

Researcher unveils new approach to treat lower back pain

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Using a branch of science that crosses disciplines to study complex problems, a Michigan State University researcher is introducing a new way to understand and treat lower back pain, a condition affecting more than 40 million Americans and costing billions of dollars each year.

N. Peter Reeves, a researcher in Osteopathic Surgical Specialties in MSU's College of Osteopathic Medicine, is studying the [spine](#) using systems science, which became popular in the early 20th century. With a systems approach, it is possible to study complex systems in a way that not only includes their parts but also how the parts interact to affect the entire system.

"The attractiveness of the systems approach is that it allows the research community to share results and integrate data to provide a coherent picture of the spine system, which in turn can be used to better diagnose and treat [back pain](#)," Reeves said.

The problem with current clinical approaches is they focus on a reductionist method, in which a medical problem is broken down into smaller parts to isolate elements of the condition, Reeves said.

Reeves recently presented his research at an international back pain symposium in Brisbane, Australia. The meeting brought together about a dozen of the top spine researchers across the world to discuss differing opinions and models on managing back pain and understanding spinal control.

As part of the symposium, each attendee presented his research and models, with the hopes of reaching agreement among the clinical and research community.

"With this approach, it will be possible to address some long-standing research questions," Reeves said. "The first step is to present the concepts inherent to systems science so that a common understanding can be formed in the spinal research community."

Reeves attended the symposium with Jacek Cholewicki, a colleague in Osteopathic Surgical Specialties who helped coordinate the Australian meeting. In addition, Reeves is working closely with researchers in MSU's College of Engineering on developing equipment to test the approach.

Adopting the systems science approach is vital moving forward, he said.

"Back pain research is at a crossroads," said Reeves, who is establishing a Center for Spine System-Science at MSU, which will bring together top researchers from across the world. "There are a lot of questions that need to be addressed, and we need the right framework to answer them."

Currently, Reeves and colleagues are developing systems science methods to integrate data obtained from the testing of cadaver spines and muscular control of live subjects. The next step is to define the spine as a complete system, meaning researchers can predict the response of the system to any type of disturbance or evaluate the system to various forms of impairment (degenerative disc disease or muscle wasting common with low back pain).

"The spine is extremely complex; you cannot fully appreciate medical conditions without looking at the big picture," he said. "If you were building a new airplane, it would be impossible — and dangerous — to

design the parts of the plane in isolation and not considering how these individuals parts would interact with one another. The spine is no different."

Source: Michigan State University ([news](#) : [web](#))

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