

## Publication

## A comparison of acoustic cardiography and echocardiography for optimizing pacemaker settings in cardiac resynchronization therapy

**JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)****ID** 1196535**Author(s)** Zuber, Michel; Toggweiler, Stefan; Quinn-Tate, Lori; Brown, Lei; Amkieh, Ali; Erne, Paul**Author(s) at UniBasel** [Zuber, Michel](#) ; [Erne, Paul](#) ;**Year** 2008**Title** A comparison of acoustic cardiography and echocardiography for optimizing pacemaker settings in cardiac resynchronization therapy**Journal** Pacing and clinical electrophysiology**Volume** 31**Number** 7**Pages / Article-Number** 802-11**Keywords** acoustic cardiography, echocardiography, Doppler, biventricular pacing, CRT

**BACKGROUND:** Cardiac resynchronization therapy (CRT) is useful in managing patients with refractory heart failure. To increase efficacy, pacemaker settings are optimized, with Doppler echocardiography being the preferred method. Recently, acoustic cardiography, an automated method that records, analyzes, and displays simultaneous ECG and heart sound data, has been developed. In this study, the suitability of acoustic cardiography as an alternative to Doppler echocardiography in CRT optimization is evaluated. **METHODS:** We studied 43 CRT patients undergoing optimization. Using Doppler echocardiography, we determined the optimal atrioventricular (AV) delay with a transmitral flow assessment. For optimization of the interventricular (VV) delay, we used the left ventricular outflow tract velocity time integral (VTI). For acoustic cardiography, we used the electromechanical activation time (EMAT, the interval from QRS onset to the S1). Reproducibility of echocardiography and acoustic cardiography was determined by programming 10 different delay settings twice in random order. **RESULTS:** All 43 subjects underwent AV optimization, and 14 had CRT devices allowing VV optimization. While the intraobserver variability of EMAT and Doppler echocardiography parameter was similar (9.9% vs 8.5%), the reproducibility of EMAT was the highest ( $r = 0.91$ ) and VTI was the lowest ( $r = 0.35$ ). The correlation between the optimal AV delays determined by EMAT versus transmitral flow assessment was 0.86 ( $P < 0.001$ ). The correlation between the optimal VV delays determined by EMAT versus VTI was 0.58 ( $P < 0.05$ ), perhaps due to the poor reproducibility of the VTI. **CONCLUSION:** For CRT optimization, acoustic cardiography provides results similar to echocardiography but with improved reproducibility and ease of use.

**Publisher** Blackwell Futura Publishing**ISSN/ISBN** 0147-8389**edoc-URL** <http://edoc.unibas.ch/dok/A6006701>**Full Text on edoc** No;**Digital Object Identifier DOI** 10.1111/j.1540-8159.2008.01094.x**PubMed ID** <http://www.ncbi.nlm.nih.gov/pubmed/18684276>**ISI-Number** WOS:000257705900003**Document type (ISI)** Journal Article, Randomized Controlled Trial