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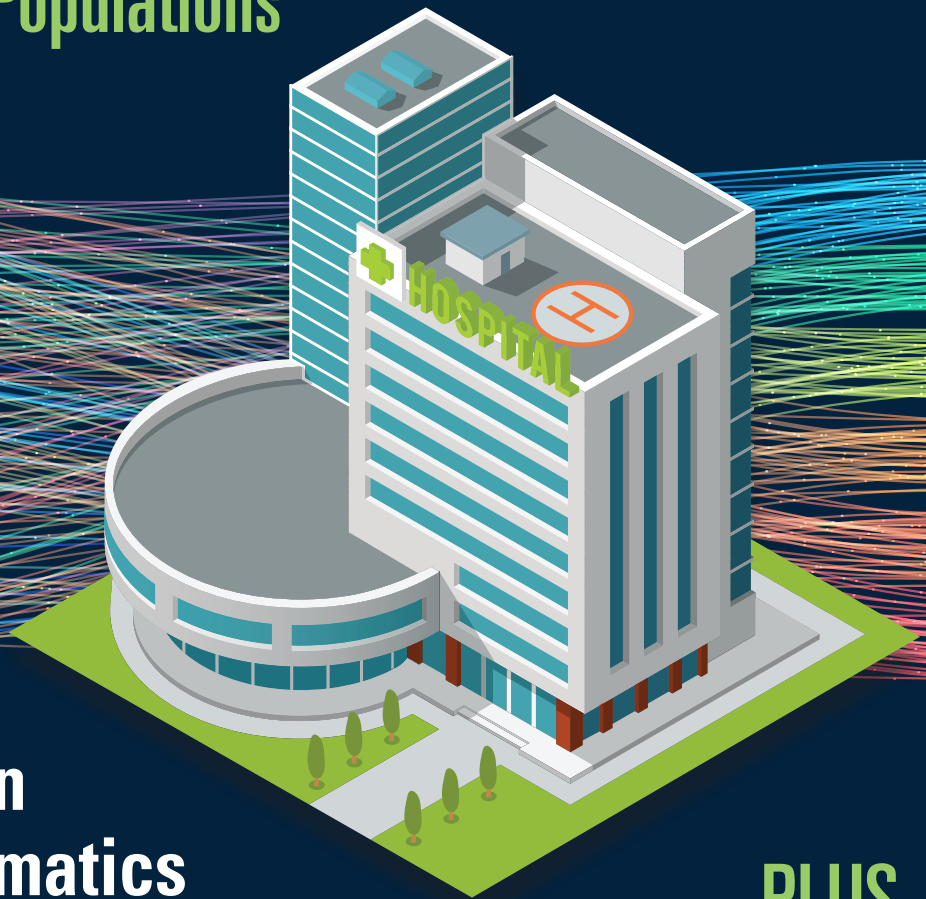
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Jane Goodall's Revolutionary Primate Study—and What Matters Now in Healthcare

By Mark Hagland



In 2006, author Dale Peterson, who had known naturalist Jane Goodall for decades, published his book, *Jane Goodall: The Woman Who Redefined Man*. Goodall, who became world-famous for her 26-year study of chimpanzees in Gombe Stream National Park on the eastern shores of Lake Tanganyika in what is now Tanzania, had met celebrated anthropologist Louis Leakey in 1960 in Kenya. Leakey set Goodall on an astonishing lifepath, recruiting her to study chimpanzees in the wild and bring fresh insights to our understanding of that important

species—and purposely choosing an inexperienced young adult to do that norm-shattering work. After adjusting to the rough conditions in the bush, Goodall ended up providing the world with groundbreaking insights, among them that chimpanzees form sticks and plants into tools, regularly eat meat, and (tragically, for her) make war on one another.

Yet she was savagely criticized by the white, male, academic “experts” who totally dominated the field at the time. Indeed, one of the most riveting sections of Peterson’s book involves his narration of what happened during April 12-14, 1962, at a three-day symposium entitled “The Primates,” and sponsored by the Zoological Society of London, and held there. The conference’s host, Baron Solomon “Solly” Zuckerman, a South African-born zoologist and primate studies authority, ridiculed Goodall after she had carefully presented her findings, even though he had never spent significant time in the field with chimpanzees, as she had (in fact, his specialty had been baboons).

As Peterson writes, “Sir Solly Zuckerman remained forever convinced that the primate problem had already been solved—by himself—and that it was mainly a masculine melodrama on the themes of sex and violence. Yet even by the early 1960s modern primate studies were beginning to reveal and revel in almost the opposite sort of story... the new research and reports from the field were starting to show... great diversity, an astonishing variety of ways in which the world’s many primate species had adapted to their great diversity of environments.”

And clearly, Zuckerman felt himself superior to Goodall, at that time, an unknown young woman with no academic credentials. Having asserted repeatedly that meat-eating was a rare phenomenon among primates, he felt threatened by her observation-based conclusions. As Peterson writes, “At the end of that day’s presentations, Sir Solly began his official summation with the barbed comment that ‘there are those who are here and who prefer anecdote—and what I must confess I regard as sometimes unbounded speculation.’ He supposed it was ‘not entirely a matter of personal taste whether one regards this sort of study of primate behaviour, or of primate evolution, as constituting a real contribution to science or not.’”

Of course, Jane Goodall would have the last laugh; her rigorous field study of chimpanzees in the wild revolutionized zoological science.

Observation-based inquiry and experimentation are at the heart of the activity around leveraging data analytics for population health right now in U.S. healthcare. In this issue’s cover story (pp. 4–10), you can read about what the innovators in the industry are doing, as they pursue a very broad range of strategies in a wide variety of areas. Every discovery is leading to new advances. As in Gombe in 1960, it’s an exciting time to be innovating.

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Social Determinants of Health and Health Data Exchange

What does the landscape look like around the collection, storage, sharing and use of data around the social determinants of health (SDoH)?

What we've seen in our SDoH consulting services is the leveraging of aggregate sources of information (e.g., census data) or individual reports of challenges (survey data) as SDoH data sources today. Those types of data vary widely, as does the sensitivity around storage, sharing and use of those data points. Z codes have included categories capturing several SDoH areas for years but have been minimally used. Recently, focus under USCDI v2 recommendations could drive increased utilization of these encounter codes at the point of care, which would increase consistency of SDoH capture, thus improving utilization.

What are the biggest challenges right now in terms of systematizing data collection and analysis around SDoH data?

Resources are limited, and organizations expend significant resource time to implement data collection methods, often surveys, at the point of care to assess social determinants for patients. These can be incomplete, sensitive to bias and stagnant in time. For example, patients may have hesitation in admitting openly to challenges with housing or may not consider themselves unhoused because they have a place to stay at that time, yielding an incomplete picture of the risks. Healthcare organizations typically only capture survey responses at a visit, meaning they will always represent a single point in time and leave blind spots for patients that haven't had a visit or who didn't have time to complete it at their visit. In addition, organizations are challenged to systematically leverage that data in patient care planning. Data entry and standardization are required to support analysis. Analytics and informatics teams are often overwhelmed with more requests than they can address, and analysis of topics that are tied to reimbursement or compliance will often take precedence when resources are limited.

Where are the pioneering patient care organization leaders making the most headway in figuring out how to systematize SDoH data, including work around data hygiene, data cleansing, vocabulary and terminology systematization and analytics?

Organizations with a specific focus and concrete plan tend to make the most headway on implementing SDoH programs and leveraging SDoH data in a systematic way. That can take the shape of focusing on a specific set of barriers to impact (e.g., transportation, medication adherence) or limiting programs to a specific patient population. Addressing a finite set of challenges enables organizations to develop programs that can be executed, implemented and standardized. It is critical to create programs that address workflow concerns to allow for scaling and expansion down the road.

Given the need for ROI, how can Healthcare organizations equip themselves to measure the impacts and outcomes of SDoH initiatives?

To evolve SDoH programs from special projects to business as usual, organizations must focus on program evaluation. While evaluation can take several shapes, successful evaluation will come with consistent features: active planning for evaluation at the time of program creation; leveraging multiple data types and sources to assess a more complete picture; taking a broad view of success to include patients, the organization, operational impacts and outcomes; and having patience.

Organizations that take a very narrow focus, specifically looking to define success based on percent lift in a predictive model or specific treatment outcomes, are at risk of missing other positive impacts. Patient satisfaction and progression across stages of behavior change are measures that indicate positive momentum toward more measurable changes in outcomes. Organizational metrics like increase in successful contacts



Emily Mortimer
Sr. Director, Healthcare
Strategy

LexisNexis Risk Solutions

with a patient, increases in referrals and resource utilization, can be leading indicators of future success. What is important to remember in all cases is consideration of both near-term and long-term goals through various lenses for a broad view of success.

What will the landscape around all this be like in a few years?

The landscape will be impacted by two factors and the associated incentives:

1. How successful organizations can implement and standardize SDoH programs.
2. The continuity of policy/legislative focus on SDoH, including consistent use of Z codes to classify SDoH barriers on medical claims and within EHR systems.

Organizations today are interested in considering and evaluating SDoH more so than necessitating SDoH programs. As an industry, we must continue to prioritize the development and execution of SDoH programs for better patient outcomes with favorable fiscal impact.

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Analytics for Population Health and Clinical Transformation: Moving Forward on the Journey of 1,000 Miles

The data analytics pioneers aren't stopping for a moment—they're moving forward on all cylinders, and providing templates for everyone to follow

By Mark Hagland

What seemed incredibly messy and poorly defined even five years ago, is gradually now coming into focus, and that is the question of where the entire “journey of 1,000 miles” around leveraging data and analytics for population health management and clinical transformation, is headed. What's clear now, as the leaders of pioneering patient care organizations plow ahead on that road, is that things are moving towards both big-picture coordination of masses of data to improve the health status of entire communities, and at the same time, towards smaller-picture pinpointing of gaps in care delivery and effectiveness, across entire integrated health systems.

Among the larger integrated health systems, certainly, the senior leaders at UC San Diego Health in San Diego are steaming full-speed ahead. And helping to lead the

charge there is Amy Sitapati, M.D., a practicing internal medicine physician and the chief medical information officer for population health for the organization (in fact, UCSD Health has three CMIOs—one for population health, one for inpatient care, and one for outpatient care). Dr. Sitapati, who looks at the overall U.S. healthcare system and says, “We're still in kindergarten in terms of U.S. healthcare system-wide efforts,” also says that “We're mid-field now in terms of



Amy Sitapati, M.D.

way an individual health system thinks about this.”

In fact, she reports that, at UCSD Health, “We're using complex risk stratification

to match each patient to our Healthy Places Index, based on zip code, to better understand the community base a patient might come from, and how that might inform our work. We're focused on equity, so when we run a report on hypertension for hypertension control, since 97 percent of our patients have completed racial information, we can identify Black patients, for example, and can identify who the patients are, in terms of the Healthy Patients Index. And if patients are interested and it's applicable, we can reach out to individuals who are facing structural barriers. So now we can say to them, we have this program to offer healthy food



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that's low-salt and low-cholesterol and help you access healthy food. Indeed, that means that Sitipati and her colleagues are not only identifying individuals with chronic illness, such as hypertension, diabetes, or congestive heart failure; they are also connecting those individuals to micro-level community disease prevalence, and are working to help those individuals overcome structural barriers that can be uncovered through population-level and micro-community-level data analysis.

Overall, Sitipati says, the technology is available now to do everything that needs to be done in terms of population health-level data analytics (though she adds that there remains a "hassle factor" with some applications); the key challenges, once an organization reaches her organization's level, become process-related. "Tech-quity is a hard one; how do you achieve technology access and literacy for all? And linguistic access—are we actually there? There are things we need to do on a health system side to make it work, and at the patient level. I think of my own mom who's in her late 70s but has poor vision and mobility and has difficulty simply connecting her iPad to her TV—or my Spanish-speaking patient who has diabetes and may not have Wi-Fi at home, what does that mean to offer digital health? These are the things we need to talk about."

Still, it's clear that nothing is stopping the leaders of pioneering patient care organizations around the country from moving ahead on countless fronts now. What's clear is that the technology is adequate to do advanced data analytics for population health management, care management, clinical transformation, and operational optimization. Now, industry leaders agree, the challenges are strategic and operational.

