# Ductus arteriosus stenting could help severely ill infants with pulmonary arterial hypertension

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Treatment for infants who have severe pulmonary arterial hypertension (PAH) is sometimes limited. Because they haven't physically matured, a

procedure could increase the risk of serious complications, including failure of the heart's right ventricle.

A Boston Children's Department of Cardiology study has found an interventional therapy that's potentially safe and suitable for those critically ill small infants: the placement of a transcatheter stent in the heart's ductus arteriosus. The study shows it can improve right ventricle function and open the door to PAH treatment.

"This is a technique that could be successful and used for this group of patients," says Mary Mullen, MD, Ph.D., director of Boston Children's Pulmonary Hypertension Program and the principal investigator of the study, which was published in *Pediatric Cardiology*.

## A piece of the heart helps deliver PAH treatment

PAH is rare in infants, but it has a high mortality rate for young, high-risk patients. It's difficult to manage the condition because of its severity and how it is connected to other serious conditions, including congenital heart disease (CHD), developmental lung disease, and genetic syndromes.

Interventional therapies such as surgery or a Potts shunt can decompress the right ventricle and maintain cardiac function despite severely elevated pulmonary artery pressure, Mullen says. But those treatment options aren't always safe or effective for severely ill infants.

Wanting to find a way to treat those children and reduce the risk of mortality, Mullen and seven Boston Children's colleagues—including the study's lead author, Jason Kerstein, MD—reviewed the records of nine patients who were 2 years old or younger when they had ductus arteriosus stenting for acute PAH sometime over the past 10 years. This type of stenting isn't new, but it's not commonly used, either.

The Boston Children's cardiologists who inserted the stents took advantage of the infants having an intact ductus arteriosus, the small connection between the pulmonary artery and aorta that eventually closes and atrophies as a child grows. Through catheterization, a stent opens the ductus arteriosus to "provide a pop-off" that decreases blood pressure between the aorta and pulmonary arteries and lessens strain on the right ventricle, Mullen says.

## Giving critically ill children time for further treatment

The health records showed the stent was successfully placed and lasted in eight of the nine infants. Five of the eight were discharged; one patient was still hospitalized when the study was finalized. The infants were all severely ill, high-risk patients. Some also had CHD or a congenital diaphragmatic hernia, and one had interstitial lung disease.

After the stent was placed, the infants needed constant monitoring and treatment for other health conditions, Mullen says. But the procedure, she says, did what it was intended to do: It improved right ventricle function and served as a bridge to when the infants could receive pulmonary vasodilator medicine to further treat PAH.

Further study is needed to solidify the type of patients who would be ideal for a ductus arteriosus stent. But Mullen says the research team believes infants with different types of PAH will see sustained improvement in RV function after the procedure.

"For these patients who are critically ill without, potentially, other options, it provides time by being a bridge to other treatment," she says. "It can help improve the right ventricle enough for other treatments to work and for patients to improve."

**More information:** Jason S. Kerstein et al, Transcatheter Ductus Arteriosus Stenting for Acute Pediatric Pulmonary Arterial Hypertension is Associated with Improved Right Ventricular Echocardiography Strain, *Pediatric Cardiology* (2023). DOI: 10.1007/s00246-023-03233-7

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