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Healthier Patients, Stronger Communities

A big data approach to improving care in academic medical centers

A **big data platform** can support real-time streaming of clinical data from edge devices, driving improved clinical outcomes and boosting physician satisfaction.

THE NATION'S 200+ ACADEMIC MEDICAL CENTERS (AMCS) are entering into a new era, one in which rising volumes of data are used to improve patient outcomes, strengthen communities and support hard-pressed physicians. But to reap those gains, they first need a modern infrastructure to realize the data's full potential.

Key health care trends that include value-based vs. fee-for-service reimbursements, merger activity and joint ventures with payers put increased pressure on AMCs to deliver superior care efficiently and cost-effectively, while always keeping attention foremost on the patient.

The next step for these institutions is to embrace the human side of data—to leverage data in support of patients, doctors and the community at large. For this, they will need a big data platform, one that delivers modern tools including analytics, real-time data streaming, artificial intelligence and machine learning.

The potential for data in AMCs

AMCs already are in possession of reams of valuable human-centric data. They're benefiting from the emerging internet of things (IoT): Information gleaned at the network edge from connected medical devices, sensors and monitors. It's part of a larger trend, as some 7 billion such internet-connected devices are already in use across all industries, according to IoT Analytics, and that trend holds true for health care with expected growth to exceed $534 billion by 2025.

In addition, AMCs hold a vast store of social and institutional data derived from payer claims and other sources, all of which could be used to drive more effective care.

While many AMCs lack the ability to access this data in real-time, such a capability stands as a game-changer for those looking to take their operations to the next level. Paired with big data analytics, real-time streaming—the ability to ingest and analyze information as it happens—has the potential to empower early interventions. When a patient's temperature spikes, for example, automated systems could kick in to call for faster intervention.

This kind of big data application could enable caregivers to get out ahead of a range of conditions including congestive heart failure, sepsis and stroke, just to name a few.

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WHY CLOUDERA?

1. Hybrid and Multi-Cloud
Control, analyze and experiment with data wherever it lives. Easily and securely move data and metadata between on-premises file systems and cloud object stores.

2. Analytics from Edge to AI
Solve demanding business use cases. Apply real-time stream processing, data warehousing, data science and iterative machine learning across shared data, securely, at scale on data anywhere from the Edge to AI.

3. Security and Governance
Simplify data privacy and compliance for diverse enterprise data. Use a common security model, role and attribute based access policies and sophisticated schema, lineage and provenance controls on any cloud.

4. 100% Open
We empower customers with the freedom to choose — open source, open compute, open storage, open architecture and open clouds. Open for developers, partners, and open for business. No lock-in. Ever.

At Cloudera, we believe that data can make what is impossible today, possible tomorrow. We empower people to transform complex data into clear and actionable insights. We deliver the modern platform for machine learning and analytics optimized for the cloud. The world's largest enterprises trust Cloudera to help solve their most challenging business problems.

Learn more at **cloudera.com**.

The human side of this is threefold. Patients benefit, obviously, from an elevated level of care. In a high-pressure AMC environment, where physician burnout is always a looming concern, data can help doctors feel better informed and be more productive. In the big picture the entire community benefits. AMCs hold a unique place within their communities, and they can best serve that mission when analytics are engaged to develop the fastest, best possible care, helping individuals get back to work and keeping families and businesses strong.

Real-world examples
Some AMCs have cracked the code to making the best possible use of the extensive range of data at their fingertips. Rush University Medical Center has put in place a modern data platform that leverages machine learning and analytics-as-a-service for hospital administrators, clinicians and researchers. Clinicians can access data in near-real-time—from genomic data to medical device data to unstructured clinical notes and text. "To be data-driven is not an option anymore; it is a requirement," said Jawad Khan, Director of Knowledge Management and Data Sciences at Rush University Medical Center. "Data empowers us to understand the specific gene makeup of a given patient and what care path is best."

Other health care uses for big data provide direction for university-based care providers:

- NYU Langone Health is leveraging data for predictive analytics, clinical informatics and clinical research. A big data lake empowers analysts, data scientists and clinicians to improve patient outcomes and patient experience and to reduce health care costs.

- At Johns Hopkins University, big data is being used to transport patient datasets from disparate sources quickly and securely. This data is being used initially for a precision medicine initiative that focuses on patients and their health conditions to develop targeted treatment plans.

A big-data vision to drive human outcomes
Most AMC data resides in siloed warehouses, making it difficult to access and even harder to utilize modern tools. A big data platform is essential to the AMC transformation.

A big data platform can support real-time streaming of clinical data from edge devices, driving improved clinical outcomes and boosting physician satisfaction. Big data tools can augment clinical data with social determinants of health, consumer analytics and demographic information for a 360-degree view of the patient. And key to AMC success is a solution that delivers assurances for data security and governance, especially around IoT implementations.

Artificial-intelligence and machine-learning capabilities support data analytics. These insights, in turn, help institutions deliver value-based care in support of better overall patient experience.

Ready access to data can likewise support the increasingly common practice of collaborative care across the entire care continuum. Here data helps ensure continuity of care and a steady flow of accurate and timely information among all partners.

The human outcomes of data can be seen across the AMC enterprise. Driven by deep analytics and real-time insights, a big data approach supports a collaborative environment in which patients thrive, physicians are empowered, and communities are made stronger. In this way, big data serves as a key enabler of the AMC mission and vision.