



<b>Title</b>	<b>The Clinical Effectiveness and Cost Effectiveness of Cardiac Resynchronization (Biventricular Pacing) for Heart Failure: Systematic Review and Economic Model</b>
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<b>Reference</b>	Volume 11.47. ISSN 1366-5278. <a href="http://www.hta.ac.uk/project/1518.asp">www.hta.ac.uk/project/1518.asp</a>

## Aim

To assess the clinical and cost effectiveness of cardiac resynchronization therapy (CRT) for people with heart failure and evidence of dyssynchrony by comparing CRT devices, CRT-P and CRT with defibrillation (CRT-D), each with optimal pharmaceutical therapy (OPT), and with each other.

## Conclusions and results

Five randomized controlled trials met the inclusion criteria, recruiting 3434 participants. Quality was good to moderate. Meta-analyses showed that both CRT-P and CRT-D devices significantly reduced the mortality and level of heart failure hospitalizations, and they improved health-related quality of life in people with NYHA (New York Heart Association) class III and IV heart failure and evidence of dyssynchrony (QRS interval >120 ms) who were also receiving OPT. A single, direct comparison indicated that the effects of CRT-P and CRT-D were similar, with the exception of an additional reduction in sudden cardiac death (SCD) associated with CRT-D. Implanting a CRT device in 13 people would result in an average saving of one additional life over a 3-year period compared with OPT. The NHS device and procedure cost of implanting a new CRT-P system was estimated to be 5074 pounds sterling (GBP) and that of a CRT-D system 17 266 GBP. The discounted lifetime costs of OPT, CRT-P, and CRT-D were estimated as 9375 GBP, 20 804 GBP, and 32 689 GBP, respectively. One industry submission to NICE used a discrete event simulation model that gave estimated incremental cost-effectiveness ratios of CRT-P vs OPT of 15 645 GBP per quality-adjusted life-year (QALY).

## Recommendations

The study found that CRT-P and CRT-D devices reduce mortality and hospitalizations due to heart failure, improve quality of life, and reduce SCD in people with heart failure NYHA classes III and IV, and evidence of dyssynchrony. When measured using a lifetime time horizon and compared with optimal medical therapy,

the devices are estimated to be cost effective at a willingness-to-pay (WTP) threshold of 30 000 GBP per QALY; CRT-P is cost effective at a WTP threshold of 20 000 GBP per QALY. When the cost and effectiveness of all three treatment strategies are compared, the estimated net benefit from CRT-D is less than with the other two strategies, until the WTP threshold exceeds 40 160 GBP/QALY.

## Methods

See Executive Summary link at [www.hta.ac.uk/project/1518.asp](http://www.hta.ac.uk/project/1518.asp).

## Further research/reviews required

Further research is needed into the identification of those patients unlikely to benefit from this therapy, the appropriate use of CRT-D devices, the differences in mortality and heart failure hospitalization for NYHA classes I and II, and the long-term implications of using this therapy.