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Titel des Beitrags: The Munich Triathlon Heart Study: ventricular function, myocardial velocities, and two-dimensional strain in healthy children before and after endurance stress.

Abstract: Intense exercise has been shown to have negative effects on systolic and diastolic ventricular function in adults. Very little is known about the normal reaction of the growing heart to endurance stress. For this study, 26 healthy children (18 males) with a mean age of 12.61 years (range, 7.92-16.42 years) took part in an age-adapted triathlon circuit. The athletes were investigated by two-dimensional (2D) echocardiographic/speckle tracking, M-mode, pulse-wave Doppler, color Doppler, and color-coded tissue Doppler at 2-4 weeks before and immediately after the race. After the competition, cardiac output increased, mediated by an increase in heart rate and not by an elevated preload, according the Frank-Starling mechanism. Two-dimensional speckle tracking showed a reduced longitudinal strain in the right and left ventricles and additionally reduced circumferential strain in the left ventricle. The late diastolic inflow velocities were increased in both ventricles, indicating reduced diastolic function due to an impairment of myocardial relaxation. Immediately after endurance exercise, systolic and diastolic functions were attenuated in children and adolescents. In contrast to adult studies, this study could show a heart rate-mediated increase in cardiac output. The sequelae of these
alterations are unclear, and the growing heart especially may be more susceptible to myocardial damage caused by intense endurance stress.

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