Deep Brain Stimulation for Essential Tremor and Parkinson’s Disease

Policy Number: HS-075

Original Effective Date: 1/12/2009


APPLICATION STATEMENT

The application of the Clinical Coverage Guideline is subject to the benefit determinations set forth by the Centers for Medicare and Medicaid Services (CMS) National and Local Coverage Determinations and state-specific Medicaid mandates, if any.

DISCLAIMER
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HS-075

The Clinical Coverage Guideline is intended to supplement certain standard WellCare benefit plans. The terms of a member’s particular Benefit Plan, Evidence of Coverage, Certificate of Coverage, etc., may differ significantly from this Coverage Position. For example, a member’s benefit plan may contain specific exclusions related to the topic addressed in this Clinical Coverage Guideline. When a conflict exists between the two documents, the Member’s Benefit Plan always supersedes the information contained in the Clinical Coverage Guideline. Additionally, Clinical Coverage Guidelines relate exclusively to the administration of health benefit plans and are NOT recommendations for treatment, nor should they be used as treatment guidelines. The application of the Clinical Coverage Guideline is subject to the benefit determinations set forth by the Centers for Medicare and Medicaid Services (CMS) National and Local Coverage Determinations and state-specific Medicaid mandates, if any. Note: Lines of business (LOB) are subject to change without notice; current LOBs can be found at www.wellcare.com – select the Provider tab, then “Tools” and “Clinical Guidelines”.

BACKGROUND

Essential tremor (ET), a common movement disorder, affects more than 1 million Americans and at least 1% of the adult population over the age of 40. This disorder has an insidious onset, with varying progression over time. Typical symptoms include postural tremor of the outstretched upper limbs that is absent at rest, not worsened by movement, and not associated with extrapyramidal or cerebellar signs. Like ET, Parkinson’s disease (PD) is a slowly progressing, chronic neurodegenerative disorder of unknown etiology that affects an estimated 1.5 million Americans, with approximately 40,000 new cases diagnosed each year. Although diagnostic criteria for PD vary among clinicians, PD is generally associated with the symptom complex of resting tremor, bradykinesia, and rigidity. In the advanced stages, PD leads to dementia and death. Most patients with movement disorders respond well to pharmacological treatments for extended periods of time however, surgical treatments for PD and ET must be considered when these disorders become severe and medications fail or cause unacceptable side effects.

Deep brain stimulation (DBS) is being investigated as an alternative to pallidotomy and thalamotomy for treatment of these movement disorders. DBS involves continuous, high frequency stimulation of the ventral intermediate nucleus (Vim) of the thalamus, the internal globus pallidus (GPI), or the subthalamic nucleus (STN), using electrodes implanted in one of these structures. Electrical stimulation of these areas of the brain simulates the effect of a surgical lesion, but, unlike pallidotomy and thalamotomy, DBS can be adjusted and reversed (Hayes, 2004). DBS involves high-frequency electrical stimulation of a specific site in the ventral intermediate nucleus (Vim) of the pallidus, internal globus pallidus (GPI), or subthalamic nucleus (STN) of the brain using unilateral or bilateral electrodes that are connected to a pulse generator implanted in the chest. Proper placement of each electrode for DBS requires guidance by stereotactic localization. Sets of images acquired by magnetic resonance imaging (MRI) or by x-ray–based helical computed tomography (CT) are assembled into a coherent, detailed, three-dimensional model of the patient. To employ this model during surgery, magnetic or optical markers are attached to the patient at defined locations on a stereotactic frame. Local anesthesia prevents pain at the points where the frame contacts the skin of the patient. A computerized tracking system then collects data from an optical or magnetic sensor and displays the location of the site to be stimulated relative to the site of electrode insertion into the skull. The stereotactic guidance system also displays the track the electrode should follow to reach the stimulation site. After a burr hole has been drilled in the skull to allow electrode insertion, stereotactic localization allows each electrode to be guided to within approximately 1 mm of the targeted site. The track for the deep brain electrode is prepared by inserting a probe approximately 10 mm from the target. Neurosurgeons then conduct test stimulations at frequencies over 100 Hz to evaluate tremor amplitude, diffusion of stimulation, the threshold for paresthesias, and the development of speech disturbances. In addition, some researchers apply electrical pulses at 2 to 4 Hz to study the diffusion of stimulation. Throughout the procedure, teleradiography may be used to confirm the electrode position. Once the optimal functional target has been identified and satisfactory stimulation obtained, the surgeon secures the permanent electrode to the skull using a plating system. The distal aspect of the electrode is then tunneled to a small incisional wound located behind the pinna of the ear, the wounds are closed in a fashion that allows electrode retrieval, and the stereotactic head frame is removed.

