THE RIGHT PRESCRIPTION FOR HEALTHCARE ANALYTICS

Five essential changes healthcare organizations need to make to get the most from data analytics.

TAKEAWAYS

1 With the right data analytics systems in place, healthcare providers can deliver better care at a lower price

2 The healthcare industry needs to move to a 21st-century IT infrastructure model that allows for data-driven decision-making

3 Healthcare providers must understand how teams already work to create technology that will stay turned on

Data analytics is touted as a tool that will transform healthcare.

Armed with analytics, providers should be able to keep patient populations healthier and improve the way care is bought and sold, all while delivering precise, patient-centric care.

But for healthcare providers to see ROI on data analytics initiatives, they need to start making changes across their organization—and fast.

Nearly all providers have moved to digital systems, but electronic medical records (EMRs) are only the beginning. Not all data fits neatly into those systems, and getting helpful insights from all that information is still a daunting task for most organizations.

How can hospitals and clinics predict outcomes? How can they move to patient-centered medicine, where the right data about each person is in the right place at the right time?

It will require sophisticated analytics systems and tools—such as machine learning and artificial intelligence (AI)—that most healthcare organizations haven't yet built into their IT infrastructure.

"We need to move beyond just having an effective yet limited relational database management infrastructure that was developed in the 1990s, and migrate to a 21st-century data model to more effectively support data-driven decision-making," said Brett MacLaren, vice president of enterprise analytics at Sharp HealthCare in San Diego.

MacLaren oversaw a proof-of-concept project using technologies from Cloudera and Intel to analyze EMR data to identify patients at risk of needing emergency intervention.

The project was 80 percent accurate,[1] even with limited data, highlighting the potential of predictive analytics to help hospitals improve the quality and cost of patient care.

To use advanced analytics and make more effective use of healthcare staff and resources, here are five essential changes every healthcare organization needs to make.

[1] 80 percent accuracy indicates the level of accuracy observed when scoring a set of test data that was not used in the development of the model.

IT'S CRITICAL TO
PUT TOGETHER A
MULTIDISCIPLINARY
TEAM WITH
REPRESENTATION
FROM CLINICAL
TEAMS TO DETERMINE
WHETHER IT WILL BE
USEFUL, WHAT TO DO
WITH THE DATA, AND
HOW TO PUT IT INTO
CLINICAL PRACTICE.

1: Upgrade (or replace) your foundation

The first step for most organizations is to examine their current infrastructure and decide whether it needs to be modernized.

"As healthcare digitally transforms, we have to think about building the right foundation to scale out over the future," said Jennifer Esposito, Intel's general manager for worldwide health and life sciences.

Organizations need to ask, "Do they have the right data available to them in their own systems, or do they need to access it from other systems?" said John Lynn, a healthcare industry analyst. "And do they trust that data? We cannot do precision health if we do not trust the data that's in our health systems."

It's critical to have an advanced analytics system designed for all the important datasets that can impact patient care. It should be built on big data architecture that can store and process varied data sources, from EMRs to medical images. It should also support real-time analytics workflows and provide data science teams with a secure environment that meets data governance and regulatory requirements.

Solutions like the one Sharp is using, from Intel and Cloudera, can ensure that healthcare organizations can turn data into actionable insight.

2: Start with a clear, single problem

Healthcare has many problems to be solved, but getting the most value from advanced analytics will require ignoring many of them—at least to start.

"You want to have very specific questions, and pull the pieces of the data that you want to answer those questions," said Bob Rogers, chief data scientist for analytics and AI solutions at Intel. "The question of how to start bringing analytics, particularly advanced analytics or AI, into a health system really starts with finding a really good question to answer."

It's crucial to identify the right kind of gaps in how the health system works and not look for minor, incremental improvements.

"Healthcare providers can't offer high-touch resources to every patient, so they have to decide where to point the resources that are most needed," said Esposito. "Stratification is key, so the riskiest are treated with the most gusto. That is what effective use of analytics can enable."

Esposito has seen a lot of interest in predicting the onset of sepsis, preventing costly readmissions, and predicting crises that require emergency intervention, among others.

"The goal is to find those patients that are very high risk for hospital-acquired infections, falls, readmissions, or other similar events, and put most of the resources into helping those people and preventing those costly issues," she said.

It's also important to find one limited use case, execute it well to demonstrate the value, and grow from there.