As Carl Dolezal, a principal at The Chartis Group, the Chicago-based consulting firm, puts it, "I think different organizations are pursuing different journeys. I work with many organizations on this. Those that are truly data-driven and really get value out of their analytics investment,

and formed a partnership around analytics. Strategic plan, clinical improvement, rapid response to COVID. You've got analytics sitting with you, and are engaging early in the process. Some organizations are still in a more transactional mode. Meaning, they sit at a table, ask analytics to help them with specific things."

That said, Dolezal adds that "We're in a transition period, where organizations are moving from a transactional model to a more consultative model, where analytics is at the table working to help solve the problems. They're an active part of the solution."

Let a thousand flowers bloom

The very heterogeneity of the analytics initiatives taking place in patient care organizations across the country speaks to the energy and commitment being demonstrated by leaders in the field right now. Among the countless efforts evolving forward:

At the 40-hospital, \$23 billion UPMC health system in Pittsburgh, chief health-

moving forward, Marroquin says, "The clinicians are beginning to understand why there are differences in outcomes among some of the patients. Why are some patients doing very well in managing their hemoglobin a1c, as compared to others, for whom their hemoglobin a1c is more difficult to control? Is it because of social issues? Access to care? Other factors? A little bit of everything? We're using a lot of tools that can allow our clinicians to



Michael Kelleher, M.D.

visualize the data, so that they can start to understand some of the nuances, to better understand the population—from their baselines all the way to their outcomes. And from that, one can generate hypotheses: what are the predictors of not having your hemoglobin a1c in control? or who are the chronic kidney disease patients who suddenly require urgent dialysis without



"The clinicians are beginning to understand why there are differences in outcomes among some of the patients. We're using a lot of tools that can allow our clinicians to visualize the data, so that they can start to understand some of the nuances." —Oscar Marroquin, M.D.

care data and analytics officer Oscar Marroquin, M.D. reports that he and his colleagues are involved in a comprehensive effort to analyze the populations of patients the system is caring for, who have either diabetes or chronic kidney disease. Dr. Marroquin and his team are helping clinician leaders to work to understand how many patients of each type are being seen in a given year, how often, how comorbid they are, their ages, what medications they're on, and in what settings (i.e., in-person versus telehealth). As the initiative is

warning? And when we identify that there are some populations that behave that way, they're asking how we can intervene more proactively" to improve those patients' outcomes.

At the Palo Alto, Calif.-based Nines Radiology, a 12-radiologist practice that is also affiliated with Nines Inc., a radiology information solutions company, president Michael Kelleher, M.D. and his fellow radiologists are applying artificial intelligence (AI) to a range of challenges in radiology practice, beginning with optimizing how radiological studies are developed and resolved. "What we're doing," Dr. Kelleher says, "is that we're using AI-based algorithms to detect when studies have incomplete information that the radiologist won't be able to read, and then that's being directed to the reading-room assistants to prepare the study to be read. And that's had a really huge impact on our ability to be efficient." With around 15-20 percent



"We're now dealing with much more information, and it has to be defined and formatted, to create that insight. I think that interoperability, right out, is still a challenge."

—Carl Dolezal

Innovating Healthcare by First-Principle Approach

What are the grand challenges being faced in healthcare and how should they be approached for effective solutions?

There are plenty of grand challenges in our healthcare system which primarily stem from system/organization silos, providers/payers fragmentation and lack of true patient-centeredness in communities. Those challenges create a number of gaps in terms of care delivery when a patient goes through different care settings. That's an issue within a hospital itself. And then you extend it to a number of other settings: prehospital, rural hospital, emergency department, referring hospital/clinic, and then transport. Then secondary hospital and there may be a tertiary center too, and post-discharge varied care centers. When it comes to healthcare, no two regions or communities are alike, even in the U.S.

There is a disconnect in communication. There is a disconnect in coordination. There is a disconnect in collaboration. These are seemingly very simple, but not many people are paying attention to what I call C3. The communication, coordination, and the collaboration that is within the facility or between the facilities along the patient journey. The fourth element is comprehensive which provides frictionless access to every patient and is robust enough to withstand any shocks. Meaning, these things should happen, but also need to happen more comprehensively so that nothing important is left out at the foundational level. Say you build a house, if the foundation is not comprehensive and robust, however well communicated, well-coordinated or well-collaborated, then anything that you build on top of it is only short lived. It's not going to serve the purpose that you intended it to serve in the long run.

As in physics, to solve a complex problem we have to go down to first-principle (ie like atoms in Physics) and build out from there; a complex healthcare system having several rigid problems/needs requires us to adopt such first-principle approach to not only solve the problem effectively but also helps overall healthcare system work smoothly, efficiently and long lasting.

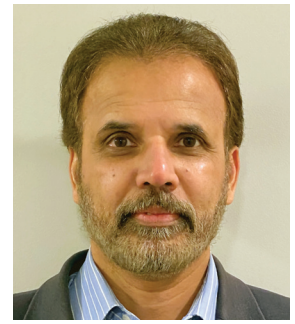
What does the overall landscape look like right now in terms of providing the right infrastructure and device

architecture for clinicians and other end-users in healthcare?

When it comes to the technology, what we need is a fluidity, not rigidity, just like water. Water is a fluid; it flows through wherever there is a gap or there is a hole. So, that is where the "first-principle" approach comes in. Once you adopt a first-principle approach and the foundation is laid out, it goes like a fluid, so it connects things and goes through the gaps, and it establishes interoperability as a technology architecture. Then at the same time, it collects the data seamlessly. You're not actually collecting on purpose; it collects seamlessly so that it becomes a data-driven architecture at the point of care. If you don't have point of care alignment, you lose sight of your overarching goal. Technology architecture should not be thought of as "just for sake of technology;" it has to serve the overarching challenges in the first-principle approach, meaning that it has to be aligned for the point of care which is patient centered and provider friendly. When it comes to the technology, what we need is to go to the fundamentals of communication, transparency, and empowerment in decentralized environment, and unleash the potential of modern healthcare by utilizing innovative mobile solutions that are as fluid as water in bridging the healthcare gaps and withstands any shocks.

What are the biggest challenges in creating that architecture—technological, people, process, operational? How can those be addressed?

It is actually all of the above, but more importantly orchestration. There are so many technologies, people, issues, and processes. It is not only what the challenges are for now, but what challenges might come in the future. People are living organisms and all these processes and technologies are also, in a way. The keys to orchestration are already out there, but you need to orchestrate together. Orchestration is also about keeping the business first principles in mind, not just technology in mind. A lot of orchestration that people are rolling out, like architecture and technologies, involves only technical people and it should be more business savvy with engineering principles applied.



Harry Reddy
Chief Executive Officer
ALLM in Cambridge, MA

How can healthcare leaders engage in strategic planning to provide the precisely correct sets of technological tools that clinicians and other end-users most need?

Making sure that these grand challenges are addressed, but not addressed in a silo. It is imperative when you are addressing these challenges you are not creating another silo.

We also need to apply the first-principle approach of starting at the foundational level by thinking afresh and using systems-thinking way where everything is interconnected with positive reinforcement and feedback loops built-in, as COVID-19 exacerbated these needs. We have a once in life time opportunity of pivoting for a transformative change with equitable access. At the same time, you have to also think about your neighborhood and your town. It's not about just your home, because you're not living in silo. You are living in a community. It's about how you interact with your neighborhood, how you interact with your community, and how you exist as a social-being.

This is a generational opportunity of making healthcare work by embracing 16th century decentralized person-centered approach with first-principle approach of digital transformation in systems-thinking way; the keys to realize such successful healthcare is to provide at point of need the effective access, communication, transparency, and empowerment. COVID-19 has proven us again that the same keys are more effective than any other forces!

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“Physicians and other clinicians are struggling with an ongoing signal-to-noise ratio, an alert-fatigue epidemic.” Alerts need to be powered by analytics, “at the moment when we can influence a patient’s health trajectory.”

—Ryan Nellis

of studies not ready for reading at the time that they’re normally pushed out to radiologists—whether because the image sets are incomplete or some information is missing—identifying those studies and sending them back to engineers for further preparation, has made the radiologists considerably more efficient, he reports, at a time when productivity is more vital than ever. As a result of leveraging a key element in an AI-derived algorithm to identify incomplete studies, “That has resulted in a 10-percent improvement in productivity,” he notes. “And that means really big changes in efficiency.” Over time, Kelleher says, “We’d like to tackle the rest of the radiologist experience with similar endeavors—thinking about the things that don’t work well. Fortunately or unfortunately, there’s a lot of low-hanging fruit” available to address, he adds.

Even smallish primary care physician

groups are making major strides in applying analytics to practice challenges. David Uptagrafft, CFO at the nine-provider (three physicians, six advanced nurse practitioners) Innova Primary Care in Huntsville, Ala., reports that he and his colleagues have been on an intensive journey around data analytics since 2015, when they decided to participate in the Chronic Care Management (CCM) program sponsored by the Centers for Medicare and Medicaid Services (CMS). At the time, he notes, “The data from CMS showed trouble ahead for smaller organizations. So we started trying to deliver relational-based care. And CMS introduced the CCM module that gave us more insight into individual patients. So we got involved in the CCM program when it launched in 2015.” What’s more, he says, he and his colleagues are also navigating complexity because of the paper-based workflow directed by Blue Cross

Blue Shield of Alabama, the dominant commercial payer in Alabama. Partnering with the Boston-based eClinicalWorks, he reports, has helped tremendously in terms of moving data around, and in terms of using eClinicalWorks’ population health modules, which are helping the practice’s members see gaps in care. One absolutely key element in success so far has been leveraging the coding hierarchy tool within the eClinicalWorks platform in order to obtain week-to-week updates showing which providers are correctly coding the complexity of their patients, which it turns out is an absolutely essential element to success in the CCM program. And in that regard, he says, the timeliness of data and of the process of analyzing that data, is turning out to be absolutely crucial to ongoing success as a medical group practice.

Leveraging analytics to support physicians at the point of clinical decision-making

In addition to leveraging analytics to support community-wide population health efforts; to identify gaps in care for patients with chronic disease; to improve clinical operations in medical group practices;

Facing the Complexities of Moving forward around HIE

An important conversation with Chris Hobson, M.D., Chief Medical Officer at Orion Health



Chris Hobson MD, MBA
Chief Medical Officer
Orion Health

Earlier this autumn, Healthcare Innovation Editor-in-Chief Mark Hagland spoke with Chris Hobson, M.D., Chief Medical Officer at Orion Health, about some of the complexities facing the health information exchange (HIE) sector in U.S. healthcare, during a recent digital healthcare innovation event sponsored by Healthcare Innovation. Dr. Hobson spent 16 years as a hospital physician in primary care in New Zealand before joining Orion as an executive nearly 20 years ago; his perspective is international and global, around health data exchange and related issues. Below are a few excerpts from their recent discussion.

There are so many models for HIE. Is that helpful? Or a problem, at this point in time?

As a rule, we like competition; competition is a good thing. It makes us strive to do better. As a principle, we're very happy working in a competitive market; and the U.S. is a highly competitive market. There are actually different models for what an HIE does. One is direct exchange of secure messages. We see the large and small EHR [electronic health record] vendors saying, we comply with most of the standards, so you can just put your data in here; and that model holds a lot of appeal, especially to hospitals and large enterprise. And we've always focused on the ability to take data in any form and store and share it. So competition is good, but does have to be managed to some extent.

When you look at how HIE models are evolving right now in this landscape, what's your 40,000-foot-up view of how well the models are evolving forward?

I think things are evolving forward pretty well; it doesn't mean the next steps will be easy; but things are going well. The pressure of COVID pushed a lot of new automation. At the start of the pandemic, we had customers saying, please, just give us the technology; they were very eager. And from my clinician perspective, there are a number of studies showing that the use of clinician and general use of HIEs is steadily improving.

We're learning that in about one-third of ED [emergency department] visits, physicians looked into the HIE. But those numbers are going up; people are happy, they're deriving value. A couple of weeks ago, a nurse told me, "When it comes to the HIE, clinicians go their first; they trust the HIE." So I think things are improving. We were up to about 100 HIEs across the U.S.; we're down to about 50, which seems to be about the right number.

