

# Age is just a number: Cardiac resynchronisation therapy in older patients has comparable outcomes to those that are younger

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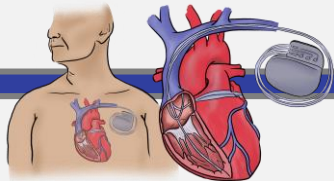
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## Introduction

Older patients may be less likely to receive cardiac resynchronisation therapy (CRT) for the management of heart failure. We aimed to describe the differences in *clinical response*, *complications*, and *subsequent outcomes* following CRT implantation compared to younger patients.



## Methods

A retrospective cohort study of unselected, consecutive patients implanted with CRT devices was conducted between March 2008 and July 2017. Complications, symptomatic and echocardiographic response, hospitalisation for heart failure, and all-cause mortality were recorded, comparing patients aged **<70**, **70-79**, and **≥80 years** (Figure 1).

## “Response”

≥1 point improvement in New York Heart Association (NYHA) or ≥10% improvement of left ventricular ejection fraction (LVEF) (Figure 4 3a/b).

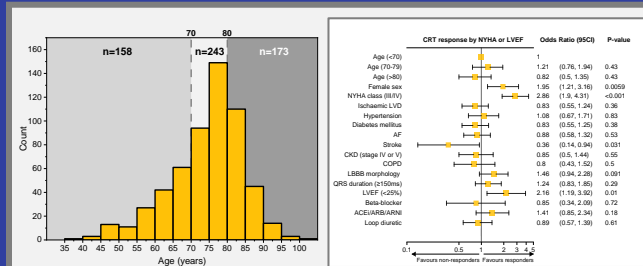


Figure 1: Histogram depicting the distribution of ages in the entire cohort.

Figure 2: Forest plot depicting the predictors of cardiac resynchronisation therapy response.

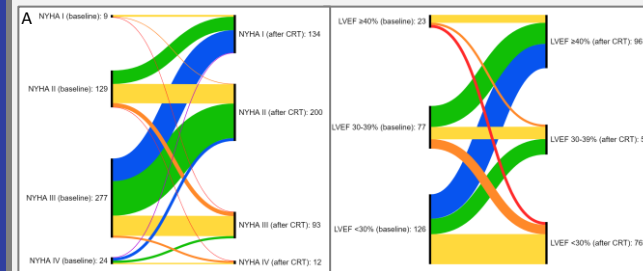


Figure 3a/b: (3a) Sankey diagram representing the change in NYHA class before and after CRT, and (3b) Sankey diagram representing the change in LVEF before and after CRT. Blue represents an improvement of 2 categories; Green represents an improvement of 1 category; Yellow represents no improvement; Orange represents a worsening of 1 category; Red represents a worsening of 2 categories. NYHA, New York Heart Association; CRT, cardiac resynchronisation therapy; LVEF, left ventricular ejection fraction.

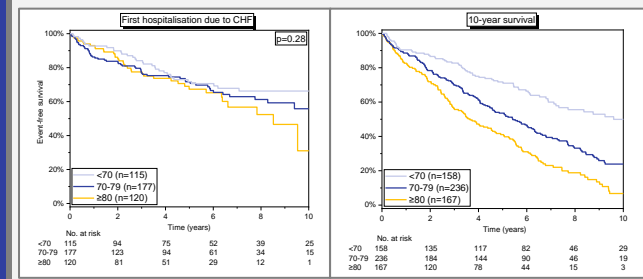


Figure 4: Kaplan-Meier curve showing the differences in time to first hospitalisation secondary to chronic heart failure (CHF) stratified by age groups.

Figure 5: Kaplan-Meier curve showing the differences in time to death stratified by age groups.

## Results

574 patients (*median age 76 years* [IQR 68-81], 73.3% male) received CRT. At baseline, patients aged **≥80 years**:

- had worse *symptoms*,
  - were more likely to have *co-morbidities*,
  - were less likely to be receiving comprehensive *medical therapy*,
  - had similar *left ventricular (LV) function*,
  - were less likely to receive *CRT-defibrillators* compared to *CRT-pacemakers*,
  - and had infrequent *complications* which were not more common compared to younger patients.
- ❑ Age was not a predictor of *NYHA or LVEF response* to CRT (67.2%, 71.2%, and 62.6% responders in <70, 70-79, and ≥80 years, respectively; p=0.43) (Figure 2),
- ❑ time to first *heart failure hospitalisation* was similar across age groups (p=0.28) (Figure 4),
- ❑ and *10-year survival* was lower for older patients (Figure 5).

## Conclusion

The *benefits* of CRT on symptoms and LV function were *not different* in older patients despite a greater burden of co-morbidities and less optimal medical therapy. *These findings support the use of CRT in an aging population.*