

A MULTICENTER STUDY OF THE COMPLICATIONS AND RISKS ASSOCIATED WITH CARDIAC  
RESYNCHRONIZATION THERAPY IN PEDIATRIC AND CONGENITAL HEART DISEASE PATIENTS

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## **Objectives**

Cardiac resynchronization therapy (CRT) studies in pediatric and/or congenital heart disease (CHD) patients have shown an improvement in ejection fraction and heart failure symptoms. However, the long-term risks of this important treatment modality are not well-established. This study aimed to quantify, and identify determinants of, complications and longitudinal CRT system survival in a multicenter cohort.

## **Methods**

All CRT recipients aged <21 years and/or CHD, with systemic ventricular ejection fraction <45% and symptomatic heart failure prior to CRT implant were identified. Detailed baseline indices, acute (<30days) complications, and long-term follow-up including lead failure and system revisions were collected.

## **Results**

In total, 167 eligible CRT recipients were identified. Median weight at implant was 36.7kg [25<sup>th</sup>-75<sup>th</sup> centiles 16.2-70kg]. Median follow-up was 3.9years [1.2-7.9years]. The majority of implants were pacing-only (CRT-P, 125(74%)), with defibrillation capability (CRT-D) in 43(26%). The system was endovascular in 49(29%), epicardial in 109(65%), and hybrid in 9(5%).

Acute (<30days) complications were reported in 14(8%) subjects (including significant bleeding (3), acute infection (1), diaphragmatic capture (5, all epicardial systems), pneumothorax (1), generator pocket complication requiring reintervention (4)). There were 4(2%) late system infections (31months [6-53months] post implant). System revision (generator or lead replacement) occurred in 50% of CRT systems by 5.8 years post-implant. Time to system revision was shorter for CRT-D (versus CRT-P) systems (HR 1.9, p=0.035), and lead failure rates were higher for epicardial/hybrid systems (HR 3.1 [1.08-9], p=0.035). (Figure 1A-B). Those with the very lowest weight at implant experienced a higher risk of complications (Figure 1C), with each weight band (+/-5kg) below 10kg associated with significantly increased risk.

## **Conclusions**

In pediatric and CHD patients, CRT is associated with a risk of acute complications and relatively early system revisions, particularly in the smallest (<10kg) patients. These factors should be taken into consideration when implementing this important therapy.