How do you think the 21st-Century Cures Act will drive change, and hopefully innovation in the HIE sector, and greater interoperability?

As a rule, we like TEFCA [the Trusted Exchange Framework and Common Agreement] and the 21st Century Cures Act and the things that it's pushing the market to do. For one thing, there's the emphasis on FHIR APIs; that's a good thing. That's an ideal mechanism for it's the exchange of patient-centric data; it empowers patients, and allows the payer to pay for data exchange; those are really good things. The reality for us is that some systems, some vendors are just not ready technologically; they can do HL7 V2. The information-blocking rules and the requirement to exchange USCDI [the United States Core Data for Interoperability (USCDI) standardized set of health data classes and constituent data elements for nationwide, interoperable health information exchange] data—if that works that will provide a big push to the industry to move forward, and we'll be very supportive of that. The second thing to talk about here is TEFCA, the Trusted Exchange Framework and Common Agreement. We really like it. The concept of a QHIN—where you're going from being a health information network to being a qualified health information network—we like that. And we like the ability to move data between HIEs, using standards. I saw the other day that ONC is saying that they'll move to that next stage with TEFCA in 2022; and we see that as a positive. And

as standards move forward, it reduces the number of times we need to do non-standard things for our clients. The more standardized, the better for us.

You bring up the fact that we've got perhaps too many models.

That's right. Having many models, you will pick up on the strengths and weaknesses of the different models, and that's good. But, perish the thought in the United States, yes, the government does have to play a role, in setting standards and creating some commonality. I think that ONC and CMS are doing the right things in that regard.

As we shift more and more into value-based contracting, more and more information will be needed. How will that affect data exchange?

We have payers who say, we want you, the providers, to move to value-based care. And the providers say, well, we need the data. Data is essential for doing value-based care. And the interoperability, as described in the CARES Act, is really for the benefit of the entire population. So our ACO [accountable care organization] clients often start with the HIE as one of the key enabling things they need.

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and to strongly improve the ability to optimize reimbursement in federal and private payer value-based programs, what are some other directions in which analytics work will evolve forward in the near future?

One has got to be in the leveraging of analytics to support physicians at the point of clinical decision-making, as doctors are actually on the verge of creating orders for care and tests, says Ryan Nellis of the Charlotte-based Premier Inc. Nellis, who is vice president and general manager for Premier Clinical Decision Support, which still operates under the publicly facing name of Stanson Health, says that “Physicians and other clinicians are struggling with an ongoing signal-to-noise ratio, an alert-fatigue epidemic.” What’s becoming more and more obvious, he says, is that all the alerts need to be powered by analytics, “at the moment when we can influence a patient’s health trajectory. What should a doctor do at the point of the care? Tell them to switch a med, cancel a wasteful treatment,” and so on. “And so as a market right now, we’ve got a lot of data; we’ve got it flying out of our eyeballs; we need to do a better job of distilling the data at the right time in the right place. A lot of us at Stanson were from Cedars-Sinai, based in LA, and we’ve got a team of doctors, nurses, and pharmacists, who are spending their days thinking about how to get the right information to the doctor at the right moment. So you don’t pop up alerts at the beginning when the doctor opens up the EHR, but at the point of clinical decision-making.”

There remain several challenges to moving forward effectively in this area, Nellis says. One is simply the exhaustion that clinicians are experiencing during the ongoing COVID-19 pandemic. But the other? “The fact is that 60 percent of the patient chart is still in the form of blurbs and blobs of text. In other words, it’s a freetext problem.” Indeed, he adds, “This is about the broader environment around EHR use.

“As one CMIO with whom we work told me recently, ‘My EHR is like the lights of Las Vegas’: in other words, blinding” in terms of the amount of data and information being thrown at practicing physicians. What’s more, he says, “One common narrative is that everyone believes that EHR vendors are another barrier. In my opinion, they’re not a barrier; they’re making their systems better, and are open to third-party vendors. We have a really great

relationship with the EHR vendors. You might be surprised to hear that. People think in their heads that EHRs are a big challenge; I think they’ve really changed, and the EHR vendors are really trying to move forward to help us distill information to support patient care.”

Where we go from here

So, where does this leave leaders of patient care organizations as they move forward on all these journeys-within-the-broader-journey?

Well, for one thing, say those involved, provider leaders have been learning about agility via their experiences during the COVID-19 pandemic. As UPMC’s Marroquin reports, “COVID accelerated the need for data to drive how we do

“One common narrative is that everyone believes that EHR vendors are another barrier. In my opinion, they’re not a barrier; they’re making their systems better, and are open to third-party vendors. We have a really great relationship with the EHR vendors.”

—Ryan Nellis

things. Because when you don’t have prior experience to rely on (‘priors’ in epidemiological lingo), one has to rely on the immediate learnings from near-real time data to drive how we go about delivering care. For example, when monoclonal antibodies came out, we had to rapidly identify who would be eligible for treatment with the antibodies so that we could provide this life-saving therapy to the largest number of eligible people; so, in a matter of days, we developed an algorithm that would help us alert clinicians and patients that they were eligible for the antibodies within one day of a positive test. That was in contrast to what I mentioned above, that earlier on our analytics journey, that it would take us months-to-years to go from an idea to a deliverable, while with COVID this would happen in days. That is what I mean that COVID has proven to be an accelerator in how we use data. And we could only do that work because we actually had a lot of the pieces already in place here at UPMC.”

More broadly, Marroquin testifies that “All the pieces that I’ve mentioned need to be put in place in order to meaningfully use data and analytics; because without them, one cannot do this at scale. And

that requires institutional commitment that data/analytics are a priority, which then is manifested by having a dedicated team that is singularly focused on the task, with a lot of attention to detail, and the determination to keep pushing the ball forward on the goal of deriving meaningful insights from the data we have available that can be used to better deliver care for our patients.”

Impact Advisors’ Dolezal emphasizes the vastness of the data landscape itself. “There is a massive, massive amount of information” involved now. “We used to focus on analytics coming from EHRs, transactional systems, ERPs, etc. Now, wearables, patient-provided information, social determinants of health” are also potential sources for analytics work.

“We’re now dealing with much more information, and it has to be defined and formatted, to create that insight. I think that interoperability, right out, is still a challenge. We haven’t solved that yet. Our ability to exchange data and information remains a challenge. And I still see some blocker mentality in some organizations, where freeing up the data remains a challenge. But one of the most vexing problems remains talent: it is harder and more challenging than ever to recruit good analytics talent into healthcare. Getting data scientists into healthcare, into a complex environment where data has to be curated and cleansed, it’s just a challenge, and we’re being forced to be really discerning because of that.”

UCSD Health’s Sitipati says she and her colleagues are absolutely focused on reaching out to partner in all this work with public health entities and payers. She says she’s very excited that the managed Medicaid payers in her region are extremely interested in partnering in very concrete ways with providers to improve the health of the populations that they all serve. And, she concludes, “In terms of advice, I’d say that if you don’t have a plan for where you’re going, you have no idea where you’re going.” **HI**

Payer-Provider Collaboration: It's a Whole New World

The traditional lines between payers and providers are shifting, as more and more providers enter alternative payment models (APMs) and take on population health management and care management as core functions. How do you see the relationships between payer and provider organizations shifting in the next couple of years?

While historically the payer/provider relationship has at times been adversarial, with the availability of copious amounts of health-care data, there is the opportunity for payers and providers to collaborate to improve the health of the patient of the patient now more than ever. Both organizations should be focusing on modern methods of capturing, codifying and analyzing data collected on patients so that information can be utilized to provide better outcomes.

The level of cooperation between payers and providers is changing as well. Where do you see the main areas of potential cooperation?

From my perspective, there are two main areas where payers and providers can collaborate - better outcomes and lower cost. From an outcomes perspective, the healthcare industry has established a set of evidence-based medicine guidelines, which can stand as the basis for a patient's care in the majority of cases. By understanding where the patient has received this care and collecting the information from providers around the provision of this care, payers can work collaboratively with the providers to determine gaps in the overall treatment of the patient. Claims payment data from a variety of providers can set the basis for evaluating necessary clinical interventions and determining ongoing care. Identifying a diagnosis based on claims payment data can enable the payer to collaborate with their providers to ensure that a clinically appropriate treatment plan is created and deployed for each payment. If these clinical indicators can be identified at the beginning of care, both the payer and provider can avoid costly ongoing treatment for the patients, resulting in lower costs for the payer, provider and patient.

Which alternative payment models and organizational structures do you see as the most successful so far? ACOs? Bundled payments? Clinically integrated networks? Narrow networks?

The struggle with any alternate payment model is the ability to assess where a provider stands within the model. Providers struggle to get a birds-eye-view of where they are with their patient population and where they need to make changes in their case management of high-risk patients. From a hospital consolidation perspective, a singular EMR with comprehensive charge capture can enable an organization to collect the data they need to analyze where they are with their patients. However, with patient leakage, especially in rural areas or with snowbird patients who receive care in two different states, an organization can still lack all the data they need to make these decisions. As payers, the data is collected from wherever the patient is seen and can give a more comprehensive view of a patient's care. In order to assess their financial standing in their at risk contracts, providers need to push payers to provide them with access this data on an ongoing basis so it can be analyzed with their available data to allow providers to more effectively negotiate and manage their at risk contracts.

What are some of the key lessons that the leaders of hospitals, medical groups, and health systems are learning right now that will provide templates and lessons learned for others going forward?

One of the emerging trends in the market is the advent of "payviders" - a business collaboration between the care provider and the insurer. Providers see opportunities to grow revenue by accepting risk and growing their patient population. Payers see opportunities to partner with providers to expand value-based contracting. Since the passage of the ACA, the number of ACOs has grown dramatically. Many of those include partnerships between payers and providers.



Priscilla Sandberg
Healthcare Alliance
Executive
Pure Storage

How quickly will the collaboration accelerate in the next few years? Will the landscape around APMs and payer-provider collaboration be very different three years from now?

As with everything in healthcare, it is almost impossible to predict where the future will take us. As one of the only industries that is dramatically affected not only by government legislation, but also by consumer choice and preferences, the landscape is constantly changing. The advent of price transparency and public data that reports on outcomes and cost will most likely drive consumers to take charge of their care in a way that we have not seen in the past. With the ever-rising cost of healthcare and high deductible plans, consumers will be the driving force behind the success of not only the providers, but also payers who are supporting their care. The claims payment transparency that consumers have now is unparalleled and as healthcare continues to hit consumers in their pockets, they will demand more efficient care with better outcomes. Payers, in an effort so lower costs, will demand the same type of outcome related data from their providers in order to provide better customer service for their members.

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AI: The Importance of Governance

By Joseph L. Marion and Henri Primo

Artificial intelligence (AI) is one of the more promising technologies in medical imaging of the 21st century so far, with widespread potential in healthcare. New applications are emerging every day in both diagnostic imaging, as well as in many workflows and analytical areas, driven by the changing norms of value-based care and population health management.

Before AI grows exponentially, the authors believe that AI governance is critical to an efficacious and cost-effective implementation of the many AI-based applications. Healthcare providers can learn from other experiences in healthcare, such as cardiovascular information systems. Cardiovascular services tend to be diverse in nature with invasive, non-invasive, and event-recording applications. As systems emerged, no single vendor seemed to have an all-inclusive solution, and consequently different department sections acquired what was best for them. The net effect was a proliferation of systems that, in many cases, did not interoperate well and made assimilation of the comprehensive patient information by the cardiovascular specialist difficult.

Similar in nature has been the application of advanced visualization. There can be multiple departments with advanced visualization needs, such as diagnostic radiology, orthopedics, surgery, etc. Each of these areas may have pursued a particular

vendor's solution—again resulting in a proliferation of systems with overlapping functionality and poor interoperability.

In order to avoid similar experiences with AI, providing proper governance can potentially minimize organizational inconsistencies, inefficiencies, and expenses. We will review the current state of AI through examination of some real-world experiences, and then explore what is needed in AI to avoid the mistakes of the past.