"The most interesting areas that we've been able to successfully implement AI have been in areas that the system is already struggling," said Parsa Mirhaji, M.D., Ph.D., director of Clinical Research Informatics at Montefiore Health System and Albert Einstein College of Medicine in New York, during an AI panel at HIMSS 2017.

"Analytics tools are improving at an unbelievably fast pace," said Sharp's MacLaren. "I believe if you have a good understanding of the problem you're trying to solve, the tools will be there to develop and run the solution."

3: Prepare your people

One of the most important questions in getting the most value from data analytics is how the people fit in. Learning existing workflows and talking to the people that will use the technology are critical.

"A lot of projects start by getting the data in one place and developing a predictive model and verifying its accuracy," said Esposito. "But then what? Unless you put it into practice at the hospital, it's useless."

It's critical to put together a multidisciplinary team with representation from clinical teams to determine whether it will be useful, what to do with the data, and how to put it into clinical practice.

"Then look at the cultural issues," said Esposito. "For example, who does what, and how does the workflow change? And make sure the team isn't just IT-driven but also includes key clinical stakeholders, like the chief nursing officer and all the teams that touch it."

Everyone can recall an example where a great new technology was rolled out and then scrapped because people weren't ready for it, or it simply didn't work with practical realities.

"There's a lot of technology out there that's been turned off by doctors because it's wrong occasionally, and that can be very distracting," said Rogers.

It's critical to understand how people already work in order to create technology that will stay turned on. For any changes in behavior and workflows—and many are coming as new systems get rolled out—healthcare organizations need to start outreach and education programs early.

And don't forget the patients. "The opportunity is there to observe large numbers of patients...and provide a GPS for navigating their own care," said Rogers. "We've all had questions about, 'Should I call the specialist right now? I forgot to take my pill—do I take two now?'"

The sooner that organizations start to gather and analyze this data, the more intelligent their systems will be.

Making sure the right resources are in place is also key. The complexities of big data require a specific skill set, and having those skills can mean the difference between success and failure.

"Is there a data scientist in the group?" said Esposito. "Finding somebody with clinical expertise that has math skills is helpful. We're seeing a large percentage of health systems that have 'rent-a-data-scientist' resources available, so there's no reason not to start now."

4: Don't throw away that data

Many hospitals discard data they don't use and later regret it, once they realize it could have been extremely useful for other emerging use cases.

For example, telemetry data from the bedside might be stored only for days or weeks and then deleted.

A cost-effective, scalable platform, such as Cloudera's Intel-based solution, enables providers to keep all that data without worrying about storage constraints.

"You just don't know what the amazing critical use cases of the future will be," said Esposito. "You want some of that data. You have to make sure you have it when you determine a new potential amazing use case, instead of realizing it and then having to wait to collect new data for the next five years."

5: Get ready to fail and fix things along the way

Trial and error is inevitable, and every organization will have its hiccups. If you've built the right foundation, those mistakes will be learning opportunities and not catastrophic failures.

"Be prepared to see every single assumption that you have on how this is going to play out in the world be completely wrong," said Montefiore/Einstein's Mirhaji. "There is a very long way to go from a performing model in a test environment in vitro and a model that actually does impact your outcomes and your goals."

The Sharp HealthCare team was surprised to learn that demographic data such as patient age and gender, which many historical models and patient risk systems discard, turned out to be an important factor in predicting the need for immediate intervention.

The key is identifying any potential issues as early as possible by getting continual feedback along the way, from humans and systems.

"**BE PREPARED TO SEE EVERY SINGLE ASSUMPTION THAT YOU HAVE ON HOW THIS IS GOING TO PLAY OUT IN THE WORLD BE COMPLETELY WRONG.**"

—Parsa Mirhaji

M.D., Ph.D., Director of Clinical Research Informatics at Montefiore Health System and Albert Einstein College of Medicine

"You need to track how this information is being used," said Rogers. "Are they ignoring it? Are they immediately acting on it? Do they come back to it an hour later and check on it again to see if it's the same answer?"

If it's not working in a particular workflow, or if a technology is not being used as it should—or not used at all—those issues can be tweaked immediately with a system that essentially monitors itself.

And no matter how many surprises come up, just keep trying, because the end goal is worth it.

According to Mirhaji: "It will require constant problem solving and integration challenges to take those tested, validated models to something that actually improves the healthcare system."