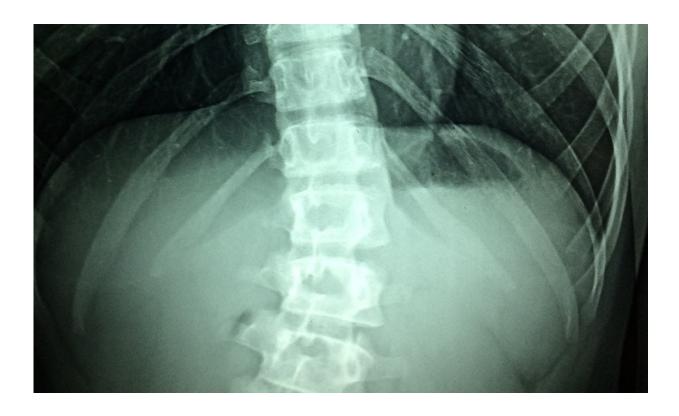# Researchers use novel imaging to predict spinal degeneration

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Research by a Barrow Neurological Institute neurosurgery team on novel imaging technique assessment of patients with lumbar spine degeneration was published in the Aug. 28 issue of *PLOS ONE*.

The research was conducted as part of an American-Russian

neurosurgery collaboration led by Dr. Mark Preul at the Barrow Neurological Institute's Neurosurgery Research Department and Dr. Vadim Byvaltsev, a leading Russian neurosurgeon, and Chief of Neurosurgery in Irkutsk, Russia at the Irkutsk Scientific Center of Surgery and Traumatology and Department of Neurosurgery, Irkutsk State Medical University.

Three years ago Drs. Byvaltsev and Preul secured the first-ever international [neurosurgery](#) scientific project funded by the Russian Science Federation and directed at the study of the degenerating spinal disc. Spinal disc degeneration is the world's most common medical diseases, and responsible for untold economic and social impact. Over the past months, 100 of Dr. Byvaltsev's [patients](#) were imaged in Irkutsk, and Barrow's Department of Neurosurgery Research was involved in data management and analysis.

A main cause for spinal disc degeneration is thought to be a change in the water content in the intervertebral disk. The team used a novel magnetic resonance imaging technique, called apparent diffusion coefficient (ADC) maps, which directly assessed the movements and dynamics of the water in the intervertebral disk and other spinal structures. The ADC maps provided precise assessments and correlations with degeneration.

"We're improving our understanding of one of the most common maladies to affect humans which is spinal disc degeneration. Imaging technology such as MRI ADC mapping will provide much greater and improved information to the physician treating patients with degenerated disc and other degenerative spine conditions," says Dr. Preul.

In further research, Dr. Evgenii Belykh, the leading research fellow on the project stated, "The imaging findings are being compared with the histology and biomarkers of disk degeneration that will eventually help

to recognize and predict the disease earlier, and help to choose the best treatment option for each patient." The research initiative will image larger numbers of patients to confirm and investigate further applications for ADC mapping in the spine.

Provided by St. Joseph's Hospital and Medical Center

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