devised to protect devices, and those approaches are the beginning steps in improving defensive perimeters around devices and the networks on which they operate. Lessons that healthcare organizations are learning have implications for security needed to expand protection from hacking to wearable sensors and devices that are on the Internet of Things.

However, healthcare organizations are struggling to catch up to improve the cybersecurity of medical devices, which most industry experts believe remain susceptible to hacking.

## Hackers' goals

In general, hackers aren't attacking devices—as well as the networks they sit on—to cause patient harm. Rather, they're looking for an easy way to get into a system, and then use that as a launching pad to access a hospital's core network, where they can gather a treasure trove of patient data that can be sold to thieves or held for ransom.

“Denying services is one thing; doing harm is another,” says John Fowler, deputy information security officer at Henry Ford Health System in Detroit.

Often, the easiest way to gain entry is

through the hundreds of medical devices within a hospital. Many of those devices have been in service for a decade or longer, and they have little, if any, security protections. Infusion pumps, lasers, medical imaging devices, patient monitors, ECG/EKG machines, anesthesia systems, defibrillators and vital signs monitors are among the devices that commonly serve as entry points for hackers.

Vulnerabilities in other devices could cause more havoc by threatening patient care. While no cases have been reported yet, hackers may exploit devices linked to patients to cause harm, or at least threaten harm, if a ransom is not paid—for example, by changing settings on pacemakers or delivering higher doses of chemotherapy, Fowler says. “That’s actually the scariest piece—that we could harm our patients.”

## Collaboration imperative

Historically, providers and medical device manufacturers have not collaborated on device security, and that has to change, contends Neal Ganguly, vice president and CIO at JFK Health System in New York. Manufacturers need to agree among themselves on the development of standards for security, in concert with providers, who can explain what they need, such as encryption protocols that do not hamper workflows.

“We need to put an industry focus on this,” Ganguly adds. “There is some talk of creating information sharing groups that can work without recrimination to foster manufacturer-provider collaboration.”

The College for Healthcare Information Management Executives is pushing to create a collaborative environment for provider-manufacturer discussions, he notes.

But there are signs of progress as medical device vulnerability has gained attention. Recent guidance from federal agencies could help providers and vendors as they work toward finding answers to better addressing cyber threats. The Food and Drug Administration issued final guidance entitled “Postmarket Management

of Cybersecurity in Medical Devices,” targeting device manufacturers. In addition, the National Institute of Standards and Technology released a draft update to the “Framework for Improving Critical Infrastructure Cybersecurity,” which addresses device vulnerabilities.

## Coding concerns

However, even hospitals that are attempting to improve their existing security levels are finding the task difficult because the devices they already have were not designed to support security upgrades.

“It is not easy to add on; you have to dig deep into the code and software to implement greater security in the devices,” contends Brian Finch, a partner in the law firm of Pillsbury Winthrop Shaw Pittman. “The chief information security officer likely won’t be familiar with systems in the device and you’ll have to retain outside help.” That extra help can save time and money, because already written software often has errors in it, and every error is a pathway for a hacker, so the more software you add, the higher the risk.

Another way organizations are looking to lower cyber threats is to segment medical devices on a dedicated network. That way, if a hacker attacks the devices, an organization can restrict access on that segment, and the hacker won’t be able to get to the electronic health record, imaging systems, workstations and other information systems, says Fowler of Henry Ford.

“It takes a lot of work to set these up,” he cautions. This concept of segmenting is relatively new, can be done on a piecemeal basis and requires new designs, additional infrastructure and more firewalls, which will require budgeting and allocation of resources.

## Focused gap analysis

As healthcare organizations look to shore up device protection, they often seek outside help. For example, patient safety organization ECRI Institute in late 2016 launched a cyber attack gap analysis service for healthcare providers, focusing on

threats to medical devices that interact with patients.

The organization uses internal experts to assess a hospital’s medical device inventory for cyber exposures and to develop programs and policies to minimize a hospital’s vulnerability. This may include using reporting mechanisms like ECRI’s hazards and alerts system, as well as others like the National Health Information Sharing and Analysis Center, says Robert Maliff, director of ECRI’s applied solutions group.

There are plenty of gaps to identify and assess, Maliff notes. Too often, organizations don’t understand which devices are connected to networks, and the medical device and IT departments aren’t talking with each other.

