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2017 - Our prediction for the year of data standards, security, and truth

As an editor, I have the opportunity to attend a large number of association conferences and meetings that cover many medical disciplines. Whether it’s a group of infection preventionists trying to track their patients’ disease states, laboratorians striving to do the most accurate tests, a physician practicing trying to access their hospital affiliates’ EMR system, or IT directors dealing with HIPAA compliance rules and data security, the list could go on, they all had one common concern at the end of 2016:

What’s going to happen now with the state of healthcare in the United States?

HIT asked a number of savvy suppliers to offer their 2017 predictions for healthcare delivery solutions that address current needs as well as potential future adjustments. Their exciting ideas in this time of big changes assure us that delivering healthcare more effectively is not only doable but well within sight. (See “HIT in 2017 and for the long haul,” pg. 6.)

Our prediction: Healthcare professionals realize that it doesn’t matter who is in the White House or whether politicians threaten to unravel established systems. At the end of the day, they recognize that healthcare is one of the most important basic needs that matters to all families, regardless of economic status. And to cover that need and fulfill that principle, the professionals that are already helping deliver that care will continue to deliver it—and do it well.

For a number of years now, we’ve all been working on standard practices, trying to keep up with new CMS reporting requirements, new ICD-10 codes, and next-generation systems to get reimbursed. It all boils down to processes that can help clinicians deliver healthcare cost effectively, that use tools that increase human efficiency and also help us overcome our shortcomings.

Have we been focusing on the wrong problems? Why does it seem that we aren’t getting to the true data to get the true answers?

The old computer phrase “GIGO” comes to mind: Garbage In Garbage Out. That is pretty much where many healthcare systems are stuck. Some are in that position due to uncertainty, others due to funding, and most, well, both.

There are tools that have been developed to help get at the data quality. For example, why haven’t hospitals embraced the Unique Device Identification (UDI) information into their EMRs and revenue cycle platforms? The use of UDI could and will be the backbone of the clean data we are striving to capture. One of our predictions is that more information on successful UDI implementation will be disseminated by some progressive healthcare systems that will show how the integration of this information and the use of data standards will be integral to our population health initiatives. And all of this will, in part, help us achieve value-based healthcare.

How can we track the costs, the outcomes, and patient satisfaction to know if we’ve been successful?

We talk about precision medicine. But, without focusing on the proper implementation of technology that can deliver individualized treatment and track results, we won’t know if we are successful.

When all is said and done, change is real and inevitable. We all have to work together—and so do our systems. We predict that healthcare delivery networks will fully adopt the Interoperability Pledge and commit to systems that deliver consumer access so their patients can participate in and understand their personal care. With these same systems in place, we will be able to share and analyze the costs, quality, and outcomes transparently and securely. With this information, we can fulfill that pledge to “implement federally recognized, national interoperability standards, policies, guidance, and practices for electronic health information, and adopt best practices including those related to privacy and security.”

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Security

Organizations line up to be part of IBM Watson security beta program

Global leaders in banking, healthcare, insurance, education, and other key industries are getting in the queue to join the IBM Watson for Cyber Security beta program. Sun Life Financial, University of Rochester Medical Center, Avnet, SCANA Corporation, Sumitomo Mitsui Banking Corporation, California Polytechnic State University, University of New Brunswick, and Smarttech are among the first 40 organizations testing Watson’s ability to assist in the battle against cybercrime. Watson for Cyber Security uses intelligent technologies like machine learning and natural language processing to identify and prioritize threats, which can help security analysts make better, faster decisions from vast amounts of data. Currently, threat identification and detection is steadily increasing the workload of security analysts with more alerts and anomalies to process than ever.

A recent study from the IBM Institute for Business Value shows that nearly 60% of security professionals believe emerging cognitive technologies will be a critical part of changing the tides in the war on cybercrime.1

Beta customers are leveraging Watson in their current security environments to bring additional context to their cybersecurity data, with new use cases such as:

• Determining whether or not a current security “offense” is associated with a known malware or cybercrime campaign; if so, Watson can provide background on the malware employed, vulnerabilities exploited, and scope of the threat, among other insights.

• Better identifying suspicious behavior; Watson provides additional context to user activity outside of the primary suspicious behavior, which can provide better guidance to whether or not an activity is malicious.

Working with these beta customers, IBM is continuing to enhance Watson’s understanding of cybersecurity data and refine how Watson can seamlessly integrate into day-to-day security operations. Source: IBM Security

REFERENCE

Research

Can a surgical mask become a virus killing machine?

An engineering researcher at the University of Alberta (UAAlberta) in Canada has developed a new way to treat common surgical masks so they can trap and kill airborne viruses. His team’s research findings appeared in the journal Scientific Reports on Jan. 4, 2017, published by Nature Publishing Group.

Hyo-Jick Choi, a professor in the UAlberta Department of Chemical and Materials Engineering, noticed that many people wear a simple surgical-style mask for protection during outbreaks of influenza or other potentially deadly viruses such as severe acute respiratory syndrome (SARS) or Middle East respiratory syndrome (MERS). But the masks weren’t designed to prevent the spread of viruses. Airborne pathogens like influenza are transmitted in aerosol droplets when we cough or sneeze. The masks may trap the virus-laden droplets, but the virus is still infectious on the mask. Masks capable of killing viruses could save lives, especially in an epidemic or pandemic situation.

Knowing that the masks are inexpensive and commonly used, Choi and his research colleagues went about exploring ways to improve the mask’s filter. In a twist of fate, a problem he was struggling with in one field of research (the development of oral vaccines) became a solution in another.

A major hurdle in the development of oral vaccines is that when liquid solutions dry, crystals form and destroy the virus used in vaccines, rendering the treatment useless. In a nifty bit of engineering martial arts, Choi flipped the problem on its head and turned crystallization into a tool to kill active viruses.

Choi and his team developed a salt formulation and applied it to the filters in the hope that salt crystals would “deactivate” the influenza virus. The mechanics of simple chemistry make the treatment work. When an aerosol droplet carrying the influenza virus contacts the treated filter, the droplet absorbs salt on the filter. The virus is exposed to continually increasing concentrations of salt. As the droplet evaporates, the virus suffers fatal physical damage when the salt returns to its crystalized state.

While developing solid vaccines, Choi observed that sugar used for stabilizing the vaccine during the drying process crystallizes as it dries out. When crystals form, sharp edges and spikes take shape and they physically destroy the virus vaccine.

“We realized that we could use that to our advantage to improve surgical masks,” says Choi.

In a series of experiments and tests at UAlberta and in the Department of Medical Zoology at the Kyung Hee University School of Medicine in Seoul, South Korea, the team arrived at a workable treatment that improves the efficacy of the fiber filter inside the masks.

By using a safe substance (table salt) to improve an existing, approved product, Choi sees very few roadblocks to implementing the innovation. Now Choi has been awarded a provisional patent for the development of virus deactivation systems based on the salt-crystallization mechanism.

Source: UAlberta
Tech Watch

Google aims to redefine meetings—virtually and in Ultra HD

If your team has a penchant for the latest in collaboration tools, why not go virtual and have multimedia meetings in 4K? The ultra high-definition Google Jamboard is a 55-inch touchscreen digital whiteboard hooked into the cloud. It comes with a built-in HD camera, speakers, and Wi-Fi and is designed to combine next-gen video conferencing and business collaboration tools to help foster your group’s creative side. Users can work with teammates from across the globe on other Jamboards or use the smartphone or tablet companion app remotely. Save your “jam” session with your colleagues in the cloud, and you won’t be left wondering, “Now what was that great idea Fred had last Friday?”

The Jamboard seeks to make the best of combining Google Search, Google Maps, Chrome, and all the tools available in the G Suite, a set of intelligent apps that includes Gmail, Docs, Drive (to hold documents, presentations, and photos), and Calendar. Plenty of other tools are available, such as sticky notes, stencils, and intelligent features like handwriting and shape recognition. A physical stylus and eraser are also part of the package.

Release date for the Google Jamboard is first half of 2017. Pricing should run under $6,000. Look for third-party app development for the board to blossom once it rolls into conference rooms around the world.

ONC

Certified Health IT Product List update

The Office of the National Coordinator for Health Information Technology (ONC) recently announced that the Certified Health IT Products List (ONC CHPL) has been updated thanks to the Enhanced Oversight and Accountability Final Rule. What’s new?

• Three new surveillance reports are available as downloadable csv files on CHPL Resources.
• The CHPL hosts two new pages to reflect health IT products that are no longer certified and developers who are precluded from certifying health IT products under the Enhanced Oversight and Accountability Final Rule. This data includes all known decertified products for the 2014 edition as well as the 2015 edition and will continue to be updated as certification statuses change.
• The CHPL now will display the results of all surveillance activities for certified products. This data is required to be updated quarterly, so the first release is expected in April. However, the setup for the new data is now in place.

What’s not changing?

• Found certification non-conformities will continue to be updated on a weekly basis. Check out the Certified Health IT Product List (https://chpl.healthit.gov/#/search) to see all these updates. If you are using a product from the CMS EHR Incentive Program, ONC encourages you to reach out to that program to confirm whether it is still eligible or to seek a hardship exemption.
You might want to fasten your seat belt. This year could be a bumpy ride. With a new administration in the White House and the fate of the Affordable Care Act in limbo, the beginning of 2017 portends a lot of turbulence for our healthcare IT journey ahead.

Luckily, we have a host of new in-flight technologies to help us with our travels, and the timing couldn’t be better to put them to the test. Precision medicine, artificial intelligence, and telemedicine are right there in front of us and ready to be used. We’ll also need assistance with navigation, better ways of working together, and to stay safe along the way. Data management, interoperability solutions, and security tools can help us face those challenges.

And if you need advice and a little comfort and companionship from a fellow passenger or pilot, look no further. HMT’s industry experts are here to provide their knowledge about what lies ahead for patients and providers alike.

It’s a weird feeling not to know where you’re going, but we can handle a change in plans. We’ve certainly done that before, and we’ll get there one way or another.

The big picture

Richard Loomis, Chief Medical Officer and VP of Informatics, Practice Fusion

This is the year that healthcare will revitalize its humanity. In 2016, the healthcare industry made a number of meaningful strides in the move to value-based care, culminating in October with CMS releasing the Final Rule for implementing the Quality Payment Program. In 2017, this focus on value-based care through new payment models will begin to shift to the greater value found in restoring the provider-patient relationship. 2017 offers an opportunity for health IT to support this focus, starting with unwinding the complexity of care delivery and the burden of measuring outcomes. Below are three themes we anticipate seeing in this year:

1. The year of EHR usability: EHR usability will become a critical success factor for providers as the burden of quality reporting continues to grow in an increasingly fee-for-value world. Practices already spend $40,000 per provider per year reporting quality measures—a sum of more than $15.4 billion each year! These costs will increase in 2017 and have a disproportionate impact on small practices. It will be financially prohibitive to practice medicine without a user-friendly EHR.

2. Meaningful measures of interoperability: Continuing to add subjective measures for interoperability is not sustainable for physicians, especially those in small private practices. Rather than try to develop measures for the myriad of ways interoperability may be occurring and mandating reporting for those measures, in 2017 we will assess where interoperability is needed for providers and how it can be expanded and improved to fulfill unmet needs.

3. Real World Evidence comes of age: Real World Evidence (RWE) will increasingly be valued by the healthcare and life sciences industries to augment other forms of clinical research. Although randomized clinical trials continue to be the gold standard for establishing efficacy and safety, they may not reflect typical patient care or day-to-day experiences. The FDA has already signaled their interest in RWE, and in 2017 we will see further support through the bipartisan 21st Century Cures Act passed into law.

Just as 2016 was an exciting year of transition in healthcare, 2017 will be no different.

Angela Rivera, Vice President, Health Solutions, Computer Task Group (CTG)

• The evolution from fee for service to pay for performance will only accelerate. This fundamental shift is being driven not only by the usual suspects (whether they be insurers or the government, payers fundamentally agree that costs must be reined in) but also increasingly by consumers themselves. What will differentiate 2017 from previous years is that this shift will not be subtle. The pay-for-performance era is here. As a result, organizations will increasingly be called on to demonstrate continuous improvement.

• Long-standing legacy systems, including ERP and other core administrative systems across the industry—both in hospital and payer environments—will reach a point of diminishing returns. As the industry continues to change, and transformative trends (like the move toward pay for performance) march forward, IT infrastructures will need to be upgraded and, in many instances, replaced—all on a much greater scale than in years past.

• The gap between organizations that are ahead of the curve on policy changes and the technological advancements they require and those that are not will widen. Everything from an organization’s efforts to optimize existing systems and workflows, to rulings such as CMS’ final
2,398-page ruling on the Quality Payment Program, will further differentiate those organizations that use technology effectively from the late adopters. MACRA is a great example: Payments that fail to participate in the required data reporting will see payment adjustments of up to 4% in the first reporting year and up to 9% thereafter. In fact, it’s safe to predict that this alone could result in increased consolidation among smaller practices as some look to gain the technology and transformative resources needed to better address final MACRA rules.

• Customer experience will be on everyone’s minds. Despite all of the changes shaping the industry, the consumerization of healthcare will continue, making it imperative for all sectors of the industry to provide consumers with the tools and services necessary to navigate the complexities associated with healthcare and make sound personal healthcare decisions. For this reason, leading healthcare providers will increasingly adopt and deploy service desks that address the needs of consumers and internal users.

