Method for Synchronizing a Pulsatile Cardiac Assist Device with the Heart

Tech ID: 31845 / UC Case 2018-519-0

BRIEF DESCRIPTION

Patients with severe heart failure can require both a cardiac pacemaker to help the timing of the heart and a ventricular assist device (VAD) to physically help pump blood. UCI researchers have developed a method to synchronize the actions of a pulsatile VAD with a pacemaker in order to reduce heart stress and improve treatment effectiveness.

SUGGESTED USES

- Improve treatment of heart failure where both a pacemaker and VAD are required

FEATURES/BENEFITS

·Sustains proper synchronization in patients with pacemakers and VADs

·Reduces heart strain by ensuring the VAD does not oppose a weakened heart

TECHNOLOGY DESCRIPTION

Cardiac resynchronization therapy (CRT) uses an implantable device (pacemaker), which provides electrical signals when a heart's natural pacemaker is dysfunctional or when the heart's electrical conductance network is faulty.Roughly 3 million people worldwide have pacemakers.Ventricular Assist Devices (VAD), more commonly referenced as cardiac assist devices, are mechanical pumps that are used to partially or completely replace the function of a failing heart.VADs can be used for short-term or long-term treatments, and have increased in use to address a constant shortage of available heart transplant donors.

A timing issue, however, arises when a patient has both a pacemaker and a VAD.If the VAD fall out of sync with the pacemaker, blood flow can be impeded, exposing the heart to additional stress.UCI researchers have developed a method to synchronize a cardiac pacemaker with a pulsatile style VAD.The VAD and pacemaker are paired such that, after the pacemaker performs its sensing and pacing functions, the VAD receives and analyzes the signal produced by the pacemaker to begin its contraction cycle.This method helps to ensure the VAD's contraction works in conjunction with the failing heart and not against it, helping to reduce strain on the heart and improve patient outcomes.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20190374693	12/12/2019	2018-519

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OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Devices
  - Disease: Cardiovascular and Circulatory System

RELATED CASES

2018-519-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Percutaneous Heart Valve Delivery System Enabling Implanted Prosthetic Valve Fracture
- A distensible wire mesh for a cardiac sleeve
- Method to Improve the Accuracy of an Independently Acquired Flow Velocity Field Within a Chamber, Such as a Heart Chamber
- Percutaneous Heart Valve Delivery System
- Growth-Accomodating Transcatheter Pulmonary Valve System
- System for Transcatheter Grabbing and Securing the Native Mitral Valve's Leaflet to a Prosthesis
- Real-time 3D Image Processing Platform for Visualizing Blood Flow Dynamics
- Automated Histological Image Processing tool for Identifying and Quantifying Tissue Calcification
- Fully Automated Multi-Organ Segmentation From Medical Imaging
- Simple, User-friendly Irrigator Device for Cleaning the Upper Aerodigestive Tract and Neighboring Areas
- Automated 3D Reconstruction of the Cardiac Chambers From MRI of Ultrasound
- Minimally Invasive Percutaneous Delivery System for a Whole-Heart Assist Device

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