Current state of AI

In order to understand the current state of AI and governance we must understand how AI has evolved. First, let us differentiate between imaging and non-imaging AI. In the broadest sense, AI refers to machines that can learn, reason, and act for themselves. They can make their own decisions when faced with new situations, in the same way that humans and animals can. These algorithms use statistics to find patterns in massive amounts of data.

Imaging AI focuses on a branch of computer science dealing with the acquisition, reconstruction, analysis and/or interpretation of medical images by simulating human intelligent behavior in computers. Machine learning algorithms are a subset of artificial intelligence methods, characterized by the fact that you do not have to tell the computer how to solve



Joseph L. Marion



Henri Primo

the problem in advance. Instead, the computer learns to solve tasks by recognizing patterns in the data. By analyzing thousands of similar images looking for specific patterns, the computer is able to predict if a certain pattern is representative of a particular diagnosis.

Non-imaging AI also employs algorithms, but instead of analyzing image content, they may look for patterns in data that are relevant. For example, if a patient has had multiple exams that include calculation of an ejection fraction, an algorithm that examines a vast amount of data looking for ejection fraction values and compares them would be helpful to the clinician. Similarly, an algorithm that uses machine learning to examine a number of patient parameters such as age, mobility, prior visits, etc. might be used to assess whether a patient is likely to be a no-show for an appointment, and recommend preemptive action.

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There are three main sources of evolving AI development: research developments; commercial developments; and AI platform development. Many research facilities are developing algorithms for specific factors, both imaging and non-imaging. Conversely, there are a number of commercial companies that are developing algorithms based on the products or services they sell.

Finally, there are companies that are concerned with the delivery of such AI algorithms, and they are focused on developing a platform or marketplace for delivery of potentially their own- or third-party algorithms. This is similar to smartphone applications that are most likely delivered via an “app store” controlled by the phone’s operating system supplier such as Apple or Google. A user may choose to download any number of applications, and typically pays for only the ones they choose to use. A platform with multiple algorithms may be a better sell, but there are concerns about platform “exclusivity.”

One might say the current state of development in all sources are in their infancy. In most cases, it appears that imaging AI is evolving separately from other areas. According to John Mongan, M.D., Ph.D., associate professor of clinical radiology, associate chair, translational informatics, director, Center for Intelligent Imaging, the Center for Intelligent Imaging at the University of California at San Francisco (UCSF) is evolving a framework for imaging AI, “We consider the risks for deployment as well as the probability of success and the clinical impact.” Mongan believes AI Governance “should include when and when not to use an AI algorithm. People using it must understand when it is and when it is not useful.”

According to Alex Towbin, M.D., Neil D. Johnson Chair of Radiology Informatics, Cincinnati Children’s Hospital Medical Center, “Cincinnati Children’s is in the very early stages of AI. We have one clinical application implemented, and a number of internally developed applications in development. We have also purchased one externally developed stroke application, but have not implemented it yet.” There are a number of applications they have acquired that say they employ AI, but they are not really sure about that. His focus is on automated workflow, which may not directly be AI, but is part of it.

Another example of governance is Brigham and Women’s Hospital, in conjunction with Massachusetts General Hospital. Kathy Andriole, Ph.D., director

of research at the MGH and BWH Center for Clinical Data Science states, “There are initiatives in many areas both imaging and non-imaging, including radiology, cardiology, the ICU, pathology, COVID, workflow optimization, and light images.” According to Andriole, “We have a committee across Mass General Brigham that oversees and approves clinical implementation of AI algorithms. The committee decides if and when an AI algorithm is implemented and looks at how to assess different applications.” Andriole indicated that “diagnostic applications get the publicity, but there may be more potential in non-diagnostic algorithms such as workflow.”

The University of Michigan balances between a governing committee and individual department efforts, according to Karandeep Singh, M.D., assistant professor of learning health sciences, internal medicine, urology, and information at the University of Michigan. Singh chairs the Clinical Intelligence Committee that oversees operational AI activities at Michigan Medicine. While the university as a whole has efforts focused on AI/ML research (e.g., the Michigan Integrated Center for Health Analytics and Medical Prediction [MiCHAMP]) and resources for translation (Precision Health Implementation Workgroup), the Clinical Intelligence Committee’s primary focus is on clinical operations. Singh says, “there is a mechanism to initiate requests to the committee where a given clinical workflow could benefit from the use of an AI/ML model. In turn, the committee helps clinical stakeholders review and endorse models based on products that are available from vendors or models developed by researchers. In general, a researcher cannot directly bring a model to the attention of the committee but needs to have a clinical partner.” According to Singh, “If an AI/ML model affects a broad set of clinicians or other stakeholders, it requires review by the committee.”

According to Gary J. Wendt, M.D., professor of radiology and vice chair of informatics, University of Wisconsin Madison (retired) “there is a long-standing governance body in place that also addresses AI, including an approval process, but it doesn’t appear there is any coordination with non-imaging applications.”

Imaging AI use cases are currently not diagnosing diseases but are merely a tool to extract data abnormalities in imaging studies or for quantifying physical parameters such as blood flow rates or volumetric

information from imaging data sets. These results are then presented to the diagnostician, e.g., as a pop-up overlay screen on a PACS display. The radiologist can then consider if these data are meaningful for augmenting the clinical diagnosis.

Other AI system configurations can use the AI-detected abnormalities or quantified data to accelerate the triage workflow process to present the AI prioritized results to the radiologist. In the future there will likely be more and varied use cases.

What is needed for AI governance?

Given the current state of AI, it is not too soon to consider governance within your institution. The first point to consider is the differentiation between imaging AI and non-imaging AI applications. Is there sufficient overlap between these areas to warrant a common governance?

Using radiology services as an example, AI imaging applications such as a stroke detection algorithm able to differentiate between Intracranial hemorrhage (ICH) and a large vessel occlusion (LVO) usually receive the greatest amount of publicity. However, workflow orchestration applications that guide the caregiver automatically thru the clinical data such as medical history, lab results, etc. and then intelligently prioritize the worklist study selection may be just as valuable.

Wendt stated, “Knowing the results of an AI analysis on an image five minutes before it is read may not be as valuable as having relevant information for that exam available at the time the study is interpreted.” Furthermore, Wendt and Towbin both suggest that AI image analysis may be more beneficial outside imaging services in improving the time to treat a lesion that has been analyzed by an AI algorithm.

Contrast these examples with an AI algorithm that evaluates the current patient schedule for a department, where the algorithm predicts potential no shows and improves the actual percentage of patients that show up for an exam. Such a non-imaging algorithm may have a more beneficial economic impact on the department than an imaging application.

Regardless of scope, there is value in some form of governance and oversight to guide AI deployment. The University of Michigan, the University of California at San Francisco, and Brigham and Women’s/Massachusetts General all appear to have working committees who play a role in AI

FHIR is the Way Forward

Tell us a little bit about some of the capabilities of FHIR that our audience should know about.

FHIR is effectively replacing a standard called HL7. HL7 was needed because, in the hospital setting, you have so many different systems across supply chain, billing, labs, and more, and they needed to talk the same language. Otherwise, that system wouldn't be able to scale. But the challenge with HL7 is that it doesn't adhere to new best practices around having HTTP access and RESTful access that supports caching, as well as other capabilities that make it easier to interact with this data.

FHIR essentially made it easier to create certain resources and define what those resources and data are. For example, a patient record has a specific set of attributes, and once you follow the FHIR standard, you know that if you're going to talk about a patient, you're going to have to provide this data when you're sharing it with a vendor. The beauty of this standard is that it allows everyone to speak the same language.

What is your interpretation of how the 21st Century Cures Act will interact with the development of new API's and the sharing of data?

To understand the reasoning behind this law, we should first think about the problems that we currently face from a health technology perspective. If we want to drive innovation for patients, we must make patient data easy to access and easy to move around. That data should be accessible not just within an organization, but across organizations so that you create an ecosystem of innovation on top of that data, where new startups and companies can think of ways to use that data for the benefit of patients.

But there was never an incentive previously for various different institutions

to do that. As a result, the data was siloed, which meant that you couldn't access it, and you couldn't build on top of it.

The Cures Act mandated that institutions give patients access to their own data. Now, I have control over my data; I can pull it and share it with anyone I want. As a result, we'll start seeing an ecosystem of solutions that can offer services to the patient, ask for data, and give patients back something meaningful in exchange. This can only increase innovation and help us tackle some of the challenges we see in healthcare overall.

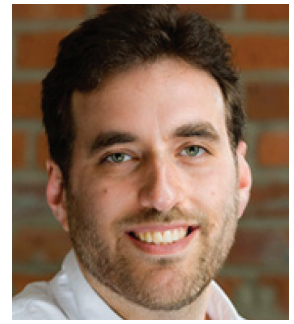
What kinds of advances will separate the more innovative health plans from the less innovative ones?

The health plans that are going to be at the cutting edge are the ones investing in building an API infrastructure internally to make it easier to access member data. They can achieve this by looking to FHIR as a standard, so it's easier to build tools and services on top of that infrastructure.

At Wellframe, when we partner with a health plan, we typically need to integrate our system with theirs as well as with other vendors. When health plans have already invested in interoperability, the integrations are much easier, and you can enable more for the member.

For plans still using custom APIs, it's hard to exchange and extract that data. It's very challenging to achieve a more innovative, consumer-focused experience as a result. As a consumer, you can see when there are silos in your data—when you feel that you have to talk to six or seven departments to get an answer, or when the web interface looks very disjointed, compared to working with an organization that has a strong, cohesive experience.

Even when consumers use multiple vendors or tools offered by that plan,



Mohammad Jouni MS
Chief Technology Officer
Wellframe

the most innovative health plans offer a connected flow of information and data as well as a seamless experience.

What's your advice to those who are on this path toward interoperability?

Try to be an agent of acceleration of this change as much as possible at the micro and macro scale. Whether you're the leader in an organization or a developer, learn about the standards, figure out how they fit, and lean into them. The more we all embrace these new standards, the faster innovation happens, and the more we all benefit—as people trying to improve the healthcare system and as healthcare consumers ourselves.

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applications oversight. In all these cases these were committees not necessarily established specifically for AI. Therefore, it may be easier to utilize existing infrastructure to provide governance than to start from scratch.

A governance body should be multi-disciplinary to ensure all relevant services are addressed when considering the merits of an AI application. This is particularly important when considering AI applications that cut across multiple services and clinicians, such as a pre-diabetic algorithm that may impact a general practitioner, endocrinologists, ophthalmologist, and potentially others.

In the case of the University of Michigan, the feeling is that a service line such as radiology may be sufficiently self-contained with respect to some AI algorithms that they can self-manage AI governance. For example, an algorithm that analyzes images for a specific cancer, or a workflow prioritization algorithm may only affect the radiologist, and therefore may have little impact outside radiology.

The concept of an AI orchestration platform has been expressed by multiple AI vendors as a means for managing AI applications. These platforms are similar in concept to mobile phone vendor “app stores” in that they can offer multiple applications in one place, usually for a subscription fee. The intent of these platforms is to enable a vendor to approve a number of different applications, whether they be internally developed or from a third-party source, thereby making it easier for an institution to use. While in theory these platforms can simplify the accessibility and use of AI applications, not every vendor’s platform may have all the applications an institution is interested in, likely resulting in the need for multiple platforms.

According to Mongan, AI implementers should look to the DICOM (Digital Imaging Communications) standard as an example of a successful deployment methodology model to follow for interface standards for deployment of AI. The DICOM standard has grown to be a successful means of digital image sharing by establishing a standardized format for a variety of images. Creating a standards group and defining a standard means for conveying an AI algorithm would be a tremendous boon to the acceptance of AI applications.

Implementing AI can be enhanced by following the experiences of others, including:

- **Identify AI application activity:** There are likely areas already that are working on or using AI algorithms. Understanding where

there is already activity, and if it benefits more than the service responsible can help determine the best place for governance.

- **Define an AI implementation strategy:**

A well-defined strategy is fundamental to AI Governance. It should include who is responsible for governance authority for the enterprise as well as for individual services, as well as governance processes.

- **Determine the highest priority AI areas:**

Some AI applications will have localized value, whereas others may have enterprise-wide value. For example, an algorithm that assists in the identification of small lesions may have value within radiology, whereas one that predicts no-show rates may have more universal value. An institution will need to have clearly defined policies relative to the criteria for determining the value of an AI application. Is it monetary? Clinical? Other?

