Improving Medicine with Predictive Modeling

Predictive medicine and predictive modeling use data and evidence-based care to help physicians treat patients and administrators to calculate utilization.

In 2013, the average wait time was more than 20 minutes at a doctor's office and upward of four hours for emergency departments. Understandably, the longer a patient waits for care, the more it hurts the health care facility's reputation and the organization's bottom line.

Long patient wait times also hurt the patients who are forced to sit for hours during highly stressful situations. It's a position no one wants to be in, but patients have come to expect it. This "standard" has far-reaching implications. In a society where people crave instant gratification, trust in health care facilities is tarnished the minute people reach waiting rooms.

The growing popularity of personalized, predictive medicine, and its transformation into predictive modeling, may be just what the doctor ordered for an overwhelmed health care system. A marriage of data and evidence-based health care, predictive modeling has the power to bolster patient satisfaction and revitalize the health care field.

Predictive Medicine

We all know the old doctor's office routine: Fill out paperwork about family and medical history that you've filled out before, wait a while, answer the same questions, wait again, maybe run some tests, and wait some more.

Predictive medicine replaces that routine by simplifying and personalizing the process. Combining previously stored data about the patient, mass amounts of evidence-based medical information and a user-friendly data infrastructure, predictive medicine can estimate when patients will become ill or when they'll be at risk for dangerous health conditions.

Because the data infrastructure is more accessible, predictive medicine empowers patients to take charge of their health. They no longer have to stumble through medical jargon, and they can visualize and interpret their medical backgrounds in a simpler format. Predictive medicine also helps patients to understand which symptoms qualify as actual medical emergencies, thus preventing unnecessary trips to the ED and avoiding congesting the ED further.

In addition, predictive medicine allows physicians to catch conditions*before* they turn into medical emergencies or leave lasting damage. Patient alerts allow primary care

physicians to handle preventive care in the office, freeing up ED doctors' time and workloads. It also cuts down on the amount of care needed to improve the health of individual patients.

When care providers are armed with information before patients are in the office, they can pinpoint possible diagnoses. While this information may not always lead to final diagnoses, it does give providers some direction, helping them to narrow down possible ailments. This capability not only will cut down patient wait time, but also free up more time for providers to help other waiting patients.

Predictive Modeling

The hospitals and health care organizations that have already made personalized, predictive medicine their standard for care have taken the first step toward improving the overall health care system. But in recent years, some health care organizations have taken predictive medicine a step further — jump-starting the revolution of predictive modeling.

While predictive medicine concerns individual patients, predictive modeling combines individual patients' data to give a picture of the health system's entire patient population. Expanding the principles of personalized medicine to hospitals and clinics, predictive modeling allows health care administrators to transform collected data into insightful guidelines for managing future demands on the health care system.

For example, predictive modeling could help administrators to more accurately forecast the number of patients who will arrive at the ED on a given day. This insight can aid administrators in making more informed decisions concerning everything from staff scheduling to supply ordering.

Predictive modeling already has been used to lower wait times in certain health care facilities. Administrators at Johns Hopkins Hospital used predictive modeling and interactive software to lower patient wait times in their ED from an average of 10 hours to four hours in just one year. And one Massachusetts Institute of Technology student's research into applying predictive parameters to hospital waiting rooms has been proven to lower ED wait times by 10 percent (or approximately 40 minutes).

Better Patient Satisfaction

Predictive modeling can help hospitals and clinics to improve patient relations. Decreasing wait times ultimately will translate to better patient satisfaction, more trust in facilities and physicians, and superior customer return rates. And happier, more satisfied patients lead to a better reputation and financial strength for health care facilities.

As more health care facilities implement predictive modeling measures, even more benefits are sure to emerge. For example, the longer predictive modeling is used, the more accurate predictions will become. And, as more physicians gain detailed, up-to-date information about their patients and their facilities, they'll be equipped to better manage their time and serve the patients in their care.

In a society in which people don't like delays, waiting for health care is becoming an increasingly unwelcome nuisance. Ballooning wait times are puncturing patient satisfaction, hurting hospitals' credibility and damaging organizations' bottom lines. But predictive modeling has the potential to change all of that by transforming the health care industry through data-driven insights — now and into the future.