

Method and Device to Modulate Cardiac and Pulmonary Autonomic Control

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Technology description

UNMET NEED

Autonomic control and sympathovagal balance controls both systemic and pulmonary arterial pressures. Cardiac sympathetic nerves have been implicated in the pathophysiology of heart failure and arrhythmias. Over 22 million people worldwide suffer from congestive heart failure. While pacemakers send electrical signals through nerves to restore cardiac function, they are painful and require major surgery to place. Surgical and interventional treatments to increase ventricular function, such as coronary artery bypass and stenting, valve repair/replacement, left ventricular volume reduction surgery, and mechanical circulatory support device implantation are more invasive approaches reserved for patients not responsive to pharmacologic treatment. There is a need for a less intrusive therapy to treat disorders like arrhythmias.

TECHNICAL DESCRIPTION

JHU researchers have developed a method and apparatus to modulate cardiac and pulmonary sympathetic nerves via the cardiac plexus either by permanently inhibiting the nerves or by transient stimulation to cause desired effects. This device allows for transtracheal intervention of the cardiac and pulmonary nervous systems at the tracheal bifurcation. The advantages of this site include accessibility to the nerves of interest via bronchoscopy or fluoroscopy, a lack of significant vascular structures nearby decreasing the risk of major bleeding complications, lack of cardiac motion allowing for focused ultrasound or radiation therapy, and a confluence of bilateral nerves making modulation of cardiac nerves from right and left ganglia possible from one anatomic location.

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