Implantable Joint Angle Transducer Tools
(VA Reference No. 01-001)

Unique set of surgical tools and techniques to accomplish orthopedic implantation of a joint angle transducer in the upper limbs to restore or improve joint movement function in paralyzed patients

Technology
Orthopedic implantation of a joint angle transducer

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Key Features
- Implantable joint angle transducer to restore or improve joint movement function
- Minimizes tissue damage
- Suitable for long term use

Stage of Development
Reduced to practice with prototype system developed and demonstrated in clinical studies

Keywords
Medical Device
- Functional neuromuscular stimulation
- surgical tools
- surgical implants
- joint movement
- joint angle

Patent Status
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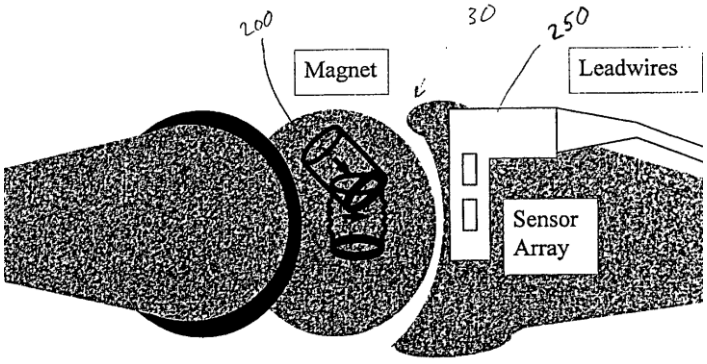
Technology
The Department of Veterans Affairs has developed a unique set of surgical tools and techniques to accomplish orthopedic implantation of a joint angle transducer (IJAT).

Description
The implantable joint angle transducer developed by the VA is a magnetic field device designed for joint angle detection and provides command-control and feedback information to a functional neuromuscular stimulation (FNS) system, which is used to restore or improve joint movement function in the upper limbs of paralyzed patients. The system that is designed for long-term use (approximately thirty years) utilizes implanted sensors, stimulation electrodes, a stimulator/telemeter, and a transmitting/receiving coil. Although the principles of cannulated instrumentation embodied in the developed technology are well established in the surgical field, the developed technology tools are uniquely designed for the implantation of specific FNS components.

Schematic of Prototype IJAT



Competitive Advantage
Currently, FNS devices that are implanted are limited to single degree of freedom joints and are not biocompatible for long term use due to packaging limitations.

This invention:
- Overcomes the risk of materials bio-incompatibility by the use of titanium capsules for both the sensor and the magnet.
- Can be applied to similar implantation procedures anywhere in the body.
- Minimizes tissue damage and adverse surgical events.

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).