



Department of Biomathematics Seminar Series:
Frontiers in Systems and Integrative Biology

Hemodynamic Optimization Parameter Evaluation for Cardiac Resynchronization Therapy



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ABSTRACT:

Cardiac Resynchronization Therapy (CRT) improves cardiac performance in advanced heart failure patients. Patients indicated for CRT have low ejection fraction and a wide electrocardiographic QRS. These patients have a mechanically dyssynchronous contraction of the ventricles that can be improved by providing cardiac stimulation of both the right and left ventricles using specialized cardiac pacemakers. CRT pacing therapy reduces cardiovascular related hospitalizations and improves survival while decreasing symptoms and improves exercise tolerance. About 200,000 patients benefit from CRT annually. This presentation will cover CRT therapy delivery including the basic pacemaker and defibrillation devices, implantation, and some technological challenges remaining. One challenging clinical objective is not just to provide therapy, but to optimize therapeutic benefit. Currently in select patients, pacemaker settings are adjusted to optimize hemodynamic performance using echo cardiography. This process takes place in the clinic and is extremely time consuming and expensive. Ideally, CRT pacemaker settings could be quickly and easily optimized for every patient during a routine office visit. Ultimately, in the not too distant future, the implanted CRT devices will actually measure cardiac performance with sensing systems. Feedback from the sensing system would then be used to adjust stimulation parameters to optimize cardiac performance. Completed research into methods that could be used to measure and optimize cardiac performance will be presented along with a discussion of ongoing clinical research.

Host: Elliot M. Landaw, M.D., Ph.D.

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