

Cardiac resynchronization therapy (CRT) has been used to treat systolic heart failure with evidence of electrical dyssynchrony for two decades. The evolution of evidence from feasibility trials to completion of pivotal studies was extremely rapid, spanning less than 10 years. Data for improved survival, quality of life, functional status, and cardiac structure with CRT are clear and consistent. Subsequently, CRT has been incorporated into the practice guidelines for patients with systolic dysfunction and evidence of dyssynchrony represented by a widened QRS duration since the mid 2000's.

However, it was noted that a significant proportion of patients did not appear to respond favorably to CRT (about 30% by clinical and 50% by structural parameters). Therefore, further clinical characteristics have been identified to be associated with favorable outcomes: wider QRS duration, sinus rhythm, left bundle branch block, non-ischemic etiology. Thus, the most recent practice guidelines from the American, European, Japanese and Korean societies have incorporated these data to further refine patient selection. The current state of CRT can be characterized as well established, cost-effective, safe and efficacious, with the experience of thousands of trial patients, and many more in the "real-world."

Nonetheless, it appears that even in the US, optimal use of CRT has yet to be achieved. Data from 2010 as well as more recent information suggest that appropriate use of CRT happens in less than 40% of "indicated" patients. In addition, there is significant variation across centers, and disparity based on gender and race. Further optimization of CRT use will require improved education, outreach, access to care, and a renewed focus on the benefits. Dissemination of more protocolized follow-up and optimization of device function, better lead technology to allow ideal pacing site location, and new modes of pacing (LV only, adaptive, endocardial) may also improve the likelihood of favorable outcomes.