High Current, Radio Frequency Coupled Microstimulator for Autonomic Applications

(VA Reference No. 01-022)

Novel fully implantable, high-current microstimulator designed to correct autonomic neural problems associated with spinal cord injury

Technology

The Department of Veterans Affairs has developed a fully implantable, high-current microstimulator designed to correct autonomic neural problems associated with spinal cord injury such as difficulties with bowel, bladder, and coughing functions. The technology appears to overcome the autonomic problems by direct stimulation to muscles and organs where injury or disease has destroyed the nerve paths by which the functions are normally controlled.

Opportunity

The implantable microstimulator developed by the VA operates by receiving a radio-frequency signal from an external transmitter. This signal is first used to charge the device; when fully charged, the stimulator is activated and a pulsed current is applied to external electrodes. The system can provide electrical stimulation and contraction of muscles and organs requiring pulses with large currents and long duration leading to a restoration of central nervous system function in the simulated muscles and organs.

Competitive Advantage

While conventional rehabilitation maximizes the retained function of the disabled individual, few interventions increase control of the paralyzed functions.

Unlike existing technologies, the present invention:

- Improves the patient quality of life and reduces risk of urinary tract infection.
- Involves attaching the device directly to tissue or muscle, as opposed to nerves.
- Simplifies the surgical process because surgeons are not required to cut nerves during the process preventing the risk of undesired complications.
- Can be implanted through a small incision.

Status

The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).

Technology

Implantable microstimulator for correction of autonomic neural problems

Inventor

Lisa Riedy, Ph.D.
Paul Zaszczurynski, Ph.D.
Keith Bruninga, M.D.
James Walter, Ph.D.
Hines VA Medical Center
Hines, IL

Key Features

- Device can be implanted in a minimally invasive procedure
- Improves patient quality of life
- Attaches directly to tissue or muscle, as opposed to nerves
- Batteries and complex control circuitry are not required

Stage of Development

Reduced to practice with prototypes developed

Keywords

Medical Device
- Microstimulator
- Surgical implant
- Autonomic neural function
- Spinal cord injury

Patent Status

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Contact

Jeffrey Moore, Ph.D.
Technology Transfer Program
Department of Veterans Affairs
Office of Research & Development
(12TT)
810 Vermont Avenue, NW
Washington, DC 20420
Phone: 202-701-7628
Fax: 202-254-0460
E-mail: Jeffrey.moore@va.gov