



THE FUTURE OF HEALTHCARE

How Data-Driven Healthcare
is Helping to Deliver Better
Patient Outcomes

FUTURE
HEALTHCARE
TODAY

 NetApp

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INTRODUCTION

How Data Visionaries are Reimagining American Healthcare

Esteban Rubens, Healthcare AI Principal at NetApp

For those of us working in healthcare these are exciting times. While no one has yet come close to creating a viable medical Tricorder, let alone a workable flying car, healthcare technology has made advances that put the medical field squarely in the “future.” As we approach the 20th anniversary of The Human Genome Project we have to marvel at the fact that at the outset, to sequence one human genome, it cost more than \$1 billion dollars and took 13 years to complete. Today, it takes one to two days and costs just \$3,000 to \$5,000 to perform that task.

Not only is sequencing the human genome really incredible science, but it's also a game changer when it comes to finding treatments for critical illnesses, extending life, and even eradicating fatal conditions entirely. Equally, in my former field of medical imaging informatics, the advances being made not only in image quality, but also in using artificial intelligence (AI) to improve image segmentation, classification, and overall diagnosis, still sometimes feel like science fiction, rather than our new normal.

Undoubtedly there's a lot of medical science at the heart of these developments, but there are other components driving healthcare organizations forward. I'm talking about data, the ability to manage data, and the capability to put it to work using sophisticated data management infrastructure. Without petabytes of data to put to work training algorithms, AI-based advances would not be possible. But without the ability to store, move, process, analyze, and apply that data in milliseconds — whether in a data center or in the cloud — we wouldn't have been able to begin the journeys that have led to these amazing discoveries.

In the stories that follow, we invite you to take a look at how some of the country's leading healthcare providers are leveraging data-driven technologies to radically improve patient care, improve health outcomes, and improve population health. The pioneering work of the individuals and organizations are just some of the daily innovations occurring in healthcare systems across the country. From the experiences shared by Duleep Wikramanayake, Chief Information

Officer for SimonMed Imaging, about how his organization built a future-ready data management infrastructure that's already enhancing medical imaging capabilities, to Dr. Stephanie Lahr's experiences using data-driven technology to improve the quality of healthcare for Americans living in rural communities via telemedicine, the stories are both visionary and very practical.

That practical insight shared by all the healthcare experts we talked with are just as important, if not more so, than the futuristic vision. Technologies like AI and cloud have all, in their time, been subjected to the hype cycle. While cloud storage, for example, has survived the hype cycle and healthcare organizations have developed proven use cases and best practices, AI is just at the beginning. In showcasing use

cases we can stop equating AI with frightening images of job-stealing robots and channel the conversation towards how AI helps speed time to diagnosis, combats physician burnout, and will help contain the costs of healthcare by reducing waste, fraud and abuse.

What I hope you take away from these stories is a not only a sense of admiration for the healthcare professionals, the organizations they work for, and their vision, but also the knowledge that the pioneering work they've done is possible. And, when I say possible, I mean possible not just for large well-funded systems, but for all healthcare organizations — and not just in the future, but today.

Are you ready to join the ranks of data visionaries?

OPENING THE DIGITAL FRONT DOOR

Opening the Digital Front Door Means Healthcare Providers Are Reinventing Access to Care

Margaret Brown, Senior Writer, Future Healthcare Today

[How Tahoe Forest Hospital District is Opening the Digital Front Door](#)

Today's consumers have embraced online access to products and services. From managing their bank account to ordering groceries online, consumers now expect to be able to access what they want, when they want it, online. And these expectations are presenting some challenges for healthcare providers.

According to Jake Dorst, Chief Information and Innovation Officer for Tahoe Forest Hospital District, healthcare organizations must pay attention to this shift and adapt to keep pace with expectations. "Patients expect to be able to access their medical information online via patient portals or be able to set appointments online. If your competition is offering these services, people are willing to drive the extra time or go further away for those online conveniences," Dorst explained. "Our job in IT will be building the 'digital front door' to care, and it's starting to force a change in how healthcare organizations approach

patient interactions."

One way in which Tahoe Forest Hospital District is meeting this need is by moving beyond the patient portal and creating a much more robust access center for patients. Here, patients have the easy-to-use tools they need to schedule appointments with their primary care physician or a number of specialists, request an X-ray or diagnostic image, request prescription refills or a call-back from the nurse. And, while many patients still prefer to call into healthcare organizations, Dorst predicts this will change quickly, so healthcare organizations must be prepared.

