

A little device making a big difference

OSF HealthCare Newsroom

Shelli Dankoff – Media Relations Supervisor

Journey Lindstrom weighed barely over three pounds when she was born prematurely at 34 weeks gestation. Among other complications, she had a patent ductus arteriosus (PDA), which meant there was a hole that didn't close between her aorta and the pulmonary artery. All babies have a PDA at the time of birth, and it typically closes in full-term babies. But in preterm babies, it's still there until they've reached term and then it's supposed to close. When it doesn't, these babies are fighting an even bigger uphill battle.

"It can cause them to have respiratory distress, be on a ventilator for a long time. It can cause feeding problems, necrotizing enterocolitis, it can cause chronic lung disease, it can cause - at times - pulmonary vein stenosis because of increased flow to that particular lung from the PDA itself," explains Priti Patel, M.D., a pediatric cardiologist with OSF HealthCare Children's Hospital of Illinois.

Journey's PDA did not close on its own and that caused her heart to start failing when she was just two weeks old. She had difficulty feeding and breathing and was facing other challenges. It was a scary time for her parents.

"After that we found out she had more holes in her heart than we originally had known about but they were really small. We had stayed in the hospital for 10 weeks. She had the PDA which was still not closing, they tried two weeks-worth of medication to try to close it - it didn't close. Then Dr. Patel had told us about this Piccolo device," remembers Heather Lindstrom, Journey's mother.

The Piccolo device was approved by the U.S. Food and Drug Administration (FDA) in 2019 for use in premature babies. Less than the size of a pencil eraser at four millimeters, it's one of the smallest devices that can be used to close a PDA. It doesn't require surgery but is fed through a vein in the leg into the heart. After thoroughly vetting it to make sure it was safe, doctors at OSF HealthCare Children's Hospital of Illinois in Peoria used the Piccolo device to fix Journey's heart in 2021 when she was less than two months old.

"Because their heart is so small, it's almost the size of a peanut trying to get through there. And doing the procedure would run the risk of damaging the tricuspid valve. So I wanted to make sure that they were not reports of too many problems or complications with it before doing it here," says Dr. Patel.

"Almost immediately after she had the surgery, you'd notice the difference of her feeding and stuff like that. She was breathing easier and wasn't as tired and she went from eating just a couple of mils to eight to 10 and then all sudden just kept going up from there. I can't believe this little thing did all this for us," says Lindstrom.

Adds Dr. Patel: "We were able to successfully close her PDA using the one of the smallest devices that we have. And then after that she was able to feed by mouth did not need the NG and she went home and she's doing well and she's doing great. We were able to do it through the vein, we did not even access the artery in her case, because of the risk of causing a clot or anything in the artery. So that's why we did it with just the femoral vein."

OSF Children's Hospital is one of a limited number of centers – and the only one in downstate Illinois – to offer the Piccolo device (Journey and her family live in East Moline, Illinois and make the trip to Peoria.). Doctors have performed five such procedures to date, one on a baby weighing just over 1.5 pounds. It takes an entire team of caregivers for the procedure to be successful.

"It's definitely not (something) you can get anywhere in the country. It has to be a good setup like we have here. You have to have cardiologists who are trained with the procedure and we certainly do have that at OSF," says Subhrajit Lahiri, M.D., also a pediatric cardiologist with OSF Children's Hospital.

"The procedure is actually very safe. In fact, what the studies have shown that if you're using a Piccolo device, the smaller the child is, the safer it is. And the reason being this PDA the one we close, get short with age. So the longer the duct is we have more room to put the device in and when they get bigger, they actually get smaller."

In the past doctors would have to use a surgical option to treat neonates with PDAs, and that can come with other potential complications. Doctors say placing the Piccolo device is a quick procedure with a fast recovery getting the baby back on track and growing.

"When I started my career, we didn't have this device. So it was always a struggle for the child for the team what to do now because we have a PDA it's bothering the child we can't move on. We can get surgery, but you of course think about the consequences of recovery. And now when I see the device and being able to use it in the small children, I think it makes a big difference for not only for the child of course for the child and also for us in having this option easily available and as a safe option," says Dr. Lahiri.

"We can help those babies so that they can come off the ventilator sooner be able to feed sooner, because the PDA does cause a lot of complications from that standpoint. So it is very exciting for us and for the parents," add Dr. Patel.

Journey is now 15 months old and her mom says she is a typical toddler. She says nothing slows her down and Journey is as silly, fun and loving as they come. Although she is still tiny, Heather says Journey epitomizes the saying "big things come in small packages!" She enjoys being in the pool, playing fetch with the family beagle, chasing her big sister around, and will soon become a big sister herself.

As for other parents who might be facing a similar situation or might be hesitant to try the Piccolo, Heather has this advice:

"100% do it, I mean, she's just doing so great and it was so fast. I was really losing hope that we would ever get to leave the NICU, but it was just such a quick turnaround. And she's doing amazing!"

Learn more about the congenital heart program at [OSF Children's Hospital of Illinois](#).