• Security concerns extend beyond patient privacy data and the cloud. It is undisputed that security concerns have been top of mind for some time now, and these concerns only continued to increase as reports of healthcare organizations being hacked in the United States have grown in number. Looking ahead to 2017, there is a need to continue the laser focus on these potential breaches as they relate to medical records and privacy issues, but organizations should now also be looking closely at their safeguards against breaches associated with medical and biomedical devices. These devices are connected—often with limited or no security—to the hospital’s network, making patient data stored and transmitted through these devices accessible.

Bruce Johnson, CEO, Global Healthcare Exchange (GHX)

Despite considerable uncertainty over the future of the Affordable Care Act, the need to deliver better quality care at a more affordable cost remains constant. In 2017, healthcare technology should see a continued and heightened focus on data quality and visibility for a variety of purposes, from reducing costly errors in business transactions to understanding what products and therapies deliver the best outcomes for patients. There is a lot of excitement over advances in analytics, but the success of those new technologies depends upon the accuracy and accessibility of data. Further, many organizations recognize there is still significant waste in the system that can be eliminated through increased automation and better data, reducing the need for manual intervention.

We also anticipate the continued mergers, acquisitions, and other organizational alliances by both providers and suppliers seeking economies of scale, the success of which all depends on being able to integrate and share data. Suppliers will continue to focus on consolidating back-office systems so they can devote more resources toward serving an increasingly decentralized customer base as care moves to more non-acute settings.

Finally, after decades of talking about the need for data standards, we see real momentum with the implementation of the U.S. FDA unique device identification (UDI) rule in the United States, and the European Union planning to issue its own version of the rule this year. More than 50% of suppliers we surveyed have or plan to implement GS1 standards within the next two years, and providers become preferred, and sometimes exclusive, providers. This helps narrow the network to reimburse only procedures done in facilities that show exceedingly positive, quality outcomes. Not only will this improve outcomes, but it will also be more cost effective as it decreases readmissions and complications.
As we enter 2017 and continue to see Modernizing Medicine Founder and Chief Medical Officer, Co-Founder and Chief Medical Officer, Modernizing Medicine, Paris B. Lovett, M.D, Chief Medical Office, Hospital IQ

Despite the uncertainty about the future of the Affordable Care Act, the three Es—efficiency, effectiveness, and experience—will remain a priority for the industry. We can expect to see more being done with bundled payments, as well as increased levels of transparency related to both price and quality. Hospitals will still face intense pressure to improve efficiency and the patient experience. This will drive hospitals to look for ways to reduce inpatient care, whether it’s doing more in day clinics or conducting more post-acute care in people’s homes. Regardless of “repeal” or “replace,” hospitals will have less room for error with bed allocation, so technologies that help automate and align resources, such as staff, operating rooms, and inpatient beds, will be in greater demand.

Teledicine today and tomorrow

Michael Sherling, M.D., MBA, Co-Founder and Chief Medical Officer, Modernizing Medicine

As we enter 2017 and continue to see healthcare technology and delivery evolve, it’s important to reflect on progress, hurdles, and what lies ahead. Key areas of focus in recent months and years have been improved access to care and quality; teledicine is a technology and strategy that has been highly touted for its potential to improve both.

Since its inception, teledicine has been a hotly debated topic throughout the healthcare space. The potential has always been evident, but the technology, compliance, and financial models have required ongoing refinement to make this remote care delivery model viable. While early models and technologies were clunky, teledicine is quickly becoming more mainstream and accepted by patients, providers, and payers. Unfortunately, it seems as if teledicine took a backstage role during 2016. However, it appears that in 2017 it will thrive, in particular with the new language in the 21st Century Cures Act. This groundbreaking legislation mandates that by March 2018, Congress is advised which telehealth services are eligible for reimbursement by Medicare and private payers.

Many physicians view teledicine as an alternative and efficient way to serve patients. It allows them to provide timely treatment, diagnosis, and professional advice for patients when a virtual visit is appropriate. Often, patients are not able to come into the physical doctor’s office for a variety of reasons, including a lack of mobility or geographic separation. In addition, teledicine creates a convenient way to treat and assist patients that might not require an in-person appointment, such as follow-up for a rash or acne.

While physicians should understand how new technologies may fit into their workflow before adopting them, teledicine can provide a unique opportunity for physicians to up-level their business and patient care. With smartphones becoming ubiquitous across the general populace, the primary tools already exist to enable this innovative and powerful new care delivery model.

Here are a few teledicine thoughts that may come into play in 2017 and beyond:

1. Teledicine solution within the EHR System. Currently, only a few select vendors and healthcare providers offer teledicine, and even fewer have it integrated with their EHR system. As the importance of patient engagement grows, the need for patients and physicians to have access to accurate medical information such as medications and allergies will be critical for its future success. One platform that includes both the EHR system and the teledicine solution solves this patient safety concern.

2. Additional revenue stream. With teledicine, physicians can add a revenue stream to their practices. First, if a patient is a no-show, providers can fill that time treating patients virtually and still get paid for their time. Physicians can also see patients in the office who may have more immediate needs and use telehealth technology to care for patients who can simply share a photo for a quick follow-up visit.

3. Rural care should improve. It’s no secret that access to healthcare in rural areas is a challenge. Teledicine can provide physicians with another means to access their patients and care for them without an in-office visit, thus changing how patients living in remote areas are treated.

4. Even more data can surface. Data is crucial to navigating today’s complicated healthcare landscape. It allows physicians to identify and treat complicated diseases, build up focus areas for their practice, or measure patient satisfaction. Teledicine data will create more opportunities for physicians to improve customer service and their disease-lines for patients.

Technology continues to play an increasingly larger role in improving physician efficiency and patient care. For physicians who have mainly charted on paper or utilized old technology, new systems may be a challenge, but those who do their homework and understand which systems and technologies best fit their practice and patients should thrive.

The healthcare space is moving forward. By the time our predictions come to fruition, it is likely another form of technology will surface. That said, we do see teledicine as a huge opportunity and one worth further exploration and adoption. It will require a group effort to achieve some of the positive outcomes I’ve outlined, but I do believe that the patients, providers, and vendors are up for the challenge.

John Squire, President and COO, Amazing Charts

The reality of teledicine today entails patients connecting with their doctor by securely sending text messages, videos,
Side effects may include sighs of relief.

Shifting to value-based care doesn’t have to be such a pain. Find out how the new 3M™ Performance Matrix Platform, powered by Verily, can help you uncover real, actionable insights to improve the overall health of your organization.

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and pictures with their smartphones. These touchpoints are then captured in the provider’s EHR system and integrated into the patient’s chart/record for accuracy.

While this approach may not require a high level of tech, this type of remote care given by providers is still considered telemedicine, and it will become more and more common over the next year—especially in the direct primary care (DPC) market. Typically, DPC providers take a monthly membership fee from patients in exchange for 24/7 care. As such, most DPC doctors offer secure messaging anytime to provide high-level customer service. For example, patients who visit DPC physicians who use Amazing Charts can easily access their provider by using InLight EHR’s Twistle integration that enables HIPAA secure messaging.

In addition to texting, consumers are becoming technologically savvy and using wearables to gauge their health. Telemedicine will further increase as these technologies enable real-time collection of biometric data such as temperature, blood pressure, and pulse. The latest versions of Fitbits, Apple Watches, etc., will continue to empower patients to stay healthy and active.

In 2017, the expansion of reimbursement for non face-to-face services will also fuel the growth of telemedicine. Medicare’s new billing code for chronic care management illustrates that the future of value-based care does not require 15-minute office visits. Instead, the healthcare environment is shifting toward keeping patients out of the office with follow-up phone calls about medications and answering patient questions via text.

Today’s telemedicine does not necessarily mean video conferencing between physicians and patients in remote locations, but the market may eventually evolve to that level of care. This futuristic view of virtual visits has not come to fruition, mainly because patients don’t want to speak with doctors that don’t have a full picture of their health. Until the interoperability issue is fixed, this will likely remain unchanged.

### AI gets the chance to prove itself

**Anil Jain, M.D., FACP**; VP and Chief Health Informatics Officer, Value-Based Care, **IBM Watson Health**

We at Watson Health use the term “augmented intelligence” rather than “artificial intelligence,” given that our AI aids and assists rather than replaces the role of the clinician. Cognitive technologies coupled with traditional data sciences can quickly read and understand clinical and social data and connect relevant pieces of information to identify areas of risk, apply published guidelines, and then make recommendations on how to best manage the care of the specific individual. Ultimately, the care team makes the final determination but is assisted through cognitive technologies to make population health management a bit more person-centric.

Chronic conditions are a perfect use case for cognitive technologies. Appropriately managing chronic conditions is critical if we are to reduce the unnecessary healthcare spend. Managing chronic conditions requires monitoring various markers (vital signs, blood tests, symptoms, etc.) of disease activity to determine whether patients are optimally managed. Cognitive technologies can examine care paths and disease markers and identify the most appropriate treatment options. For example, Watson Health, in partnership with Medtronic, is developing the first generation of an app expected to uncover important patterns and trends in diabetic patients based on retrospective analysis of patients’ insulin, continuous glucose monitors, and nutritional data. Augmented Intelligence from cognitive technologies can also benefit patients with multiple chronic conditions in which various therapies may interact, leading to complications and poor outcomes. The complexity of these patients can often make it difficult to apply specific guidelines, but cognitive insights can help examine the evidence of various condition-specific guidelines and provide evidence-based recommendations.

Finally, AI can help make big data more actionable. Over the last decade, health systems have made considerable investments in EHRs, enterprise business intelligence, and analytics to respond to various internal and external programs to help improve their quality, reduce cost of care, and measure performance across the organization. Many of these efforts have led to enterprise data warehouses or large data marts, with many of them engineered for traditional analytics based on well-described business rules and rigid definitions. However, with cognitive technologies coupled with big data cloud technologies, health systems can have more degrees of freedom on how they define their metrics, include more disparate unstructured data, and have more timely analytics.

**Tasheen Suleman** (left), CEO, and **Dr. Jim Lebret**, Medical Director of **Clinical Analytics, CloudMedx**

2017 will bring about the awareness that while EHRs were great data-entry tools, they need to do a lot more as patient volumes, and their complexity, rise. It is putting a lot of pressure on both the health systems as well as individual doctors who are burdened by maintaining high quality in a clinical environment as well as maintaining revenue. Tools such as AI will help alleviate most of these pressures. For example:
- Natural language processing: the ability to read clinical notes from electronic records and understand them like doctors do.
- Machine learning: the ability to learn from data, make correlations, and make predictions for risks, diagnosis, and outcomes.
- Predictive analytics: being able to model and predict what is going to happen is a game-changer for many aspects of medicine.

Together, these artificial intelligence tools combine to become greater than the sum of their parts. They serve to unlock the data bottleneck in healthcare and can literally help save lives. Ideally, these AI tools will turn the raw data into information that clinicians will find current, digestible, accurate, and actionable.

For example, a patient may report an allergy to penicillin on a questionnaire. With AI tools, the information can automatically be taken up, processed, placed into the right area of the chart, and even surfaced at a specific moment (i.e., if a penicillin script is written). Another example could be where a system

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**Note:** The text above is a natural representation of the document content, aiming for readability and coherence. It may differ slightly from the original formatting due to the nature of converting text from a graphic to plain text.
In 2017, precision medicine is poised to begin to deliver on its promise. We are reaching an inflection point where drivers will cause sustained acceleration that will ultimately lead to broad transformation of healthcare.

Continued gains in machine learning, in-memory computing, and advanced visualization will power more nuanced precision medicine. This will enable deeper insights at the moment of decision in a democratized fashion across the enterprise.

But real-world challenges have largely related to interoperability rather than sophistication of analysis. There is good news here with continued maturation and adoption of standards such as Fast Healthcare Interoperability Resources (FHIR). Though there will be fits and starts along the way, 2017 will see progress from a “marketing checkbox” adoption of interoperability standards to a deeper embrace. This will be driven by customers leveraging these services in real scenarios and driving more sophisticated implementations. The political and social winds are blowing strongly toward freeing data, and this will motivate vendors to be on the right side of history—and avoid ending up in front of Congress. The road to seamless interchange may be a thousand-mile journey, but we will be well underway in 2017.

In the past, provider interest in precision medicine has been uneven. There will be progress here too. Nearly 20% of payments are now value based, and the trend is accelerating. This reality seems to have penetrated, causing many organizations to begin to skate toward the proverbial puck even though their payer mix of today isn’t forcing immediate action. And, in healthcare, once movement starts, the rest of the market follows quickly along.

2017 is just the beginning. Ever-cheaper sequencing and the explosion of omics data, along with computational power to make sense of it, ensures that we will continue to see accelerating change as healthcare transforms to a data-driven enterprise.

David Delaney, M.D., Chief Medical Officer, SAP HEALTH

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In the past, provider interest in precision medicine has been uneven. There will be progress here too. Nearly 20% of payments are now value based, and the trend is accelerating. This reality seems to have penetrated, causing many organizations to begin to skate toward the

Precision medicine

David Delaney, M.D., Chief Medical Officer, SAP HEALTH

In 2017, precision medicine is poised to begin to deliver on its promise. We are reaching an inflection point where drivers will cause sustained acceleration that will ultimately lead to broad transformation of healthcare.

