

Barnstable boy prepares for innovative scoliosis surgery

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This month, an 11-year-old Barnstable boy will become one of the first children to undergo an innovative surgery for scoliosis in a Massachusetts hospital.

If all goes well, **Nathan Winslow**, a sixth-grader at the Horace Mann Charter School, can say goodbye to the hard plastic brace that circles his middle, and which he was supposed to wear until he was 19 years old.

"It's 23 hours a day, seven days a week," Nathan's mother, Cara Winslow, said about the "Boston brace" that corrects Nathan's mild curvature of the spine.

And even with the brace, there was still an 80 percent chance that Nathan, who promises to be a tall young man, would still have to have surgery to fuse his vertebrae together to correct the spinal curve, Mrs. Winslow said.

Surgeons are hoping to prevent Nathan from having to go that route by performing a less invasive technique called a vertebral body stapling, which was pioneered at Shriners' Hospital for Children in Philadelphia.

During the operation, scheduled for Monday at Children's Hospital in Boston, surgeons will use metallic staples to connect vertebrae, crimping them on one side to leave room for the other side to grow and straighten out.

Dr. Randal R. Betz, who helped pioneer the technique in Philadelphia, is traveling to Massachusetts for Nathan's surgery. He said in an orthopedics journal that braces fail to completely control mild scoliosis up to 50 percent of the time.

The brace itself is somewhat limiting. Children have to take it off to play sports - and they don't always want to put it back on.

"Active kids who are facing years of bracing treatment and are either unwilling or unable to tolerate bracing are the reason we are so committed to finding an acceptable alternative," Janet L. Cerrone, a physician assistant at Shriners', wrote in an e-mail.

One issue with Nathan, whose spine had a curve of 38 degrees when he was placed in a brace this summer, is that he is expected to grow quite tall, Mrs. Winslow said.

"They were not very optimistic about the brace working for him," Mrs. Winslow said. "The brace will not give him any correction. With the stapling, they're hoping to straighten him out."

Cases of mild to moderate scoliosis and those concentrated in the chest-thorax as well as lumbar area respond well to vertebral body stapling, said Dr. M Timothy Hresko, of Children's Hospital in Boston, who will be on operating on Nathan with Betz.

"It's a smaller deal, easier recovery" than fusion surgery, Hresko said.

During the operation, Nathan will lie on his side, and one of his lungs will be temporarily deflated to allow the surgeons room to insert the staples.

The staples are made of Nitinol, known as a "shape-memory metal" for its ability to change shape according to temperature.

The prongs of the staple will be kept straight in a basin of cold water as Nathan is prepared for surgery. When the inch-wide staples are clamped onto the bone, the body's temperature will cause them to curve into a C.

The surgeon will straighten out the spine when the patient is relaxed under anesthesia and with each staple clamp together two vertebrae on the side the bones are bowing out, Cerrone said. This should correct the

curve and keep it from getting worse.

Use of staples in orthopedic surgery isn't new, but previous attempts to use them to treat scoliosis failed because the prongs broke off. Memory metal, an alloy of nickel and titanium developed by the aviation industry, is better at accommodating the motion of the spine, Cerrone said.

Nathan's surgery, expected to last about two hours, will leave him with 2-inch incisions under his armpits. His lung will be re-inflated after surgery, and he'll have a chest tube for about two days to drain any excess fluid.

Another child is being operated on the same day, said Hresko, who believes the surgery is a first for Massachusetts.

"Several doctors in Philadelphia are doing this procedure, and other pediatric orthopedists from Atlanta, Chicago, St. Louis, Los Angeles and now Boston (to name a few) have learned from Dr. Betz," Cerrone said.

Pneumonia is a risk from the surgery and one that the medical staff will be looking for, Hresko said. "Most children and adolescents with scoliosis are generally healthy, so risks of surgery are minimal," Cerrone said.

Nathan will go home from the hospital four or five days after his surgery and is not expected to need any physical therapy.

"In six weeks, he'll be able to go back to playing hockey and snowboarding - everything he likes to do," Mrs. Winslow said.

There's still a chance Nathan may need fusion surgery when he is a teenager. "But at least he's had four years not living in the brace," Mrs. Winslow said.

"Should the stapling not succeed in arresting the curve progression, the patient is still able to have a spinal fusion with no adverse effects from having had the stapling," Betz said in an e-mail.

For Nathan, the operation should restore the range of movement that is somewhat restricted by the hard plastic brace.

"You can't stretch when you sleep" in the brace, said Nathan, who has an older brother and younger sister.

And every time he eats at school, the nurse has to loosen the brace to allow his stomach room to expand.

"It would be kind of weird to have to go to the nurse's office every day until you're 19," Nathan said.

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Caption:
Nathan Winslow

Eleven-year-old **Nathan Winslow** soon will be the first child in Massachusetts to have new vertebral stapling surgery to correct scoliosis.



A graphic representation of the vertebral stapling procedure.



An X-ray shows a spine with metallic spine staples in place, just as Nathan's will be after he undergoes vertebral stapling surgery next week.



Nathan Winslow, 11, relaxes at his Cummaquid home with his mom, Cara, and sister, Emily.



Cape Cod Times / Ron Schloerb

What is scoliosis?

A disorder in which the spine curves in an S or C shape. The cause is unknown, but the disorder can run in families.

Who gets scoliosis?

People of all ages, but it most commonly occurs in children ages 10 to 12 and in young teenagers. Girls are more likely to get it than boys.

How is scoliosis treated?

The doctor may recommend the patient wear a brace, have fusion surgery or - in a recent development - undergo vertebral body stapling. Fusion surgery is considered the most invasive treatment because a surgeon fuses together two or more bones in the spine and may also install a metal rod. In some cases, the doctor doesn't recommend treatment but keeps a close eye on the curve.

Source: National Institutes of Health

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