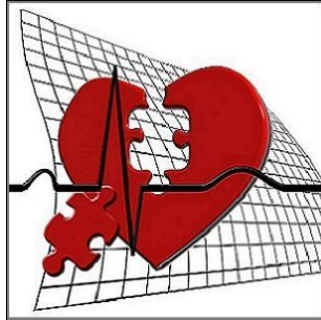


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## Big Data Reducing Heart Readmissions



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University of Washington Tacoma's "big data" experts collaborate with MultiCare Health System and Microsoft to improve outcomes for hospital patients with heart disease. This collaboration has led to the creation of a tool, Risk-o-Meter, that can help predict which heart failure patients would be readmitted to the hospital within 30 days after discharge.

The tool is accessible via the web or apps for Android and Windows smartphones and other mobile devices. The patient or a caregiver enters demographic and basic clinical data — eg, age, gender, length of previous hospital stay, blood pressure, and existence of other diagnosed diseases such as diabetes or history of stroke. Unlike other readmission-risk calculators, the Risk-o-Meter is able to work even when the patient's data are incomplete. For example, if a patient does not know his or her blood pressure, this submission can be skipped.

The Risk-o-Meter compares the patient's submitted information against millions of records of other patients available in the data network. The tool then displays a number which represents the percentage chance the patient will be readmitted to the hospital within 30 days. The number is colour-coded: green for low risk, yellow for medium risk, red for high risk. Importantly, the patient can review the risk factors that lead to that prediction, and what steps can be taken in order to lessen the risk.

The Risk-o-Meter project began when MultiCare, the South Sound's largest hospital and healthcare organisation, approached UW Tacoma's Center for Data Science (CDS) to help analyse MultiCare's readmission cases for heart failure patients. Given the massive amounts of multifaceted data related to those patients, MultiCare wanted CDS researchers to examine these data to determine whether algorithms could be developed to help its clinicians predict which patients would be most likely to require readmission within 30 days.

In an UW Tacoma story about the project, CDS director Dr. Ankur Teredesai said, "The motivation to use data mining on health care data emerged from a series of discussions in the classroom with students who were already working or interning at MultiCare. We started exploring predictive modelling on clinical data and soon had breakthrough ideas."

MultiCare's project team, led by Dr. Lester Reed, senior vice-president for quality, worked closely with CDS, helping to connect the researchers' ideas to the clinical side of the hospital system. Albert Marinez, MultiCare's director of information intelligence, provided critical insights into the types of data on heart failure patients being collected by the hospitals' IT systems.

In 2013, CDS's work received a boost through Microsoft's Azure for Research grant. "The access to cloud-computing infrastructure, running on Azure, allowed us to quickly scale to run multiple experiments simultaneously. This greatly accelerated our effort," according to David Hazel, managing director of CDS. Microsoft's cloud platform, Azure, is HIPAA compliant -- meaning the system meets legal requirements for the handling of protected medical data.

Both UW Tacoma and MultiCare are aware that innovative data analytics — the concept behind the Rock-o-Meter project — could benefit any hospital. "We are launching what we call 'readmission score as-a-service'," says Dr. Teredesai, riffing off the term 'software-as-a-service' used widely to describe cloud-based computing power. "This would enable anyone from healthcare providers to insurers to mobile app developers to connect to our service and use the bank of predictive models." Ultimately, the readmission score service concept could work for many chronic conditions, not just heart failure.

Source: [University of Washington Tacoma](#)  
Image credit: Pixabay

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