Continued gains in machine learning, in-memory computing, and advanced visualization will power more nuanced precision medicine. This will enable deeper insights at the moment of decision in a democratized fashion across the enterprise.

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2017 PREDICTIONS

The need to focus on security is a sure thing

Drew Ivan, Director of Business Technology, Orion Health

With major projects like ICD-10 and Meaningful Use largely behind us and new initiatives like precision medicine in the future, 2017 will be a transitional year. A great deal of technology infrastructure has been laid down, and 2017 will be the year to deal with some of the implications of these technology investments and get started on some of the value-added functions they enable. Over the past eight years, the healthcare industry has invested heavily in an EHR infrastructure, and in 2017 the risks and rewards related to this investment will begin to come to fruition.

Enabling a shift to value-based reimbursement will be one reward. It will be critical to ensure that the rewards associated with value-based reimbursement flow back to the providers who are enabling it through their increased documentation efforts.

Another reward will be the ability to track specific genomic, behavioral, and social data to enable precision medicine and provide better outcomes than ever before.

President Obama’s signature healthcare care project, the Precision Medicine Initiative, and Vice President Biden’s closely related Cancer Moonshot project put the focus on precision medicine in 2016. The 21st Century Cures Act continues funding for these programs into 2017 and beyond, so we should expect continued momentum in this area.

While these programs focus on genetic aspects of precision medicine, a new kind of precision medicine is also emerging. Behavioral and social determinants of health are just as specific to an individual and have just as much impact as genetics. These factors also have the advantage of being easier to manage at a lower cost.

Therefore, in 2017, we should expect to see a broadening of the definition of precision medicine. In the past, the term has been synonymous with genetic variations, but going forward, we’ll see a more comprehensive picture of a patient’s status being used to tailor treatments for their unique situation.

David Finn, Health IT Officer, Symantec

2016 taught me a great lesson: predictions and trends don’t amount to much—remember that election thing? What actually happens is what matters.

Being human, we can’t help but prophesize and forecast the future. The way I see it, a lot of what happens in 2017 in healthcare and HIT depends on what becomes of the Affordable Care Act and how the business of healthcare will be incentivized and paid for. That is prophecy, at this point. We know that changing the business model will change care, reimbursement, and the number of covered lives, impacting the technology needed and how it is used.

Here are some things we do know will happen in 2017, no matter what happens in Washington, D.C.:

- Healthcare data will continue to be valuable and easier to get than other valuable data.
- Cyber criminals of all types will continue to target healthcare organizations.
- Insiders will continue to be a problem—remember that election thing?
- Sharing health data for treatment, payment, and operations will expand.
The Internet of Things will impact healthcare in ways we have not yet imagined.

Organizations that try to improve security by adding all manners of systems, technology, and people with limited understanding of security and/or healthcare will make security worse.

Organizations that address security with a holistic approach using sound systems, security engineering techniques, and security design principles can make their systems less vulnerable; reduce damage caused by disruptions, hazards, and threats; and improve resilience against attacks so they can continue to support critical missions and business functions after being compromised.

Population health benefits med adherence, outcomes-based care, seniors

Sean Cannone, D.O., CMD, Senior Vice President and Executive Medical Director, Evolution Health

As we move into 2017, we will see a greater need to increase patient engagement, enhance the quality of care, and improve patient outcomes. We have to start by adopting a patient-centered approach.

Three of the most important strategies for advancing outcomes-based care and a patient-centered care model include:

1. Utilizing a platform that aligns healthcare resources and patients’ individual healthcare needs on a 24-hours-a-day, seven-days-a-week basis.
2. Employing an integrated multidisciplinary team that includes the ongoing involvement of a clinical pharmacist.
3. Leveraging technology in meaningful ways to identify high-risk patients proactively within a population, coordinate healthcare resources, foster communication among the healthcare team, and support patient care navigation.

Providers must tailor therapy to patients’ personal preferences, care goals, and life circumstances, so patients take on a more active role in their health and improve their medication adherence. Additionally, we can optimize patient care in a time-sensitive manner by utilizing an interprofessional healthcare team, such as pharmacists for anticoagulation management, medication regimen reviews, and patient education.

We also know that most patients are not intentionally non-adherent. Adherence is a complicated issue with many possible causes that can include financial challenges, adverse events, memory deficits, and poor health literacy—all of which affect patients to varying degrees.

Increased access to technology such as smartphone applications and text messages provides unique opportunities for pharmacists and other healthcare providers to monitor and improve patients’ medication adherence. Technology tends to impact patients with logistic- or memory-related issues the greatest.

Meanwhile, for those with primarily social or psychosocial barriers, there is a more muted effect. At Evolution Health, we have found that it is most effective to use technology as a supplement to face-to-face or telephonic communication.

The best technological practices for improving medication adherence involve those that have direct patient contact; this can be telephonic in nature. Face-to-face interaction through video conferencing may be more impactful since it maintains the human element of the patient-clinician interaction. However, the most important element is not the mode of communication, but the frequency of patient encounters. Typically, more frequent patient encounters result in improved medication adherence and patient education. To maintain sustainability, we must leverage the services of an interprofessional team. Apps and text messaging can then serve as technological adjuncts, providing helpful reminders and educational information.

Travis Palmquist, VP and General Manager for Senior Living, PointClickCare

• More need for medication management. The average assisted-living resident is on nine medications! Multiply that across hundreds of residents a facility houses. It’s a huge challenge. But families expect that their loved ones will have accurate and efficient meds administration. You need technology to achieve that.
• More connections to reduce medication-related risk. It’s time to put the connections in “connected health.” With the dispensation of nine different medications per resident across an entire community, you can’t have errors. So we are seeing technology emerge in the form of electronic communications with pharmacy, automated time windows, and alerts. The key is to use technology, when possible, to help minimize risk as much as possible.

The evolution of the portal to keep families in touch. We are now seeing an exciting assortment of creative resident-engagement tools as well as family portals. This area of technology is growing quickly, and operators need to stay on top of it.

Technology enabling better service capture and documentation. For some senior care facilities using paper workflows, all input needs to be logged separately. Others may have information buried in multiple systems that don’t talk to each other. All this makes it harder to capture, track, and ensure that services, especially “unscheduled services,” are being recorded. If not, they won’t get billed. And this is an industry that is 95% to 100% private pay. We need to see an ROI. We now have technology that will automatically make across-the-board changes as well as tightly integrate services with the billing records.

Dave Wessinger, CTO, PointClickCare

• Data will drive senior care’s participation in ACOs and other managed-care...
2. We’ll see more inroads toward patient management. Ramon Chen, Healthcare Data Management Expert and Chief Marketing Officer, Reltio, every operation at the core of almost every operation.

1. Organizations will double down on building a compliant culture. With distributed data sources, the commercialization of IT, increasing mobile use, and demands to get faster access to data, compliance teams are more challenged today than ever before. In 2017, we’ll see more healthcare organizations using technology to manage, enforce, and build a compliant culture, so that all employees adopt best practices in handling sensitive data. Allowing teams to share and collaborate on data while keeping it safe and secure results in a significant competitive advantage.

2. We’ll see more inroads toward patient centricity. The rise of the “p-suite” has been a continuing trend, but technology capable of managing sensitive data while attaining a single view of patients has still been a challenge. 2016 saw increased use of modern data management platforms to protect patient and consumer data. 2017 will see cloud data management vendors offering HITRUST-certified platforms while bringing together reliable data across a variety of sources that make a 360-degree patient view, and subsequent personalized engagement, a reality.

3. Time to market will continue to shrink. Healthcare organizations are facing growing pressure to differentiate disease treatments. Speed and agility are essential. 2017 will bring more data management technologies, helping them further shorten time to market. Additionally, innovation in mobile, predictive analytics, machine learning, and new data-driven applications will provide easily-accessible and complete views of stakeholders, so users can better orchestrate customer engagement to achieve commercial and R&D goals.

4. Personalized medicine will evolve. While precision medicine, as outlined by President Obama’s initiative in January 2015, is a boon for the industry and patients, it’s been viewed as either an opportunity or threat to healthcare organizations. In 2017, we’ll see personalized medicine become a reality, with modern data management platforms distilling information down to what really matters for each patient. This will lead to better efficacy, outcomes, and justifiable value, and the associated level of transparency will improve the entire healthcare ecosystem for all parties involved.

5. More healthcare organizations will adopt an integrated approach to data. Various business units within an organization typically access, use, and manage their own data sets to solve their own business challenges in sales, marketing, and compliance. CIOs and CDOs at leading healthcare companies have already implemented technologies that enable a single, complete, and reliable pool of data accessible by all employees. With cloud data management platforms dramatically lowering typical cost and resource barriers to achieve shared data nirvana, many more will follow suit in 2017.

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Top analysts provide their long-range forecast

IDC Health Insights released its IDC FutureScape: Worldwide Healthcare IT 2017 Predictions at the turn of the year to provide healthcare executives across the globe a guide to likely future technology and business scenarios. According to their predictions, the next three years will be focused on the adoption of disruptive technologies that will enable healthcare digital transformation. The drivers include the rise of computer-based intelligence with the increased adoption of cognitive/Al and robotics. The increased adoption of Internet of Things (IoT) technology is resulting in the convergence of mobile, social, and sensors. The illness burden across the globe is continuing to increase with an aging population, an epidemic of chronic illness, and the continued outbreak of infectious diseases, all of which will continue to drive healthcare technology innovation and force changes in reimbursement while contributing to shortages of medical and pharmaceutical resources.

IDC Health Insights predicts that:
- By 2018, ransomware attacks on healthcare organizations will double.
- By 2019, there will be a 50% increase in the use of robots to deliver medications, supplies, and food throughout the hospital.
- By 2019, 60% of healthcare applications will collect real-time location data and clinical IoT device data and embed cognitive capabilities to discover patterns, thereby freeing up 30% of clinicians’ time.
- By 2020, 20% of payers will offer personalized benefits with options for a consumer to dynamically reduce his or her premium and/or alter deductible/copay by disclosing personal health data.
- By the end of 2018, payers will have saved $1 billion globally through implementation of robotic process automation (RPA) tools, skill sets, and process reengineering.
- In 2017, patient engagement across the life science/healthcare ecosystem will jump from passive to active.
- By 2020, 70% of the developed nations will homogenize health insurance with the rest of the world, moving to replace self-employer-based options with expanded government sponsorship.
- Seeking a passive way to measure patients’ vital signs and other biometrics, more than 40% of healthcare organizations across the world will use IoT-enabled biosensors by 2019.
- By 2020, care plan adjustments will be made in real time with cognitive/Al using data from wearable devices, resulting in 20% more patients being engaged in their health.
- By 2018, drug makers will double their investment in analytics focused on healthcare provider data to reach millennial and gen x doctors the way they prefer it: electronically.

Source: IDC Health Insights
In 2011, the U.S. Department of Health and Human Services (HHS) released rules under the Affordable Care Act (ACA) in an effort to help healthcare delivery organizations, including doctors, hospitals, and other providers, cut costs by coordinating care using Accountable Care Organizations, or ACOs.

In 2014, there were 626 ACOs and 20.5 million lives covered, according to Leavitt Partners, and the number grew to 726 and 23 million lives covered in 2015. 2016 saw an increase to 838 with 28.3 million covered by an accountable care arrangement.1 Leavitt Partners is a consulting firm created by Michael O. Leavitt, former head of HHS, to advise clients in the healthcare sector.

The value of ACOs is supported by several influential organizations in the healthcare industry. The National Association of ACOs says ACOs are proving to be one of the most promising solutions to bend the cost curve and provide high-quality patient care.

And in early 2017, the Centers for Medicare and Medicaid (CMS) implemented the Next Generation ACO Model. The model authorizes CMS, through its Center for Medicare and Medicaid Innovation (CMMI), to “test innovative payment and service delivery models that have the potential to reduce Medicare, Medicaid, or Children’s Health Insurance Program expenditures while maintaining or improving the quality of beneficiaries’ care.”

CMS also has released Accountable Care Organization 2017 Quality Measure Narrative Specifications.2 The document presents the 31 quality measures that assess ACO quality performance and the quality performance standard for the 2017 performance year for the Shared Savings Program and the Next Generation ACO Model.

CMS measures the quality of care using 31 nationally recognized quality measures in four key domains:

- Patient/caregiver experience (eight measures).
- Care coordination/patient safety (10 measures).
- Clinical care for at-risk population: Diabetes (two measures scored as one composite measure), Hypertension (one measure), Ischemic Vascular Disease (one measure), Depression (one measure).
- Preventive Health (eight measures).

But while there have been many success stories surrounding ACOs, there have been a number of failures too, particularly by early adopters and ACO mergers. The lofty goals of managing and delivering coordinated care have been hindered by the challenge of delivering coordinated care successfully without a strong data warehouse.

One of the largest stumbling blocks is the lack of shared IT systems that can gather the many sources of data records and systems. The effort to track patient behavior, their compliance to prescribed treatment regimens, care costs, and patient outcomes needs a strong set of tools to gather and analyze these patient records.

Health Management Technology talked with three sources of ACO tools that could help organizations with their ACO successes.

Q: There has been a lot of focus this last year on the lack of success in a number of ACOs. Why do you think they are failing, and how could your software tools help them succeed in 2017?

