

Study Affirms Benefit of Back Braces as Scoliosis Treatment

By [CATHERINE SAINT LOUIS](#)

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A new study provides the best evidence yet that wearing a back brace will slow the progression of the most common form of scoliosis in adolescents, helping them avoid painful spine surgery.

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Daniel Acker for The New York Times

Maddie Houser, 13, at home in Iowa City with the brace she wore for three years. Her mother, Becky, was opposed to surgery.

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A back brace worn by Maddie Houser, now 13, who wore baggy tops and yoga pants to school to accommodate it.

Physicians have recommended bracing for more than 50 years, but until now, studies of its effectiveness had produced mixed results. The United States Preventive Services Task Force recommended against scoliosis screening in schools partly on the grounds that [there was insufficient evidence](#) that bracing and other conservative treatments relieved back pain or improved quality of life in these children.

The [new randomized study](#), published on Thursday in The New England Journal of Medicine, should end the longstanding debate, several experts said, and may spur the task force to reconsider its position.

The trial is “very convincing,” said Dr. B. Stephens Richards, a pediatric orthopedic surgeon at Texas Scottish Rite Hospital in Dallas. “It scientifically proves that brace treatment works for adolescents with scoliosis who are at risk of curve worsening to the point of needing surgery.”

Adolescent girls are more likely than boys to have idiopathic scoliosis, or curvature of the spine from no known cause. Rigid bracing is worn to restore spine alignment by external force.

It is a demanding treatment at a vulnerable time of life.

“When you have a teenager who is anxious about wearing a brace to school or what their friends will think, it gave us a bit of heartache to try to convince them if we weren’t certain ourselves,” said Dr. Paul D. Sponseller, the director of orthopedic surgery at Johns Hopkins Children’s Center, who was not involved in the study. “In light of this new evidence, we can say we really do have a basis for putting them through bracing.”

In the study, researchers analyzed data on 242 patients at 25 sites across the United States and Canada. The children were all aged 10 to 15 and still growing, and they all had a spinal curvature of 20 to 40 degrees.

Of those patients, 116 were randomly assigned to observation or bracing for at least 18 hours daily. Because too few families agreed to randomization, the researchers added a group of 126 adolescents who chose for themselves between bracing and observation.

Bracing was deemed a failure if spinal curvature progressed to 50 degrees or more, a point at which surgery is often suggested. It was deemed a success if the child achieved skeletal maturity without this degree of curve progression.

The trial was stopped early because of the apparent efficacy of bracing.

In the analysis that included both groups, the rate of treatment success was 72 percent among children with bracing, compared with 48 percent among those under observation. The benefit increased the longer bracing was worn. More than 90 percent of the children who were successfully treated wore their braces more than 13 hours a day.

Dr. Richards, the immediate past president of the [Scoliosis Research Society](#), said the study’s strengths were the inclusion criteria, limited to adolescents most at risk for spinal curve progression, and the use of a high-tech, temperature-sensitive device in the braces to measure compliance objectively.

“There were a lot of doctors like me who treat scoliosis as the primary focus of their practice who had doubts about whether bracing was effective,” said Dr. Stuart L. Weinstein, the lead author of the study and a professor of orthopedic surgery at the University of Iowa. “Now the jury is in.”

Bracing has been the standard of care since the 1940s. It took so long to perform a rigorous trial of its effectiveness not only because it was “a gargantuan task,” said Joe O’Brien, the president of the [National Scoliosis Foundation](#), but also because parents did not want to “just sit there and wait and watch.”

Such a study raised moral challenges, too. “Ethically, you have to accept that some patients will be randomized to not using a brace, and your presumption is they will end up needing surgery,” said Dr. John T. Smith, a professor in the orthopedics department at the University of Utah.

When her daughter Maddie was given a scoliosis diagnosis at age 10, Becky Houser, of North Liberty, Iowa, wanted to avoid surgery “at all costs.” So Maddie, a participant in Dr. Weinstein’s study, chose to wear a brace.

“We didn’t want to not do anything,” said Mrs. Houser, who manages rental properties. Thirty years ago, she underwent surgery for scoliosis herself, spending three weeks in a hospital and nine months in an upper-body cast.

After three years of wearing baggy tops and yoga pants to school to accommodate the brace, Maddie, now 13, was thrilled to learn that her spinal curvature was holding steady at 28 degrees. With no more major growth spurts left, she no longer needs bracing.

“We are extremely relieved,” Mrs. Houser said.

A common surgical treatment, spinal fusion, entails putting screws and rods in the spine to straighten it. The procedure has greatly improved, but young patients still face risks like infection, bone healing problems and, rarely, paralysis.

Despite the apparent success of bracing, the study did not pinpoint which children are most likely to benefit from it. Indeed, the researchers found that outcomes were successful in 41 percent of the intervention group even though they seldom wore the brace.

Conversely, Erica Shumaker, a high school freshman in Tipton, Iowa, wore her brace 22 hours a day while participating in the study. Yet her spinal curvature progressed, and she is likely to need surgery.

“Her brace isn’t helping as much as they thought it would,” said her father, Rick Shumaker. “But there’s nothing we would do any different.”

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