And while providers may train employees against phishing attacks, they still let physicians plug unsecured smartphones into medical devices to charge during surgery, with phones potentially delivering viruses to a hospital’s network. “You don’t want staff members plugging personally owned devices into the hospital’s networks,” Maliff warns.

The ECRI assessment covers eight areas: managing equipment; installing patches; training security staff; managing risks; scanning for vulnerabilities; proper disposing of medical devices; including security features in requests for proposals; and device integration lab tests.

The analysis generally takes one or two days depending on organization size. Leadership that should participate includes the CIO, CISO, sourcing and purchasing personnel, and informatics, risk management and clinical engineering professionals. This is the group that will take the recommendations to the board.

If nothing else, the cyber attack gap analysis can help these leaders improve their relations with the board, Maliff believes. “The last thing any hospital leader wants is to be in front of the press because there is ransomware in their facility,” he says. “This is a proactive approach for medical device security.” ■



# MORE INTELLIGENCE FOR RADIOLOGY

Machine learning offers promise, but much work lies ahead.

*By Marianne Matthews*

**M**achine learning is emerging as a key hope to change the practice of radiology—the opportunity seems ripe, with rising calls for radiologists to demonstrate increased quality and value, even as technology yields bigger data sets and more complexity.

But exactly how machine learning will impact the radiology profession—and healthcare in general—remains to be seen. It will take time and experimentation, some say.

Keith Dreyer, DO, likens the machine learning revolution to the promulgation of electricity, which originally was used

just for lighting but eventually ushered in a host of inventions—washing machines, dishwashers, air conditioners, televisions, computers—previously unimaginable.

“Once you start to make machines think, taking data and performing predictive analytics, things will happen that are beyond human capability and current imagination,” says Dreyer, vice chairman of radiology at Massachusetts General Hospital and associate professor of radiology at Harvard Medical School. “So if you could predict a group of patients that are likely to have a positive CT of the brain before it was performed, think of the advantage that would be.”

## How it can help

As computers outperform humans at complex cognitive tasks, machine learning has enormous potential to enhance diagnostic accuracy, predict prognosis and, ultimately, improve patient outcomes.

J. Raymond Geis, MD, department of radiology at University of Colorado School of Medicine, describes how researchers at Mayo Clinic use a machine learning algorithm on a well-defined problem of a brain tumor called glioblastomas. Different types of glioblastomas have different genetic abnormalities, and physicians treat the tumors differently based on these ab-

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normalities. Radiologists looking at images of glioblastomas can't determine which genetic variation they are—but Mayo's machine learning program can.

"The advantage for radiology is in these small, well-defined clinical situations where the machines can get more information from the images than two human eyes can distinguish," Geis says.

## Seeking validation, data

While still in its early stages, a critical task of machine learning in radiology is to extract more knowledge from data. "In medical imaging, we've dramatically increased the capability of visualization of the data, but what we haven't improved on is to create quantifiable data coming out of those modalities," Dreyer says. "Once we have algorithms capable of doing that in an automated sense with high reliability, the output from diagnostics is going to be more consistent—the result will be much stronger predictive capabilities for diagnostics in precision care."

Still, various challenges must be overcome to achieve widespread use of machine learning. For starters, while there are thousands of machine learning software programs available from hundreds of vendors, each is designed for a very specific clinical situation. But in daily practice, physicians see hundreds of thousands of kinds of pathology, and it's simply not feasible to invest in thousands of narrowly focused machine learning programs.

That diversity of offerings is difficult for hospitals to manage. Today, many health systems are consolidating IT purchases, a trend that runs counter to that posed by machine learning offerings.

Some experts caution against being an early adopter of machine learning, contending that the technology has yet to be validated. "There is way too much emphasis on a particular capability," says Paul Chang, MD, professor and vice chairman of radiology informatics at the University of Chicago School of Medicine. "I don't like approaches or disruptions that con-

centrate on technical capability. I'd much rather it be driven by use case."

Current use cases are immature or not compelling because of the fundamental challenge of deep learning. The vast majority of deep learning algorithms require supervised training with a data set. For example, Chang says, to create a deep learning program that can detect lung nodules and determine whether they're cancerous, you have to train it by sending it a batch of images you identify as cancerous and a batch you identify as non-cancerous.

Those vetted data sets have to come from production systems. "We don't have research data sets," Chang says. "The huge barrier to deep learning is that we don't have training data sets."

