Implementing Resistance Training Into Pediatric Exercise: Single Ventricle Populations

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Key Points:

- **Resistance training is a safe exercise modality for children.**
- **The single ventricle (single chamber heart) population may receive large benefits from resistance training that improve quality of life.**

While once was thought of as a modality only for adults, resistance training has proven to be a reliable and safe mode of exercise for muscular strength and fitness in the pediatric population. Although now more readily accepted as a modality for healthy children, these trends have not been echoed for children with chronic diseases, yet evidence suggests that resistance training may provide similar benefits[1].

Exercise was once considered unsafe for pediatric special populations, such as congenital heart disease patients with single ventricle (chamber) anatomy. Any type of exercise was thought to put too much additional pressure on the reconstructed heart. Recent findings in pediatric research and adult congenital heart disease patients concerning resistance training makes a strong argument for the implementation of resistance training in pediatric diseased populations[2].

Figure 1: With proper guidance, resistance training in children can be an effective exercise modality that leads to health benefits, motor development, and psychological benefits (Photo source).

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Unlike a normal four chamber heart, single ventricle anatomy requires one ventricle to pump blood to the entire body and lungs before returning to the heart. This anatomy relies heavily on the use of peripheral muscles and the one-way valves in veins to continuously pump blood throughout the entire body[2]. Cordina et al. found that resistance training in adult populations with single ventricle anatomy resulted in an improvement of the heart function and pumping due to increased muscle mass. Children's Hospital of Wisconsin also found that an at home cardiac fitness program was safe for the single ventricle population ages 8-12[3]. With increasing literature supporting the safety of resistance training in children[4], weight training programs should be focused on this population.

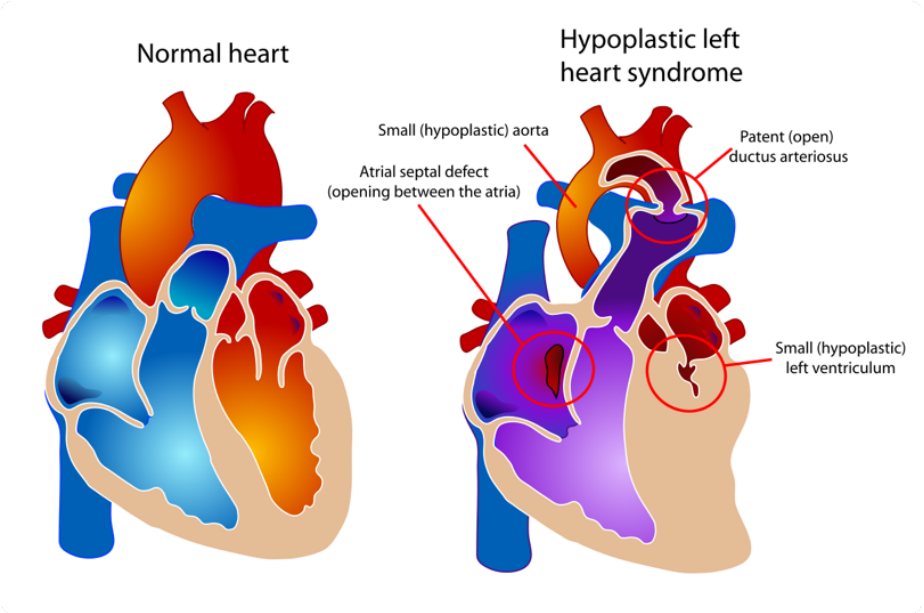

Figure 2: A single ventricle heart compared to a normal heart. (Photo source)

While concerns about the approach to resistance training exist for children, there are many options to approach resistance training in children that do not follow the normal routine of repetitions and sets using barbells and dumbbells. Resistance training can be disguised as play for children in the form of obstacle courses and activities that rely heavily on the use of the lower limbs. This type of exercise will not only increase muscular strength but help coordination and psychological development[1].

References

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