[The Cloud Holds the Key to Enabling Patient Access](#)

In the past healthcare organizations wanted their technology on-premise where its maintenance and security were under their control. But as technology has evolved and as the cloud has become more prevalent in healthcare the need to keep things on-prem and in-house has diminished. Which

has delivered some significant benefits to all healthcare organizations, but particularly smaller systems. Cloud has leveled the playing field and truly democratized IT. What this means in practicality is that smaller hospitals the opportunity to buy solutions that they previously could not have afforded, because it can be purchased as-a-service.

For Dorst this means that he doesn't have to hire in-house expertise to maintain infrastructure, "Working with a trusted partner, like NetApp, enables me to lower my overall operating expenses and be better prepared because I have access to the experts who work on this technology full-time."

And when you're opening the digital front door, a consistently good experience for the patient as they interact with the portal or other gateway is extremely important. "You should strive to deliver a seamless experience for the patient and be able to rectify and understand any bad experiences quickly, said Dorst. "Because we have a trusted cloud partner, I know that I have the foundation to deliver a reliable and secure experience for patients, I have access to understand what is happening in my system, and I have a deep bench of experts ready to help my team."

Transformation is a Whole Hospital Project

Regardless of where a healthcare organization is in its transformation, Dorst said it's important to remember that the move to digital services is not an IT project. Rather it's a "whole hospital" project,

because it involves every department in the facility.

"This transformation is going to affect physicians, your clinical staff, your front-line staff, your finance team; no group within the hospital is immune to the changes that come with opening the digital front door," he shared. "Your first step is to get buy-in, not just from upper management but from all stakeholders. You really don't want to take this transformation on as an IT project and try to force change. Nobody likes change that's forced on them, but when everyone is invested in the project, you've got the support and resources you need to succeed."

PRESCRIPTIVE ANALYTICS

From Descriptive to Prescriptive: How AI is Already Improving Healthcare Delivery

Jenna Sindle, Managing Editor, Future Healthcare Today

On the Cusp of Data-Fueled Revolution

For John Showalter, Chief Product Officer at Jvion, healthcare is on the cusp of a major data-fueled revolution. With healthcare being one of the few industries where Artificial Intelligence (AI) is ready for deployment, Showalter foresees a rapid change that will improve patient care and health outcomes. One of the most interesting applications is the use of AI to augment clinicians' capabilities and offer additional pathways for patient care by supplying data that not only helps them predict what might or will happen with a patient, to enabling what should happen for an optimal outcome for each individual under a clinician's care.

But before you imagine an Orwellian future for healthcare with machines determining who receives treatment and who doesn't, it's important to understand what prescriptive analytics are — and are not — and why experts like Showalter are advocating for healthcare systems to embrace this data-fueled revolution.

Prescriptive Analytics: AI in Action

"AI is poised to improve healthcare in myriad ways," Showalter shared in our recent conversation. "In the past, we were limited to systems that were only able to report the news — using data to describe what's already happened or what's going on now. Today, we can use data to predict what will happen, but the next step, the one AI is enabling, is to use data prescriptively."

Prescriptive analytics not only anticipates what will happen and when it will happen, but also why it will happen. Further, prescriptive analytics suggests decision options on how to take advantage of a future opportunity or mitigate a future risk and shows the implication of each decision option.

By using data prescriptively Showalter was clear to point out that this doesn't mean the data will prescribe a therapy or a course of treatment, but instead be used to streamline patient care, stimulate an action or a need to change course in patient care. "Right now

I'm seeing prescriptive analytics being used to great effect in oncology and in medical imaging," he shared.

Showalter continued, "for the treatment of patients with cancer, information from their Electronic Health Record (EHR) is analyzed by the AI platform, which then prescribes an action, such as beginning a conversation about palliative care, for the clinician to consider. The clinician then evaluates the suggested action within the full context of the patient's diagnosis and treatment plan, and then any decisions that are made are made between the clinician and the patient." In medical imaging the role of AI is even more pronounced. "Imagine a patient goes to their primary care physician (PCP) with a persistent headache," said Showalter. "While the PCP doesn't suspect a brain

bleed, based on other clinical evidence they send the patient for a CT scan. For a non-emergent CT scan it will be at least 72 hours before a clinician will read the image. However with AI, a machine can read and triage images based on what the algorithm finds and flags as urgent conditions for immediate attention by the radiologist. This can take the diagnosis time from 3 days to 30 minutes, which in the case of brain bleed, is the difference between life and death."

