



## Congenital Cardiology Solutions

### VENTRICULAR MORPHOLOGY OR FENESTRATION STATUS DOES NOT IMPACT EXERCISE CAPACITY IN FONTAN PATIENTS: A STUDY UTILIZING NEAR INFRARED SPECTROSCOPY

Poster Contributions

Poster Sessions, Expo North

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Authors: *Rohit Seth Loomba, Rohit Rao, Children's Hospital of Wisconsin/Medical College of Wisconsin Affiliated Hospitals, Milwaukee, WI, USA, Phoenix Children's Hospital, Phoenix, AZ, USA*

**Background:** Previous studies have demonstrated that fontan patients have decreased exercise capacity when compared to those with normal cardiovascular anatomy. Differences have also been noted within various subgroups of fontan patients, such as morphology of the single ventricle and whether the fontan conduit is fenestrated or not. This study investigates these trends utilizing noninvasive near infrared spectroscopy. It was hypothesized that those with left ventricular morphology and fenestrated fontans would have better exercise and NIRS profiles.

**Methods:** 50 fontan patients and 51 patients with normal cardiovascular anatomy were recruited for this study. NIRS probes were placed to obtain regional oxygen saturation (rSO<sub>2</sub>) from the brain and kidney. Readings were obtained at 1 minute intervals during rest, exercise, and recovery. A standard Bruce protocol was utilized with a 5 minute recovery period. Average rSO<sub>2</sub> for normal vs fontan patients, fenestrated vs unfenestrated fontans, and morphologic left vs right ventricle fontans were graphed to compare trends. Specific change in rSO<sub>2</sub> values from the brain and kidney between rest and peak exercise, rest and 2-minutes into recovery, rest and 5-minutes into recovery were then compared using independent t-tests. Similar analysis was then done with respect to the arterial-venous oxygen saturation difference

**Results:** When comparing normals to fontans, fontan patients had a statistically significant lower duration of exercise (9.3 minutes versus 13.2 minutes,  $p < 0.001$ ). There was no statistically significant difference in rSO<sub>2</sub> change or AV0<sub>2</sub> at the aforementioned time points. A small oxygen debt was also paid back to the brain in fontan patients after exercise. When comparing fontan patients with and without fenestration, there was no statistically significant difference in exercise time, rSO<sub>2</sub> change, or AV0<sub>2</sub> difference. When comparing fontan patients with a morphologic left or right ventricle, there were no statistically significant differences either.

**Conclusion:** Ventricular morphology and fenestration did not affect exercise duration or NIRS trends in exercising Fontan patients.