- **Establish governing bodies to review and approve AI applications:**

The value of AI governance can be enhanced by establishing a process for the review and approval of AI applications. This may assist in avoiding redundancy in similar algorithms, as well as provide better interoperability across service lines.

Summary

According to Towbin, “We already have algorithms today, but it is probably two or three decades away from large segments of our work being automated with hundreds or thousands of algorithms firing at once.” Towbin also believes “the real value of AI is when it’s doing things I can’t do.” He further believes that “the first 100 years in radiology has been qualitative medicine, while the next 100 years will be quantitative.”

Wendt is skeptical of AI cost justification, “You need to get the CFO on board, as anything that will show a readmissions reduction will be favorable.” Similarly, Wendt believes that the potential of a platform for AI will optimize interoperability and minimize training. As for where AI algorithms will reside, Wendt is concerned that EHR vendors are reluctant to get involved as it may involve 510(k) regulatory requirements.

A central theme from several contributors is the value of standardization. Both Singh and Mongan stress the importance of standardization. Mongan suggests looking to DICOM standard, as “it was the biggest success story in imaging,” while Singh believes that physician organizations (e.g., American Society of Nephrology or

American College of Radiology) would be effective groups for AI guidance, but models and technologies affecting different types of stakeholders need deep collaborative work for algorithms to be both accepted and helpful.

Many AI imaging algorithms are considered “Software as a medical Device” or SaMD, by the FDA. As such, only FDA-approved AI applications should be used by diagnosticians.

There are multiple algorithms approved by the FDA, often for the same application. An example would be for stroke detection. Having a multitude of algorithms with similar functionality proliferating thru a multi-hospital IDN would significantly increase operational cost without a guaranteed improvement in patient care quality. This is contrary to a strategy for achieving the Triple Aim, a framework for simultaneously achieving an improved patient experience, improving the health of populations, and reducing healthcare cost.

An imaging governance committee (IGC) for vetting and standardizing all AI applications makes sense. The IGC could be dedicated to specific service lines of an IDN, such as an imaging service. The IGC should consist of different IDN stakeholders, such as medical, legal, regulatory, IT, clinical engineering and others. The IGC could also manage other domains besides AI, such as the standardization of other assets such as PACS in the imaging service line across the IDN. Finally, the IGC should have representation of the IDN’s C-level governance.

As the authors have experienced in many IDNs, lack of coordination and lack of standardization is often the cause of an “intra service lines” breakdown and is at the origin of unnecessary costs and quality issues with care delivery. It also causes “inter-communication” issues between different service lines leading to even more care delivery quality issues. In contrast, standardization leads to quality improvements and cost savings. These actions result ultimately in better patient satisfaction, and as such enables achieving the trifecta of the Triple Aim. IDNs need to standardize processes and technologies. In order to achieve the Triple Aim in AI deployments, they also need to implement IDN-wide and service line-specific AI governance. **HI**

Bios for Joseph L. Marion and Henri Primo can be found online at: <https://hcinnovation-group.com/21243735>

In Demand, On Demand: Healthcare IT Staffing

Looking at the landscape around staffing right now in healthcare IT, what are the biggest needs among senior-level positions in patient care organizations?

Senior-level talent must possess the ability to engage a changing staffing environment that includes remote talent, highly specialized expertise, and a growing contingent workforce. The days of hiring a team and maintaining them in a traditional work environment is giving way to a workforce-centric model in which talent and expertise is in high demand and making demands.

From a topical perspective, the industry is calling for leadership in digital transformation, cybersecurity, artificial intelligence, and patient engagement among other topics. Whether these are new roles or extensions of existing senior level staff is the question organizations will evaluate. Our experience tells us these areas, especially digital transformation, and cyber security, are so complex and fast moving that it is challenging for local internal staff to keep up in the same way organizations that specialize in these topics can.

Where are the biggest gaps, relative to the skills and experiences needed and how has the Covid-19 pandemic impacted healthcare IT staffing?

Demand for health IT talent is at an all-time high. Traditional healthcare staffing agencies are seizing the moment in record numbers, retooling their traditional healthcare offerings to engage in IT recruiting and placement. Like other industries, healthcare has and continues to be devastated by staffing shortages, driven in large part by the Covid-19 pandemic. Healthcare IT is not immune to this phenomenon with critical shortages presenting in virtually every discipline to include end user support, application analysts, infrastructure, and cyber security.

Out of adversity comes opportunity and that is currently manifesting in the healthcare IT staffing space with many new agencies entering this space. While this is a time of great opportunity, it is also a time for health

care organizations to critically assess the ability of these previously non-IT healthcare staffing and consulting firms to identify skills-rich technical and application talent. As I watch staffing firms and associations race to claim a spot in health IT staffing space, I am reminded of a saying that goes like this – “to a hammer, everything is a nail”. With literally hundreds of technologies and healthcare specific applications requiring deep expertise – every agency placement can’t be just another resource.

What is the situation around clinical informaticists, especially at the senior levels?

Clinical Informaticists continue to be in demand. However, I have witnessed a changing focus for this role with regulatory compliance rising to the top of their agenda. Healthcare IT encompasses people, processes, and technology, while the complexity surrounding healthcare regulatory compliance and constantly shifting agendas creates need for deep understanding of systems and workflows. Strong communication skills coupled with even stronger analytical skills ensures physicians, nurses, and the array of clinical care providers can successfully interact with IT systems to the benefit of their organizations and most importantly the patient.

What are some of the geographic differences that you see?

The most significant element of staffing that I see related to geographic differences is that geography no longer matters! It is far less important today than ever in our history. Technology makes it possible for many jobs to be performed from literally anywhere in the world. The Covid-19 pandemic provided the proof statement that remote work is and can be productive and effective.

What does the period of the next 24 months look like?

Just as we could not have predicted the impact of the Covid-19 pandemic on healthcare and healthcare workers, it is equally challenging to consider the changing face of health IT staffing in the next 24 months. However,



Rebecca Quammen
DBA MBA FACHE CEO
HealthITq & Quammen Group

there is consensus that a highly skilled and in demand workforce has been liberated from traditional employment norms.

What advice would you like to share with CIOs and other senior-level healthcare IT leaders?

Focus on talent! It is really the only variable that matters. Deep, rich, experiential talent with broad knowledge of targeted healthcare IT topics is essential. Arguments surrounding the merits of insourcing versus outsourcing are losing ground. Covid-19 has decisively changed the trajectory of employment and staffing in every industry, with healthcare topping the list. Now more than ever, the workforce wants to be valued, they want work that is enriching and offered unconditionally on their terms.

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Q&A: Informaticist Philip Payne on Washington U.'s Precision Medicine Journey

Founding director of university's Institute for Informatics describes 'deep phenotyping' to better understand the environments in which patients live

by David Rath

Philip Payne, Ph.D., wears a lot of hats at the Washington University School of Medicine in St. Louis. In addition to leading the Institute for Informatics, he is associate dean of Health Information and Data Science and chief data scientist. He also has been involved in informatics efforts related to the COVID-19 pandemic. In a recent e-mail Q&A with *Healthcare Innovation*, Payne described some of Washington University's work in the area of personalized medicine.

Healthcare Innovation: Can you describe the ARCH Personalized Medicine Initiative, a joint venture between the Washington University School of Medicine and Centene? What are some of its goals?

Payne: Washington University School of Medicine has a strategic focus in both research and clinical practice that will advance precision medicine. That means we need to better understand at a biomolecular and a clinical and a population

level the features of our patients that both contribute to wellness but also disease and how patients respond to therapy so that we can use that increased understanding to make better decisions at an individual patient level that optimize quality, safety and outcomes of care. We have a variety of collaborators that we work with that help support this research, including traditional funding sources such as the National Institutes of Health. But in equal measure, we also have collaborations with organizations such as Centene and others that are investing in precision medicine research in order to improve the health and wellness of patient communities.

What are some of the elements of informatics infrastructure that underpin this personalized medicine approach?

Fundamentally, the challenge that we have with personalized medicine or precision medicine is that rather than treating patients as a function of how the average



Philip Payne, Ph.D.

patient presents or the average patient may respond to therapy, we instead want to understand the individual features of each unique patient that contribute to both wellness and disease, and response to therapy. That means we need a lot more data to understand the patients that we have seen historically or that might be participating in clinical studies now, so that we can build the evidence base that informs that very tailored approach.

A lot of the work that we do in informatics is in the context of what we refer to as deep phenotyping. For example, how do we extract all of this critical information from the electronic health record from a variety of biomolecular instruments such as those that we use to genotype or sequence patients, not to mention patient-generated

SDoH Success Factors: Partners, Data, Outcomes

What are big challenges with systematizing data collection and analysis around SDoH data?

SDoH data entails more complexity than other types of data. First, the fact basis and measurability can be much more ambiguous than some types of clinical data. For instance, consider height and weight in contrast to distance to closest grocery store (from where?), health literacy level, or past trauma. Second, the utility and value of the data is less proven. Third, a great deal of SDoH information isn't in digital form, greatly inhibiting data access and exchange. There are technical means to accelerate, but we're not there yet.

How do organizations align, collaborate, and glean value from the data?

Alignment requires key stakeholders to find common ground across respective missions, identify mutual partnership benefit and agree on specific data initiatives. In the case of SDoH, stakeholders are quite varied and may include non-profits, ancillary healthcare providers, even religious or neighborhood organizations. I created FAST Goals Methodology™ to quickly align stakeholders and find that common ground, that joint purpose. It addresses alignment of people and organizations along with their objectives, capabilities, data, and technology. When alignment is done well, operationalization becomes easier and value creation is accelerated.

Where do we start?

Even with alignment of purpose, a single organization, or a heterogeneous group such as described above, still must create a line of sight to a viable, tangible business case or mission-based value (for non-profits and community organizations). Many SDoH programs struggle with this, with clarity (measurability) of outcome goals, return on investment, and what consumers most need. Our solution, WholeCare+ straddles the grand intent of leveraging SDoH data for good with an immediate, concrete opportunity offered by CMS' special benefits incentivization. It captures various aspects of SDoH – like

member preferences and self-advocacy levels, to help health plans design benefit offerings. While curated for this specific purpose, this data can be used to determine longer-term SDoH levers and strategies.

What data management tips could help avoid pitfalls on this journey?

Success with alignment and business case definition will still falter if data capture, interoperability and operationalized decision intelligence are not well executed. Here are two tips for avoiding pitfalls. First, talk consistently with your data partners and technologists by creating operational definitions. These are clear and concise definitions that, when used by different people, still yield the same result. For instance, does “smoking history” mean “yes/no” or “start date, stop date, how much.” Operational definitions help avoid the problem where people think they are talking about the same thing, but they aren't. Second, be prepared for getting value from sparse and skewed data sets (even when the volume of responses to a survey, for instance, is high). Thoughtful sampling, continuous discovery (borrowing from Design and Lean Startup toolkits), and coupling statistical with logical and causal analysis should all be part of your repertoire.

What will the landscape be like in a few years?

The organizational landscape will continue to shift as different players stake out their roles. Rather than speculate on those specifics, I'll focus on a critical success factor for all: to create business and digital solutions that can be composed and recomposed rapidly, allowing us to adapt and flex together, and address ever-evolving, and fast-changing consumer needs, expectations, and opportunities. In my organization, we consider patterns of alignment and scenario planning when creating accelerators and implementing custom solutions for core capabilities or interoperability. This is taking a systems view, and those who do so – service providers, platform builders, digital startups and custom solution builders – will shape the landscape ahead of us.



Jeannine Sivi
Director of Healthcare Solutions
SDLC Partners

Jeannine is a business and technology strategist who recognizes undiscovered possibilities and spearheads paths of practical innovation - cutting through complexity and ambiguity, and delivering value at speed, at scale. A global thought leader on mission-driven improvement, she is expert in marrying solution engineering and process transformation with market trends to create breakthroughs. She leads SDLC Partners' Healthcare Solutions, where she and her team envision "Healthier Lives via Frictionless Healthcare" and passionately address persistent digital health ecosystem challenges – with one solution earning a Gartner Hype Cycle mention. She previously held leadership and technical roles at UPMC, Carnegie Mellon's Software Engineering Institute, and Eastman Kodak Company. She holds engineering degrees from Purdue and RIT, and CalTech's certificate in Technology & Innovation Management. A Pittsburgh native, she enjoys its cultural diversity and has a long-standing passion for nature and animals.

