

PUSHCART

Title: Personalized simulations for improving cardiac resynchronization therapy.

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Project partners



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Abstract The heart is a mechanical pump that is controlled by an electrical signal transported throughout the heart by a specialized rapid conduction system. In many patients with heart failure, this wiring becomes damaged and the heart is improperly activated. Cardiac resynchronization therapy tries to correct this by using a pacemaker with two electrodes. However, it is unclear where exactly to place the electrodes. As a result, many patients fail to realize the full benefit. Part of the problem is individual variation in heart geometry and scar tissue. The PUSHCART study will help to solve this problem by creating sophisticated, personalized computer models of the heart. Starting from a basic science perspective, models describing electrical and mechanical heart function along with circulatory system behavior will be developed and validated. The optimal electrode position will be found based on computer simulations and verified experimentally. In the final phase, performance in patients will be evaluated.



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