mortality or hospitalizations in patients with FC.⁷ Maximal oxygen uptake evaluation becomes prognostic in FC when performed serially and reveals a decline over time.⁸

Beyond any prognostic ability, in ongoing research, the ability to keep up with peers physically has been identified as an important outcome to patients with FC. Given the dual importance of exercise capacity, it should continue to be used as a key outcome. This article by Patel and colleagues emphasizes the importance of long-term continuous clinical and hemodynamic evaluation of patients with FC. Ideally, in a prospective manner, with strict adherence to standardized CPET methodology. Predictors of decline in CPET measures and interventions to prevent decline and improve measures can result in great impact in directing care of patients with FC.

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Commentary: As we learn more, we know little

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The Fontan operation is the goal for patients with a single ventricle, and the procedure has undergone various modifications over the years. Originally introduced in 1990,¹ extracardiac conduit Fontan possesses some advantages such as improved flow dynamics, lower arrhythmias, and technically less challenging. Nonetheless, lack of growth potential and thrombogenicity are important drawbacks and lead to reinterventions. Patel and colleagues² have provided us with an important study looking at the intermediate outcome of the extracardiac Fontan. The authors studied

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CENTRAL MESSAGE

Optimal Fontan conduit size continues to be unknown.

165 patients undergoing the extracardiac Fontan by magnetic resonance imaging over a span of 6 years. The results were discouraging. The Fontan cross-sectional area decreased in at least one-third of patients as early as 6 months postoperation, although there was no change thereafter. They found that patients had smaller than normal pulmonary arteries and there was an absence of pulmonary

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artery growth relative to somatic growth after the Fontan procedure similar to what has been reported elsewhere.^{3,4} On the positive side, despite the decrease in conduit size and lack of pulmonary growth, cardiac index and exercise capacity were maintained.

Multiple authors have attempted to determine the optimal Fontan conduit size based on a variety of factors, such as energy loss, flow dynamics, and potential for conduit thrombosis, but finding an ideal size has been challenging.^{5,6} Most surgeons performing the extracardiac Fontan attempt to place the largest conduit a patient can accommodate, hoping that placing an oversized conduit will allow the patient to grow into their Fontan circulation. The objective, longitudinal magnetic resonance imaging data of the current study shows that our simple solution to the problem of providing growth potential for the extracardiac Fontan is futile. Instead, matching Fontan pathway to somatic growth will require a different strategy than extracardiac conduit oversizing. Possibilities for the future include novel biomaterials that allow for growth over time, or biologically

inert materials that can be remodeled by percutaneous interventions.⁷

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