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data or data that may help us understand the environments in which patients live or social determinants of health and disease? We need to be able to identify all those data, connect all those data to one another and then understand them in that multi-scale context, which is very complex from a computational standpoint. And so that's really what we do in the Institute for Informatics. We work very hard to discover those data sources, to integrate them, to harmonize them and understand them.

Can you talk about some projects within the personalized medicine initiative?

We have a variety of projects underway in the Institute for Informatics that contribute to our precision medicine strategy, and they span a broad variety of diseases that most people are familiar with such as cancer, cardiovascular disease, neurodegenerative disease, and other common diseases. We also have projects focused on rare diseases that occur less frequently but are no less important when we think about how we can have better, more precise approaches to diagnosis and treatment planning.

One of our focuses is Alzheimer's disease. We know with Alzheimer's disease that there are a variety of presentations, and while the biology may be somewhat similar across those presentations, some patients will see very rapid neuro-degeneration and deterioration of their cognitive function, while for other patients it's a longer, more gradual process. And while we don't have curative strategies for any of those scenarios, there are measures we can take to improve quality of life and also to support caregivers and family members as they navigate this disease. But that means we need to understand what's the likely outcome for a patient.

We've been looking at a broad variety of data sources from patients enrolled in clinical trials in Washington University's memory care clinic. This includes data that are captured in the EHR but also a variety of cognitive evaluation instruments and patient-generated data. And we've been using machine learning methods in order to identify patterns in that data that will allow us to predict which patients are going to have a rapid decline and which are more likely to have a slower, more longitudinal decline. We've seen great success with those preliminary models, and now we're working with our clinical collaborators to validate those. And importantly, we're doing that with data that's captured in the

clinic so it doesn't require us to do anything different at the point of care. Rather it's a different way of looking at all that data that we collected at the point of care so we can improve our ability to make these prognostic assessments of a patient. We talk about this in the Institute for Informatics as being an effort to understand patient trajectory, so not all precision medicine is about finding a new treatment. Some aspects of precision medicine are simply about better understanding the trajectory a patient is on, so we can make smarter choices throughout the duration of that entire trajectory.

What are some of the challenges in terms of finding critical insights from EHRs and other data sources? What are some approaches you have taken to using EHR data?

One of the issues with using the EHR data in precision medicine or healthcare research is that much of the data that's really important to understand both health and disease is not captured in discrete or structured fields in the EHR. By that I mean very specific and concrete measurements that we can use when we apply advanced computational methods like machine learning.

Probably somewhere between 70 percent to 80 percent of the really high value data is either captured in narrative text in the form of notes in the EHR. It may be captured in documents, images or other communications that are scanned and attached to the record as PDFs or other non-computable formats. In all three of those scenarios, we have to use advanced computational methods to extract information from that narrative text from those scanned documents and images in order to render the discrete features that ultimately inform, for example, the predictive models in Alzheimer's disease or cardiovascular disease or diabetes or cancer. That's very challenging in terms of training the computational algorithms that allow us to extract that information, validating that the information that we're extracting is in fact accurate, and then integrating that with the other discrete data that we do get out of the EHR. That is exacerbated further when we start talking about patient-generated data or social determinants, which are also very important.

With the unstructured content that's found in notes in the EHR, one of the approaches we use is natural language processing or NLP, which is an AI approach to effectively interpret that narrative text and extract features. And it's not entirely

different when we talk about imaging data. Humans looking at an image can point to a spot or a lesion in a chest CT, for example. But what we have to do is train a computer to recognize that same pattern and create a discrete field, which is, there is a lesion, where is it anatomically located? How large is it and how certain are we that it's there? That's a very simple example, but it helps illustrate how we're teaching computers to interpret pictures. A lot of what we do is teach the computer to read or teach the computer to interpret pictures so we can get those structured features back out and put them into our predictive models.

Are there elements of machine learning and AI behind the strategies to address cancer and other conditions?

There is a lot of interest in biomedicine around the use of AI, and in particular machine learning or deep learning to identify patterns in data and predict outcomes for patients. Broadly, there's great promise there in that these types of algorithms allow us to identify these high-order patterns in data that more traditional statistical modeling and testing approaches do not allow us to identify.

We know that in both health and disease, the patterns that exist around the interaction of genes, gene products, clinical features, people's behaviors, and their environments are very complex and that there's unlikely to be a single indicator that will tell us whether or not a patient is or is not going to experience a disease state, but rather it's a confluence of all these different indicators that help us to predict outcomes, and that's where the power of machine learning and other AI methods become all that much more important.

The real challenge is that while everyone is very excited about the promise of these AI-based methods, we still have to subject them to this same type of rigor in terms of their evaluation as we would any other discovery in biomedicine. The real challenge is that despite all the enthusiasm about machine learning and AI, we need to temper that with the need to do rigorous empirical research to understand whether these algorithms really produce the improvements in quality, safety outcomes and value of care that we anticipate. This is where we've seen some trouble early on. For example, there have been reports where people have said they have built an amazing algorithm, and it's going to diagnose everybody who might be at risk of

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lung cancer based on their chest CTs. Later, it's found that that algorithm doesn't travel well and it's not replicable across multiple sites and populations, or it gives the wrong answer, and that's because it was treated perhaps more as an engineering exercise than a biomedical research exercise.

We have a number of projects right now where we built predictive algorithms to look at patient trajectory such as whether or not individuals are going to develop sepsis or other critical issues during an inpatient hospital stay. Then we do a series of prospective studies where we actually run these algorithms for real patients in the hospital, but we're not actually delivering those alerts to providers to make clinical decisions. Rather, we're trying to see whether the outcomes that the providers ascertained during standard of care activities for these patients match what our algorithms are predicting. If we see enough concordance between our algorithms and those experts, then we move to the next phase and we evaluate prospectively where we give those alerts to the providers and see if that changes outcomes. It's not a whole lot different from how we would proceed through the multiple stages of clinical trials for a new diagnostic or therapeutic approach. What we're doing is running clinical trials of AI, working through these increasingly sort of expansive stages of use and evaluation.

Are there also some issues around data bias?

If you don't use the right data to train your algorithm and understand how that data maps to the features of the patient populations that you are intending that algorithm to benefit, you can both encode biases and potentially predispose negative outcomes for the populations that you're going to deliver that solution to. So that means you have to start from the very beginning to measure and understand biases in the data that you're using to train the algorithm, and then similarly biases in the way in which you structure that study. Unfortunately, in the computational domain, the general thinking is just 'get me more data,' not necessarily thinking about how we reduce biases and increase the diversity of that data. That's a change in culture around these AI approaches that we have to promote. And it's certainly something that we focus really carefully on here with the work that we do in the Institute for Informatics.

Is a lot of the work based on breakthroughs in genomics? Or in clinical phenotypes?

Yes, genomics is a powerful way of understanding the basis for human health and disease, but I'm often inclined to say to my students when I sequence a patient and understand what information is encoded in their DNA, what I really learned is the blueprint for what is going to be built. So if you'll forgive the metaphor ... we all know that when we build a building -- even when we have a blueprint that an architect has put together -- the actual building that we get is a function of the availability of materials, the quality of the labor that built that building, even maybe the weather while it was being built, the ground conditions, etc. There's a lot of factors that influence how we get from that blueprint to the final building. Well, the same is true for human beings. When I know the sequence of an individual's DNA, or potentially if I've looked at their RNA, I will know what is meant to happen biologically. But then all these other factors -- clinical phenotype, behavior, environment -- come into play. So breakthroughs in genomics are absolutely essential to delivering precision medicine, but we also have to measure all of these other data sources and combine that data if we're really going to understand the sort of complex, multifactorial space that contributes to both health and disease, and so in many ways we have been more successful in the genomics domain than we have been in our ability to phenotype patients clinically or understand how their environment or behaviors influence health and disease. We really have to play catch-up in order to better understand what's going on beyond the genome if we're really going to be able to achieve the promise of precision medicine.

Has your organization created models and used predictive analytics to better empower clinical operations, research and public health initiatives in response to the COVID-19 pandemic? Does it require new types of partnerships within your organization or within the community and public health organizations?

We have developed predictive models and deployed them for use both locally and at the population level to help us better respond to the pandemic. And these models have spanned a spectrum from identifying patients who are critically ill

that might benefit from palliative care consults to better understanding the trajectory of our patients in the ICU and anticipating who might experience respiratory failure and therefore need early intervention in the form of more advanced respiratory therapies. And most recently we've been looking at how can we predict likely outcomes when a patient is placed on ECMO. Because we're now seeing younger, sicker patients with COVID, and one of the questions is should we put them on ECMO earlier? Because often ECMO is a therapy of last resort, which means that patients are already very ill when they're placed on ECMO, which reduces the therapeutic benefit to them. The question is, could we identify those patients earlier and perhaps intervene earlier to maximize outcomes and reduce the likelihood of complications?

In addition to that, we've done similar work at the population level, trying to anticipate hot spots of COVID infections based on prior activity in the region, such as testing or other patient reported data. Across the board, COVID-19 has both been a driver for us to think about how we can use prediction to better organize our response to the pandemic. It's also been a catalyst for moving some of these algorithms into the clinical environment or into the public health environment more quickly than we normally would have. This has both benefits and challenges -- the benefit being we're getting real world experience; the challenge being we're not always getting the opportunity to evaluate them at the level of rigor that we might have if it was not a crisis situation. This is not to say that we're deploying unsafe algorithms; we're constantly monitoring these algorithms. It's actually a whole discipline of informatics that we refer to as algorithmic vigilance, which is basically constant monitoring of the algorithm performance to ensure that it is doing what it is anticipated to do and that the results are accurate. But without a doubt, prediction has been a major part of how we responded to the pandemic.

You have been involved with the National COVID Cohort Collaborative (N3C), which aims to bring together EHR data, harmonize it and make it broadly accessible. What were some lessons your organization learned from the rapid-fire response to COVID?

Well, I think there's three critical lessons that we've learned from our rapid-fire response, especially at the national level.

The first is that even with a disease like COVID, where we see high numbers of cases in almost every community, no single institution has enough data to be able to do the types of AI-driven studies just mentioned above. You really have to combine data across organizational boundaries if we're going to have enough robust, comprehensive data to train the types of algorithms that allow us to better respond to COVID-19 or any other emerging infectious disease in the future. So data sharing is central to this type of response.

What we learned is that nationally we really didn't have the infrastructure to do this. Despite the massive investments that have been made in electronic health records, the massive advancements in computation available at our fingertips, we simply don't have that infrastructure in healthcare. So, we've had to build that infrastructure in real time over the last 18 months in order to respond to COVID-19.

There are a number of ways in which we can use advanced computational methods to not only analyze this data, but also to ensure the privacy and confidentiality of the patients from whom the data has been generated. We have learned how to use a

number of important technologies like synthetic data generation algorithms as well as more advanced data de-identification tools to ensure that we can do high-quality analysis and protect privacy and confidentiality. I think what it's shown us is that we can do both things, and so we need to maintain that same bar moving forward when we think about broader efforts to improve population health using large amounts of data.

What are you most excited about working on in the year ahead?

I think that the big opportunity in the year ahead is what I've often described to people is a renaissance in clinical decision support. For a long time, the history of informatics and data science in healthcare has been defined by the history of clinical decision support, i.e., using large amounts of data to better understand what a likely outcome for a patient in front of us today would be so we can make smarter decisions for them, and we do that every day.

