A System for Selection and Optimization of Patients Undergoing Cardiac Resynchronization Therapy

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Technology description

Background Many patients whose hearts have been damaged by heart attack (myocardial infarction, MI) go on to suffer from heart failure, wherein decreased heart efficiency causes shortness of breath, fatigue, and weakness. As a result of the scar that forms after an MI, these patients frequently have damage to their heartΓÇÖs electrical conduction system which further impairs pumping of blood. A relatively new treatment is being applied which utilizes a pacemaker to make electrical conduction more efficient, or synchronous, and is called Cardiac Resynchronization Therapy (CRT). However, at present it is difficult to determine which heart failure patients with prior MI stand to benefit from CRT. Technology The inventors have developed a heart imaging platform, SmartPace, based on an imaging technique called Single Photon Emission Computed Tomography (SPECT), which produces images of the heart which display both scar and electrical conduction in three dimensions. The platform is comprised of proprietary software containing decision algorithms which analyze SPECT data to decide whether CRT in a given patient would be expected to improve conduction efficiency and thus yield a beneficial clinical response. For patients, the SmartPace algorithm predicts who will respond. The platform creates an individualized prescription which consists of the optimal configuration of the pacing device so as to achieve an optimal outcome. The platform also produces a detailed image which is then integrated into the operating room to serve as a virtual roadmap during implantation of the CRT device.

Advantages

* First known technique to use Single Photon Emission Computed Tomography (SPECT) as a basis for Cardiac Resynchronization Therapy (CRT) patient selection.
* 3D data presentation serves as a guide for surgical planning and deployment of CRT device.

Institution

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