Nemours Children's Health Study Finds Limited Benefit in Replacing Magnetically Controlled Growing Rods for Children with Scoliosis

Most benefit comes from the first set of rods, suggesting some patients can be spared a second costly procedure

WILMINGTON, Delaware (July 22, 2025) — Many patients with early-onset scoliosis spend several years with growing rods implanted on their spines. A new study led by a Nemours Children's Health researcher suggests that for patients with magnetically controlled growing rods, the first set provides the greatest benefit, and replacements are associated with poorer correction of spine curvature.

For the past decade, physicians have been using magnetically controlled growing rods (MCGR) as a noninvasive alternative to traditional growing rods. MCGR technology allows doctors to stabilize the spine through computer-controlled magnets placed on the patient's skin, allowing the patient to continue growing for what could be years, before undergoing spinal fusion surgery. However, in about one-third of cases, MCGR rods must be replaced due to breakage or failure to achieve desired length.

A study recently published in *Spine Deformity* evaluated 39 cases of patients with early-onset scoliosis, 13 of whom received MCGR replacement.

The researchers found that patients who received MCGR replacement grew more than those who did not—an average of 61 millimeters vs. 47 millimeters. Most of the growth occurred with the first set of rods: The patients grew an average of 21 millimeters with the first set, and 16 millimeters with the second set. Only two patients experienced greater lengthening with the second set of rods.

Furthermore, major curve correction at the time of definitive fusion surgery was significantly less in the replacement group (approximately 7 degrees) compared with the group who did not (approximately 12 degrees).

"Given that implanting another set of MCGR has physiological and psychological effects on patients, and also entails additional cost, indications for MCGR replacement should be carefully considered," said study author Suken A. Shah, MD, the Shands/MacEwen Endowed Chair of Orthopedics and Chair of the Department of Orthopedic Surgery at Nemours Children's Health, Delaware Valley. "The diminishing effectiveness of replacement rods could be because the spine grows more rigid over time. This study calls into question the efficacy of replacing MCGR."

The study also showed that patients who had received MCGR replacement showed less improvement following their definitive spinal fusion surgery than patients who had not had the rods replaced. Patients who had MCGR replacement experienced 51% improvement in their major curve, compared with 65% improvement among the patients who did not have MCGR replacement.

Shah added that while the study size was small, the results are significant enough to potentially change practice.

"Our findings suggested that perhaps we should consider conversion to traditional growing rods or see if the child is appropriate for conversion to a final fusion," Shah said, noting that the patient's age and estimated growth potential are primary considerations in making this decision.

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About Nemours Children's Health

Nemours Children's Health is one of the nation's largest multistate pediatric health systems, which includes two freestanding children's hospitals and a network of more than 70 primary and specialty care practices. Nemours Children's seeks to transform the health of children by adopting a holistic health model that utilizes innovative, safe, and high-quality care, while also addressing children's needs well beyond medicine. In producing the highly acclaimed, award-winning pediatric medicine podcast Well Beyond Medicine, Nemours underscores that commitment by featuring the people, programs and partnerships addressing whole child health. Nemours Children's also powers the world's most-visited website for information on the health of children and teens, Nemours KidsHealth.org.

The Nemours Foundation, established through the legacy and philanthropy of Alfred I. duPont, provides pediatric clinical care, research, education, advocacy, and prevention programs to the children, families and communities it serves. For more information, visit Nemours.org.

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