Building the Infrastructure and Managing Obstacles

In many industries the ability to implement innovative technologies is stymied by a lack of infrastructure and an over abundance of obstacles. But healthcare organizations are a little different because they have embraced cloud storage and data management solutions to the benefit of patient, provider, and IT team alike. For the IT team, moving to the cloud has enabled the retirement of legacy systems and the opportunity to leverage nearly everything As-a-Service. With limited resources — both financial and personnel — the IT team is now able to focus on their core responsibilities managing the unique needs of their organization and its patients' data.

So what obstacles are standing in the way of these tools in a field that is, as Showalter has shared, primed for adoption? The first obstacle is concern over the security of data in the cloud, because AI requires vast amount of data to be stored in order to generate meaningful results. While there's always risk in storing data, whether it's



a sticky note on your monitor or patient data in a database, the major hyperscalers like Microsoft, Google, and Amazon spend billions of dollars annually to ensure that patient data is protected. Microsoft, alone, has over 3,500 cybersecurity experts who work 24/7/365 on security.

Even with that secure foundation, the need to share data securely without violating HIPAA and other regulations is a top of mind concern. “With so much personally identifiable information (PII) and personal health information (PHI) attached to each electronic health record (EHR), healthcare records are prime targets for theft and often unwittingly exposed as they are shared between organizations, departments, and devices,” shared Showalter.

Looking beyond security Showalter identified a very interesting barrier to adoption. “The biggest barrier to adoption as I see it is actually the clinician,” Showalter shared. “Healthcare organizations have the tools — cloud and high-performance computing — they need; they’re both readily available and inexpensive.”

Clinicians, however, need training on decision support and application of insight. Taking clinician-directed prescriptive analytics from concept to an integral part of practice requires training. “Putting prescriptive analytics to work is not just about creating a checklist or a carrying out a specific set of tasks,” said Showalter. “However, this will ease as technology becomes more prevalent and as the next generation of clinicians come on board.”

Overcoming Obstacles and Delivering on the Vision

Even with these obstacles, Showalter predicts that in the next five years there will be a rapid adoption of predictive analytics beyond today’s use cases in hospital medicine and medical imaging. “Within the next decade population health will be AI-driven, and there will be extensive use of predictive analytics in ambulatory medicine as well for risk mitigation, in particular.” This change will free up clinician time from routine tasks so that they can focus on the patient and high-value tasks like motivating behavioral change in patients.

More importantly, because AI is a cloud-driven solution, it’s not just leading healthcare systems in major cities that will benefit from this innovation. Cloud has leveled the playing field in healthcare; a regional hospital in rural Washington can access the same services as a major research and teaching hospital in Seattle but scaled to their needs. The simplification of access and the democratization of sophisticated IT will speed healthcare organizations to adopt new tools, like predictive analytics, more quickly than anyone anticipated.

With prescriptive analytics addressing some of the biggest challenges faced by healthcare systems and being able to facilitate better care for patients, it’s no wonder that it’s poised to be one of the biggest disruptors in the healthcare field in the next decade. While no evolution is without its pain points, healthcare providers have the foundation in place, so the steps

from innovation to execution are reduced. “With a bit of due diligence, ample training, and keeping clinicians in the loop, there are few barriers to fully realizing the benefits of prescriptive analytics,” Showalter concluded.



MEDICAL IMAGING

AI Drives Improvements in Medical Imaging and Delivers Better Patient Outcomes

Margaret Brown, Senior Writer, Future Healthcare Today

Medical Imaging at the Forefront of Data-Driven Innovation

Medical imaging is one of the fastest growing fields of medical care. The field has come a long way from the grainy black and white images we relied on just a decade ago to diagnose everything from broken bones to the presence of tumors. In the last decade medical imaging has evolved to produce rich, multi-dimensional, high resolution images that help clinicians diagnose illnesses more quickly and more accurately to deliver better patient outcomes.

