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Big data paves way to connected health

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Singapore: As the healthcare sector around the world shifts towards a patient-centric paradigm, patients and healthcare organizations need better and smarter ways to access, interpret and store the large amounts of data surrounding each patient. Stakeholders now focus not only on the episode of care, but also on the entire patient interaction suite: patient history, preventive health and wellness, diagnostics, devices, therapies, post-treatment processes, chronic disease management, and even structures for patient interaction and education. Data management is crucial for the connected health strategy of any healthcare organization.

Big data offers healthcare organizations the opportunity to achieve multiple benefits, including improved quality of patient care and reduced costs. By generating actionable insights from information in clinical, non-clinical, and consumer-enabled wellness sources, these players can identify opportunities and predict behavior and outcomes in order to improve the overall healthcare system, making connected health a reality.

Big Data = Big Challenges

Big data means large volumes of different types of data in different formats arriving in an endless stream. This creates not only expected processing challenges, but also challenges around how to meaningfully interpret the variety of data-much of it not described using consistent standards or metadata-into information and recommendations, while eliminating noise and erroneous data. There are also challenges around using big data for healthcare:

â€¢ Accuracy: Patients tend to understate factors such as smoking and failure to comply with treatment, and some overstate factors such as exercise. These biases need to be identified and corrected or passive techniques applied to acquire data that does not have self-reported bias.
â€¢ Privacy: There is reluctance to divulge personal information because of concerns about privacy. Incentives, security and privacy guarantees must be enhanced to address these concerns.
â€¢ Consistency: Standards need to be developed and implemented to promote consistency, increase usefulness and facilitate data usage.
â€¢ Facility: Mechanisms need to be developed to make it easy for patients to self-report data accurately. This includes evolving passive mobile computing devices that require no effort. Ideas such as fostering community among patients to encourage self-reporting, accuracy and sharing are also needed. Techniques are needed to get data from healthy people to make the populations truly representative and not biased by the ill.
â€¢ Fragmentation: Healthcare data is notoriously fragmented. There is also unwillingness among healthcare participants to share data-this should improve as new models emerge and encourage players to cooperate, but other incentives need to evolve.

Regardless of the challenges, mobile computing and big data are central to improving healthcare outcomes and quality. Mobile computing provides data that is aggregated into big data warehouses with other data including medical, administrative, and demographic data. As health platforms support multiple medical devices, rather than just fitness trackers, analytics can be effectively used to mine this information, spot trends, draw inferences, and make predictions that can then be shared with healthcare constituents to improve quality outcomes and optimize the spend.

Towards a Patient-Centric Model

Consumer engagement and awareness form a critical driver in the new patient-centric model. The APAC healthcare market is expected to grow to US$ 752 by 2018 at a CAGR of 12.8 percent as compared to the global growth rate of 6%. A large part of total healthcare costs is heavily influenced by consumer behavior. Getting patients to change their behavior is therefore critical to changing the wellness equation. Changing behavior requires addressing patients' mindsets at different psychological stages in the disease journey, from prevention to diagnosis to care. It contains several key components: patient activation, patient engagement, patient motivation, and patient retention.

Data plays a part in patient activation, which refers to patients' ability and willingness to proactively manage their health. Patients are increasingly using self-tracking devices, such as Fitbit and Jawbone, to manage their activity levels. The data generated from such devices, which forms a part of what we define as individual's Code Halo, is combined with other technologies, such as social media, gamification and predictive analytics, to generate user insights. These insights can lead to positive self-management behavior changes in patients with chronic conditions.

In addition, leveraging clinical data analytics for quality care at lower costs can be accomplished in many ways: 1) can be applied as predictive analytics to identify those individuals within the population that are most likely to respond to care management interventions, 2) can be leveraged to measure trends in disease prevalence and population risk profiles, 3) can be utilized to evaluate the relative effectiveness of specific care management programs on engaging patients, and 4) can be leveraged for channels through which interventions could be administered for better outcome.

Forging Ahead with Big Data

The application of big data and analytics in healthcare helps leverage genomic data to personalize treatment for rare and deadly diseases, identify fraud, waste and abuse, and improve patient compliance in health management programs.

Moving forward, healthcare organizations need to devote time and resources to planning and implementation of big data and mobile computing solutions and realize potential benefits. Healthcare organizations can establish a business intelligence center of excellence with a focus on mobile computing and big data. They can also work with a partner that understands the healthcare industry and the full range and implications of big data and mobile computing technologies, including trends, security, and internal and external system integration. This will provide the foundation needed for strong execution. With this

approach, healthcare organizations can make their connected health journey more effective and transformative.