



Normal Values, Patterns And Variability Of Mitral And Tricuspid Inflow Pulsed Doppler In Healthy Children And In Congenital Heart Disease With Right Ventricle Diastolic Dysfunction

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Background: Mitral (MV) and Tricuspid valve (TV) pulsed Doppler velocities and derived gradients are commonly evaluated during routinely echocardiographic examination but data on normal pediatric patients are still limited.

Aim: to establish nomograms for MV and TV Doppler in a large cohort of prospectively enrolled healthy children. Secondly, we aimed to evaluate Doppler patterns in children with congenital heart disease (CHD) characterized by right ventricular pressure overload (RVPO) shortly after surgical/percutaneous intervention

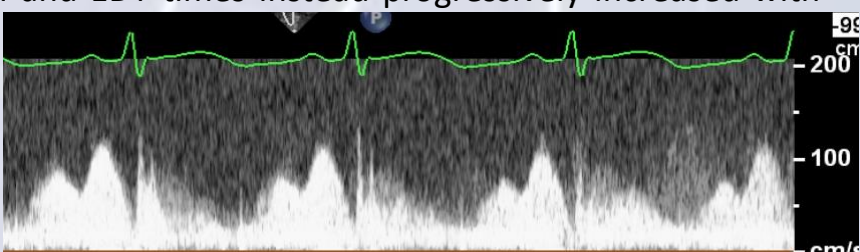
Methods: We gathered data from Echocardiographic measurements included pulsed Doppler MV and TV E and A velocities, E deceleration times (EDT), and maximal/mean gradients and time velocity integral (TVI) derived

Results: A total of 540 healthy subjects (median 6.4 years, IQR 2.4-10.0 years) and 45 CHD (27 pulmonary stenoses and 27 tetralogy of Fallot, median 4.7 months, IQR 0.3-13.36 months) within 36 hours after percutaneous/surgical intervention were included. Maximal velocities and gradients of both MV and TV were higher in neonates and infants ($p < 0.001$), while mean velocities and gradients were lower ($p < 0.001$), with values stabilizing after 2 years of age. VTI and EDT times instead progressively increased with age ($p < 0.001$).

Both for the MV and TV, E/A pattern varied greatly among age groups, and inversion within consecutive beats was quite common, especially for the TV. Compared with age-matched controls, in CHD MV and TV variability in E, A velocities, EDT times were reduced and E/A pattern inversion within consecutive beats was absent.

Conclusions: We report values and patterns for MV and TV inflow Doppler from a large population of healthy children, and we compared these data

with MV and TV doppler spectrum, velocities and gradients in a wide RVPO pediatric population



Pathological pattern of MV with absent variability

	0-30 days	31 days-24 months	2-5 yrs	5-11 yrs	11-18 years	2-18 yrs	Total	p
MV Normal								
No inversion	13 (48.1)	85 (81.7)	79 (97.5)	233 (98.3)	101 (100)	413 (98.6)	511 (92.9)	<0.001
Inversion in 1 beat	3 (11.1)	6 (5.8)	1 (1.2)	2 (0.8)	0 (0)	3 (0.7)	12 (2.2)	<0.001
Inversion in 2 beats	3 (11.1)	4 (3.8)	0 (0)	1 (0.4)	0 (0)	1 (0.2)	8 (1.5)	
Inversion in 3 beats	8 (29.6)	9 (8.7)	1 (1.2)	1 (0.4)	0 (0)	2 (0.5)	19 (3.5)	<0.001