

The aging heart: Is impaired relaxation inevitable?

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Unlike the left ventricular systolic function, which remains relatively well preserved with age, the left ventricular diastolic function declines progressively with age. A controversy exists as to whether this decline is a benign consequence of aging (akin to graying hair) or a serious disease (akin to osteoporosis). Because of the impact of senescence, normal values of all diastolic echocardiographic parameters are adjusted for age. As humans age, the following parameters decrease in value: isovolumic relaxation time (IVRT), mitral inflow peak E velocity and E/A ratio as well as the mitral annular tissue Doppler e' velocity and e'/a' ratio. Conversely, the following parameters increase with age: deceleration time of the mitral inflow E wave, peak velocity and duration of the A wave as well as the pulmonary vein S/D ratio (**Figure**, based on reference values from *J Am Soc Echocardiogr* 2009 Feb; 22(2):107-33.). However, there is a large overlap in normal values between various age groups. Age-related changes in diastolic function parameters predispose elderly patients to the development of diastolic heart failure. In animal models, exercise training reverses diastolic dysfunction caused by aging. In humans, the effects of training on diastolic function are less clear. Aggressive treatment of risk factors that are common among elderly patients such as hypertension and coronary artery as well as treatment with angiotensin receptor blockers may counteract the impact of aging on left ventricular diastolic function.

Figure: Impact of Aging on Left Ventricular Diastolic Parameters

