

### **Three- Dimensional Echocardiographic Evaluation of Left Ventricular Systolic Dyssynchrony in Healthy Children**

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Introduction: Three- dimensional echocardiography (3DE) is a most promising technology enabling pediatric cardiologists to evaluate left ventricular (LV) systolic function in children. One important determining factor of LV systolic function is the degree of dyssynchronous myocardial contraction among the segments of the left ventricle referred to as left ventricular systolic dyssynchrony (LVSD). Validated reference values of LVSD parameters are needed. Previous pediatric studies did not provide reference values relevant for children aged <5 years due to small sample sizes, underrepresentation of children aged <5 years or a distribution varying from normal.

Methods: We used 3DE and QLAB for defining reference values for the systolic dyssynchrony index (SDI) and other LVSD parameters in healthy children aged 0 to 14 years. 35% (n= 33) of the children included in our study were aged <5 years. The three- dimensional images were provided by one sonographer and were analyzed by one reader.

Results: LVSD parameters of 93 children (53 male, 40 female, mean age 6.8 +/- 4.1 years) were included in the calculation of reference values. The mean SDI was 2.00 +/- 0.97. It showed a normal distribution and was found to correlate with age.

Conclusions: Including 33 children aged <5 years in the study revealed an age dependency of the SDI. We were able to define an upper limit of 3.94% (Z+2) for the SDI. Further studies should define age specific upper limits for the SDI, a meaningful parameter of LVSD.