## Building beyond EMRs

Right now, hospital IT organizations are EHR-centric, which presents another obstacle to the implementation of machine learning. "EHRs are not currently equipped to handle broad-scale AI integration," says Dreyer. "We do, however, have a vehicle for integration of predictive analytics in our current evidence-based Clinical Decision Support interface. We plan to use this vehicle for our AI integration as well."

Experts agree that a good deal of fundamental framework is required before machine learning can truly take hold.

Chang believes hospital CIOs would be wise to take a "hedge strategy." He sees a huge economic risk to diving into deep learning too early. Moreover, he adds, deep learning is just one of many cybernetic decision support capabilities—Bayesian networks, analytics, big data, registries, to name a few others—that CIOs need to be prepared to manage.

But EMR systems were designed to help clinicians from an operational standpoint and were not designed to address this new need. "EMR is not an architecture," Chang says. "It's one of many components of a true enterprise service bus that allows us to support modern needs."

The challenge for CIOs is to figure out now how to get one's EMR-centric IT infrastructure to be able to feed and consume these kinds of cybernetic services at scale in a HIPAA-compliant way. "If I were a CIO, I'd be thinking, I'd better start building the capabilities in my existing IT stack so when deep learning is validated and becomes real, I'm ready to use it and exploit it," Chang says.

For hospital IT execs, that means determining a way—at scale and compliant with HIPAA rules—to extract all the data that currently stands in various silo data sets and correlate it with outcomes to feed these new systems.

But the use of machine learning in healthcare is already happening, Dreyer contends. In radiology, machine learning algorithms are detecting pulmonary nodules, diagnosing polyps and screening for breast cancer. However, many more algorithms are on the horizon.

Once economic and IT barriers are addressed, machine learning has the potential to dramatically improve the ability of physicians to establish a prognosis. For example, it could be used to correlate all lung cancer patients with their lab values, genetic profiles and diagnostic images to find patterns that help doctors.

But according to Geis, we might also see applications of machine learning where the data that's generated helps to measure value in medicine. Machine learning has the potential to look at medical data—EHR data, financial data, measurement of outcomes—and search for patterns based on individual providers or groups of providers. That would enable algorithms to tease out individual contributions to care.

For example, an algorithm might assess the effect of two doctors by looking at patterns that follow patient treatment. "It has the potential to identify factors like, 'Everyone who goes to Doctor A seems to do a little better or their care costs a little less,'" says Geis. "Once people start looking at it that way, this will be one of the biggest explosions of machine learning." ■

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- Optimus Healthcare Partners, chief medical officer and VP physician network development
- Horizon BCBS of New Jersey, member of HMO board of directors



Interview by Fred Bazzoli

## Finding Value in Information

When James Barr, MD, and a partner were starting a medical practice some 30 years ago, they knew information would be valuable. “We wanted to show how well we were doing,” he recalls. “Instead of doing a manual chart audit, computers provided a great way to capture information on our own performance.” Using an early version of Microsoft Access, Barr and his partner custom developed their own electronic health record. Now, as a medical director of two accountable care organizations, information is even more valuable, whether it’s used for improving quality or enabling better care by the ACOs. Communication ties together clinicians to better coordinate care and ensure that everyone involved with a patient knows what’s going on. “We really embrace team care,” he says.

#### **On the impact of accountable care**

We’re moving from reacting to the patient to managing the patient. All of our patients are our patients all of the time, not just when they’re sick. We use risk stratification tools; we do outreach and find out how they’re doing. Technology helps us do a better job with all of that.

#### **On how technology changes care**

We’ve been trained to react to the patient when he or she comes in. We’re using technology to change

that. We use health information exchange to pull up a report from a hospital. Instead of doing regular office visits, we can do an email consultation. With the ACO, we can go in and get our electronic daily census, find out where our attributable patients are—if they wind up in a hospital, we get that notification.

#### **On the goal of technology**

The key strategy we utilize with all this technology is, it isn’t about the technology—it’s about the patient. The No. 1 priority is to improve our relationship with the patient and improve outcomes. The physician’s role is to be focused on the relationship with the patient. Technology should allow the physician to have more time to spend with the patient, to look at the patient. We should be able to use the technology to engage the patient and then use the technology with the patient in shared decision making.

#### **On improving the caregiver**

Technology also can be used to show the physician how to be a better doctor. In a value-based care arrangement, we show physicians how technology can improve their quality and efficiency. My personal wake-up call was when I was measuring my own performance, and I found I was 40 percent compliant with norms. I found out I wasn’t using the information in the EHR the right way; I wasn’t engaging my patients. ■



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