With these new imaging techniques providing clearer insight into what is happening within the body, the amount of data that is generated by medical imaging departments is creating an additional opportunity for clinicians to advance medical care. With multiple care areas creating massive amounts of medical information, this vast data repository has created a unique opportunity for clinicians to leverage the power of artificial intelligence (AI).

We spoke with Duleep Wikramanayake, Chief Information Officer for SimonMed Imaging and Tony Turner, Strategic Partner Manager for Healthcare at NetApp to find out more about why medical imaging has become one of the most compelling use cases for AI and how this technology will benefit both clinicians and patients.

AI Uses Case in the Field of Medical Imaging

“As medical imaging modalities improve the precision of the images they’re gathering, we are discovering things that the eye can’t see,” said Wikramanayake. “Your eye can only see so much; with AI, computer-aided diagnostics is looking even deeper from a pixel-to-pixel level. That detail, layered with retrospective analyses and related diagnoses, gives a view we’ve never had before.”

While Wikramanayake says that AI is helping guide healthcare toward better diagnostics, he thinks its use can go beyond that. “I think we need to leverage AI to dig deeper and look to a cause,” he said. “It is almost impossible for a human being to do all

that research and collect that data, so this is where I think AI will make the greatest difference.”

In fact, Wikramanayake hopes to soon see AI as something that is a standard component built into medical imaging, rather than used “after the fact,” as it is now. With AI built in, an anomaly could be spotted, and further exploration could take place during the exam. It also could improve how the technician conducts the exam, speed up the time to delivering images for the AI to interpret, and help the radiologist confirm insights in the moment for faster, more accurate diagnoses.

“What if, at the application level, AI could issue an alert and notify the clinician if an anomaly was detected? Or what if a healthcare organization could create a database of patient information for AI that would enable the technology to associate symptoms with a diagnosis. Because AI is a self-learning technology, the system would ‘know’ which symptoms are, or aren’t, related to a specific diagnosis. Not only would this help the clinician diagnose disease more quickly, but it would also have a positive impact on patient outcomes.”

Building the Case for Investment in AI-Ready Infrastructure

According to Wikramanayake healthcare organizations must be willing to invest in the IT infrastructure, including the computing power, that is needed to support AI. Right now AI is expensive, which presents barriers to many healthcare systems. However, he

predicts that this will change in six months to a year.

All of this technology — AI, automation and whatever comes next — has to help the organization from a patient care and an ROI perspective. “One of the biggest hurdles in AI for hospitals without the proper infrastructure are multiple silos of clinical data. This makes it hard to gain access to all that valuable data to train AI algorithms,” added Tony Turner, Strategic Partner Manager for Healthcare at NetApp.

“IT infrastructure is incredibly important. Without it, you can’t successfully implement AI. It’s impossible,” Wikramanayake explained. “And when I say IT infrastructure, I mean everything that goes with it: security, storage, data management, and all the tools that govern compliance around the data,” he shared.

AI is Vital to the Future of Medical Imaging

Harnessing the power of AI to improve patient outcomes is within reach for most healthcare systems in the United States. While there are several different pathways to demonstrate the vitality of AI to clinical care and patient outcomes, building and implementing use cases in medical imaging represent a ‘quick-win’ opportunity for clinicians and healthcare information technology specialists.

Both the quality and quantity of data needed to fuel AI are already present in the medical imaging field. With petabytes of data readily available for analysis and learning, there’s a

real opportunity to deliver results that will benefit both patient and clinician quickly. From augmenting the ability of clinicians to read images, to reducing time to diagnosis, eliminating errors, and identifying additional clinical information to further refine treatment, the use cases for AI in medical imaging are clear.

What's needed now is for healthcare systems to make the necessary investment in their IT infrastructure to harness the potential they hold in these stored images. "The supportive infrastructure must be in place and capable of scale before you can experience the power of AI," Wikramanayake concluded.



RURAL HEALTHCARE

How Telemedicine Can Help Solve the Rural Healthcare Crisis

Jenna Sindle, Managing Editor, Future Healthcare Today

Rural Healthcare in Crisis

It's no secret that America's healthcare system is in crisis. From a shortage of doctors and nurses, provider burnout, and of course, the rising costs and accessibility of care, there are many challenges to overcome. And, while these challenges impact all Americans, they are most keenly felt in rural America.

