# Less Time, Same Results: A New Focused Protocol for Magnetic Resonance Imaging in Presumed Idiopathic Scoliosis

Robert Gomez, Nigel Wang[1], Trevor Luck, David Jessen, Dustin Adam Greenhill[2]
[1]St. Luke's University Hosptial, [2]St. Lukes University Health Network

INTRODUCTION: Although not always mandatory for idiopathic scoliosis, magnetic resonance imaging (MRI) may be indicated to rule out non-idiopathic findings. Many institutions and insurance companies require physicians to prescribe and obtain approval for three separate MRIs to visualize the entire spine (cervical, thoracic, and lumbar). This study aims to investigate the clinical efficiency of a newly developed focused MRI protocol that was created specifically to evaluate presumed idiopathic scoliosis.

METHODS: Patients aged ≤ 21 years old with presumed adolescent idiopathic scoliosis (AIS) who scheduled an MRI between September 2021 and December 2023 under the care of a fellowship trained pediatric orthopedic surgeon were retrospectively reviewed. Exclusion criteria included incomplete records or concomitant anesthesia. Patients either received separate prescriptions for cervical, thoracic, and lumbar MRI (traditional protocol) or underwent a new focused MRI protocol that was created with altered resolution expectations to visualize clearly atypical anatomy and rule out a Chiari malformation, syringomyelia, or tethered cord. Demographic information, number of days needed for imaging, appointment check-in and check-out times, and MRI findings were recorded.

RESULTS:

Among 41 included consecutive patients, the initial 21 underwent three separate MRIs while the following 20 utilized the new focused protocol. Average Cobb angles were 62.2º ± 15.4º and 60.2º ± 20.3º in the traditional versus the focused MRI protocol groups ($p = 0.733$), respectively. Patients in the focused protocol group were younger (13.9 versus 15.6 years, $p < 0.001$), took less days until imaging was complete (1.0 versus 1.5, $p<0.001$), reserved less appointment slots (1 versus 3, $p<0.001$), had shorter visit durations (61 minutes versus 89 minutes, $p<0.001$), had less aborted imaging exams due to anxiety (0% versus 16%, $p<0.001$), and less insurance denials warranting peer-to-peers (0% versus 14.3%, $p<0.001$). There was no difference in the rate of abnormal findings (30.0% versus 23.8%, $p=0.655$). In the focused MRI cohort, syringomyelia was identified in two patients and miscellaneous abnormalities were identified in four patients (hip cyst, large ovarian cyst, and a brain stem lesion).

DISCUSSION AND CONCLUSION: A focused MRI protocol for presumed idiopathic scoliosis decreases a child's time in the MRI bore, minimizes required outpatient appointment slots, and potentially lowers the rate of aborted imaging exams without sacrificing the ability to detect pathology.