

**Right atrial enlargement in Children with Atrial Septal Defect or Pulmonary Hypertension with Congenital Heart Disease: comparison to normative values**

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**Objectives:** Right atrial (RA) size may become a very useful, easily obtainable, echocardiographic variable in patients with congenital heart disease (CHD) with right heart dysfunction, however according studies in children are lacking. We investigated growth related changes of RA dimensions in healthy children. Moreover, we determined the predictive value of RA variables in both children with secundum atrial septal defect (ASD) and children with pulmonary hypertension (PH) secondary to CHD (PH-CHD).

**Methods:** Prospective study in 516 healthy children, in 80 children with a secundum ASD (> 7 mm superior-inferior dimension), and in 42 children with PH-CHD. We determined three RA variables: end-systolic major-axis length, end-systolic minor-axis length, and end-systolic area, stratified by age, body weight (BW), length (BL), and surface area (BSA).

**Results:** RA end-systolic length and area z-scores were increased in children with ASD and PH-CHD when compared to those variables in the healthy control population. Using the Youden Index to determine the best cut-off scores in sex and age-specific RA dimensions we observed a sensitivity and specificity up to 94%, and 91%, respectively, in ASD children and 98%, and 94 %, respectively, in PH-CHD children.

**Conclusions:** Normal values for RA size, and area in a representative, large pediatric cohort are provided. Enlarged RA variables with scores > +2 were predictive of secundum ASD and PH-CHD. Echocardiographic determination of RA size can identify enlarged RAs in the setting of high volume load (ASD) or pressure load (PH-CHD).