Some ACOs are failing short because they don’t have adequate technology partners. Many population health solutions only provide analytics, inundating ACOs with data that isn’t actionable and leaving them with marginally improved quality scores at costs that remain high. Moving the needle on cost and quality is extremely burdensome and requires services that can identify patients in need of care, create workflow efficiencies, engage patients and coordinate their care, and free up staff time and resources.

This combination of analytics and services is why we refer to athenahealth Population Health as a comprehensive, end-to-end population health management service.

Q: Does your cloud-based platform integrate with your EHR platform as well as others?

All of athenahealth’s services, including our EHR, athenaClinicals, and athenahealth Population Health, are cloud-based and connect users to the athenahealth network. But most medical groups and healthcare networks managing patient populations need to connect to multiple data sources.
“It doesn’t get more mission-critical than healthcare.

Our network partner got that in a heartbeat.”

Jim Lowder
System VP, Technology
OhioHealth
Client since 2005

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The athenahealth Population Health service helps organizations integrate complex amounts of data, including payer claims data; financial data from practice management systems; clinical data from laboratory providers; clinical and administrative data from disparate EHRs; patient and event information from urgent care or emergency facilities; and feeds from other consolidated sources like health information exchanges, enterprise systems, and other data warehouses.

Out of that complexity, we create a single source of truth and consolidated workflows in our “virtual desktop,” helping organizations gain insight into their data, and most importantly, take action.

Q: What quality measures does your service capture?
The quality measures are too vast to enumerate, but in short, we help organizations categorize and align patient data to the specific quality metrics for which they’re held accountable.

Q: How does your platform analyze shared risk benefits?
We stratify and identify gaps in care; provide care management tools to help care managers communicate with patients; consolidate workflows to help care teams coordinate care; and provide custom dashboards and analytics to track and manage costs, utilization, and outcomes. All of these tools help organizations analyze shared risks and benefits and make informed decisions.

Q: Do you have any success stories that you could share?
Organizations using athenahealth Population Health experience an average 55% lower cost growth than the industry average, 47% improvement in Medicare Shared Savings Program (MSSP) ACO quality scores, and a 16% improvement in network retention.

Q: Are there other benefits of your tools you would like to share?
We offer the industry’s only success guarantee for the Medicare Shared Savings Program (MSSP).

Q: What quality measures does your platform capture?
Our goal is to provide a comprehensive measurement solution that supports your organization in monitoring performance against government, payer, and internal priorities. With Health Catalyst’s ACO Measures tool, you can drill into your performance on CMS regulatory measures, but you’re also equipped to build (or we can customize) payer-specific measures.

The capability to measure performance and drill into each measure anytime, not only after a required reporting period, provides the capability to identify inefficiencies and opportunities for improvement in a timelier manner.

Some of the standard measures we include that you’ll want to keep an eye on, regardless of payer, are things like high-cost imaging utilization, length of stay (LOS), admissions, and readmissions.

And finally, by delivering standardized information about a group of patients who share a similar clinical condition or experience, your organization can provide care management teams a focused set of patients to work with. Registries are a key tool for monitoring cohorts of patients. We also provide standard cohorts out of the box with the capability to modify as you like.

For most organizations, cohorts are simply patients that fall within a specified group of administrative codes, such as ICD or CPT. But if you rely solely on administrative codes, you will find they often exclude patients who should have been included in the cohort and miss targeting them for a particular population health management strategy.

Q: How does your platform analyze shared risk benefits?
One of the most fundamental elements of being able to do a good analysis of your performance in a shared risk contract is to have the most complete data set that you can. Your analysis is only as good as your data.

By accurately discerning your per member per month (PMPM) performance, your organization can identify performance trends. The PMPM Analyzer tool allows you to look at a single contract or across all of them, so that you can identify worrisome trends, costly leakage, or major areas of utilization that you want to work to improve.

We’re also doing some really interesting work around bundled payment analytics and HCC optimization—you wouldn’t want to provide great care for a high-risk patient only to find that you’re not getting credit for it because you forgot to code them appropriately.

Q: Do you have any success stories that you could share?
Mission Health, North Carolina’s sixth-largest health system, recognized that the goals of ACOs were in alignment with its mission and formed an MSSP ACO called Mission Health Partners (MHP), which is responsible for 40,000 patient lives.

MHP knew that its manual approach to data collection and reporting would not be sufficient for the required ACO quality metrics. By leveraging a previously implemented enterprise data warehouse platform and applying an ACO MSSP analysis tool called athenahealth Population Health, they were able to achieve improved performance metrics, such as a 45% improvement in one year. This allowed them to keep their cost growth in check and focus on improving patient care in a more efficient manner.
lytics application, MHP was able to automate the processes of data gathering and analysis and align the data with ACO quality reporting measures.

The visibility and transparency of near real-time, online performance data coupled with focused process improvement have resulted in subsequent improvement in all of the ACO metrics, especially in the percentage of patients receiving the appropriate preventive screenings. Improvements have included a 9.6% increase in compliance over all reported ACO metrics, with more patients receiving recommended treatment or screenings. There also was a 40% increase in the number of patients receiving any cancer screening, including a 46% improvement in the number of patients receiving colorectal cancer screening. It also resulted in a 45% increase in the number of patients getting fall risk screening.

Another example: As one of the largest healthcare systems in the Upper Midwest, serving 41 communities with 13 hospitals and 61 clinics, Allina Health knew that if it could reduce LOS while continuing to deliver high-quality care, it could realize significant cost savings. Allina also recognized optimizing LOS was one of the key drivers of its impatient financial performance. They developed the technical infrastructure and analytic capabilities to understand LOS performance by the minute and not the day, adjust LOS to account for patient acuity and compare performance to national benchmarks, make LOS data available to clinicians across the organization in near real time, and estimate the financial impact of LOS opportunities to enable targeted interventions for improvement.

By establishing these analytics, Allina leveraged its enterprise data warehouse and analytics platform and optimized LOS, yielding the following results in the first two years of its improvement efforts: 26,000+ inpatient days saved, $13.4 million in direct operating expenses saved, hospital capacity (bed availability) created for 5,000+ admissions, adverse patient events avoided, and total cost of care reduced.

Q: Are there other benefits of your tools you would like to share?
One of the things that makes Health Catalyst unique in this space is that we’re not just about tools; we’re about outcomes improvement. We want to be a partner to you along that journey to improving outcomes and succeeding in these contracts, which is something that’s reflected in how we work with our clients, often taking risk right along with them to show commitment to the process.

Q: There has been a lot of focus this last year on the lack of success in a number of ACOs. Why do you think they are failing, and how could your software tools help them succeed in 2017?
ACO success is complex, and the right technology underpinning is imperative. We need to take a broader approach to value-based markets and alternative payment models and encourage the use of a connected care platform to exchange, share, and route information.

Payers and providers are still struggling to figure out how to access data, work collaboratively, and get actionable information to curb costs while improving outcomes for their shared patients. Access to clinical information from disparate data sources is still the Holy Grail for applications that drive change.

Q: InterSystems has created HealthShare to help with clinical integration, analytics, and care coordination. What are the most advantageous touchpoints for clinicians in choosing the best care for their patients? How does your platform analyze shared risk benefits?
InterSystems HealthShare is a set of solutions, built on a health informatics platform, which has helped a number of clients move the needle from volume to value. Key ingredients include risk stratification, care coordination, predicting future high-risk patients, and alerts that notify care team members based on events such as an ED admission or an inpatient discharge.

Q: Do you have any success stories that you could share?
New York-based Northwell Health’s internally developed Care Tool uses our technology to bring together clinical, claims, and other data from multiple settings. This enables care coordination and collaboration, which drives down cost and improves the health of their high-risk Medicare patients.

Coordinate My Care (CMC) is a clinical service for urgent care plans, hosted by the Royal Marsden National Health System’s Foundation Trust in London. It helps patients and family think through and document their wishes for urgent care and end-of-life plans and then share those plans with care providers, such as ambulance services. Using HealthShare to automate this information sharing, CMC is helping patients across the London region achieve their goals. At the same time, costs associated with that care are declining.

Healthix, one the largest health information exchanges in the nation, also uses HealthShare to provide valuable services to healthcare organizations across the greater New York City area. An example of this is Brooklyn Health Home, a New York State Medicaid Health Home. Healthix supports early intervention in the care cycle for high-risk behavioral health patients by alerting care managers when patients are admitted into an emergency room.

Q: What quality measures does your platform capture?
In a Harvard Business Review article, Michael Porter and Thomas Lee, M.D., outline six components of a strategic agenda to “fix healthcare,” predicated on moving from volume to value. The sixth component—“build an enabling information technology platform”—highlights the need for patient-centered data that is accessible and sharable across all settings of care.

Moving from our current delivery system to models focused on patient-centered value such as ACOs, is still in its early stages, and quality measures are still in the formation. However, focusing on Porter’s sixth pillar can help clients accelerate the journey. HMT

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A new focus on coding quality audits

By Susan E. Belley, M.Ed., RHIA, CPHQ,
Manager, Clinical Content Development
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One of the unsung benefits of ICD-10 is that the new coding standard has brought increased organizational awareness to the subject of coding quality audits. In my consulting work with hospitals and health systems across the United States, I field more questions on this topic than ever before.

Healthcare organizations always have performed internal coding quality audits, but prior to ICD-10 implementation, the number and frequency of audits depended on staff resources, available budget, and sufficient time to conduct audits in the face of competing priorities. Facilities were less likely to spend dollars on external coding validations because the health information management (HIM) staff had years of experience in ICD-9 coding and working with ICD-9 coded data to identify potential problem areas.

What is driving today’s increased interest in coding quality audits? Most obviously, the newness and specificity of ICD-10. As coding professionals continue to gain experience with the new codes, the Centers for Medicare and Medicaid Services (CMS) recently released a significant batch of new ICD-10 codes for 2017 as a result of the end of the code freeze on Oct. 1, 2016. This date also marked the end of the physician grace period, which was instituted by CMS to help physicians transition to ICD-10 without fear of increased claim denials due to inaccurate codes. Physicians now must make certain that the ICD-10 codes submitted on claims reflect the clinical documentation and are accurate.

Coding audits that validate diagnosis-related group (DRG) shifts and/or identify illogical DRGs also have become more critical to achieving revenue cycle success under ICD-10. Proactive auditing can pinpoint inaccuracies prebill, before there is any impact on reimbursement. When audits uncover coder knowledge deficits, HIM and revenue cycle departments can institute further education to ensure better performance moving forward.

Finally, hospitals and health systems understand that accurate and complete coding has a direct impact on the validity of quality outcomes data and patient risk stratification, which determines quality rankings, public report cards, and increasingly, performance under value-based payment. Coding quality audits can help healthcare organizations verify that all patient conditions governed by coding and reporting guidelines are thoroughly documented and accurately coded.

Here is a sampling of the questions most frequently asked about coding quality audits:

How often should our organization audit coding?

I recommend prebill auditing to review records of critical cases (e.g., DRGs that have potential for coding error, mortalities, PSIs/HACs, or DRGs with a single complication/comorbid condition (CCs/MCCs). Prebill audits should be conducted every day to identify potential errors that could negatively impact reimbursement and maintain the health of your organization’s revenue cycle. Retrospective reviews also should be performed, such as a monthly or quarterly review of a record sampling for each coder. Beyond this, healthcare facilities also should be prepared to perform ad hoc audits when a DRG shift or a trend is identified to either validate the shift or identify the problem.

If we are doing regular, thorough coding audits at our facility, do we need to have an audit done by an outside company?

External audits are vital. An independent, outside viewpoint often can bring a fresh perspective when it comes to detecting problems that may have been overlooked. It’s not uncommon for external auditors to identify situations where the incorrect principal diagnosis has been selected or an incorrect principal procedure code has been assigned. Both of these impact MS-DRG assignment, yet sometimes these scenarios are not evident to internal audit staff.

In addition to regularly scheduled internal audits, at least one external audit should be completed each year. Organizations do yearly audits of their financial books—since coded data impacts reimbursement, it is vital for organizations to give external coding audits the same importance as their financial audits.

Case example

Validating DRGs

A patient returned to the hospital several days after a traumatic fall that caused several rib fractures. Complaining of breathing difficulty and shortness of breath, the patient’s pulse oxygen was 89% on room air. A chest X-ray revealed that a pneumothorax had developed since the fall. A chest tube was placed, the pneumothorax resolved, and the patient was discharged several days later. The DRG assigned to the case was MS-DRG 950 Aftercare without CC/MCC (complication and comorbidity).

At face value, however, this was not an aftercare situation. A deep dive into the case revealed that the coder had assigned the code for traumatic pneumothorax with a seventh character of “D,” which indicates a subsequent encounter for the pneumothorax. This code was incorrect because it actually was the initial encounter for this condition. Instead, the seventh character of “A,” indicating the initial encounter of care, should have been assigned. Once the seventh character was changed, the correct DRG was calculated—MS-DRG 200, Pneumothorax with CC. The corrected code resulted in a DRG weight increase of 0.4654, which translated into increased reimbursement for the facility.
Who should be involved in our coding quality audits?
Coding quality audits should involve a multidisciplinary team that consists of coding professionals, clinical documentation improvement (CDI) professionals, physician advisors, and representatives from the patient quality and safety teams. Each of these members can provide vital input into the accuracy of the clinical documentation that drives the coding of each case under review.