We've always thought about it as a function of the data that we collect in the clinic or in the hospital, and what we've learned during the pandemic is that

there are a lot of other really critical data sources. This includes biomolecular data, patient-generated data, environmental data, social determinants of health, and all the measures that go along with that. And we've not used that data traditionally to inform clinical decision support, but we've learned during the pandemic that when we put those pieces together, we get clinical decision support that's vastly better than the clinical decision support that we've had in the past. The question is, do we take those lessons learned — and I believe we will — and build more comprehensive clinical decision support that meets the needs of not only providers but actual patients, who are being engaged as an integral part of the decision-making process. In a lot of ways, precision medicine doesn't always have to be about sequencing patients. Sometimes precision medicine is just about making sure patients can get to the right provider at the right time and place, and we don't need a genome to do that. We don't need other complex data sources. We just need to understand a patient's needs and map it to available healthcare resources and really connect the dots. **HI**



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Advocate Aurora Health CMO Dr. Gary Stuck Unpacks the System's MSSP ACO Success

Shortly after CMS released its most recent result for ACOs participating in the Medicare Shared Savings Program (MSSP), Dr. Gary Stuck, the health system's CMO, spoke regarding his organization's major successes in the program

By Mark Hagland

On August 26, leaders at the Downers Grove, Illinois- and Milwaukee, Wisconsin-based Advocate Aurora Health posted a press release to the organization's website announcing breakthrough results on the part of the integrated health system's three federal accountable care organizations (ACOs.)

As the press release stated, "Data released by the Centers for Medicare & Medicaid Services (CMS) show that Advocate Aurora Health's three affiliated Accountable Care Organizations (ACOs) combined generated the highest savings of any integrated health system in the nation in the 2020 Medicare Shared Savings Program (MSSP). Advocate Aurora generated \$110 million in savings, the system's best performance yet despite the immense challenges of the pandemic. The 2020 effort brings Advocate Aurora's total savings for the federal government and taxpayers to more than \$423 million since joining the program in 2012. The 28-percent improvement over 2020's total savings came as teams in Illinois and Wisconsin continued to help each other learn and improve in the years after the 2018 merger, providing high-quality, highly coordinated care while managing costs," the press release stated, adding that "Those results reflect Advocate Aurora's unwavering commitment to value-based care, lowering costs for patients and other payers while providing the highest quality care possible."

"Last year we established that once we were beyond this pandemic we wanted to be remembered for three things - for taking good care of our team members, our patients and our community," Advocate Aurora Health CEO Jim Skogsbergh said in a statement contained in the press release. "While the pandemic isn't over just yet, we continue to pull together, combining the skills of teams in Illinois and Wisconsin and putting our scale to work for our patients. Our results in this program put hard

numbers on what we always say is true: We know how to help people live well."

The press release noted that "Several initiatives across Advocate Aurora's continuum of care contributed to improved patient outcomes and cost savings. Notable wins included:

- Being fully integrated and aligned, putting ambulatory and inpatient care under one leadership structure
- Transition of the Illinois Care Management team to Epic's Healthy Planet Population Health platform, and full integration with all hospitals on Epic
- Expansion and standardization of clinical education drove efficiencies and improved competency of the team allowing them to serve more patients
- Number of patients served grew by over 5,600 cases across both states
- In 2020, our care management penetration into the MSSP population increased over 10 percent compared to 2019, touching 10 percent of the entire MSSP population in IL and almost 13 percent of the MSSP population in Wisconsin
- Expansion of our Advanced Care at Home Program, which includes Hospital at Home and Palliative Care"



Gary Stuck, D.O.

And it quoted Gary Stuck, D.O., the health system's chief medical officer. "Once again, we have shown ourselves to be a national leader in value-based care," Chief Medical Officer Dr. Stuck said. "I couldn't be more proud of our resilient team and their focus on this important work."

The press release noted that "MSSP ACOs are offered financial incentives to both improve quality and reduce health spending. When an ACO - a group of doctors, hospitals and other providers that form networks to coordinate patient care

- demonstrates that it has achieved certain quality and cost reduction benchmarks, it is rewarded with a share in the savings generated for Medicare."

It also noted that "Advocate Aurora's three ACOs combined received \$56 million back from the program, savings that are re-invested in patient care. Advocate Aurora's three affiliated ACOs span both the states it serves, with Advocate Physician Partners Accountable Care, Inc. managing 113,033 Medicare beneficiaries in Illinois and Accountable Care Organization of Aurora, LLC and Aurora Accountable Care Organization, LLC managing 47,871 and 23,727 Medicare beneficiaries, respectively, in Wisconsin."

The Advocate Aurora integrated health system overall encompasses 26 hospitals, 500-plus sites of care, 10,000 physicians, and 75,000 team members, and earned \$12 billion in revenues last year. The system was created in 2018 as the result of a merger between two existing systems, Advocate in the Chicago area and northeast Illinois, and Aurora in the Milwaukee area and across the eastern portion of Wisconsin.

Shortly after the announcement of the MSSP results, Dr. Stuck spoke with *Healthcare Innovation* Editor-in-Chief Mark Hagland regarding the advances that the health system's ACO leaders have achieved, and his perspectives on the future of the organization's ACOs and of the ACO phenomenon more generally. Dr. Stuck practiced clinically for 32 years; currently, all his energies are focused on executive leadership in the organization. Below are excerpts from that interview.

How do you account for your organization's success in the MSSP? It continues to be challenging to achieve success in the program, doesn't it?

Thanks for recognizing how difficult it is. In the Chicago market, even some great

organizations that are very high-quality, didn't achieve savings. Our focus has always been about improving outcomes while also saving money. We're very focused on the innovation, and look at it as a learning ground, in terms of how we might expand our success in the MSSP, into work with all our payers? We're looking to expand that. But I think early innovation—we've been doing it a long time—and an intentional focus on investing in our people and our technology. Our scale helps us, because we can do this across a large volume of patients and a large geography.

And part of the success is because we're on a common electronic health record now, including throughout our employed medical group; that's Epic. We've used that data to support care management teams, through Epic's Healthy Planet. That's a powerful care management tool, available to team members across the continuum of care. So we've invested in that technology, but also, in our integrated care management program.

So we've invested in people; and there's a cost to that. But following patients once they've left the hospital. And COVID gave us a little push. We're using Care Companion, Vital Tech, and Emmi [the Emmi AI patient engagement solution from Wolters Kluwer] that we're using to reaching out to our patients, to monitor them, in order to prevent unnecessary rehospitalizations and ED visits. And our seniors want to be at home, and want to be cared for at home. If we can give them that, it's a big satisfier for the patient and the family, and improve outcomes and save money. Integrated care management team uses those tools to reach out to those patients. Emmi leverages phone calls, and also provides educational videos.

Some have compared this work to trying to turn a ship around in mid-ocean. On the one hand, larger, integrated health systems have far more resources than smaller organizations or standalone hospitals. But the politics and bureaucracy can be challenging, correct?

I do think it depends on the organization. But our CEO, Jim Skogsbergh, is serious about improving outcomes and lowering costs for purchasers, payers, and patients. And the fact that we've spent millions in technology and on people—we have a proven track record. We're serious



about it. And though it might lower our revenues in the short term, it's the right thing to do for our patients, payers, and taxpayers. And when you're looking at things like bundled payments and the MSSP, there's a learning curve, and it requires an unwavering commitment over time.

And another example of that is that we've grown the program. Within the context of our care management program, we've touched 10 percent of our MSSP patients in Illinois and 13 percent of our MSSP patients in Wisconsin.

Can you speak to the ongoing challenges in the U.S. healthcare system of changing the physician culture and evolving it forward? It's physicians who control most healthcare spending, and who need to buy into any systemic changes.

It's a wonderful question. And you're right: there's no question our healthcare spending is out of control, and Medicare funding is in trouble. And the Commonwealth Fund report showing the U.S. ranking eleventh of eleven in quality; it's embarrassing. The problem is clear and it's out there. To answer the question, we feel we're tearing down some of the silos. And we're aligning financial incentives for physicians. You know, it's not just doing more, it's doing the right care in the right place. We're intentional about reducing duplicative services. And we have programs where we talk with the physicians about state of the art and best practices; and sometimes, it takes a long time to incentivize different behaviors. But doctors feel satisfaction in reducing expenses while delivering improved care, actually.

What have been the biggest challenges in changing the physician culture, and how have you and your colleagues overcome them?

For all of us, we're still living in two worlds—the fee-for-service world, and the world in which we're taking on increasing risk under value-based care. You still have some push and pull, and some folks are still anxious about living in both worlds. So it's education, it's realigning incentives, and it's also budgeting with eyes around value-based care.

So many leaders have referred to the one-foot-in-the-boat, one-foot-on-the-shore question; what does that feel like for you on a day-to-day basis?

Well, it's uncomfortable, but as we continue to see success, in improving outcomes while reducing unnecessary care and costs—with our proven track record, we'll be a trusted partner for patients' healthcare.

What does the next couple of years look like for you and for Advocate Aurora Health?

We've had our challenges with COVID, and we're challenged with the surge, with the Delta variant, and with staffing. So there are other challenges that are pressuring all healthcare systems across the country; I see us continuing to expand our care management. We see how effective that is. We've done a pretty good job of starting to take care of these chronic conditions, and we need to continue to do a good job of giving optimal care in the right setting. **HI**

CMS's Strategic Plan for CMMI: A New Administration Shifts on Policy—and Strategy

Will CMMI fare better now under new management, under the new administration? The issues facing Chiquita Brooks-LaSure and Liz Fowler are complex, but at least they've got a strategy

by Mark Hagland

As we reported earlier, “On Wednesday, Oct. 20, top officials at the Centers for Medicare and Medicaid Services (CMS) and innovation arm, the Center for Medicare and Medicaid Innovation (CMMI) held a webinar for members of the news media, in order to outline their strategy for CMMI going forward. CMS Administrator Chiquita Brooks-LaSure and CMMI Director Elizabeth (Liz) Fowler, Ph.D., J.D., made extensive comments, and were supported by other CMS and CMMI officials, who explained their strategy, in a webinar whose name matched that of the white paper they released at the same moment: ‘Driving Health System Transformation: A Strategy for the CMS Innovation Center’s Second Decade.’”

As we reported, “As all the officials speaking during the one-hour webinar emphasized, CMMI’s strategy going forward will be to help to shift the current U.S. healthcare system toward becoming ‘a health system that achieves equitable outcomes through high-quality, affordable, person-centered care.’ In fact, ‘Administrator Brooks-LaSure told the remotely connected audience that she is absolutely committed to the goal ‘that CMS serve the public as a trusted partner and steward, dedicated to expanding health equity... and improving health outcomes. To me, everything we do at CMS should be aligned with one or more of our six strategic pillars,’ she emphasized.”

The white paper that the CMS officials discussed at length, entitled “Driving Health System Transformation—A Strategy for the CMS Innovation Center’s Second Decade,” outlines a very major set of policy changes for CMMI, as the flagship innovation agency inside CMS. Its introduction opens with this set of statements: “The Center for Medicare and

Medicaid Innovation (CMS Innovation Center or “Innovation Center”) is launching a bold new strategy with the goal of achieving equitable outcomes through high-quality, affordable, person-centered care. To achieve this vision, the Innovation Center is launching a strategic refresh organized around five objectives. These strategic objectives will guide the Innovation Center’s models and priorities, and progress on achieving goals for each will be to assess the CMS Innovation Center’s work and impact.”

The white paper stated that “The last ten years of testing and learning have laid a strong foundation for the CMS Innovation Center to lead the way towards broad and equitable health system transformation. This white paper describes the Innovation Center’s refreshed vision and strategy and provides examples of approaches and efforts under consideration to achieve the goals of each strategic objective. The Innovation Center’s overarching goal will continue to be expansion of successful models that reduce program costs and improve quality and outcomes for Medicare and Medicaid beneficiaries. In addition, the paper emphasizes how measuring progress toward broader health system transformation is also critical to achieving these goals and vision.”

And Administrator Brooks-LaSure emphasized in her comments on Wednesday, that the following will be the most important priorities for CMMI going forward: improving health equity by addressing systemic health disparities; “work[ing] to integrate the perspectives of CMS stakeholders into our policy and program development”; building on the Affordable Care Act (ACA) to expand access to quality, affordable” healthcare, in the context of the Biden administration’s “Build Back Better” strategy; “protecting

our programs’ sustainability into the future by serving as a responsible steward of public funds”; “driving innovation to tackle our other system challenges and promote value-based, person-centered care”; and promoting innovation not only in the healthcare system, but also inside CMS itself as an employer.