Hoehn and Yahn Scale

In the advanced stages, PD leads to dementia and death; the degree of disability is generally divided into stages:

- **Stage I.** Unilateral involvement only, usually with minimal or no functional impairment.
- **Stage II.** Bilateral or midline involvement, without impairment of balance.
- **Stage III.** First sign of impaired righting reflexes, evident by unsteadiness as patient turns or demonstrated when patient is pushed from standing equilibrium with the feet together and eyes closed. Functionally, the patient is somewhat restricted but is capable of activities of daily living (ADL). Disability is mild to moderate.
- **Stage IV.** Fully developed severe disabling disease. The patient is still able to walk and stand unassisted but is markedly incapacitated.
- **Stage V.** Confinement to wheelchair unless aided.

*Unified Parkinson's Disease Rating Scale (UPDRS)*

Total UPDRS consists of four parts. Parts I, II, and III contain 44 questions each measured on a 5-point scale (0-4).

- **Part I.** Mentation, behavior, mood: intellectual impairment, thought disorder, motivation/initiative, depression.
- **Part II.** Activities of daily living (ADL): speech, salivation, swallowing, handwriting, cutting food, dressing, hygiene, turning in bed, falling, freezing, walking, tremor, sensory complaints.
- **Part III.** Motor examination: speech, facial expression, tremor at rest, action tremor, rigidity, finger taps, hand movements, hand pronation and supination, leg agility, arising from chair, posture, gait, postural stability, body bradykinesia.

**POSITION STATEMENT**

**Applicable To:**
- ✓ Medicaid – All Markets
- ✓ Medicare – All Markets

**Exclusions**

Deep brain stimulation (DBS) is **NOT medically necessary** nor a covered benefit for members with ET and PD, if ANY of the following conditions are present:

- Non-idiopathic Parkinson's disease or "Parkinson's Plus" syndromes; OR,
- Cognitive impairment, dementia or depression, which would be worsened or interfere with the member's ability to benefit from DBS; OR,
- Current psychosis, alcohol abuse or other drug abuse; OR,
- Structural lesions such as basal ganglionic stroke, tumor or vascular malformation as etiology of the movement disorder; OR,
- Previous movement disorder surgery within the affected basal ganglion; OR,
- Significant medical, surgical, neurologic or orthopedic comorbidities contraindicating DBS surgery or stimulation.

NOTE: DBS devices are considered medically necessary if they are FDA approved or used in accordance with FDA approved protocols governing Category B Investigational Device Exemption (IDE) DBS clinical trials.

NOTE: Members who undergo DBS implantation should not be exposed to diathermy (deep heat treatment including shortwave diathermy, microwave diathermy and ultrasound diathermy) or any type of MRI, which may adversely affect the DBS system or adversely affect the brain around the implanted electrodes.

NOTE: DBS should be performed with extreme caution in patients with cardiac pacemakers or other electronically controlled implants, which may adversely affect or be affected by the DBS system.

**Coverage**

Unilateral or bilateral thalamic ventralis intermedis nucleus (VIM) deep brain stimulation (DBS) for the treatment of Essential Tremor (ET) and/or Parkinsonian tremor and unilateral or bilateral subthalamic nucleus (STN) or globus pallidus interna (GPI) DBS for the treatment of Parkinson's disease (PD) is **considered medically necessary** when the following criteria are met:

Thalamic VIM DBS is **considered medically necessary** when ALL of the following criteria are met:

- There is a diagnosis of ET based on postural or kinetic tremors of the hand(s) without other neurologic signs, or a diagnosis of idiopathic PD with the presence of at least two cardinal PD features (i.e. tremor,
rigidity or bradykinesia) which is of a tremor-dominant form; AND,
- There is marked disabling tremor of a least level 3 or 4 on the Fahn-Tolosa-Marin Clinical Tremor Rating Scale in the extremity intended for treatment, causing significant limitation in daily activities despite optimal medical therapy; AND,
- There is a willingness and ability to cooperate during a conscious operative procedure, post-surgical evaluations, adjustments of medications and stimulator settings

STN or Gpi DBS are considered medically necessary if ALL of the following criteria are met:

