

Cardiac Resynchronization Therapy-Implantable Cardioverter-Defibrillator (CRT-ICD)

CRID 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7

Asynchrony of electrical activation of different portions of the ventricles results in dyssynchrony of mechanical contraction leading to decreased efficiency of pump function. The cardiac resynchronization device (which may have combined cardioverter-defibrillator capability) synchronizes electrical activation through a right ventricular lead and a lead inserted into a branch of the coronary venous system for left ventricular activation¹.

Clinical decision-making for cardiac resynchronization therapy for individuals with heart failure with reduced left ventricular ejection fraction includes consideration of an individual's risk of worsening symptomatic heart failure despite guideline-directed medical therapy and the anticipated likelihood of favorable clinical response to cardiac resynchronization therapy balanced against short-term procedural risks (e.g. cardiac tamponade and contrast-mediated acute kidney injury) as well as long-term device-related risks (e.g. thrombosis and infection)^{1, 2, 6, 8, 9}.

Large randomized controlled clinical trials (including MIRACLE, COMPANION and CARE-HF) and meta-analyses provide valuable information to guide optimal selection of candidates for cardiac resynchronization therapy for individuals with heart failure with reduced left ventricular ejection fraction. For instance, the benefit-risk assessment for cardiac resynchronization therapy is favorable for individuals with continued symptomatic heart failure due to left ventricular ejection fraction of 35% or less despite guideline directed medical therapy who have a left bundle branch block with a prolonged QRS activation duration of 150 milliseconds or greater. Conversely, the benefit-risk assessment for cardiac resynchronization therapy is NOT favorable for individuals who have not yet had the benefit of a trial of guideline directed medical therapy, or are asymptomatic, or have better left ventricular ejection fraction or have a non-left bundle branch block morphology with QRS activation duration less than 150 milliseconds^{1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14}.

Indications for cardiac resynchronization therapy which may be combined with implantable cardioverter-defibrillator therapy for individuals with heart failure with reduced left ventricular ejection fraction are based on well-established clinical medical specialty organization evidence-based guideline recommendations and Appropriate Use Criteria^{10, 12, 15, 16, 17, 18}.

References

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