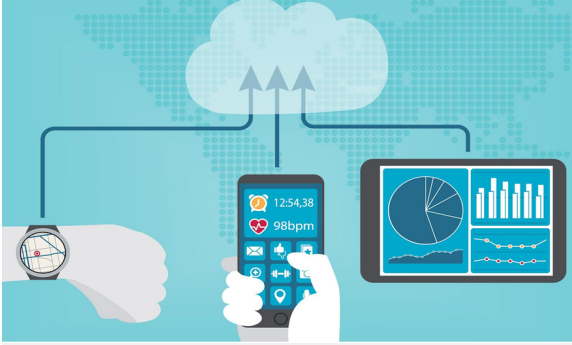

BIG DATA IMPROVES HEALTH IN A BIG WAY

Big data is playing a big part in our health and wellness. But what is "big data" anyway, and what does it have to do with your healthcare? Simply put, it's the collection of massive amounts of information. That information, or data, is sorted, stored and analyzed by researchers and scientists. Then it's used by your doctor to give you better, faster care.

For example, your doctor might access a database of EKGs to match one patient's abnormality with others and see what treatment had been most effective in similar cases. Or a digital warehouse of drug interactions could be accessed and a patient's condition, stats and current prescriptions entered. The resulting comparison with data from other patients could avoid harmful interactions, and suggest more effective drug treatments.

"Big data positively impacts patient care by using large-scale patient-derived data to support what we as healthcare providers do well," says Mona Shattell, PhD, RN, FAAN and Associate Dean for Research and Faculty Development in the College of Science and Health at DePaul University. "And it provides opportunities to do it even better.

"It also gives researchers desperately needed data to decrease the burden of disease and improve quality of life," she says. "Big data in healthcare is more than good. It's essential, in fact."

Researchers see patterns in healthcare data. Those patterns are then used to help predict outcomes. Doctors can diagnose faster, prescribe even more effectively, and prevent complications.

"Research is about understanding a question," says Wayne Applebaum, Vice President of Analytics & Data Science for Dallas-based Avalon Consulting. "What question are you trying to answer, and what information do you need to answer it?" He sees the cataloguing and analysis of a patient's data – things like adverse drug effects, X-rays, CT-scans and EKGs – as having potential in predicting patient outcomes.

For example, a *New York Times* story – "Can Big Data Tell Us What Clinical Trials Don't?" – featured a physician whose lupus patient showed perplexing symptoms. A search of her hospital's database of other lupus patients with similar symptoms led her to diagnose an unusual complication in her patient and prescribe the drug to resolve it.

Analysis of data on an even larger scale promises to help more patients, with more serious conditions.

The Ohio State University Comprehensive Cancer Center created the Oncology Research Information Exchange Network (ORIEN), the world's largest bio repository. It's a constantly growing, evolving data warehouse of information populated from a spectrum of patients and conditions. The system tracks a patient's molecular, clinical and epidemiological data and follows the patient throughout his or her lifetime. Partners have access to one of the world's largest cancer tissue repositories and data from more than 100,000 patients who have consented to the donation for research. The information is used to develop personalized treatment plans that are evidence-based, timely and cost-effective.

Patient data is compared and contrasted to identify each individual's own, particular genetic errors. That information helps determine how to treat the cancer. Tim Wright, Director of the Center, says data-assisted, individualized treatment plans can be created and turned around in less than a month.

Other organizations are determining how big data might help develop treatment plans, as well as predict and prevent complications and adverse drug interactions.

"What data has done is given us a new set of tools," Wright says. "And the more data we collect, the greater variety we have and the better the tools we develop."