- A diagnosis of PD based on the presence of at least two cardinal PD features (see above); AND,
- Advanced idiopathic PD as determined by the use of Hoehn and Yahr stage or Unified Parkinson’s Disease Rating Scale (UPDRS) Part III Motor Subscale; AND,
- L-dopa responsive with clearly defined “on” periods; AND,
- Persistent disabling Parkinson’s symptoms or drug side effects (e.g. dyskinesias, motor fluctuations, or disabling “off” periods) despite optimal medical therapy; AND,
- There is a willingness and ability to cooperate during a conscious operative procedure, post-surgical evaluations, adjustments of medications and stimulator settings

Provider and Facility Requirements

For DBS lead implantation to be considered medically necessary, providers and facilities must meet the following:

1. Neurosurgeons must:
   - Be properly trained in the procedure;
   - Have experience with the surgical management of movement disorders, including DBS therapy; and
   - Have experience performing stereotactic neurosurgical procedures.

2. Operative teams must have training and experience with DBS systems, including knowledge of anatomical and neurophysiological characteristics for localizing the targeted nucleus, surgical and/or implantation techniques for the DBS system, and operational and functional characteristics of the device.

3. Physicians specializing in movement disorders must be involved in both patient selection and post-procedure care.

4. Hospital medical centers must have:
   - Brain imaging equipment (MRI and/or CT) for pre-operative stereotactic localization and targeting of the surgical site(s);
   - Operating rooms with all necessary equipment for stereotactic surgery; and
   - Support services necessary for care of patients undergoing this procedure and any potential complications arising intraoperatively or postoperatively.

CLINICAL EVIDENCE

A study by Kim, Jeon, & Paek (2011) found that pain levels improved in patients with Parkinson’s disease through the use of subthalamic DBS (STN). Improvements of pain in PD by STN DBS were described in early reports of large-scale studies showing the benefit of STN DBS on cardinal motor symptoms and motor complications in advanced PD. The authors cite a 1998 study by Limousin, et al. which found that painful off-period dystonia improved in all of their 16 patients at 1 year, with this symptom completely disappearing in 12 patients. Another early study found that pain in the ‘off’ period decreased by 66% in 26 of 27 patients, as assessed using UPDRS item 17 at 6 months after surgery (Krack, et al., 1999). However, the effect of STN DBS on pain other than dystonic pain has not been thoroughly evaluated.

STN DBS also improved non-fluctuating pain that did not improve with medication at baseline, which suggests that STN DBS ameliorates PD-unrelated pain. Upon a follow-up of 21 of these 29 patients, we found that this beneficial effect persisted after 24 months. One interesting finding was that new pain developed in many patients during a long-term follow-up. Five of the 21 patients reported new pain at 3 months, and almost half of them reported new
pain at 24 months. The development of new pain after surgery is not surprising given that the prevalence of pain increases with age in the general population. However, it is also possible that the improvement in motor symptoms by STN DBS may have unveiled pain which already had existed but was unnoticed due to distress from the motor symptoms prior to surgery. In addition, central pain in PD would worsen with the progression of PD.

The mechanisms of STN DBS in PD and the pathophysiological basis of sensory disturbances and pain in PD are not completely understood. Therefore, the mechanisms by which STN DBS improves pain in PD remain unclear. In many patients with PD, pain fluctuates with motor fluctuations. For this reason, it is tempting to postulate that an improvement of pain is related to an improvement of motor symptoms. Accumulated evidence indicates that STN DBS improves pain in PD while also improving motor symptoms. Pain by itself cannot and should not be a target symptom for STN DBS in PD. However, the potential benefit of this procedure on pain in PD should be considered and discussed with patients.