The rural healthcare crisis has been well documented in the media in recent months. However, while the coverage has been extensive, there has been relatively little discussion about how to actually solve this problem and not only deliver a better standard of care, but also extend the range of services available to rural communities.

To explore possible solutions, we caught up with Dr. Stephanie Lahr, Chief Information Officer and Chief Medical Information Officer at Regional Health in Rapid City, South Dakota. Both Dr. Lahr and Regional Health are leading the way when it comes to addressing the unique healthcare needs of rural communities.

The Urban-Rural Divide in Healthcare

While there is a national shortage of doctors, nurses and other medical staff, the impact of these shortages hits hardest in rural areas, shared Dr. Lahr.

"Physicians who work in rural settings may be working as an emergency room physician, an inpatient physician and as a clinic physician, and the dependence on them is much greater than in other settings," Dr. Lahr explained. "If that one person leaves, you just lost your ER doctor, your clinic doctor and your hospital doctor all at the same time. The impact of the loss of even one person who is providing healthcare in rural America can mean a community goes from having healthcare to not having healthcare."

With fewer clinicians, burnout comes more quickly. Because rural healthcare systems already lack a deep pool of applicants who can step in to replace a departing clinician, the burnout cycle intensifies as the search for a replacement continues.

Further compounding the human factors of

the rural healthcare crisis is the technology divide. In addition to enabling better patient outcomes, the latest healthcare IT tools can help alleviate burdens on clinicians, but rural healthcare organizations often lack the ability to purchase the newest tools.

“Every provider wants more technology and doesn’t have enough money for all the technology they want. In rural environments, the expectation, especially with the consumerization of healthcare, is that the same care, tools, and technology will be available in small town America that are available in New York or San Francisco,” said Dr. Lahr.

“What people don’t necessarily understand is that large organizations in urban settings are able to leverage their size in technology investments by distributing their costs over multiple business lines. Small-town America expects to have access to the

same clinical systems and technical systems, but their local provider has a much smaller organization to support the cost of running that system,” she concluded.

Telemedicine: An Idea Whose Time Has Come

In spite of these challenges, Dr. Lahr is beginning to see improvements in rural healthcare thanks to telehealth and telemedicine. “Telemedicine presents an opportunity to solve the rural healthcare crisis,” shared Lahr. “It can bring extra physicians, expert physicians and other specialty resources to a rural community without the need to hire new staff, build new support systems or add to the workload of clinical staff.”

The regulatory and technological challenges that once stood in the way of telemedicine deployments are beginning to fall away. These include licensing challenges that, in the past, required a physician to have a license in every state to be able to provide care. Today reciprocities and other agreements are allowing providers to have some of their licensing expedited, or carried over, into other states or into a consortium of states. However, what is still standing in the way of successful deployment of telemedicine programs is infrastructure, shared Lisa Hines, former director of telehealth at Greenville Hospital System in South Carolina and now a strategic advisor for Healthcare at NetApp. “Infrastructure is vital to the enablement of telemedicine initiatives. Data from Electronic Health Records, diagnostic images and bedside monitors has inundated healthcare



systems,” she noted. “Having the necessary technology to ingest that data for analysis and then provide valuable insights that enable patient care actions and treatment is an underlying necessity to support programs such as TeleICU, TeleStroke, and TeleSepsis.”

In Dr. Lahr’s estimation, many of the remaining obstacles to telemedicine can be overcome by collaboration with partners — requirements and systems for secure teleconferencing with patients, and an easy path for physicians to access EMR and EHR systems to add notes, check on care and review status of patients.

“Security and integration are absolutely necessary for a successful telehealth offering,” Dr. Lahr said. “If you are running this as part of a business in which you need to get through 25 clinic patients from 50-60-80 miles away, you must have integration and the technology to facilitate the orchestration and coordination of patient data,” she noted.

The Bottom Line

While healthcare organizations will never transform from brick and mortar operations to a fully digital environments, telemedicine is bringing tremendous opportunities for rural communities across the country to access more healthcare support. “Immense change is happening,” shared Dr. Lahr. “Some of the trailblazing folks at big healthcare systems are proving that telemedicine works and showcasing their results, whether that’s in terms of better patient outcomes, greater

patient satisfaction or reduced costs.” From Hines perspective, the benefits that rural communities are accruing from access to telemedicine will only increase over the next few years. “Next-gen telehealth services will include technologies such as chatbots and sensors that will help moms-to-be receive prenatal care remotely and seniors receive care more quickly in the event of a fall,” she shared.