What criteria should we use to select an external auditing firm?
Look for a company with experience in coding across the continuum of care (inpatient, outpatient, professional). It should have both knowledge and experience in clinical documentation improvement in order to identify opportunities for an organization to improve their documentation practices in support of accurate coding. The company also should have expertise in reimbursement and risk adjustment and be familiar with the functionality of different EHR systems.

What is an acceptable code accuracy rate?
It’s not only important to measure coding accuracy, but also reimbursement accuracy. Reimbursement accuracy (e.g., DRG accuracy) should be 95% or greater. Coding accuracy should hover around 95%+ as well.

What trends do you see in the auditing of coding?
There is growing attention being paid to the accuracy of professional fee coding now that the ICD-10 physician grace period has ended. Increasingly, external auditors are being asked for estimates of unlisted codes used in professional services claims and for plans to remediate this situation. In addition, CDI managers are asking for assistance in auditing the performance of CDI professionals, with a focus on several key questions: Are CDI specialists missing query opportunities? Are they assigning accurate DRGs? While not coding per se, CDI performance is integral to generating a thorough and accurate coded record.

Should your facility conduct more frequent coding quality audits under ICD-10 than it did with ICD-9? Absolutely, and for the obvious reasons described here. If your facility doesn’t have a coding quality audit plan in place, develop one and share it with key stakeholders. Be transparent and communicate audit findings, whether good, bad, or ugly. Coding quality is not just the responsibility of coding professionals; it’s the responsibility of your entire organization.

Identify yourself as a professional who possesses the knowledge and expertise in health informatics.

Informatics professionals work in health informatics and information management, building connections between information technology and the people who utilize healthcare data. They make sure information is complete, accurate, relevant, readily available, and ensure the healthcare organization’s information is secure and patient privacy is protected.

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Rethinking denial management

Most organizations take an administrative approach to managing denials. Maybe that’s why they’re not collecting as much as they should.

By John Holyoak, Associate Vice President of Product Management, McKesson RelayHealth Financial

Few hospitals would admit to not having a denials management program, and yet as many as one in five claims for services already rendered is denied or delayed.¹

Denials erode the provider organization’s bottom line, resulting in the permanent loss of an estimated 3% of net revenue.² However, it’s not just the cost of the denials themselves or the revenue lost—3% of the bottom line is significant no matter how it is sliced. It costs an average of $25 to rework an individual claim.³ The opportunity cost of resources that could be focused on other activities is huge as is the cost in terms of days in A/R from the revenue cycle perspective.

That’s the bad news. The good news (if you can call it that) is that about two-thirds of denials are recoverable, and almost all (90%) are preventable.⁴ The problem is that many provider organizations continue to view denials as a back-of-the-house patient handling problem, although studies reveal that 30% to 40% of denials are attributed to registration errors.⁵ Another problem is that denials often are addressed as administrative issues when there are clinical factors involved.

It turns out that most denial management programs have several flaws that, if corrected, can close the gap on those 90% of preventable denials. A common flaw is not focusing enough attention on the front end of the revenue cycle; another is not addressing denials from a holistic, organization-wide approach that includes the intersection of financial and clinical factors.

To understand how that approach can be implemented, let’s look at some of the most prevalent denial causes and then explore avenues for action to stem them.

Common causes
Consider the top reasons for denials and how often they occur:

<table>
<thead>
<tr>
<th>Denial Reason</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration/Eligibility</td>
<td>28.0%</td>
</tr>
<tr>
<td>Duplicate Claim/Service</td>
<td>19.2%</td>
</tr>
<tr>
<td>Service Not Covered</td>
<td>15.0%</td>
</tr>
<tr>
<td>Missing or Invalid Claim Data</td>
<td>11.7%</td>
</tr>
<tr>
<td>Medical Documentation Requested</td>
<td>6.5%</td>
</tr>
<tr>
<td>Authorization/Pre-Certification</td>
<td>5.8%</td>
</tr>
<tr>
<td>Medical Necessity</td>
<td>5.4%</td>
</tr>
<tr>
<td>Medical Coding</td>
<td>4.3%</td>
</tr>
<tr>
<td>Untimely Filing</td>
<td>3.1%</td>
</tr>
<tr>
<td>Coordination of Benefits</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Source: RelayHealth Financial network data

Much of the information needed to get a claim to the right payer with the right core data about the patient is gathered prior to service. So the 30% to 40% of denials seen downstream is the result of registration and pre-service related challenges—issues that can and should be prevented.

Pre-authorization is another huge source of denials and work effort. The nursing staff spends more than 13 hours per physician per week on prior authorization—far more than any other administrative interaction.⁶ And 78% of physicians in an AMA study said eliminating the hassle of pre-authorization is “very important.”⁷ Pre-authorization and medical necessity-related denials account for more than 11% of all denials and span both the revenue cycle and clinical realms. This is just one of many areas where the alignment of revenue cycle and clinical teams can help with denials management.

Analysis enables strategic action
In the not-so-distant past, revenue cycle work (and, hence, staff) was predominately clerical in nature—coding claims, working claim edits, or doing pre-registration and registration activities. Today, with new systems and technologies to manage those clerical functions, a larger portion of the revenue cycle staff has titles like analysts and data scientists. Any good denial prevention/resolution process should be grounded in core analytics—using tools to understand available data to determine where the problems lie. But even with good data we need organizational support. Data should not be used as a weapon as you enter into a dialogue with clinicians or patient access areas. It should be used as informative and interchanging.

Considering the spectrum of denial reasons, it’s apparent that this is an organization-wide problem that must be managed by multiple disciplines. So identifying and addressing the root causes of denials has a larger financial benefit than appealing and overturning denials. Managing denials should begin with using available data to analyze where errors and slowdowns occur, prioritizing those causes, and then addressing them.

Root causes can originate anywhere—from patient access and registration, insufficient documentation, and coding/billing errors to payer behavior and utilization/case management. Once the root cause is identified, it must be analyzed to determine which has the greatest impact. Is it a certain physician, service line, or payer? A certain type of code? A process in need of redesign in both the clinical and revenue cycle areas? Armed with an analysis, you can begin to prevent and manage denials in a more strategic, deliberate manner.
Revenue cycle prevention strategies

Registration/Eligibility
As reflected in the denial data chart, registration/eligibility errors account for the largest percentage of denials, so they represent the best chance to improve overall revenue cycle performance. Eligibility denials often occur when a payer is no longer responsible for coverage. Not everyone’s eligibility changes “on a dime,” but some parts can. How much of the deductible has been met? A remaining deductible of $5,000 could drop precipitously between the time eligibility is first checked and when the bill is posted. Other coverages can be retroactive, which also would impact eligibility.

Root-cause analysis may reveal that the patient’s staff is not performing thorough eligibility verification. The solution would involve confirming eligibility at scheduling, then three days before elective service, on the date of service, and once more before submitting the claim. For emergency patients, eligibility should be checked at the point of service, and patients who undergo unscheduled procedures should be contacted within 24 hours. The tools are there to enable these multipoint eligibility checks. The data is available in real time and should be used that way.

It can’t be stressed often enough that revenue cycle success begins at registration. Registration errors vary widely but can be as simple as a missing member ID prefix. The application of business rules and tools to examine registration data can help improve accuracy, completeness, and consistency. Errors then can be fixed in the workflow, in real time, to help prevent downstream denials.

Pre-Authorization
Denials caused by pre-authorization usually are due to failure to secure an authorization in advance or a clinically driven change in the procedure. Authorization starts with procedure-specific policies crafted and managed at the payer, plan, employer, and group levels.

To grasp the scope of the policy problem, consider the number of different payers and plans encountered daily. An examination of 1,300 policy documents across multiple payers looked for commonality across procedures (what requires an authorization and what doesn’t). It revealed only about 8% commonality across payers and plans. The decentralization of the pre-authorization process in hospitals and health systems is another issue, but ultimately it is the physician who is responsible for securing an authorization prior to service.

The solution is to shift from a reactive approach to a proactive solution that provides many more points of integration and a seamless flow of information from provider to payer and back to provider. Plus, by providing clinical guidance and evidence-based support throughout the process, instead of operating in a reactionary mode, providers can improve efficiency and reserve expert resources to address those complex cases that require exceptions. Best practices for minimizing pre-authorization and medical necessity denials include the following:

- Define roles and ownership. Designate a team to govern the pre-authorization process and ensure a reliable and stable approach.
- Automate screening and verification. Automate pre-authorization screening and verification—and have these processes embedded in the workflow—to know what requires a pre-authorization and to verify that it is in place.
- Automate payer policy maintenance. Automate the location, capture, and maintenance of payer authorization policies to increase accuracy and reduce administrative burden.
- Automate authorization acquisition. Obtain the authorization with automation, including evidence-based support.
- Get a handle on medical necessity. Medical necessity is foundational for a broader set of process opportunities that can reduce denials and help improve care quality. As such, the case management system must be examined to identify gaps that cause denials.

Aligning revenue cycle and clinical
Revenue cycle staff needs to share data and provide insight into where the opportunities are to prevent errors, streamline processes, and determine where to focus denial prevention and management efforts.

While leadership might have an understanding of the resources wasted and revenue lost, and the case manager might have a strategy to improve performance, the clinical staff rarely if ever sees a report on denials. They don’t know length-of-stay or denial rates, and they’re not being asked for input on how they can help improve processes. Ensuring that operational reports from finance and revenue cycle are being circulated and reviewed can go a long way toward bridging this gap.

Ultimately, data should be the driver of a denials management program. Teams need access to reports to build action plans for improvement. If you have the data, and teams are developing action plans and looking for improvement opportunities, they will find ways to reduce denials, length-of-stay and cost, and help improve quality.

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Over the past 25 years, the majority of medical imaging providers have slowly migrated away from managing paper and film-based images to embracing digital imaging informatics, such as radiology information systems (RIS), picture archive and communication systems (PACS), cardiovascular information systems (CVIS), vendor neutral archiving systems (VNAs), and digital reporting/speech recognition solutions. These solutions are supplemented by a number of subsystems for breast imaging reporting, messaging, business analytics, advanced image processing, nuclear imaging, peer review, critical results tracking, image fusion, and more.

Switching your imaging solution

Is your imaging solution more like a flip phone or smartphone?

By Murray A. Reicher, M.D., FACR
Chief Medical Officer, Merge Healthcare, an IBM Company

Over the past 25 years, the majority of medical imaging providers have slowly migrated away from managing paper and film-based images to embracing digital imaging informatics, such as radiology information systems (RIS), picture archive and communication systems (PACS), cardiovascular information systems (CVIS), vendor neutral archiving systems (VNAs), and digital reporting/speech recognition solutions. These solutions are supplemented by a number of subsystems for breast imaging reporting, messaging, business analytics, advanced image processing, nuclear imaging, peer review, critical results tracking, image fusion, and more.

With multiple solutions from varied vendors in place, some imaging providers find it difficult to replace key systems simultaneously and see very little value in changing just one. That is one of the many reasons why imaging providers haven’t yet upgraded early generation technologies. Others include:

- A focus on compliance with the federal EHR Incentive Program and adoption of a new generation of hospital information systems; and
- The economic stresses of declining reimbursement and plateauing imaging procedure growth rates that constrain budgets and make it difficult for healthcare management teams to replace multiple systems at once.

So, how do you know when it’s time to replace your imaging IT? Two obvious answers are when one of your major systems is discontinued by the vendor or when your staff becomes dissatisfied enough with a vendor to demand a change. Perhaps a more strategic answer for determining the best time for replacement is when a vendor demonstrates a solution that results in superior clinical and economic outcomes.

The smartphone of imaging technology

I often compare the current state of imaging IT to my personal situation prior to purchasing my first smartphone. Before making the switch, I owned a flip phone, camera, Rolodex, audio recorder, computer, and GPS device. My smartphone didn’t replace my phone—it replaced all of those devices with a simple, easily understood, and cost-effective solution with a superior user experience.

I believe the current generation of imaging IT solutions will be replaced in much the same way. A modular, comprehensive imaging IT system delivered via a software-as-a-service model will replace multiple individual solutions. Such a sophisticated solution will provide the benefits of faster technology iteration, built-in user learning, and a simpler, more powerful user experience. Equally as important, it will relieve the customer of large up-front capital outlays and extensive hardware implementations. As new systems evolve, they will become truly collaborative, assisting healthcare professionals and patients in evidence-based decision-making while increasing patient-centric services and meeting national goals for transparency of health records—goals that are aligned with the American College of Radiology’s call for patient-centric radiology.

Determining when to switch

How do you know when the time is right to start shopping? Following these five steps will give you a clear picture:

1. **Take inventory.** Conduct a comprehensive inventory of your current imaging IT systems. You may need to go beneath the surface to discover the full array of technologies and interfaces you own and manage. In my experience, it would not be unusual for even a small integrated health system of four or five hospitals to find 30 or more IT vendors in radiology and cardiology.

2. **Know your true costs.** Tally the costs for each vendor including interfaces, capital depreciation, and internal support costs.

3. **Consider human factors.** Benchmark the levels of user understanding of each system and clinical user satisfaction.

