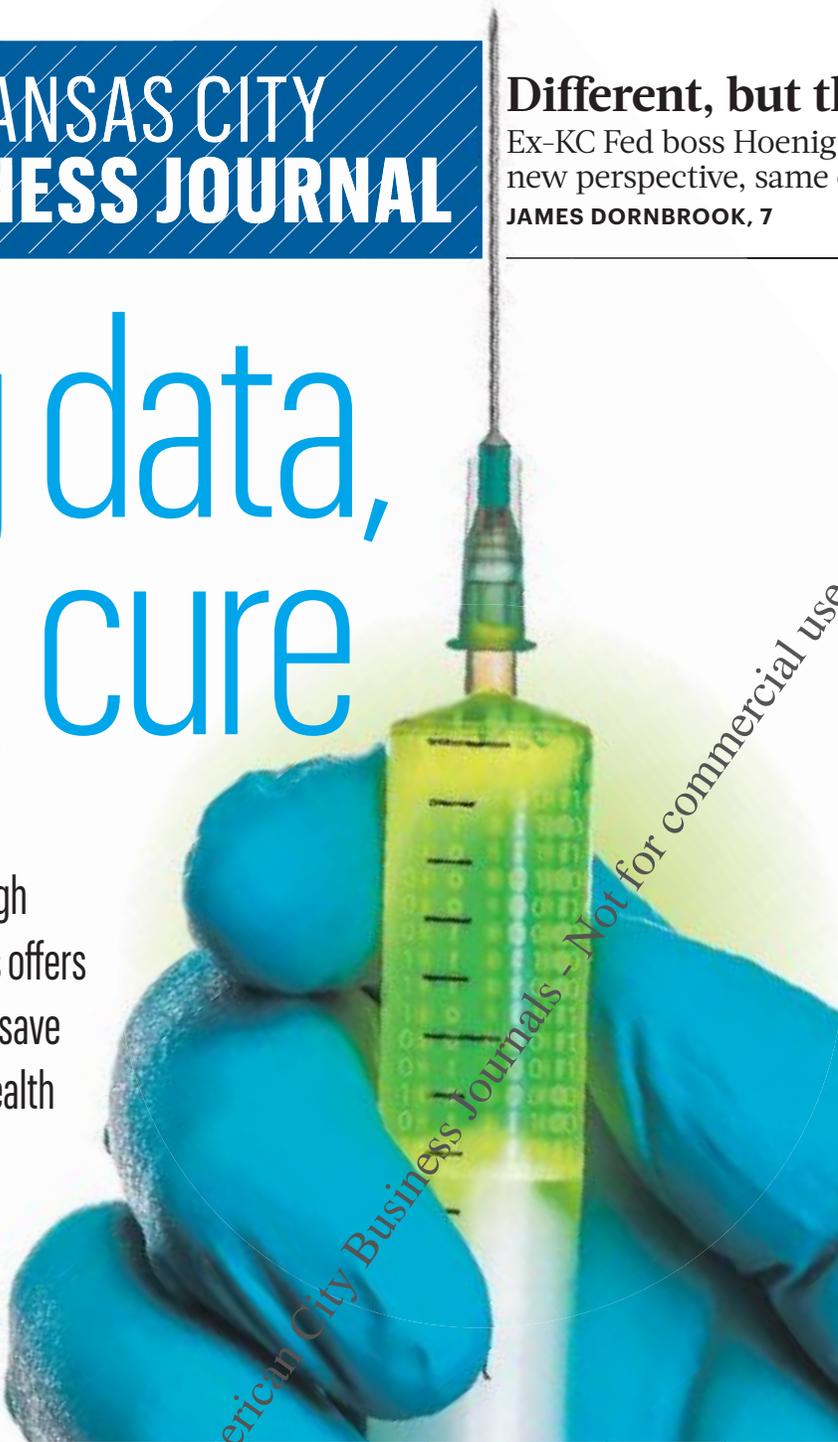


KANSAS CITY BUSINESS JOURNAL

COVER STORY

Big data, big cure

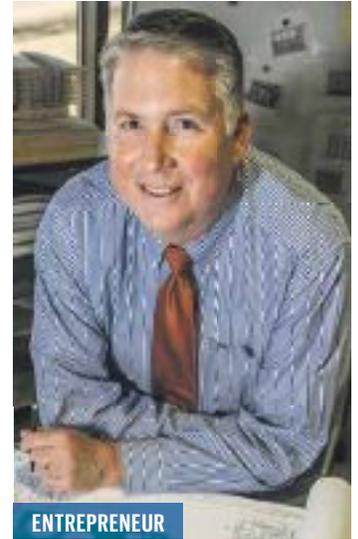
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KANSAS CITY BUSINESS JOURNAL
January 17, 2014
Vol. 32, No. 19, \$3.95
1100 Main St.
Suite 210
Kansas City, MO 64105



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COVER STORY

Big data, big cure

Databases can help predict illness, spotlight best treatments

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In the future, the health care system will be able to warn you when you're about to get sick and step in before things go wrong.

