

TRANSTHORACIC ECHOCARDIOGRAPHY IN CLINICALLY HEALTHY ADULT NEWFOUNDLAND DOGS: REFERENCE VALUES FOR THE BREED

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Specific echocardiographic reference ranges have been published for several canine breeds. In 1996, one paper stated M-mode values for Newfoundland dogs. The aim of this study was to report reference M-mode, 2D and Doppler echocardiographic values for Newfoundland dogs and to compare M-mode measurements with allometric scaling reference values according to Cornell and colleagues.

Newfoundland dogs were prospectively recruited among those undergoing screening for congenital and acquired heart disease. Screening includes patient history, physical examination, and systemic arterial pressure measurement by Doppler flow meter and transthoracic echocardiography (M-mode, 2D and echo-Doppler). Screening is performed on conscious dogs of at least 1 year of age. Dogs without historical, clinical, electrocardiographic and echocardiographic signs of cardiovascular disease were included in the study.

Unpaired, two-tailed Student's t-test and linear regression were performed to evaluate the influence of gender, age and body weight (BW) on echocardiographic parameters. Echocardiographic measurements were compared to previously reported reference values. The reference limits of echocardiographic parameters in the Newfoundland dogs were calculated. Forty-six healthy adult Newfoundland dogs of both genders (20 males and 26 females), 1 to 6 years of age (mean 2.6 ± 1.6 years), 40 to 72 kg (mean 54.7 ± 8.84 kg) fulfilled the inclusion criteria. Significant but weak correlations were detected between aortic diameter (Ao) and age ($p= 0.012$, $r^2= 0.186$), left atrial to aortic ratio (LA/Ao) and age ($p= 0.047$, $r^2=0.192$), E-point to septum separation (EPSS) and BW ($p= 0.038$, $r^2= 0.117$), M-mode left ventricular internal diameter (LVID) in diastole (d) and systole (s) and BW (respectively $p= 0.002$, $r^2= 0.201$ and $p= 0.006$, $r^2= 0.158$), and between Ao and BW ($p= 0.008$, $r^2= 0.203$). None of the echocardiographic measurements was statistically different between males and females.

Left ventricular internal diameter in diastole, LVIDs, Ao, EPSS increased with BW, as expected. The aorta appears to become wider with advancing age. A proportion of the studied population had M-mode parameters below the allometric scaling reference range, suggesting that this method can over-estimate M-mode parameters in this breed. These findings stress the importance to report Newfoundland breed specific normal ranges for echocardiographic parameters.

Conflicts of interest: No conflicts of interest reported