4. **Set economic and clinical goals.** Determine if there are clinical functions you need to or want to provide where technology is limiting you. In other words, begin with a thorough self-assessment that establishes economic and clinical benchmarks.

5. **Evaluate facilities individually.** If you operate a multi-facility healthcare organization, consider benchmarking each one individually to obtain objective measures of success and variation between facilities. Use this information to establish best practices and future targets.

The benchmarking data provides the intel needed to set goals and measures of success for your imaging system. There are two additional considerations in evaluating individual vendors:

1. Can a vendor replace multiple existing solutions with a single, more comprehensive solution that provides a clinical benefit at lower cost?

2. Is the vendor positioned to replace your other imaging IT solutions over time?

If the answer is “yes,” and the vendor’s claims are substantiated by customer references, you have found the right solution, and the time is now. Whether or not you choose to embark on an imaging IT replacement program now, the exercise will undoubtedly provide new insights into your total spending and performance that will be helpful in your planning efforts. HMT
Middleware is software that is used to connect one or more different software applications. It has been simplified as glue or plumbing to pass data between applications. Middleware is being used to connect completely unrelated software into a single, user-friendly interface and to connect legacy and emerging technologies that have been developed using different designs, data models, or architectures. Much of the Internet has been connected using a middleware framework; however, as a software concept, it has existed for some time, especially in large, complex enterprise software applications such as those used in the financial and retail industries.

The other side of middleware is the development of mainframe systems where data and integration come from importing and exporting data in some standardized way. Distributed computing, supported by changes in data centers, information, and communication technologies, has lead to new platforms and the need for integration.

Middleware solves the problem of interoperability by building a platform to connect current EHR systems while allowing for a single path to add additional emerging healthcare technologies. It also supports development to access and display information in a unified manner so healthcare providers can obtain health data that is supportive of their workflow and without the need to switch between applications or understand how the data is brought together.

Middleware architecture has been shown to be the best technological solution for addressing the problem of EHR interoperability. The middleware platform facilitates the transparent, yet secure, access of patient health data directly from the various databases where it is stored. A server-based middleware framework supporting access to the various patient health data stores allows for a scalable, unified, and standardized platform for applications to be developed upon. The middleware architectural design has been successfully used to link data from multiple databases, irrespective to the database platform or where the database is located.

Here are 10 good reasons to consider middleware:

1. **Application developers can focus on healthcare apps**
   Enables medical record app developers to focus on their healthcare solution by freeing them from dealing with a diverse, complex EHR infrastructure.

2. **Inspires the next generation of healthcare innovative solutions**
   These solutions are inspired by expanding the market for the next generation of healthcare applications rather than being tied down to a stack approach, depending on the particular EHR vendor.

3. **Improves patient care outcomes**
   Patients will receive better healthcare outcomes when application developers can inspire more applications. Patients also will benefit from the next generation of applications as they will address providers’ specific needs in diverse operational care environments.

4. **Saves healthcare IT dollars**
   Focuses the healthcare IT budget on addressing providers’ needs instead of building and rebuilding the patient record infrastructure.

5. **Proven technology**
   A proven technology used for decades in many industries such as financial, retail, manufacturing, and other markets.

6. **Easy integration**
   Enables healthcare integration with diverse, deployed legacy systems, including EHR systems. It addresses EHR interoperability as part of overall integration challenges.

7. **Passive to active healthcare IT environment**
   Turns passive healthcare IT environments into active ones to enhance communication and collaboration among care providers.

8. **Avoids data duplication**
   Cost-efficient, simplified administration. It offers a better privacy protection solution than HIEs by addressing EHR interoperability while fulfilling the demand to support the patient care continuum in an operational care environment.

9. **Eliminates wastefulness**
   Addressing healthcare IT integration is much more cost efficient than the “rip-and-replace” approach.

10. **Extends EHR usefulness**
    Protects and extends healthcare IT investments in EHR and EMR systems.
The patient-centric movement: What’s driving it, what’s ahead?

Expanded patient engagement represents a true win-win situation for patients and providers.

The focus on expanding patient engagement has grown in the U.S. healthcare market. Several factors have converged to spur this movement, including new policies and reimbursement models, technology innovation, and mounting evidence that engaged patients often experience better outcomes and can be treated more cost effectively.

This new dynamic creates both opportunities and challenges for providers and will require innovative approaches and technologies to realize the full benefits of expanded patient engagement.

Policy influences
The development and continued rollout of game-changing public policies are driving much of the focus around patient engagement. Meaningful Use and the financial incentives associated with it top the list. Stage 3 raises the bar significantly, establishing three measures of patient engagement. First, it elevates the target for getting patients to view, download, and transmit personal data from 5% to 25%. In addition, it requires that more than 35% of all patients seen by a provider receive a secure message using an EHR messaging function or in response to a secure message sent by the patient. Finally, it calls for more than 15% of patients to contribute patient-generated health data to their EHR. While providers have to report on all three of these measures, they are only required to successfully meet the requirements of two.

As important, under the Affordable Care Act (ACA) and continued Medicare reform, we are seeing the U.S. healthcare model increasingly evolve from a fee-for-service to a pay-for-performance model, further amplifying the need for expanded patient engagement.

Additional drivers are on the horizon. One of the most interesting is the 21st Century Cures Act, which was signed into law by President Obama Dec. 13, 2016. It extends the concept of patient engagement to the clinical research and development realm, seeking to create the elusive closed loop from bench to bedside and back again, which is required for truly personalized medicine.

The 21st Century Cures Act looks to place patients at the center of the drug development process and advance their engagement to determine the impact of various treatments on their daily lives. The legislation includes a process to collect patient experience data for submission to the Food and Drug Administration (FDA) and requires the FDA to use this information in conducting regulatory review and risk assessments.

Technology advances
Rapid advances in health IT applications (such as EHRs and patient portals) and broader proliferation of mobile and cloud technologies (paired with a more consumer-oriented approach to healthcare delivery) are spurring the ability of patients to play a more active role in managing their care.

For example, more than 28% of consumers in a recent PwC survey reported having a healthcare, wellness, or medical application on their mobile device—a 16% increase from the previous year—and 65% of respondents with one or more health apps on their devices use these apps at least once a week. Research from Alego Health underscores the potential impact of mobile technologies on patient engagement, with consumers saying they expect the adoption of mHealth technology to significantly change their healthcare experience when it comes to information on health issues (59%), health management (49%), and communicating with healthcare providers (48%). Additionally, we are now even seeing the expansion of health systems posting patient reviews of their physicians on their own websites, highlighting new trends for the healthcare experience and patient engagement.

Clinicians and providers appear to be on the same page when it comes to the value of digital devices: 47% of patients and 79% of physicians say mobile devices help with the more effective coordination of healthcare, which supports greater involvement, according to PwC’s 2014 study, “Healthcare delivery of the future: How digital technologies can bridge the gap of time and distance between clinicians and consumers.”

Patient portals, which facilitate scheduling and information sharing as well as video consultations also have vital roles to play in expanding patient engagement.

Challenges ahead
While there is general consensus around the need for expanded patient engagement, the road to success has its fair share of twists and turns.

For instance, the absence of an adequate budget and definitive leadership often hampers many healthcare organizations’ efforts to develop an effective, comprehensive patient engagement strategy, according to HIMSS Analytics research. Many organizations lack an effective structure when it comes to patient engagement strategies, with spending and responsibilities spread across a variety of departments, from IT to ambulatory and marketing. As a result, this approach results in siloed information and best practices, which in turn stifle progress.

It is important to centralize the function—understanding that the team must include representation from across the organization. This approach provides the foundation for building a cohesive patient engagement strategy versus undertaking singular, one-off tactics. Involvement of IT leadership from the start is imperative due to the formidable role that technology plays in efforts to expand patient engagement. Tackling patient engagement from an enterprise level also enables organizations to optimize existing investments (including technology), avoid duplicate spending, and better identify and address informa-
tion integration requirements that are essential to a successful initiative.

Security concerns remain paramount for both providers and patients, as we are reminded frequently with reports of the latest health data security breach. As providers and patients increasingly use personal mobile devices to access personal health information, these devices represent a new endpoint that organizations must secure on their network. Becker’s Hospital Review identified the use of personal mobile devices in healthcare settings as providers’ second greatest data security concern, highlighting the need for secure infrastructure and connections to support patient engagement. To optimize the use of technology in advancing patient engagement, providers and patients must both have confidence in data and device security.

Focusing on the three pillars of secure mobility—the device, the network, and the data—can help ensure end-to-end protection. That being said, focusing solely on securing the technology is not enough; organizations must also consider the people and processes involved. A trusted partner that specializes in the health IT industry can help provide guidance to mitigate and manage these concerns, ensuring that a multilayer security strategy is in place.

Lastly, as we see with many emerging technologies, health IT innovation is outpacing the development of public policy paradigms, specifically when it comes to interoperability and integration. This leaves the industry at a disadvantage for unlocking the full potential of the health information exchange to expand patient engagement and improve outcomes. We are seeing progress on this front, with recognition from the Office of the National Coordinator for Health Information Technology (ONC). Its Federal Health IT Strategic Plan 2015-2020 and Nationwide Interoperability Roadmap have potential to be significant stepping stones in overcoming lingering interoperability hurdles.

Framework for the future
The foundation for the patient engagement movement has been set, and the outlook is promising for organizations that embrace it and plan carefully by adopting a holistic approach, leveraging technology innovation, and ensuring security at every step. Expanded patient engagement represents a true win-win situation for patients and providers alike, with the promise of better outcomes and more efficient care delivery ahead. HMT

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A ny healthcare security professional will tell you that security is about protecting CIA—confidentiality, integrity, and availability—of healthcare data. Most healthcare breaches involve compromised confidentiality or unauthorized access to patient data.

Ransomware in its pure form is not an attack on the confidentiality, but rather the availability of patient data. In this case, by availability I mean timely and reliable access to patient data. When healthcare does not have timely and reliable access to healthcare data, such as when it is encrypted due to ransomware and they cannot decrypt it, healthcare is severely disrupted, certainly to the point where it compromises patient safety and even to the point where healthcare organizations have to send patients elsewhere. Further, healthcare is intolerant to such disruption and therefore likely to pay the ransom.

This, exacerbated by the healthcare industry lagging other industries in security, makes healthcare a soft target for ransomware and availability attacks. As security professionals, we must look ahead to where the “puck is going” and help healthcare organizations prepare for it and ensure the necessary security is in place to enable delivery of healthcare.

Fortunately, healthcare as an industry often is not the first target for new types of attacks. Many times, financial services or defense industries are targeted first. To see where the security puck is going in healthcare, we can look at other industries. One attack that has hit the financial services industries early and hard, but is still relatively rare in healthcare, is DDoS attacks. DDoS stands for distributed denial of service and typically involves a botnet of malware-infected consumer devices that are directed by a command-and-control server operated by hackers to some central target—for example, a corporate website to firehose it with bogus network requests—essentially saturating the network and/or external web interface of the target organization, effectively denying access to legitimate users of the same external interface, often until a ransom is paid to the perpetrators.

Historically, healthcare has had most mission-critical services on the intranet, inside their secure perimeter where they are less vulnerable to external attacks such as DDoS attacks. One of the major trends is the increasing adoption of cloud computing. Whether it is EHR SaaS, office applications, backups, BC/DR (business continuity/disaster recovery), research/test/development environments, or other cloud usage models, healthcare is increasingly adopting cloud to lower costs, improve accessibility, and enable new models of collaborative care. While cloud promises many benefits to healthcare and is already in mainstream use, it also risks exposing more mission-critical healthcare services, increasingly being hosted in the cloud, to DDoS attacks.

To enable increasing use of cloud computing, while minimizing risk of future DDoS attacks, we must anticipate such threats and plan accordingly by proactively implementing key safeguards to prevent, detect, and remediate such attacks. DDoS and other attacks tend to be opportunistic, like a predator seeking easy prey. It is increasingly important for healthcare organizations, in addition to their regulatory compliance, risk assessment, and other security due diligence activities, to now also understand where they stand with security readiness compared to the broader industry. To do this, it is to be lagging peers and the industry, making it easier to attack.

Historically, it has been difficult for organizations to see where they stand with security relative to peer organizations. Often one sees healthcare security executives at conferences asking each other about types of breaches and their corresponding organizational response. While a good form of networking and information sharing, this tends to focus only on the breach du jour (right now ransomware) and the security capability du jour (currently backup and restore due to crisis with ransomware).

Unfortunately, with this kind of limited focus, executives often miss other breach types or security capabilities that are required for overall effective security. What is required is a more comprehensive way for healthcare organizations to benchmark their breach security against the industry. Intel Health & Life Sciences is leading an open industry collaboration to enable health and life sciences organizations globally to benchmark their breach security maturity, priorities, and capabilities against the healthcare industry to see where they stand. By participating in this benchmark engagement, they are able to see if they are leading or lagging in terms of security readiness across eight types of breaches, including ransomware. They also are able to see if their priorities across breach types are significantly different from the industry average, in which case they may be over- or under-prioritizing various breach types. Across 42 security capabilities they are able to see where they have gaps, and in particular where those gaps may not be common in the industry, in which case they may be lagging and relatively vulnerable due to a particular security gap.

To date, almost 50 large health and life sciences organizations have participated in this benchmark program. They include organizations focused on the healthcare provider, payer, revenue cycle, pharmaceutical, life sciences, and business associates segments. Any organization that works with sensitive healthcare information is eligible to participate.

