



IX. Role of Echocardiography

DIAGNOSIS AND ASSESSMENT

<http://guidelines.hypertension.ca/diagnosis-assessment/role-of-echocardiography/>

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Recommendations

1. Routine echocardiographic evaluation of all hypertensive patients is not recommended (Grade D).
2. An echocardiogram for assessment of left ventricular hypertrophy is useful in selected cases to help define the future risk of cardiovascular events (Grade C).
3. Echocardiographic assessment of left ventricular mass, and of systolic and diastolic left ventricular function is recommended for hypertensive patients suspected to have left ventricular dysfunction or CAD (Grade D).
4. Patients with hypertension and evidence of heart failure should have an objective assessment of left ventricular ejection fraction, either using echocardiogram or nuclear imaging (Grade D).

Background

1. Routine echocardiographic evaluation of all hypertensive patients is not recommended (Grade D).

Left ventricular hypertrophy is common among patients with hypertension, with an estimated prevalence of more than 20% depending on the measure used, and is an important independent risk factor for cardiovascular complications (1-3). Blood pressure reduction reduces cardiovascular morbidity and morbidity in patients with documented left ventricular hypertrophy (4-6).

Left ventricular mass measurement by transthoracic 2D echocardiography is a valid, serially reproducible and clinically applicable modality with high inter-study variability (2,4). With meticulous technique under study conditions, inter-study variability can be reduced to less than 34g (7) and to as little as 25g (10%) with the newer 3D transthoracic echocardiography technique (8). Nevertheless, echocardiographically derived left ventricular mass measurements remain too difficult to accurately reproduce in the day-to-day clinical setting to allow clinically relevant therapeutic regression of ventricular hypertrophy to be tracked in a given patient (9,10). Furthermore, prospective randomized trial data specifically assessing the outcomes associated with and cost-effectiveness of routine echocardiography are still lacking.

2. An echocardiogram for assessment of left ventricular hypertrophy is useful in selected cases to help define the future risk of cardiovascular events (Grade C).

Both standard ECG and echocardiography can be used to assess left ventricular hypertrophy; however, the ECG is widely recognized as having a low sensitivity for increased left ventricular mass and echocardiography is therefore the preferred technique (11).

Left ventricular hypertrophy is associated with a two- to four-fold increase in the risk of cardiovascular mortality and morbidity, including coronary events, heart failure, arrhythmias and sudden cardiac death (12). In a Losartan Intervention For Endpoint reduction in hypertension (LIFE) substudy (13), 941 of the initial 9193 participants underwent annual assessment of left ventricular mass index over a mean follow up of 4.8 years, and the prognostic significance of left ventricular mass change on the composite end point of cardiovascular death, fatal or nonfatal myocardial infarction, and fatal or nonfatal stroke was assessed. In a multivariable Cox regression model, lower left ventricular mass index was associated with a reduced rate of the composite cardiovascular end point (hazard ratio 0.78 [95% CI 0.65 to 0.94] per one standard deviation decrease in left ventricular mass index).

Because this was a subgroup analysis and not a trial of therapy for left ventricular hypertrophy based on echocardiography versus usual care, it does not support the routine use of echocardiography to track therapeutic regression of left ventricular hypertrophy. However, the detection of left ventricular hypertrophy may have an impact on patient management and, as such, echocardiography is justifiable in selected cases, especially when it is unclear whether or not pharmacotherapy should be immediately instituted. Examples include apparent white coat hypertension and Stage 1, otherwise uncomplicated hypertension.

3. Echocardiographic assessment of left ventricular mass, and of systolic and diastolic left ventricular function is recommended for hypertensive patients suspected to have left ventricular dysfunction or CAD (Grade D).

4. Patients with hypertension and evidence of heart failure should have an objective assessment of left ventricular ejection fraction, either using echocardiogram or nuclear imaging (Grade D).

These recommendations are congruent with contemporary Canadian guidelines for the evaluation of patients with heart failure and coronary disease (14-16). Evaluation of left ventricular function and ejection fraction enables classification of patients into preserved versus reduced ejection fraction categories and determines therapy (14-16).

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