Data scientists will track trillions of data points that, individually, are meaningless – but when pooled together, the data can reveal trends and patterns that predict serious medical conditions and offer guidance on treating them.

It's already happening.

More than 100 health care clients now use an algorithm Cerner Corp. developed. It predicts when patients are nearing septic shock. This allows hospital staff to step in and prevent the blood infection, which carries a 35 percent to 50 percent chance of survival and which costs hospitals \$20 billion a year, according to a 2013 study.

The algorithm takes blinded patient data, tracks clinical values and recognizes risk factors for septic shock. As more data flows into the system, it gets smarter and more accurate.

That's big data at work. And experts say it's shaping the future of health care to drive better outcomes at lower costs by shifting the paradigm of care to proactively keep people well instead of retroactively treating them when they're not.

It's no exaggeration to say that big data will save lives because it already does, as Cerner's sepsis algorithm demonstrates. Also meaningful is the potential cost savings to the health care system. A January 2013 report from the Center for U.S. Health System Reform Business Technology Office estimates that adopting big data initiatives completely throughout the system, the nation would trim \$450 billion from its soaring health care costs, cutting them by about 17 percent.

A PREDICTOR AND A LEVELER

Brad Carey, vice president and gen-

eral manager of population health at Cerner, said some scientists predict that the amount of health data we track now will be 50 times larger in less than a decade. The possibilities grow with the data pool.

"Everything is quickly becoming digitized," he said. "Now it's becoming about how you turn that data into something meaningful."



Brad Carey

He expects that within three to five years, North Kansas City-based Cerner will have developed at least 20 different algorithms tracking major health conditions.

Already in the works is an algorithm that aims to prevent hospital readmissions. It analyzes 700 variables to predict which patients have a high likelihood of needing to return to the hospital within 30 days. The federal government puts the cost of readmissions for Medicare patients alone at \$26 billion annually.

"It's really exciting when you think about the kinds of advancements that are out there," Carey said. "These are just small samplings of the kinds of things we can achieve with big data."

MAKING OBJECTIVE ASSESSMENTS

Big data is changing the health care industry in a variety of other ways, too.

ARC Physical Therapy+, a Kansas City physical therapy company focusing on workers' compensation cases, is one example of a relatively small company making the most of big data.

ARC has been tracking data since 2007, and the insight and data it has gained from about 300,000 patient visits helps the company track its progress and efficiency. Chief Marketing & Acquisitions Officer Brian Stewart said that information is crucial in proving value to ARC customers – something he thinks will become increasingly import-

ant as health care becomes more transparent.

"When we look at ourselves, we want to prove that we're valuable," he said. "In general, (consumers) make health care decisions based on something subjective: Your mom told you to go to this doctor, or your doctor told you to go to us. And while that has value, they may not know if we're any good or not. We, as providers, better start tracking and proving and providing information to people who might select us so they can make a better decision."

ARC tracks the number of patient visits, diagnoses and demographic information. With this, the company can tell patients that somebody with their diagnosis – for example, a 55-year-old obese worker who underwent total rotator cuff surgery – will need 15 visits to get back to work. It then can show the patient the company's track record using hard data.

Stewart said health care providers have some hesitance to share that data with consumers, but ARC wants to raise the bar by holding providers more accountable. Providers then will have to compete based on how good they are – not on subjective factors, such as referrals or advertising.

"We want to make everybody better," he said. "Live up to some standards. Have some accountability. If you're not good at it, get better."

DATA IS BIG BUSINESS

The idea of big data gets even bigger. There's a growing market for people and technologies that can help companies adopt better data practices.

TeraCrunch is an Overland Park-based startup that creates individualized products for companies that want to use data to track performance, better understand customers and position themselves for the future.

It's only a couple of years old, with about a dozen employees. But founder and CEO Tapan Bhatt said he expects to have closer to 100

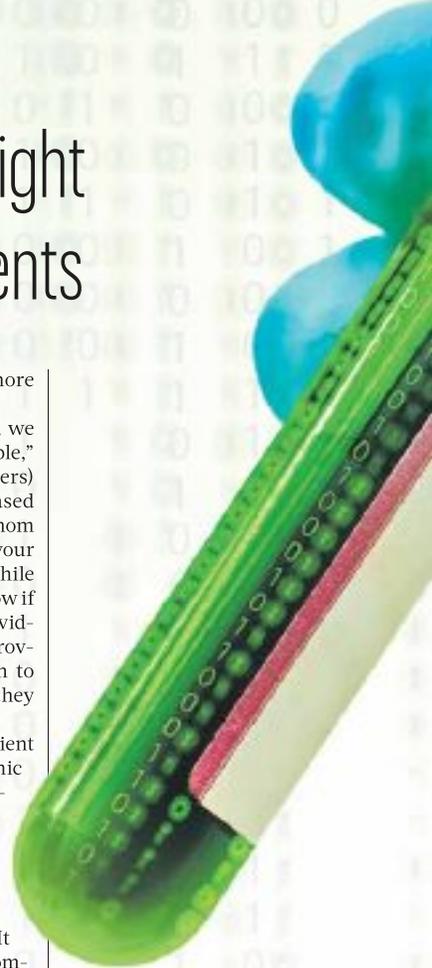
employees and \$15 million to \$20 million in revenue in the next three to five years.

