# [Midterm outcomes of right ventricular outflow tract reconstruction using the Freestyle xenograft.](https://www.ncbi.nlm.nih.gov/pubmed/30861318)

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**Take-Home Points:**

* This is study is a midterm analysis of Freestyle porcine aortic root conduit for RVOT reconstruction in pediatric and adolescent patients.
* Overall, the Freestyle conduit demonstrated excellent durability up to 10-years, especially in patients >10 years.
* Risk factors for earlier reintervention included age <10 years, weight <39 kg, smaller body surface area, and valve size 25 mm or less. Orthotopic versus heterotopic position was not a significant factor.



***Commentary from Dr. Jeremy Herrmann (Indianapolis), section editor of Congenital Heart Surgery Journal Watch:*** This report from Cook Children’s Healthcare System in Ft. Worth, Texas, analyzes outcomes of the Freestyle porcine aortic root (Medtronic, Inc., Minneapolis, MN) for right ventricular outflow tract (RVOT) reconstruction. The authors retrospectively evaluated 163 patients who underwent the procedure between 2002 – 2015 at their institution. Primary outcomes included survival and reintervention rates (surgery, transcatheter valve implantation, balloon valvuloplasty, or bare metal stent placement). The most common primary diagnoses included tetralogy of Fallot (57.1%), pulmonary atresia with ventricular septal defect (14.7%), and truncus arteriosus (10.4%). The median age was 12.2 years (IQR 6.4-16.4) and 40% of patients were <10 years old. The median weight was 39.0 kg (IQR 19.9-59.3). The median follow-up of 5.4 years (IQR 2.9-8), and there were 3 non-cardiac deaths during follow-up.

Thirty-eight (23%) patients required reintervention, and 84% of these were for conduit stenosis. Freedom from reintervention was 93.2% at 5 years and 48.4% at 10 years for the entire group, though these trends were likely heavily weighted by age group. For patients <10 years, the 10-year freedom from reintervention was only 18.0% compared to 82.6% for patients >10 years at time of conduit placement. Risk factors for earlier reintervention included age <10 years, weight <39 kg, smaller body surface area, and valve size 25 mm or less. Orthotopic versus heterotopic position was not a significant factor. No incidences of endocarditis were reported.

As with most reports regarding RVOT reconstruction options, this study faces limitations of being limited to only one institution and without including comparisons with other conduit options.

However, this report is one of the largest experiences with the Freestyle conduit to-date and offers meaningful mid-term follow-up of this conduit. The results of the present study suggest the Freestyle conduit is a durable option for RVOT reconstruction, especially in older pediatric patients.

The Freestyle conduit offers several advantages for RVOT reconstruction including stentless construction, ease of handling, and “off the shelf” availability of a wide range of sizes. In addition, its rigid structure may provide a suitable landing zone for future transcatheter pulmonary valve replacement if adequately sized. Oversizing the conduit is also helpful for accommodating any late anastomotic narrowing. While the technique of implantation (orthotopic versus heterotopic) did not significantly influence rate of reintervention, maintaining laminar flow through the RVOT may be important for long-term durability of any RVOT conduit. Determining which conduits fare better in different age groups remains a key question in congenital cardiac surgery, however.