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NEWS

RSNA Press Release

Aching Back? Sitting Up Straight Could Be the Culprit

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At A Glance

- Reclining backward in a 135-degree position constitutes optimal sitting posture.
- Positional MRI allows patients free range of motion during imaging, as opposed to traditional MRI, where the patient must lie flat.
- Back pain is the leading cause of disability in the United States and a major cause of missed work days.

CHICAGO — Researchers are using a new form of magnetic resonance imaging (MRI) to show that sitting in an upright position places unnecessary strain on your back, leading to potentially chronic pain problems if you spend long hours sitting. The study, conducted at Woodend Hospital in Aberdeen, Scotland, was presented today at the annual meeting of the Radiological Society of North America (RSNA).

"A 135-degree body-thigh sitting posture was demonstrated to be the best biomechanical sitting position, as opposed to a 90-degree posture, which most people consider normal," said Waseem Amir Bashir, M.B.Ch.B., F.R.C.R., author and clinical fellow in the Department of Radiology and Diagnostic Imaging at the University of Alberta Hospital, Canada. "Sitting in a sound anatomic position is essential, since the strain put on the spine and its associated ligaments over time can lead to pain, deformity and chronic illness."

Back pain is the most common cause of work-related disability in the United States, and a leading contributor to job-related absenteeism, according to the National Institute of Neurological Disorders and Stroke. By identifying bad seating postures and allowing people to take preventative measures to protect the spine, Dr. Bashir and colleagues hope to reduce back strain and subsequent missed work days.

"We were not created to sit down for long hours, but somehow modern life requires the vast majority of the global population to work in a seated position," Dr. Bashir said. "This made our search for the optimal sitting position all the more important."

The researchers studied 22 healthy volunteers with no history of back pain or surgery. A "positional" MRI machine was used, which allows patients freedom of motion—such as sitting or standing—during imaging. Traditional scanners have required patients to lie flat, which may mask causes of pain that stem from different movements or postures.

The patients assumed three different sitting positions: a slouching position, in which the

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body is hunched forward (e.g., hunched over a desk or slouched over in front of a video game console); an upright 90-degree sitting position; and a "relaxed" position where the patient reclines backward 135 degrees while the feet remain on the floor. Measurements were taken of spinal angles and spinal disk height and movement across the different positions.

Spinal disk movement occurs when weight-bearing strain is placed on the spine, causing the internal disk material to misalign. Disk movement was most pronounced with a 90-degree upright sitting posture. It was least pronounced with the 135-degree posture, indicating that less strain is placed on the spinal disks and associated muscles and tendons in a more relaxed sitting position.

The "slouch" position revealed a reduction in spinal disk height, signifying a high rate of wear and tear on the lowest two spinal levels. Across all measurements, the researchers concluded that the 135-degree position fared the best.

As a result, Dr. Bashir and colleagues advise patients to stave off future back problems by correcting their sitting posture and finding a chair that allows them to sit in an optimal position of 135 degrees.

"This may be all that is necessary to prevent back pain, rather than trying to cure pain that has occurred over the long term due to bad postures," he added. "Employers could also reduce problems by providing their staff with more appropriate seating, thereby saving on the cost of lost work hours."

Co-authors are Tetsuya Torio, M.D., Malcolm Pope, Ph.D., Keisuke Takahashi, M.D., and Francis W. Smith, M.D.

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