CODING

Covered CPT® Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>61863</td>
<td>Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray), without use of intraoperative microelectrode recording; first array</td>
</tr>
<tr>
<td>61864+</td>
<td>Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray), without use of intraoperative microelectrode recording; each additional array + (List separately in addition to primary procedure)</td>
</tr>
<tr>
<td>61867</td>
<td>Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray), with use of intraoperative microelectrode recording; first array</td>
</tr>
<tr>
<td>61868+</td>
<td>Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray), with use of intraoperative microelectrode recording; each additional array + (List separately in addition to primary procedure)</td>
</tr>
<tr>
<td>61880</td>
<td>Revision or removal of intracranial neurostimulator electrodes</td>
</tr>
<tr>
<td>61885</td>
<td>Insertion or replacement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling; with connection to a single electrode array</td>
</tr>
<tr>
<td>61886</td>
<td>Insertion or replacement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling; with connection to two or more electrode arrays</td>
</tr>
<tr>
<td>61888</td>
<td>Revision or removal of cranial neurostimulator pulse generator or receiver</td>
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<tr>
<td>95961</td>
<td>Functional cortical and subcortical mapping by stimulation and/or recording of electrodes on brain surface, or of depth electrodes, to provoke seizures or identify vital brain structures; initial hour of physician attendance</td>
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<tr>
<td>95962+</td>
<td>Functional cortical and subcortical mapping by stimulation and/or recording of electrodes on brain surface, or of depth electrodes, to provoke seizures or identify vital brain structures; each additional hour of physician attendance + (List separately in addition to code for primary procedure)</td>
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<tr>
<td>95970</td>
<td>Electronic analysis of implanted neurostimulator pulse generator system (e.g., rate, pulse amplitude and duration, configuration of wave form, battery status, electrode selectability, output modulation, cycling, impedance and patient compliance measurements); simple or complex brain, spinal cord, or peripheral (i.e., cranial nerve, peripheral nerve, autonomic nerve, neuromuscular) neurostimulator pulse generator/transmitter, without reprogramming</td>
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<tr>
<td>95971</td>
<td>Electronic analysis of implanted neurostimulator pulse generator system (e.g., rate, pulse amplitude and duration, configuration of wave form, battery status, electrode selectability, output modulation, cycling, impedance and patient compliance measurements); simple spinal cord, or peripheral (i.e., peripheral nerve, autonomic nerve, neuromuscular) neurostimulator pulse generator/transmitter, with intraoperative or subsequent programming</td>
</tr>
<tr>
<td>95972</td>
<td>Electronic analysis of implanted neurostimulator pulse generator system (e.g., rate, pulse amplitude and duration, configuration of wave form, battery status, electrode selectability, output modulation, cycling, impedance and patient compliance measurements); complex cranial nerve, spinal cord, or peripheral (i.e., cranial nerve, peripheral nerve, autonomic nerve, neuromuscular) neurostimulator pulse generator/transmitter, with intraoperative or subsequent programming</td>
</tr>
</tbody>
</table>
duration, configuration of wave form, battery status, electrode selectability, output modulation, cycling, impedance and patient compliance measurements); complex spinal cord, or peripheral (except cranial nerve) neurostimulator pulse generator/transmitter, with intraoperative or subsequent programming, first hour

95978 Electronic analysis of implanted neurostimulator pulse generator system (e.g., rate, pulse amplitude and duration, battery status, electrode selectability and polarity, impedance and patient compliance measurements), complex deep brain neurostimulator pulse generator/transmitter, with initial or subsequent programming; first hour

95979+ Electronic analysis of implanted neurostimulator pulse generator system (e.g., rate, pulse amplitude and duration, battery status, electrode selectability and polarity, impedance and patient compliance measurements), complex deep brain neurostimulator pulse generator/transmitter, with initial or subsequent programming; each additional 30 minutes after first hour

+ (List separately in addition to code for primary procedure)

Covered HCPCS Level II Codes

C1767 Generator, neurostimulator (implantable), non-rechargeable
C1778 Lead, neurostimulator (implantable)
C1787 Patient programmer, neurostimulator
C1816 Receiver and/or transmitter, neurostimulator (implantable)
C1820 Generator, neurostimulator (implantable), non-high-frequency with rechargeable battery and charging system
C1883 Adaptor/extension, pacing lead or neurostimulator lead (implantable)
C1897 Lead, neurostimulator test kit (implantable)
L8679 Implantable neurostimulator, pulse generator, any type
L8680 Implantable neurostimulator electrode, each (non-covered by Medicare)
L8681 Patient programmer (external) for use with implantable programmable neurostimulator pulse generator
L8682 Implantable neurostimulator radiofrequency receiver
L8683 Radiofrequency transmitter (external) for use with implantable neurostimulator radiofrequency receiver
L8685 Implantable neurostimulator pulse generator, single array, rechargeable, includes extension**
L8686 Implantable neurostimulator pulse generator, single array, non-rechargeable, includes extension**
L8687 Implantable neurostimulator pulse generator, dual array, rechargeable, includes extension**
L8688 Implantable neurostimulator pulse generator, dual array, non-rechargeable, includes extension**
L8689 External recharging system for battery (internal) for use with implantable neurostimulator, replacement only
L8695 External recharging system for battery (external) for use with implantable neurostimulator, replacement only