While there are still some challenges to overcome, there is sufficient momentum to ensure that equitable access to quality patient care is now a fundamental part of rural healthcare. “The expansion of partnerships between healthcare systems coupled with the entry of major players outside the industry will help launch even more virtual health innovation and accelerate adoption,” Hines concluded.

AS-A-SERVICE

Mercy Technology Services Showcases Value of As-a-Service Solutions for Healthcare Providers

Jenna Sindle, Managing Editor, Future Healthcare Today

[A Hospital or an IT Company?](#)

When you think of the healthcare ecosystem that a patient needs to recover from a serious medical condition or maintain optimal health it's unlikely that a technology company will appear on top of the list. But in today's healthcare system having the right solutions and infrastructure on hand can make a significant difference for patients and clinicians alike. Not only can the right technology speed the time to diagnosis and improve patient outcomes, but it can improve the organization's ability to deliver the highest standards of care while managing costs and meeting the onerous security and compliance requirements under which healthcare systems operate.

One organization that empowers hospitals across the United States to achieve these goals is Mercy Technology Services (MTS). An industry leader in healthcare technology, Mercy Technology Services (MTS) serves as the information technology backbone of Mercy, the fifth-largest Catholic health system in the United States. "From our early

adoption of a single patient record system, we've fully embraced data-driven healthcare and it's now our mission to share our knowledge with other providers to support their clinical missions," shared Edmund Siy, Vice President, Business Transformation at Mercy Technology Services.

[From Early Technology Adopter to Industry Leader](#)

As healthcare systems look to deliver exceptional standards of care for its patients it's inevitable that technology has become integral part of patient care. From the need to secure patient data, comply with regulations like HIPAA, mitigate ransomware, process petabytes of medical images, and analyze genetic data in-house it seems that sometimes a hospital is as much an IT company as it is medical facility. But, according to Greg Sonnenberg, Vice President for Sales Planning and Development at Mercy Technology Services, IT — of any type — should be a core area of focus for most healthcare systems. "Being in the data center business, or the

information security business, let alone both when it's not your core business, is not for the faint of heart," shared Sonnenberg. "Even at larger healthcare systems that have teams of people to cover security, they often are also dealing in the business of keeping their infrastructure maintained, upgraded, patched, and so on. All of that takes time, budget, and staff," he said. Most healthcare systems just don't have the depth or expertise on staff to deal with IT and security issues effectively.

"The traditional approach to IT of trying to manage everything when combined with increasing pressure to contain costs, the pressure of mandates, and the threat of ransomware attacks, is just not sustainable," added Siy. "At MTS, we've had the opportunity to build a different model and ensure that healthcare systems are able to access the latest in clinical applications and technology not by purchasing new technology, but by accessing what healthcare providers need as a service."

[Mercy's at Your Service](#)

"A long time ago, our team at MTS realized that if our IT team is focused on the nuances of our organization, where their domain knowledge is most valuable, and partnered with industry leading service providers, we were much more efficient and effective," said Sonnenberg. "For example, we've partnered with NetApp to help manage and improve the performance of data environment, which has enabled our team to deliver data-driven healthcare solutions to our customers."

This relationship has enabled MTS to deliver both internally and to its healthcare customers services like PACS-as-a-service. MTS's PACS — picture archiving communication system — imaging solution bundles a "best-of-breed enterprise viewer, vendor neutral archive, workflow orchestrator, speech recognition and reporting in a Software as a Service model" and hosts it in MTS's cloud. "This opens up the opportunity for small and mid-size hospitals to access a state-of-the-art technology that not only improves patient care but improves the efficiency of the radiology team by 30 to 50 percent because they can access all images and records with a single click" shared Siy. "But another real advantage for the healthcare organization is that there's no upfront infrastructure expense, it operates on a pay-per-use model, and maintenance, updates, and upgrades, are all taken care of."

One other area where MTS has helped its customers achieve unparalleled success is in healthcare analytics. "Analytics are at the core of many of the major advancements in healthcare today," said Siy. "By putting all the data we have on one patient, or a patient population to work, analyzing it, and then applying it, we're able to improve time to diagnosis, deliver tailored treatments, and even prevent serious illness."