As businesses learn the value of big data, the market for companies like TeraCrunch to help them process the information also will grow.

International Data Corp. estimated that the big-data technology market will grow at a 27 percent compound annual rate through 2017 and reach \$32.4 billion. That's about six times the growth rate of the overall information technology market, according to IDC.

"Data has become the new raw material for businesses to make their decisions on," Bhatt said. "It's not a technology. It's not a buzzword. It's a way of doing things that is fundamentally changing how businesses are making decisions."

Businesses – health care or otherwise – that don't get on board with big data, he said, will get left behind. ▀





► BY THE NUMBERS

17.6%

Health care costs as a percentage of U.S. GDP

30%

Hospitals and physician offices using electronic medical records to track data in 2005

75%

Hospitals using EMRs today. About 50 percent of physician offices also use them.

45%

Hospitals using a digital health information exchange to share the data they collect

\$450 billion

Estimated savings to the U.S. health care system if current big data initiatives were completely adopted. That would cut the nation's health care costs by 17 percent.

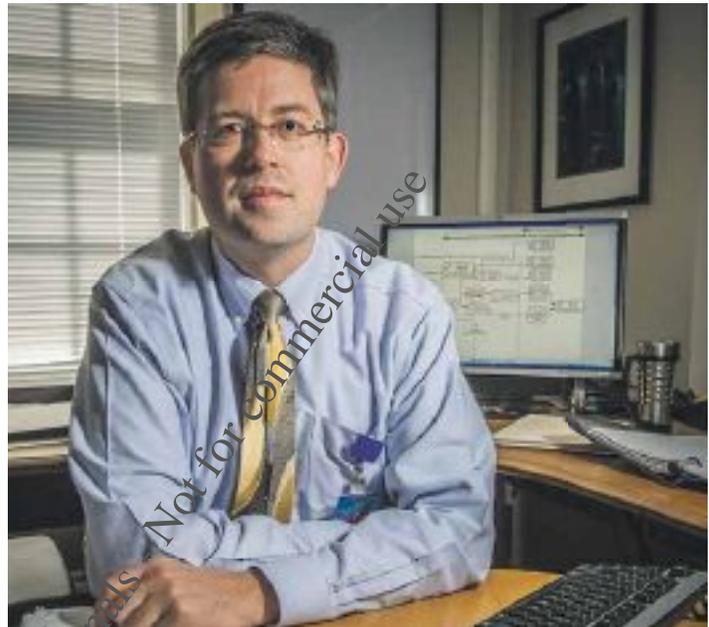
2 million

Estimated shortage of workers in 2018 who are trained in fields necessary to sustain a big data movement, including data analysis, data management and systems management.

SOURCE: Center for U.S. Health System Reform Business Technology Office, January 2013

LIFE SCIENCES

KU Med tool provides virtual research lab



DAVE KAUP

Dr. Russ Waitman is the director of medical informatics at the University of Kansas Medical Center.

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1.3 billion.

That's how many facts researchers at the University of Kansas Medical Center have collected in their effort to build a massive database about the health of their patients.

So far, they have more than 2 million people logged into the system – all of them patients who received treatment at The University of Kansas Hospital or one of its clinics.

The data is blinded, meaning there are no identifying characteristics for the people. Individually, the data is meaningless. But combined, it's a powerful tool for researchers and clinicians.

With a basic search, researchers can narrow down that data pool to compare just about anything they want.

For example, did patients with high blood pressure who were treated with Drug A do better than those who were treated with Drug B? Did Drug A work better for patients of a particular age with a particular medical history?

"Those questions are going to be answered with large amounts of data," said Dr. Russ Waitman, director

of medical informatics and assistant vice chancellor for enterprise analytics at KU Medical Center.

The system, called HERON, is about to get a big boost.

Waitman and a team of collaborators have been approved for funding by the Patient-Centered Outcomes Research Institute to connect HERON with nine other medical centers in seven states. The team requested \$6.9 million for the project and is waiting to hear whether it will be funded in full.

With 10 medical centers banded together, those 1.3 billion facts will grow exponentially. And the more data there is, the more valuable it becomes.

One subject the group plans to study is amyotrophic lateral sclerosis, commonly known as Lou Gehrig's disease. But even in Kansas City, Waitman said, the hospital doesn't see enough ALS patients to gather enough data to be meaningful. Connecting information from 10 medical centers will change that.

"I really think that whatever happens, the focus on quality is really important," he said. "Because, ultimately, better-quality health care is lower-cost health care. It doesn't do us any good to be delivering therapies that don't work. And data can help us understand what's the more effective treatment."

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