

Data analytics applied to healthcare can improve clinical and operational performance

Data is analyzed for everything from controlling labour costs to identifying individuals at risk of self-harm.

BY DR. SUNNY MALHOTRA

In the past few years, software has shown a much-improved ability for gathering and analyzing data to arrive at clinical and operational insights. These innovations, namely in the form of big data analytics, are making a significant impact in healthcare.

Companies such as Google, Apple, and Amazon have entered the market to mine this untapped and valuable resource. Many smaller companies are also creating new solutions.

Big data analytics can improve the clinical knowledge we extract from Electronic Medical Records (EMR). There are uses, as well, in data sharing, data security, supply chain management, and HR analysis that can help improve hospital performance while reducing costs.

The data analytics used by developers like Kronos can provide healthcare organizations with the tools necessary to create an accountable and efficient workflow.

Kronos delivers daily reports to monitor labour costs, productivity, patient satisfaction, and patient outcomes for continuous quality improvement. These analytic tools can also provide information on which areas of hospital personnel management need extra support, keep track of supply and demand, and relative costs of these supplies.

Using data analytics to staff employees according to patient volume trends allows providers to cut down on staffing and logistics costs and decrease time-consuming workflows, which allow for more effective and efficient patient care.

Data analytics can also facilitate sharing of information between hospitals for better patient care through secure data networks and operating systems.

Allscripts is a program developed to share patient information across EMRs and operating systems. By sharing patient information through a secure net-

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work, Allscripts can help save on unnecessary costs of repeated laboratory tests of patients who have visited multiple hospital locations.

Prescriptive analytics can enhance patient care by using machine learning to suggest courses of action that are best suited to patients by taking various inputs such as vitals, predicted disease progression based on patient health trends, and real-time alerting.

Epic, an EMR system with prescriptive

analytics integrated within, can alert physicians of care actions, pharmaceutical decisions, and health maintenance screenings dedicated to high-quality healthcare. Other data analytics can facilitate patient engagement through wearables that can track and analyze health habits to better assess patient profiles and care plans.

These wearables, such as Apple smartwatches, can provide alerts when abnormalities are sensed like increased or decreased heart rates, abnormal ECG sensing, and blood oxygen monitoring that can be communicated to the patient's provider so that proper care can be made available appropriately.

Another sector of data analytics, predictive analytics, has aided in health disparities amongst specific communities within patient populations.

Health Catalyst, for example, provides software solutions for anticipation of patient loads and capacity strains to assist hospital organizations in preparation for potential future outbreaks. Predictive analytics can also be utilized in research by mixing historical, present, and predictive machine learning tools to aid in the development of cures and treatments for present-day "incurable" diseases or cancers.

These data strategies involve using treatment results, drug-therapy plans, and genetic analysis of patients with cancer to cross-examine and analyze interactions of these properties to discover new treatments or possible cures.

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How to protect patient data from cybercriminals in a virtual world

BY ARIANE SIEGEL

When the COVID-19 pandemic took hold in 2020, the federal government's Canadian Centre for Cybersecurity issued an alert about the elevated risk to healthcare organizations. As physicians and organizations ramped up their use of online systems, they were attracting the attention of cybercriminals.

The same year, eHealth Saskatchewan was compromised by a cyber-attack, information about patient surgeries was exposed in another incident in Nova Scotia, and frontline services slowed down at the Jewish General Hospital in Montreal after cybercriminals forced the institution to curtail its internet connectivity.

Healthcare providers are increasingly targeted because they are rich in confidential patient data, and the use of technology is growing as the medical community responds to COVID-19. Hackers can make huge profits by selling patient records on

the black market or back to the healthcare institution or individual from which they were stolen.

But, by using caution and following best practices, clinicians can help protect personal health information from data theft and protect themselves against liability.

In Ontario, OntarioMD (OMD), a subsidiary of the Ontario Medical Association, offers some practical tips for data protection to clinicians including:

- Deleting emails and any images with personal health information from inboxes and device trash bins
- Ensuring software and hardware applications have been updated with the latest security patches (i.e., operating system, firewalls etc.)
- Encrypting critical data at rest when stored internally, and in transit when communicated externally
- Transmitting personal health information through secure messaging to ensure messages are encrypted
- Using two-factor authentication and change passwords regularly

- Maintaining audit logs; and
- Working with an Electronic Medical Record (EMR) vendor to ensure data is backed-up and to use testing to ensure backup systems are working.

Dr. Lawrence Rosenberg, head of the regional health agency that oversees the Jewish General Hospital, has suggested good security hygiene averted a serious data breach there, as an "anomaly" was detected during a daily verification of the system, which they then determined was a "cybersecurity intrusion."

By acting quickly to curb internet connectivity as well as external and remote access to its networks as a preventive measure, the agency was able to protect the population's data, particularly hospital data, Quebec

Health Minister Christian Dubé said at the time.

OMD provides many Privacy and Security tools and resources to help physicians adapt safely to virtual care, and to assess threats, safeguard information and respond to cyberattacks.

The OMD virtual care web page at ontariomd.vc provides a list of vendors with virtual care products and other resources to help clinicians understand how to use virtual tools in their practices.

Our OMD Educates sessions also cover privacy and cybersecurity topics regularly.

The OMD online Privacy & Security Training Module, an education tool that offers instruction on how to keep patient and practice information confidential, is available on OMD's website to all clinicians and their staff.

More than 4,000 users have benefited from the training so far, which covers a range of topics.

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