For most healthcare organizations, even the largest ones, building a sufficiently fast data management infrastructure has made healthcare analytics a wish list item, rather than a reality. However, by working with MTS, healthcare organizations can leverage

their investments and reap the rewards for their patients and their administrators. “Our own healthcare system realized over \$33 million in savings, by using the data to fuel dashboards in our 30 surgical departments. We were able to standardize use of surgical products, implement best practices and ensure they were adhered to, which saved time and lives.”

Mercy was an early adopter of electronic health records as a service, which is why Siy and Sonnenberg suggested it as an introductory service offering to other healthcare institutions. Hospitals can get their EHR as a service instead of paying millions up-front for the software itself or underlying infrastructure. “It’s much easier on their budget and finance model in contrast with having to invest in a multimillion dollar refresh every 3-5 years,” Sonnenberg said. “With as-a-service, I can build the cost of the EHR into my budget on a monthly basis. I can also leave the headache of upgrading and maintaining an infrastructure and budgeting for that to the service provider.”

As-a-Service for Better Patient Care

From their early adoption of electronic health records MTS has been a leader in the field of healthcare IT. Their team’s ability to deliver on the vision, not only for their own system but also for the wider healthcare community has ensured that more hospitals can access affordable, proven technology and that more patients have access to quality care. “In the end, while having EHR as-a-Service saves administrators millions

of dollars and helps the IT department streamline their operations, what it really does is enable the clinical staff to deliver better patient care and better patient outcomes,” concluded Sonnenberg.

As healthcare systems plan and build for their data-driven future, they would be wise to explore the value of solutions that can be delivered as a service to bring new capabilities while enabling both the clinical and IT teams to focus on their core missions. “One part of the solution is ensuring you find a partner who has expertise in providing as-a-Service solutions, but the more important part is in finding partner that understands healthcare and its nuances,” said Siy. “If they don’t understand what you mean when you talk to them about PACS and know what that system would require from infrastructure, latency, etc., that is a problem. I would caution folks to do their homework when looking at an as-a-service provider and partner with someone who has actually built a healthcare vertical and not just a marketing slide and concept.”

CONCLUSION

With a Clear Vision it's Time to Embrace Data-Driven Healthcare

Dave Nesvisky, Senior Director of Healthcare at NetApp

Throughout this collection of perspectives from some of the leading healthcare IT visionaries in the United States, it's abundantly clear data is the driving force behind the most important advancements in healthcare in a generation. Data is the fuel that powers machine learning and artificial intelligence (ML/AI), it's at the heart of predictive analytics and it's revolutionizing the care that hospitals and clinics are able to provide to patients.

But while the vision is there, what most healthcare organizations find challenging is translating that vision into action. For years, healthcare organizations viewed their data as a liability rather than an asset. With the development of AI and ML algorithms, GPU databases and other high-performance analytics tools, data has become a critical asset for healthcare providers. Data can now be used to provide new types of care, deliver consistent outcomes, and improve patient experience.

In seeing data in this new light, each of our healthcare visionaries have identified how their active and historical data can be put to

work to more effectively prevent, detect, predict, and treat disease. What our data-driven visionaries have also done is invest in a robust data management infrastructure that provides them with a fabric that unlocks the transformative power of data. By swiftly and securely connecting data regardless of where it resides — on-premise, in the cloud, at the edge, or at the core — these healthcare organizations have created a key differentiator that helps them solve some of the most significant challenges facing the industry.

With the pressure on healthcare organizations to drive down administrative costs while delivering top quality care and experiences to patients, the idea of data as a strategic asset will only continue to gain importance. Organizations like Mercy Technology Services, Tahoe Forest Hospital District, SimonMed, Regional Health, and Jvion have already embraced the vision of data-driven healthcare and begun to realize some of these benefits. We hope that in sharing their stories we can inspire you to explore the possibilities that await your organization.

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NetApp is the data authority for hybrid cloud. We provide a full range of hybrid cloud data services that simplify management of applications and data across cloud and on-premises environments to accelerate digital transformation.

Our dedicated team of healthcare experts includes former hospital CIOs, COOs and clinical application and technology experts who understand the challenges and opportunities in delivering patient care. Learn more at netapp.com/healthcare, or [email us](#) directly.

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is Helping to Deliver Better
Patient Outcomes

FUTURE
HEALTHCARE
TODAY

 NetApp