Michigan State University researchers use innovative technology to diagnose and treat head, neck pain

http://www.firstlight.cn 2007-04-06

March 29, 2007,EAST LANSING, Mich. — While some health conditions are relatively easy to diagnose using standard techniques such as X-ray or MRI, getting to the root of head and neck pain often remains elusive.

However, researchers at Michigan State University are developing some new technology – advanced motion measurement computer technology – that could someday diagnose and treat patients with head and neck pain.

The work brings together the biomechanical engineering expertise of Tamara Reid-Bush, a visiting professor of mechanical engineering in the MSU College of Engineering, and the medical expertise of Joseph Vorro, a professor of family and community medicine, in the MSU College of Osteopathic Medicine.

“ Our work together enables manual medicine to fully utilize technological advances that were not available to us in the early stages of this research,” explained Vorro.

Manual medicine uses different manipulative techniques and applications of osteopathic philosophy to diagnose and treat the musculoskeletal and other systems of the body.

The research team, which also includes Robert Hubbard, an MSU professor emeritus of mechanical engineering, has created new protocols and procedures that can track head and neck movement in 3-D space.

This tracking, called kinematic analysis, involves six sensors that are attached to a patient’s head and neck area. As the patient tilts his or her head to the left or right, the sensors tell the computer what degree the head is bending and how much rotation the head has.

Bush and Vorro then use the data to graph a patient’s results, comparing and contrasting his or her movements with those of a control group. The end goal is to compare pretreatment results to posttreatment results and determine if a patient has improved the ability to turn his or her head from side to side.

“ We have received solid indications from our data that we are on the right path with our research,” said Bush. “This simple difference we have been finding between our control group of patients, patients with pain, and patients who are pain free has never been explained before.”

“ We hope,” added Vorro, “that our testing can become the ‘gold standard’ for diagnosis.

Also taking part in the project are Sherman Gorbis, an MSU associate professor of osteopathic manipulative medicine, and Gordon Alderink, a professor of physical therapy at Grand Valley State University.

Participants were recruited from the community and from the MSU student group, Student Osteopathic Medical Association. Currently, there are approximately 60 subjects.

“ Our ultimate goal is to create objective measures for diagnosis and treatment of head and neck pain,” said Bush. “We currently are seeking further funding from MSU to support our research and plan to apply for a grant from the National Institutes of Health.”

The project has received $5,000 in seed money from the College of Osteopathic Medicine and $10,000 from the American Academy of Osteopathy.

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