

# Heart failure patients who are more likely to benefit from implantation of pacemaker

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In a large population of Medicare beneficiaries with heart failure who underwent implantation of a cardiac resynchronization therapy defibrillator, patients who had the cardiac characteristics of left bundle-branch block and longer QRS duration had the lowest risks of death and all-cause, cardiovascular, and heart failure readmission, according to a study in the August 14 issue of *JAMA*.

"Clinical trials have shown that [cardiac resynchronization therapy](#) (CRT) improves symptoms and reduces mortality and readmission among selected [patients with heart failure](#) and left ventricular systolic dysfunction. Following broad implementation of CRT, it was recognized that one-third to one-half of [patients](#) receiving the therapy for [heart failure](#) do not improve. Identification of patients likely to benefit from CRT is particularly important, because CRT defibrillator (CRT-D) implantation is expensive, invasive, and associated with important procedural risks. A primary question regarding optimal patient selection for CRT is whether patients with longer QRS [duration](#) or left bundle-branch block (LBBB) morphology derive greater benefit than others," according to background information in the article. QRS duration is a measurement of the electrical conducting time of the heart on an [electrocardiogram](#). Left bundle-branch block is a [cardiac conduction](#) abnormality.

Pamela N. Peterson, M.D., M.S.P.H., of Denver Health Medical Center, Denver, and colleagues conducted a study to determine the long-term outcomes of patients undergoing CRT-D implantation and associations between combinations of QRS duration and presence of LBBB and outcomes, including all-cause mortality; all-cause, cardiovascular, and heart failure readmission; and complications. The study included Medicare beneficiaries in the National Cardiovascular Data Registry's ICD Registry between 2006 and 2009 who underwent CRT-D

implantation. Patients were stratified according to whether they were admitted for CRT-D implantation or for another reason, then categorized as having either LBBB or no LBBB and QRS duration of either 150 ms or greater or 120 to 149 ms. Patients underwent follow-up for up to 3 years, through December 2011.

Mortality rates in the primary overall study cohort were 0.8 percent at 30 days, 9.2 percent at 1 year, and 25.9 percent at 3 years. Rates of all-cause readmission were 10.2 percent at 30 days and 43.3 percent at 1 year. The researchers found that after adjustment for demographic and clinical factors, compared with patients with LBBB and QRS duration of 150 ms or greater, the other 3 groups had significantly higher risks of mortality and all-cause, cardiovascular, and heart failure readmission. The adjusted risk of 3-year mortality was lowest among patients with LBBB and QRS duration of 150 ms or greater (20.9 percent), compared with LBBB and QRS duration of 120 to 149 ms (26.5 percent), no LBBB and QRS duration of 150 ms or greater (30.7 percent), and no LBBB and QRS duration of 120 to 149 ms (32.3 percent). The adjusted risk of 1-year all-cause readmission were also lowest among patients with LBBB and QRS duration of 150 ms or greater (38.6 percent), compared with LBBB and QRS duration of 120 to 149 ms (44.8 percent), no LBBB and QRS duration of 150 ms or greater (45.7 percent), and no LBBB and QRS duration of 120 to 149 [ms](#) (49.6 percent).

There were no observed associations with complications.

"Although prior data regarding the effects of CRT as a function of QRS duration are largely limited to meta-analyses of clinical trials, this study provides an important perspective on the role of QRS duration in outcomes after CRT implantation in clinical practice," the authors write.

"These findings support the use of QRS

morphology and duration to help identify patients who will have the greatest benefit from CRT-D implantation."

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