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Online tool aids clinicians' efforts to treat injured workers

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University of Alberta researchers have developed a new web-based tool to aid health professionals in determining the right treatment course for injured workers, helping them feel better and get back to work earlier.

Researchers used a form of artificial intelligence called machine learning to analyze injury and treatment records from Alberta's workers' compensation database to create a tool that recommends an appropriate course of rehabilitation. During early testing, the support tool actually outperformed clinicians.

"The goal of this tool, and all our rehabilitation strategies today, is to be able to help these people feel healthy again, participate in productive work and reintegrate into their jobs as quick as possible," said Doug Gross, an associate professor of physical therapy in the Faculty of Rehabilitation Medicine.

Gross' research is affiliated with WCB-Alberta Millard Health, a provider of occupational rehabilitation and disability management services. Much of his work focuses on finding new ways to ensure workers are physically on the right path to recovery—healing that also helps their emotional and financial well-being and the economy, he said.

"There are huge costs economically to the workers' compensation system, so we're constantly looking to improve health-care strategies to help these workers transition back to the workplace."

Computer algorithm at core of online tool

Gross teamed up with Osmar Zaïane, a professor of computing science in the Faculty of Science, to develop a computer algorithm that predicts a course of rehabilitation.

To do this, Zaïane's team relied on information from a provincial database of 8,611 workers who, after undergoing initial treatments, were referred for assessments to determine whether they were ready to return to work. The database contained details about injury types, rehabilitation methods, time between injury and rehabilitation, pain measures and overall outcomes, along with personal information such as age, sex, marital status, education and job status.

"For me, it was an obvious example of the type of approach we can do through machine learning," said Zaïane.

Every treatment recommended by the support tool was arrived at through a set of rules created using this historical evidence. "You can trust the tool's recommendations because you know how it made that decision and why."

The tool proved about 85 per cent accurate in recommending the right treatment—a success rate that was more reliable than assessments done by physical therapists, occupational therapists and exercise therapists. When patients are referred for treatments that don't result in a return to work, the machine considers it a mistake, Zaïane explained.

Currently, the tool is only being used to train students. Far more testing is required before it makes it into the hands of health professionals, with potential applications to train new staff and use in remote areas. But even then the goal isn't to replace clinicians, Gross said.

"This is about the clinicians making decisions and how we can help augment those decisions," he said. "We all make mistakes and do the best we can. We have different influences on our decisions and biases, and if there are tools out there that can help these health-care providers make better decisions, let's do it."

A study detailing their findings was published in the peer-reviewed *Journal of Occupational Rehabilitation*.

Provided by University of Alberta