The benchmark engagement involves a one-hour, complementary, confidential survey led by Intel or an industry partner and results in a comprehensive report that shows how the healthcare organization’s maturity, priorities, and capabilities compare with the industry and where there are significant differences in maturity, priorities, or capabilities. This provides additional, valuable information to healthcare security teams that they then can use to socialize internally with their stakeholders to help get the necessary budget and resources allocated that are required to address gaps in security capabilities.
The 42 capabilities assessed in this benchmark also are mapped in the report to HIPAA, NIST, PCI DSS, ISO2700x, and GDPR regulations and standards to enable the healthcare organization to see how addressing a particular gap also may help with compliance. To see a sample of this benchmark report see Intel.com/BreachSecurity.

Industry-level, aggregate, anonymous results across nearly 50 healthcare organizations across eight countries participating in the benchmark program to date show that key capabilities required to mitigate risk of DDoS attacks and other types of breaches and ransomware are significantly lacking.

For example, policy is required to communicate permitted use of cloud, yet only 64% have one, 30% are working on it, and 6% don’t have any policy for security and privacy.

User awareness training is required to control shadow IT cloud use and mitigate risk of accidents and workarounds, for example in using websites or apps with healthcare data. This can result in large and increasing in side clouds vulnerabilities to DDoS attack, and yet only 49% of organizations have security and privacy training where it needs to be, 34% are working on it, and 17% currently have no privacy and security training for their healthcare workers.

Risk assessment is required to identify and prioritize—as a function of business impact and probability of occurrence—risks to CIA of healthcare data. This includes risks in the form of availability attacks through DDoS or ransomware, yet only 43% are doing annual documented risk assessments, 36% are working on it, and 21% have never done a risk assessment.

Security incident response plans (SIRPs) are required in the event of a security incident to ensure careful coordination of activities and communication both internally and externally, including with digital forensics experts, regulators or data protection authorities, the media, and patients. Only 40% of healthcare organizations have their SIRP where it needs to be: documented, employees trained, tested, and integrated into process. Another 40% are working on it; 20% have no SIRP. Healthcare organizations can least afford to take an ad hoc, improvising approach in the high-pressure event of a security incident such as a DDoS attack. Missing key steps in response to security incidents can result in greatly increased business impact to healthcare organizations.

Threat intelligence is required to quickly detect and properly identify DDoS attacks and be able to differentiate them from legitimate network traffic that is spiking. Only 28% have their threat intelligence capability where they need it to be, 21% are working on it, and 51% have no capability for threat intelligence.

It is critical to ensure operating systems, applications, and especially security safeguards are hardened and kept up to date and patched or otherwise risk vulnerabilities being exploited for DDoS and other types of attacks. However, only 57% are managing vulnerabilities/hardening and upgrading and patching in a timely fashion; 38% are working on this; and 4% don’t do any vulnerability management or patching.

Many other safeguards can help with mitigating risk of DDoS attacks, including redundant network service providers, DDoS mitigation appliances able to detect and filter malicious traffic, and multiple servers and load balancers for high availability. Finally, cloud mitigation providers can offer healthcare organizations massive bandwidth, multiple DDoS mitigation safeguards, security expertise, and redundant sites to avoid a single point of failure and can scrub traffic to ensure healthcare organizations only see clean, legitimate traffic.

Only by looking ahead, anticipating trends such as the growth of cloud computing in healthcare and threats such as DDoS, and proactively identifying deficiencies in safeguards, can we as healthcare security professionals enable healthcare to minimize disruption and ensure reliable, high-quality, lower cost healthcare delivery.

Top 10 cyberattack breaches of 2016

Cyber breaches in 2016 compromised more than 12 million records according to the “2016 Year-End Healthcare Cyber-Breach Report” released recently by cybersecurity defense specialist TrapX Security. The research, which was conducted by the company’s TrapX Labs division, indicates that the continued wave of cyberattacks impacting healthcare institutions in the United States increased by 83% year-over-year to a total of 93 major attacks. The data also shows sophisticated cyberattackers now are responsible for 31% of all major HIPAA data breaches reported in 2016, which is a 300% increase in the last three years.

Following are the top 10 healthcare cyberattacks of 2016, based on the number of protected health information data records breached. The dates are not necessarily based upon the date of the attack but on the date when mandatory reporting to the Department of Human Health and Services, Office of Civil Rights, was submitted.

1. Banner Health: In August, this health system reported that approximately 3,620,000 patient records were breached, making this the single largest healthcare data breach reported so far in 2016.

2. Newkirk Products: Also in August, this company, which is part of Broadridge Financial Solutions, was attacked, and approximately 3,446,120 records were potentially compromised.

3. 21st Century Oncology: In March, 21st Century Oncology was breached and approximately 2,213,597 former and current patients were affected.

4. Valley Anesthesiology Consultants: In August, Valley Anesthesiology Consultants announced it was potentially breached during an ongoing cyberattack that occurred between March 30 and June 13, 2016. 882,590 records were affected.

5. Peachtree Orthopedic Clinic: In November, this provider of orthopedic services headquartered in Atlanta, GA, notified 531,000 patients of a cyberattack that had compromised their protected health information.

6. Central Ohio Urology Group: In May, the group reported an August 2015 cyberattack that affected 300,000 patients.

7. Southeast Eye Institute, P.A. (doing business as Eye Associates of Pinellas): In May, the institute was notified by Bizmatics, a provider of medical practice software serving more than 15,000 medical practices, that it had suffered a breach that impacted 87314 individuals.

8. Medical Colleagues of Texas: Also in May, this facility reported a breach that affected approximately 68,631 individuals.

9. Urgent Care Clinic of Oxford: In September, the clinic reported that approximately 64,000 individuals were impacted when the organization was breached.

10. Alliance Health Networks: In February, this provider reported that one of its patient databases had been left accessible via the Internet; this may have resulted in the protected health information of 42,372 patients being exposed for a period of 30 months.

The “2016 Year-End Healthcare Cyber-Breach Report” shares data on all major U.S. cyberattacks reported from Jan. 1 to Dec. 10, 2016. Some of these breaches may have been ongoing prior to the start of 2016, but to retain consistency, the report only used the official reporting dates to the HHS OCR that fall within 2016. The full report can be downloaded at https://goo.gl/31BGSO.
10 cybersecurity trends to watch in 2017

Will the hard-learned lessons of 2016 lay the foundation for healthcare security success in the future?

By Mac McMillan, CEO, CynergisTek

We are just a few weeks into the New Year, and already we have had a series of breaches reported, a new variant of the Internet of Things (IoT) denial-of-service (DDoS) attack exposed, and confirmation that nation-state cyber events are alive and well with Russia identified as meddling in our political process. I’m not sure that anyone is terribly surprised at any of this, but hopefully they’re not numb to it. Optimistically, 2017 will be the year of rededication to vigilance in healthcare cybersecurity efforts and investment in appropriate protection to the industry’s most critical asset: information. So, what did we learn last year that may bear fruit this year?

1. IoT has come of age as an attack vector for organizations and a readily available disruptive conductor for DDoS attacks. Organizations need to reconsider their network policies and controls, architectures for communications (including internet access), and the resiliency of their supply chain partners that are hosting critical systems or data. New solutions are forthcoming from companies like Symantec to deal with IoT threats, and organizations should consider deploying these when they are ready.

2. While we are all hoping for a solution to the medical device issue, we saw the FDA come up short once again with its revised guidance. It’s definitely better than the last, but the problem remains in the bold words at the top of each page: Non-Binding Guidance. In 2017, consumers should expect to still have to look for those vendors that will voluntarily build more responsible products, because this problem won’t be solved in the near term.

3. Many experts are saying that ransomware will plateau in mid to late 2017, but they forgot to say that it’s plateauing at 400 times what it was last year, and extortion is taking on new forms. For example, recent attacks wiped out information after copying it and demanded a ransom to have it restored. Extortion has become a profitable cybercrime, and it’s not likely to go away any time soon. In fact, it’s just a matter of time before mobile devices become targeted more often and the criminals find creative ways to use IoT as an extortion platform.

4. Infrastructure is becoming a target, and this is serious business for healthcare. The Mirai and Leep attacks, if characterized properly by researchers as “just tests,” portend a much more sinister and foreboding use of malware and IoT to disrupt businesses. Add the spectra of the millions of insecure wireless medical devices out there that may be susceptible, even if by accident, and you have a recipe for very bad outcomes.

5. Expect more attention to be paid to third parties as organizations become more sensitive to the risk posed by their growing supply chains. More and more incidents are being reported that involve a supplier of services or IT resources. Very few healthcare organizations have robust vendor security due diligence processes in place, much less vendor security surveillance programs. More vendors will be asked tougher questions regarding their security practices and controls and will need expert, outsourced support.

6. More solutions will emerge that employ artificial intelligence, machine learning, and heuristic capabilities. It’s about time, but don’t expect this to be a panacea for solving all things cyber in 2017. Cyber criminals will look to use these capabilities to develop even more sophisticated attacks that are better at eluding detection. Our security needs to be at least as sophisticated as the threats we face.

7. Phishing and social engineering will remain with us, but they will likely continue their trend toward becoming more focused and more sophisticated as well as harder to detect. It will take both user education and the right technology to effectively manage the risk, including web and email gateways, advanced malware detection solutions, next-generation firewalls, multifactor approaches to authentication, and the elimination of higher privileges.

8. In 2017 we’ll see more red teaming as organizations seek to put their organizations under the microscope of more realistic testing or training. This is an excellent idea, particularly for those who feel they already have a basic security structure in place. What we learn from red teaming exercises is extremely useful, but generally more valuable when a solid program is in place. Red teaming also can be used to test contingency plans, which is another area that warrants attention in light of recent attacks.

9. I think we’ll see greater adoption of the NIST Cybersecurity Framework this year as more organizations recognize that relying on the HIPAA security rule as a measurement for anything other than compliance is not reasonable. Reasonable security says we need a standard that measures every aspect of our cybersecurity readiness at the specificity we need. Hopefully, the Healthcare Cybersecurity Task Force will have some strong recommendations for improving cyber readiness soon.

10. Finally, there is likely to be greater reliance on cyber due diligence in mergers-and-acquisitions (M&A) activity as healthcare organizations attempt to understand the risks they may be inheriting and look for negotiation levers for value. More often than not, when you acquire an organization that is struggling financially, you acquire an organization with less-than-desirable security. Don’t be surprised to include cybersecurity baselines as part of your M&A checklist. 2017 starts off just like every other year—full of opportunity, some pessimism, chances to excel, apprehension of the unknown, but most of all what we make of it. So make the most of it. HMT
How to achieve IT resilience in the healthcare industry

In recent years, the healthcare industry is hearing the siren call of technology, catalyzing the use of tablets and electronic medical records in the examination room and ER. Traditional solutions in the sector previously relied upon on-prem servers to ensure control and security of data. Now, having moved many systems online and into the cloud, the industry is dealing with one of the inevitable downsides: hackers. From doctor’s offices to medical practices, hospitals to clinics, the healthcare industry has found itself to be an extremely attractive target for online threats such as ransomware, which holds systems and data hostage and can have medical staff working in the dark, relying on pen and paper for days on end.

With advancements in cloud technology, including access control, encryption, audit trails, and disaster recovery as a service (DRaaS), hospitals and medical centers no longer have to postpone surgeries and treatments when experiencing downtime, whether due to a breach or disaster. While the healthcare industry may be an attractive target, with resilient IT infrastructure, systems can be back up and running in hours instead of days, with all primary infrastructure intact and functional.

Here’s how the healthcare industry can continue its march to technological efficiency without resigning to ransomware and other threats as simply a cost of conducting business online:

Take inventory of all critical IT infrastructure
The first step in working toward greater IT resilience is to get a firm grasp on your working environment. It is imperative to understand which of your systems are critical and necessary to keep day-to-day operations running smoothly. For a doctor’s office, this may be an application for managing patients’ appointments. For a hospital, it may be something more significant around records access. Other systems, while useful, may prove to be less critical upon reflection and more easily replaced with manual processes in the event of a disruption.

Understand downtime thresholds
Next, you need to carefully examine how much downtime you can withstand as a worst-case scenario. In the event of a power outage, natural disaster, or other disruptive event, how long could you successfully continue offering critical services? At what point would a lack of specific systems impede your capability to continue providing service? Knowing this yields a valuable metric—your recovery time objective (RTO)—to focus on when planning your IT resilience strategy.

Investigate back-up systems for various outage types
Not all disasters are created equal. A power outage presents a drastically different scenario from having your data held hostage by ransomware. Now that you have identified which systems are critical and how long you can effectively make do while you work to get them back online, you need to plan and implement appropriate back-up systems. While something as simple as user error may corrupt important data and be restored easily, a power outage requires more resources like a back-up generator.

Data backup and back-up generators, however, are just a first line of defense. When application servers become inoperable, for example, bringing applications back online is not as simple as restoring a backup. Often, entire environments need to be recreated, which can be a timely process if performed manually. Recent developments in cloud technologies have made DRaaS possible, which can quickly—in hours, not days—bring critical systems back online. In addition to bringing applications and server environments back online after a crash or outage, DRaaS can assist in the event of a ransomware attack.