So, how big a change is this? It depends on one’s perspective; but clearly, what Chiquita Brooks-LaSure and Liz Fowler said on Wednesday, marked a very big departure from how Seema Verma talked for several years. Instead of Verma’s constant references to “market-driven reform,” Brooks-LaSure and Fowler are talking about how the agency’s policies can drive change. And that in itself is a big change.

One of the profound contradictions in Verma’s stated approach was that she constantly asserted that the capitalist marketplace should help to shape the U.S. healthcare system going forward, even as she increasingly pushed down harder and harder on provider organizations to move into two-sided/downside risk, even as providers told her they simply weren’t ready. Provider leaders, particularly NAACOS, became increasingly involved in a sharp-tongued back-and-forth with Verma over her very aggressive statements around downside risk, at the same time that she lauded market dynamics as a way to stimulate healthcare consumer empowerment. Contradictory? Some saw it thus.

In any case, what’s absolutely clear is that Chiquita Brooks-LaSure, Liz Fowler, and their colleagues, have created a philosophically consistent statement of policy and strategy when it comes to how they want CMMI to evolve forward—as an instrument of change, aimed at ushering in broader and deeper equity and access into the U.S. healthcare system, while at the same time treating providers better,

and also at the same time getting more value out of the development of alternative payment models.

There was a sense of chaos, really, about Seema Verma and her leadership of CMS, in particular in relation to how CMMI was run. With its leadership revolving door, contradictions in apparent objectives, and lack of consistent philosophy or strategy, the apparent contradiction between “market-driven” philosophy and extreme heavy-handedness when it came to trying to force providers into two-sided risk, many provider leaders ended up speaking out on that core contradiction.

The sense of relief on the part of provider leaders seemed almost palpable after the change in administrations. Last Thursday, the leaders of NAACOS, the National Association of ACOs, took the opportunity both to praise the performance of Next Generation ACO Model ACOs, based on performance data that CMS had released on that day, as well as to praise Brooks-LaSure and Fowler for the white paper and their statements in the press briefing the day before, Wednesday.

“The impressive Next Gen Model results are the latest illustration of the success of Medicare ACOs, benefiting patients, providers and taxpayers alike. Recent ACO results coupled with an enhanced commitment to accountable care from the Biden administration represent a notable paradigm shift toward achieving health-care transformation.”

The press release went on to add that “NAACOS was disappointed earlier this year when CMS declined our repeated requests to extend or make permanent the Next Gen program. With the program due to sunset at the end of this year, NAACOS continues to advocate that CMS develop a new full-risk option for ACOs under the Medicare Shared Savings Program (MSSP). This ‘Enhanced Plus’ option would advance ACO participation by creating a full risk and capitation option within MSSP, which to date has only been available in Innovation Center ACO models. This new model would also incorporate new benefit enhancements and incentives and create a better middle ground between MSSP and Direct Contracting,” NAACOS said.

There’s no question that associations like NAACOS are going to continue to press CMS and CMMI officials to give providers the best possible terms under which to participate in all the alternative payment models. In that same press release, NAACOS’s Gaus was quoted as

stating that “Many Next Gen ACOs aren’t moving into Direct Contracting and have expressed a desire to have an ACO option that allows them to more gradually move toward capitation without feeling like they’re taking a step backward in their transition to value-based payment models. CMS could use its waiver authority under the Innovation Center to create a new MSSP option we call ‘Enhanced Plus,’ much like it did with Track 1+, which was very popular and successful.”

The NAACOS press release added further that “Today’s results compare Next Gen ACO spending to their pre-determined spending targets or benchmarks. The CMS Innovation Center has compared spending of Next Gen patients to that of non-Next Gen patients, but the comparison group includes beneficiaries assigned to MSSP and other Innovation Center models. That flawed comparison undervalues the success of the Next Gen model.”

Indeed, the advocacy for better terms seems if anything to be intensifying right now, given the challenging circumstances under which ACOs are operating. Just at week ago, a coalition of 12 national health-care associations and stakeholder organizations urged Medicare to better account for the COVID-19 pandemic in accountable care organizations’ (ACOs’) financial targets. Specifically, the groups, led by the National Association of ACOs, are asking for an option to select pre-pandemic years on which to base benchmarks for their participation in the Medicare Shared Savings Program (MSSP), citing fairness in the way performance is measured in light of the global pandemic.

In the October 14 letter, addressed to Administrator Brooks-LaSure, the 12 coalition members wrote that “The Centers for Medicare & Medicaid Services (CMS) has worked hard since early last year to give our health system and providers the tools needed to fully combat the ongoing pandemic. We greatly appreciate those efforts which have included modifications to value-based care programs, such as those for Medicare’s largest alternative payment model (APM), the Medicare Shared Savings Program (MSSP). However, further policy changes are needed to ensure the shift to value is not derailed by the highly unusual circumstances of the pandemic.”

In fact, they wrote that “The country has seen and continues to experience tremendous variation in how the pandemic is affecting our healthcare system. Some

parts of the country were devastated in 2020 yet have now resumed more in-office preventive visits and elective procedures. For other areas, it was the opposite with 2020 providing little change in utilization from previous years, and doctors and hospitals now being hit hard by the pandemic this year. The pandemic has also affected which patients are attributed to ACOs. Since attribution is based largely on primary care services, and utilization patterns have been greatly affected by the pandemic, ACO attribution has been significantly impacted by various aspects of the pandemic, such as patients delaying care. The result for some ACOs has been major differences in ACOs’ attributed populations and performance year expenditures. These are out of an ACO’s control and not necessarily reflected in the benchmarks for which ACOs are held accountable,” the coalition members wrote to the Administrator.

How to keep everything moving forward will pose a very serious challenge to Administrator Brooks-LaSure and Director Fowler. On the one hand, their overall strategic and policy thrust is clearly far more coherent than that of Seema Verma; on the other hand, they are managing CMS and CMMI at a time of heightened challenges, with the COVID-19 pandemic costing the federal government more than ever in patient care costs, while also sapping hospitals, medical groups, and health systems of some of their vital financial strengths. Indeed, reports from both the Chicago-based Kaufman Hall consulting firm and the Charlotte-based Premier Inc. health alliance last week documented provider organizations’ considerable financial fragility in multiple areas right now.

So, what’s the right answer to all of this? The answer is that there is no single answer. The pandemic has put pressure on the entire healthcare delivery and payment system as it has put pressure on U.S. society. There is no silver bullet here at all. And the thought process can become byzantine when one attempts to assess who/what should bear more burden right now, in order to get us all through this period in U.S. healthcare history. Should it be purchasers? Payers? Providers? Even consumers? There are simply no easy answers. But one walked away from last week’s CMS/CMMI press briefing with the sense that at least the people in charge have a better idea of what they’re doing—and a more strategic—and inclusive—vision of where they’re going—which is incredibly important. **HI**

Cyber Expert Staynings: New Regulation May Help Boards of Directors Prioritize Cybersecurity

Healthcare Innovation sat down with cyber expert Richard Staynings to discuss the current cybersecurity talent drought and the importance of educating CEOs and boards of directors about cyber risks

By Janette Wider



Janette Wider

According to Cyber Seek—a tech job-tracking database from the U.S. Commerce Department and the trade group CompTIA—there are about 464,420 total cybersecurity job openings in the U.S. As healthcare organizations are continuously seeing increases in ransomware attacks, this shortage of cyber talent can put healthcare organizations at risk—but why is there such a shortage and what can healthcare organizations do to promote a better understanding of why cybersecurity professionals are vital to leadership?

Richard Staynings, healthcare technology and cybersecurity strategist, thought leader, expert witness, and chief security strategist for New York City-based Cylera, sat down with *Healthcare Innovation* Managing Editor Janette Wider to discuss the cybersecurity talent drought specifically in healthcare.



Richard Staynings

Why do you think that there is such a lack of cyber security talent in healthcare organizations, specifically?

I think there are a number of factors that have contributed to the current situation. Firstly, market demand has taken a very steep rise over recent years. So, there's been a latent recognition of the fact that we need more security professionals, particularly in our hospitals, than was the previous situation. That's been brought around by changes in risk posture, changes in the negative impact of cyberattacks like restitution fines and damages, which makes

failure to implement cybersecurity much more costly, and therefore, much more relevant to boards of directors than it was previously.

The second factor is that healthcare has historically had a cybersecurity deficit compared to financial services and other industries that 20 years ago recognized the significance of cybersecurity in order to protect their business, their business reputation, their business value, and their bottom lines. It's immediately apparent if I transfer a million dollars out of someone's account in a bank, that money is gone. It's less apparent if I transfer a million patient records out of a hospital that they have been stolen. And in many cases, things like identity theft take many years before the FBI and others are able to triangulate multiple people that have had their identity stolen back to the original source. If that source is a hospital, then the CEO is probably retired by that point, and someone else is sitting in the big chair. So, we have this latency in healthcare, which is making it difficult to understand the true significance and impact of breaches when they occur, particularly if they don't have the cybersecurity capabilities in the first place to recognize that they've actually had an attack. And for the last 20 years, many hospitals have lost massive amounts of PHI, and were totally ignorant of the fact that anyone had stolen it, but this is getting better.

How can healthcare organizations promote a better understanding of the need for cybersecurity professionals to leadership?

We need to do a better job of educating CEOs and boards of directors on the need for cybersecurity. It's an education process.

Many board members of health systems can't even spell cybersecurity, let alone understand it. So, there's a generational gap there. We're beginning to get some diversity of talent into healthcare, now we're seeing more women on boards of directors, we're seeing more minorities, and we're seeing more technology and cross industry specialists, not just the retired general and the chairman of the local business board or whatever it is. We're beginning to get people that are coming in from other industries and the people that can spell cybersecurity onto boards. But it's still not a priority because there are so many other priorities in healthcare, particularly with COVID.

What will drive hospital CEOs and boards of directors to prioritize cybersecurity?

New regulation. We saw some minor updates to The Health Insurance Portability and Accountability Act of 1996 (HIPAA) through The Health Information Technology for Economic and Clinical Health Act (HITECH Act) and the Omnibus Rule. Perhaps it is going to take changes to the Joint Commission, which deals with patient safety, to say cybersecurity is now one of your major concerns around patient safety. It's no longer about people slipping on a wet floor or other clinical errors as a result of failures in healthcare. Maybe we need a new regulation that manages privacy and security and healthcare systems. Regulation was what drove cybersecurity back in the early 2000s and late 90s. I'm not a big fan of regulation, but perhaps that's what it's going to take. There seems to be, even though we've got ever rising litigations against healthcare entities, the message doesn't seem to be getting through.



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risk transference to the insurance company, rather than deal with the fundamental problems of the lack of or inadequate security to protect against the ransomware attack.

What can someone specifically in a CISO role do to improve leadership's understanding?

What we need is CISOs that understand the business and can transfer and relate cybersecurity risks to enterprise business risks and to represent those to the board directors that are the ultimate arbiter of risk. Do you accept a risk? Do you mitigate a risk? Do you transfer a risk? Do you ignore the risk? And I think there's been far too

much ignoring risks that have taken place to say it's not significant. We don't trust what our security team is telling us. We don't trust what our external auditors are telling us. We'll take a risk. We'll deal with this next year because we don't have the budget this year to deal with it. And often they're caught with their pants down around their ankles. They get hit by ransomware. Their bet didn't pay off and they get caught. **HI**

CEOs tend to be more short term now than they ever were before. They're there for three, four, five years, and then they're out. They take their bonuses with them, and they're gone scot-free on to their next role in another hospital.

There's this mentality that it won't happen on my watch. A year ago, I heard CEOs say, ransomware is kind of worrying, but it probably won't happen on my watch. I'm a small hospital system. No one's going to come after me. They plainly don't understand that ransomware is a

broadcast attack, and it is phishing, spam, whatever that is sent out, and they're just waiting for a user to click on it, click on a link, and then they've got you.

Maybe we need to change liability. Make CEOs personally liable for more of what goes on in their hospital networks. That won't be popular at all with hospital CEOs, but they've got directors' insurance now, which basically absolves them from any wrongdoing whatsoever. We've also seen a growth in insurance that many are using as a form of risk mitigation and

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