# Echo Screening Proposed as CRT Eligibility Test

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VANCOUVER, B.C. — Baseline echocardiographic evidence of mechanical ventricular dyssynchrony is a powerful predictor of the long-term clinical benefit of cardiac resynchronization therapy in patients with severe heart failure, Maria Vittoria Pitzalis, M.D., said at a meeting sponsored by the International Academy of Cardiology.

Indeed, echocardiographic ventricular dyssynchrony is such a strong predictor that it ought to replace ECG evidence of prolonged QRS duration as a major screening criterion for cardiac resynchronization therapy (CRT) patient eligibility, added Dr. Pitzalis, who did her groundbreaking work in this field while at the University of Bari (Italy).

In the past few years, CRT has emerged as a major therapeutic advance for patients with severe heart failure despite optimal medical management. Studies have shown CRT results in reverse left ventricular remodeling as reflected in increased left ventricular ejection fraction, improved exercise tolerance and New York Heart Association functional class, enhanced quality of life, fewer hospitalizations, and, most recently, in the Cardiac Resynchronization in Heart Failure (CARE-HF) trial, a 36% reduction in all-cause mortality.

However, about one-quarter of treated patients do not benefit from CRT. There is great interest in developing ways to identify them in advance so as to spare them the expense of the device therapy as well as the risks associated with the at-times technically challenging transvenous lead placement.

A prolonged QRS interval has been required for participation in all major CRT trials and is routinely used as a screening criterion for CRT eligibility in clinical practice. A long QRS is an ECG marker for ventricular dyssynchrony. But there is increasing dissatisfaction with its use as a screening tool in light of clear evidence that some patients with a normal QRS duration have echocardiographic evidence of mechanical ventricular dyssynchrony while others with a long QRS do not.

Dr. Pitzalis and her Italian coworkers have developed an echocardiographic method of assessing patients for ventricular dyssynchrony using a standard two-dimensional Doppler short-axis view at the papillary muscle level. It is obtained by calculating the shortest interval between the greatest posterior displacement of the septum and the maximum displacement of the left posterior ventricular wall. They call it the septal-to-posterior wall motion delay (SPWMD). It's simple, reproducible, widely available, and doesn't require specialized techniques and equipment, unlike tissue Doppler imaging, an alternative echocardiographic means of assessment for ventricular dyssynchrony.

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**DR. PITZALIS**

The cardiologist presented a prospective study of 60 patients, with severe heart failure and left bundle branch block, who underwent CRT. All had baseline QRSs greater than 130 milliseconds and underwent baseline measurement of SPWMD.

During a median 14-month follow-up, 4 patients died of heart failure and 12 others were hospitalized for worsening heart failure. In a multivariate analysis, only baseline SPWMD was significantly associated with subsequent heart failure progression or improvement. A long septal-to-posterior wall motion delay (at least 130 milliseconds) was present in 79% of patients who experienced clinical improvement as defined by an increase in left ventricular ejection fraction along with at least a one-class improvement in New York Heart Association functional class. Only 9% of patients with an SPWMD of less than 130 milliseconds experienced such improvement. Change in QRS duration in response to therapy was unrelated to these outcomes.

"If you think about this result, it's not illogical, because in those patients with a long baseline delay, you're correcting the delay with CRT and therefore you are modifying prognosis. If a delay doesn't exist at baseline, you're not improving anything," she said. ■