Budget for resilience
As with any business, you will need to fit IT resilience into your budget. At first glance, it may seem like an additional cost, but there are few places to save expenses. Moving away from replicated data centers and management of redundant infrastructure, for example, will help reduce costs of healthcare through the implementation of resilient solutions. And as the saying goes, an ounce of prevention is worth a pound of cure, so examine how much potential downtime would cost in comparison to implementing agile IT infrastructure.

Implementation
Lastly, you will need to implement systems to achieve your RTOs. As noted previously, this may consist of several systems alongside one another to handle different scenarios. Beyond installing these systems, however, you should consider identifying key IT staff who will be responsible for keeping these systems properly configured and up to date. IT resilience is not something you can simply address once and never review until you find yourself hit by disaster. As new technologies are instituted and configurations of existing systems are changed, the IT staff will need to continually update DRaaS and other systems.

Unlocking IT resilience
With sensitive health and financial data, the performance of critical services like surgeries and treatment plans, and more information stored online than ever before thanks to the federal mandate for digital recordkeeping, taking the necessary measures to unlock IT resilience in the public and private healthcare industry is more important now than ever. Implementing a comprehensive and agile strategy ensures critical systems remain available, applications continue to function, and data remains readily accessible—all vital for conducting business in today’s connected environments.
FDA issues warning for battery-powered mobile medical carts

The U.S. Food and Drug Administration (FDA) issued a warning to healthcare facilities on Dec. 27, 2016, of potential safety risks associated with battery-powered mobile medical carts, noting that it is aware of reports of “explosion, fires, smoking, or overheating of equipment that required hospital evacuations associated with the batteries in these carts.” Battery-powered mobile medical carts include crash carts, medication dispensing carts, and carts that carry and power medical devices for point of care, barcode scanners, and patient monitoring. These carts typically have high-capacity lithium or lead acid batteries that can power medical devices and workstations (computers) for many hours.

The FDA recommends that healthcare professionals and healthcare facilities take the following steps to help reduce the potential for injury to patients, staff, and visitors.

Preventative maintenance of battery-powered mobile medical carts:

- Inspect batteries for signs of damage, including bulging, swelling, or cracks.
- Notify the manufacturer of damaged batteries.
- Inspect battery chargers and carts containing chargers for overheating components.
- Vacuum to remove dust and lint around battery chargers and carts containing chargers.
- Do not use batteries that do not charge properly. Ensure that batteries are replaced at the manufacturer-recommended replacement intervals.
- Conduct a survey of battery charger locations, and verify that all chargers are located in easily visible, fire-retardant locations away from patient care areas and open sources of oxygen.
- Do not install chargers or charging carts in confined spaces.
- Keep flammable and explosive objects away from battery chargers and charging carts.
- Request preventative maintenance documentation from the cart manufacturer for the healthcare facility to use.

If a battery in a mobile medical cart catches fire while charging or in use:

- Immediately report the fire according to your hospital protocol.
- Follow hospital protocol for addressing a Class C electrical fire.
- Do not touch the battery.
- Unplug the charger or power off the cart if it is safe to do so.
- Remove the cart from patient and visitor areas as safely as possible.

General recommendations for battery-powered mobile medical carts:

- Do not block any charging station vents.
- Do not tape or attach any object or material to a battery charger.
- Only operate and store the battery charger and cart with charger outside of patient rooms and in non-patient care areas.
- Contact the manufacturer if there is a problem with any component of this system. This alerts the manufacturer of a potential product concern.
- Request maintenance and user manuals for the carts, chargers, batteries, and all accessories.

Before purchasing these carts, establish the necessary criteria that meet your facility needs:

- Meets battery standards for use in a hospital environment.
- Preventative and maintenance documents to be supplied to facilities.

Visit FDA for the complete warning at http://www.fda.gov/MedicalDevices/.

Microsoft Surface gets turbocharged

Microsoft recently announced that its most powerful Surface Book yet, called the Surface Book with Performance Base, will pack 16 hours of battery life into an ever-so-slightly thicker and heavier package than the original. Sporting a 13.5-inch screen, the 2-in-1 tablet/notebook will also feature more than twice the GPU processing power than the original Surface Book. It features an Intel Core i7 processor, NVIDIA GeForce GTX 965M GPU with 2GB of video RAM, and 256 or 512 GB or 1 TB PCIe SSD. Totally new is the Surface Dial tool, a standalone companion for, or alternative to, the Surface Pen. Preorder now at the Microsoft Store.

Case Study: Integrate tablets and laptops to improve the patient experience

Selecting the appropriate tools and technology to meet today’s patient experience strategies is vital. If a tablet device for patient use is part of that strategy, safe and effective integration of the tablet is essential. GCX’s suite of tablet mounting solutions for patient engagement helps provide the tools to engage patients to participate in their healthcare—and to stay connected with their physicians and families. Successful integration of tablets is an important factor in the success of the patient experience program and can contribute to increased utilization by patients.

In one application at Virginia Commonwealth University Health System, the GCX Patient Engagement Table has enabled long-term ICU patients to use mobile devices to connect to support systems and engage in their recovery. The unique patient engagement system supports a laptop directly overhead of immobile patients and uses eye-gazing technology that allows the eye to operate like a mouse to access websites, social media, and other computer- and web-based data. This enables patients to learn about their condition, research equipment they’ll need once back at home, and participate in other activities that help them feel engaged in their care and connected to the world outside. The specially designed Patient Engagement System also allows patients to resume making independent choices (such as what kind of ambient music to play in their room), to return to leisure activities such as ordering movies, and to connect with support systems by making a Skype or Facetime call and writing and emailing letters. GCX
Solutions

Keep your mobility edge with lockable tablet solutions

More flexible and bedside-friendly than even small laptops, tablets aim to promote safer, better, and faster care by enabling doctors and other caregivers to educate and involve their patients in the process. Showing high-quality images, videos, and presentations can help especially. Enter the AFC Tablet Cart with a lockable, tamper-resistant, full-metal-jacket case created specifically to hold a tablet or iPad. This feature-rich tablet cart includes pneumatic height-adjustment settings of 28 to 44 inches from the floor for comfortable sit-to-stand settings; stability and ease of movement provided by five, 4-inch twin casters; a pole-mount 2-arm with 12-inch extension; a metal enclosure for storage; a left- or right-side sliding mouse tray; and a small 23-inch footprint. The tablet enclosure is fully customizable to fit your particular model. Custom colors are available. **AFC**

Let your Surface travel in style

Ergotron’s nimble, lightweight StyleView SV10 accommodates a Microsoft Surface tablet with an innovative interface that holds and positions the screen on a steady worksurface that uses embedded magnets for click-in tablet stability. Place the Surface in one of three secure positions: left, right, or center. There is room to spare for a mouse or task-related items. The cart’s patented lift engine easily adjusts the platform and screen to exactly the right height for whatever task is at hand, with 15 inches of vertical travel for seated and standing use. The t-slot channel interface on the cart’s column allows for customization by integrating accessories, such as a sani-wipes holder, storage bin, or add-on power options. This unit also features sturdy and safe metal construction and smooth, easily cleanable surfaces. A convenient storage compartment for a power brick or AC adapter is hidden yet easily accessed. **Ergotron**

Space-saving, benefit-packed mobile workstation

The Carstens 7920 WALKArOO Slimline Mobile Workstation keeps productivity rolling, even in confined and busy areas. Its small footprint, paired with smooth movement and sharp turning, makes it ideal for navigating corridors and getting into tight spaces to reach patients for assessments. It is versatile in that it can be equipped with either a tilting monitor mount or a tablet mount to easily integrate with EHR systems. The 7920 WALKArOO has an easy-to-clean, seamless worksurface to reduce the spread of bacteria and can be outfitted with glovebox holders for added convenience. An additional benefit is that it is made of aluminum and will not rust. **Carstens**

Intelligent mobile nurse workstation

The CareLink Nurse Workstation elevates mobile computing to the next level, improving communications by providing touchscreen shortcuts and resources at a clinician’s fingertips, effortless maneuverability with N-Stride steer assist, and fully configurable storage and organization options. N-Sight, CareLink’s intelligent platform, provides a proactive and independent cart fleet management software with new enhancements in the works, including active directory, alerts, exports, and cart locator. This solution provides an intuitive, flexible platform connecting IT to nursing, with ergonomic features and workflow solutions that enable clinicians to focus on what’s important: the delivery of patient care. **Capsa Solutions**

Efficient and secure medication delivery

MedLink is an innovative medication delivery solution that streamlines complex nursing workflows and complements bedside medication administration to reduce errors and improve outcomes. It features auto-closing and patient-assigned drawers that lock/unlock individually via the system’s software; electronic drawer labeling pulled from the existing hospital patient list; barcode scanning that allows scanning the patient wristband to automatically open the correct drawer; customizable drawer configurations; Power Track steering; and Auto Fit technology that instantly adjusts to each caregiver’s height with a single touch. **Humanscale Healthcare**

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Enabling predictive healthcare analytics through better workflows

By Kristin Russel, Vice President of Product Strategy, Transcend Insights

The shift to value-based care and the establishment of machine learning in support of data analysis is transforming healthcare. We may only be at the start of this journey, but a foundation is being set for predictive healthcare analytics in health systems that will allow physicians and care teams, hospitals, and health plans to mine diverse sets of data to identify patterns of care, benchmark data accumulated from peers, and use data to improve the quality of care they provide.

The foundation for this change was set by the 2009 Health Information Technology for Economic and Clinical Health (HITECH) Act, which established financial incentives for physicians and hospitals that adopted meaningful use of EHR systems. “Meaningful use” has put us on this path.

Investment in EHR systems has been massive. A large hospital can spend up to half a billion dollars implementing these large-scale systems, which are analogous to enterprise resource planning (ERP) systems, the information technology (IT) backbone for transactions in other industries. Between 2012 and 2013, according to statistics from the Centers for Disease Control and Prevention, physicians in the United States increased their use of EHRs by 21%, with 78% using the systems in 2013, up from 54% in 2011. While frustrations with these systems abound, they have played a critical part in our societal move toward data-driven health care. We’ve gone well beyond moving data from the filing cabinet to digital for- mats and to a point where we now can consider data quality and ask:

• Is the EHR providing actionable information?
• Are physicians supported with meaningful clinical protocols that are easily accessible, and are they in a position to receive data on care costs or on clinical care and quality measures?
• How easily can this data be transferred to care teams in other hospitals working in the same area or to other points within the health system?

The need for richer data

In a value-based world of healthcare, care teams will need access to a variety of rich data sets from a multitude of systems both within and outside their own continua of care. Benchmarking data accumulated from peers offers valuable insight into how any one team is performing on a broader level. In addition, patient data that is accessible across the entire care community supports a shared perspective of an individual’s or population’s health for a more coordinated approach to care.

This call for accessible data will require systems that are easier to use, with improved workflows that enhance, rather than deter, from clinical care. Many physicians find EHR systems frustrating and clumsy and complain that they divert attention away from patient care. According to a 2016 survey of physicians by the Deloitte Center for Health Solutions, 78% of respondents find EHRs most useful for analytics and reporting capabilities (but less important in supporting value-based care or improvements to clinical outcomes). In addition, 75% believe they increase costs, while 70% think they reduce productivity. The research found that 62% would like to see improved interoperability, while 57% would like to see better workflow and productivity in electronic healthcare systems.

When well executed, healthcare IT and meaningful analytics can provide critical insights to care teams, health plans, and patients alike into both the care they give and receive. Vendors supporting value-based care initiatives will need to work closely with end users to find ways to build solutions and tools that can be em- bedded into the daily practice of the user. If information doesn’t support, and isn’t incorporated into, the end-user’s workflows, at best the technology is not used, and at worst, we’ve made a difficult job even harder.

Less is often more

“Less is more” was first used by architect Ludwig Mies van der Rohe during the minimalist design movement in the 1960s. Later, famed Braun industrial designer Dieter Rams adapted the phrase to “less but better.” As humans, we have limited resources to make decisions before we become overwhelmed. When analytic solutions are at their most valuable, they are taking vast amounts of complex data and simplifying the information into cogent patterns that guide the end user in making decisions. This often requires taking features out of the product as opposed to putting features in. Some basic suggestions for clean and concise analytic dashboards with health-related data might include:

• Highlighting problem areas and allowing users to review these areas first;
• Removing words, replacing them with color, blocks, and arrows;
• Showing progress, rather than entire trend lines (allowing users to drill down if they want to); and
• Communicating and highlighting action areas—such as gaps in care, site of care, or formulary guidance—to facilitate the right decision.

Normalizing messy data

A fundamental technical issue facing product developers today is the need for data normalization. Interoperable engines can pull information from disparate sources into one location, but the data itself, input differently by different users, often is messy. For example, within the EHR, unstructured data on diabetes tests may be written in the physician’s notes but missing when we search for it in a specific data field. Vendors need to work closely with clients to show them where their data and recordkeeping problems live. In some cases, standard ways of inputting information might be needed. In others, some training may be necessary to enhance data collection and subsequent usefulness.

Being able to look through large swaths of information and identify trends is critical. Thus, pattern prediction can inform and improve preventive healthcare. Predictive healthcare analytics can only improve healthcare decisions, but together we must invest in the associated usability that ensures these analytics exist within enhanced workflows for better care decisions.
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