Neurosurgery
Neuroimaging
Neuroaddiction
Consultation

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Pump/Stimulator

PUMP/STIMULATOR IMPLANTS

Neurostimulation delivers low voltage electrical stimulation to the spinal cord or targeted peripheral nerve to block the sensation of pain. The Gate Theory of Pain suggests that the body can inhibit pain signals by activating certain non-noxious nerve fibers in the spinal cord. The neurostimulation system implanted in the epidural space stimulates these pain inhibiting nerve fibers blocking the sensation of pain with a tingling sensation. This small wire in the spine is connected to a small pulse generator about the size of a pacemaker that is implanted under the skin. An implantable pump can be used to deliver through a small tube or catheter morphine directly to the spinal fluid around the spinal cord. Morphine delivered directly to the intrathecal space is particularly effective because it does not have to circulate systemically throughout the body to reach the spinal cord and a result a much smaller dose of medication, approximately $1/300^{th}$ of an oral morphine dose is required; frequently less then 1 or 2 mg in a 24-hour period is used since the medication is placed exactly where the body needs it to block the pain. As a result this blocks the pain message before it reaches the brain. Pumps and stimulators are nondestructive techniques of pain control. Prior to these new technologies neurosurgeons frequently had to perform chordotomy or myelotomy, which involved cutting fibers in the spinal cord to block pain signals. These newer nondestructive neurosurgical procedures with pumps and stimulators have essentially replaced the destructive older neurosurgical open procedures of chordotomy and myelotomy.

You may be a candidate for an implantable pump or stimulator if more conservative therapies have failed, and you have a diagnosis that is concordant with your pain complaints. In addition further surgical intervention should be excluded by a preoperative examination and preoperative imaging studies such as MRI scan. Also, other steps commonly done to prior to implantation of a pump or stimulator include psychological assessment. Furthermore, you will undergo a trial procedure with a temporary stimulator or temporary infusion pump procedure to see if over 50% of your pain or symptoms are relieved. Finally, a physician will consider other contraindications such as infection, psychosis, addiction, antisocial personality disorder, borderline personality disorder, and other diagnoses. Since all surgery and anesthesia is a stress on the cardiovascular system you will need the okay of your family physician and cardiologist prior to surgery. You should discontinue any alcohol, caffeine, tobacco products, smoking, poor nutritional or other poor lifestyle habits weeks prior to your surgery. A week prior to your surgery you should discontinue any aspirin, Plavix, Coumadin, nonsteroidal anti-inflammatories, or other over-the-counter anti-inflammatories such as Advil, Aleve, Motrin, ibuprofen, Nuprin as long as it is okay with your family physician and cardiologist The night before surgery or at least 8 hours before surgery, you will not be able to eat or drink other than sips of water for medication approved by your physician.

Risk of surgery includes but is not limited to infection, CSF leak, spinal headaches, spinal hygromas, bleeding and incision pain and discomfort, seromas, meningitis, device failure/malfunction and other complications including paralysis and death. On the day of your surgery, you will be again asked to sign a consent regarding your understanding of the risk and benefits of the proposed procedure. You should always get a second and third opinion prior to any surgical procedure. In a recent national study, over 50% of patients with implantable technologies had relief of more than 50% of their symptoms.

You will be given postop instructions upon discharge, and you should contact your surgeon/physician or the emergency room if you develop a temperature of 101 degrees or higher, persistent drainage, weakness, worsening pain, or other symptoms. Additional information about your specific procedure and diagnosis can be found on our web site www.sbncmd.com or you can ask our staff to provide you with additional information or CDs and videos regarding these procedures and treatments.