** Non-covered by Medicare

Covered ICD.9-CM Procedure Codes

01.22 Removal of intracranial neurostimulator lead(s)
02.93 Implantation or replacement of intracranial neurostimulator lead(s)
86.05 Incision with removal of foreign body or device from skin and subcutaneous tissue
86.94 Insertion or replacement of single array neurostimulator pulse generator, not specified as rechargeable
86.95 Insertion or replacement of dual array neurostimulator pulse generator, not specified as rechargeable
86.96 Insertion or replacement of other neurostimulator pulse generator

Covered ICD-10-PCS Codes

00H00MZ Insertion of Neurostimulator Lead into Brain, Open Approach
00H03MZ Insertion of Neurostimulator Lead into Brain, Percutaneous Approach
00H04MZ Insertion of Neurostimulator Lead into Brain, Percutaneous Endoscopic Approach
00H06MZ Insertion of Neurostimulator Lead into Cerebral Ventricle, Open Approach
00H063MZ Insertion of Neurostimulator Lead into Cerebral Ventricle, Percutaneous Approach
00H064MZ Insertion of Neurostimulator Lead into Cerebral Ventricle, Percutaneous Endoscopic Approach
00P00MZ Removal of Neurostimulator Lead from Brain, Open Approach
00P03MZ Removal of Neurostimulator Lead from Brain, Percutaneous Approach
00P04MZ Removal of Neurostimulator Lead from Brain, Percutaneous Endoscopic Approach
00P06MZ Removal of Neurostimulator Lead from Cerebral Ventricle, Open Approach

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Covered CPT Codes

**00P63MZ** Removal of Neurostimulator Lead from Cerebral Ventricle, Percutaneous Approach
**00P64MZ** Removal of Neurostimulator Lead from Cerebral Ventricle, Percutaneous Endoscopic Approach
**00P6XMZ** Removal of Neurostimulator Lead from Cerebral Ventricle, External Approach
**0JH60BZ** Insertion of Single Array Stimulator Generator into Chest Subcutaneous Tissue and Fascia, Open Approach
**0JH60DZ** Insertion of Multiple Array Stimulator Generator into Chest Subcutaneous Tissue and Fascia, Open Approach
**0JH60MZ** Insertion of Stimulator Generator into Chest Subcutaneous Tissue and Fascia, Open Approach
**0JH63BZ** Insertion of Single Array Stimulator Generator into Chest Subcutaneous Tissue and Fascia, Percutaneous Approach
**0JH63DZ** Insertion of Multiple Array Stimulator Generator into Chest Subcutaneous Tissue and Fascia, Percutaneous Approach
**0JH63MZ** Insertion of Stimulator Generator into Chest Subcutaneous Tissue and Fascia, Percutaneous Approach
**0JPT02Z** Removal of Monitoring Device from Trunk Subcutaneous Tissue and Fascia, Open Approach
**0JPT0MZ** Removal of Stimulator Generator from Trunk Subcutaneous Tissue and Fascia, Open Approach
**0JPT32Z** Removal of Monitoring Device from Trunk Subcutaneous Tissue and Fascia, Percutaneous Approach
**0JPT3MZ** Removal of Stimulator Generator from Trunk Subcutaneous Tissue and Fascia, Percutaneous Approach

Covered ICD-9-CM Diagnosis Codes

332.0 Paralysis agitans (Parkinson’s disease)
332.1 Secondary Parkinsonism
333.1 Essential and other specified forms of tremor
333.6 Genetic torsion dystonia
333.83 Spasmodic torticollis
333.89 Fragments of torsion dystonia, other

Covered ICD-10-CM Diagnosis Codes

G20 Parkinson’s disease
G21.0-G21.9 Secondary parkinsonism
G24.1 Genetic torsion dystonia
G24.2 Idiopathic nonfamilial dystonia
G24.3 Spasmodic torticollis
G24.8 Other dystonia
G24.9 Dystonia, unspecified
G25.0 Essential tremor


REFERENCES


MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
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<tr>
<td>1/7/2016</td>
<td>Approved by MPC. Coding update only.</td>
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<tr>
<td>1/8/2015</td>
<td>Approved by MPC. No changes to Position Statement; updated Coding Section.</td>
</tr>
<tr>
<td>1/9/2014, 12/6/2012</td>
<td>Approved by MPC. No changes.</td>
</tr>
<tr>
<td>1/5/2012</td>
<td>Approved by MPC. Reformatted references. Included information the efficacy of STN DBS under Clinical Evidence section. Added 3 new references.</td>
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<tr>
<td>12/1/2011</td>
<td>New template design approved by MPC.</td>
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