Medical Policy
Deep Brain Stimulation

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Policy Number: 473
BCBSA Reference Number: 7.01.63
NCD/LCD: National Coverage Determination (NCD) for Deep Brain Stimulation for Essential Tremor and Parkinson Disease (160.24)

Related Policies
- Spinal Cord Stimulation, #472
- Responsive Neurostimulation for the Treatment of Refractory Partial Epilepsy, #716

Policy
Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity

Unilateral deep brain stimulation of the thalamus may be considered MEDICALLY NECESSARY in patients with disabling, medically unresponsive tremor due to essential tremor or Parkinson disease.

Bilateral deep brain stimulation of the thalamus may be considered MEDICALLY NECESSARY in patients with disabling, medically unresponsive tremor in both upper limbs due to essential tremor or Parkinson disease.

Unilateral or bilateral deep brain stimulation of the globus pallidus or subthalamic nucleus may be considered MEDICALLY NECESSARY in the following patients:
- Those with Parkinson disease with ALL of the following:
  - A good response to levodopa, AND
  - Motor complications not controlled by pharmacologic therapy; AND
  - one of the following:
    - A minimum score of 30 points on the motor portion of the Unified Parkinson Disease Rating Scale when the patient has been without medication for approximately 12 hours, OR
    - Parkinson disease for at least 4 years.
- Patients older than 7 years with chronic, intractable (drug refractory) primary dystonia, including generalized and/or segmental dystonia, hemidystonia, and cervical dystonia (torticollis).

Deep brain stimulation for other movement disorders, including but not limited to tardive dyskinesia, multiple sclerosis, and post-traumatic dyskinesia, is considered INVESTIGATIONAL.
Deep brain stimulation for the treatment of chronic cluster headaches is considered INVESTIGATIONAL.

Deep brain stimulation for the treatment of other psychiatric or neurologic disorders, including but not limited to epilepsy, Tourette syndrome, depression, obsessive-compulsive disorder, anorexia nervosa, alcohol addiction, Alzheimer disease, and chronic pain, is considered INVESTIGATIONAL.

**Medicare HMO Blue℠ and Medicare PPO Blue℠ Members**

Medical necessity criteria and coding guidance can be found through the link below.

**National Coverage Determination (NCD) for Deep Brain Stimulation for Essential Tremor and Parkinson Disease (160.24)**


**Prior Authorization Information**

Pre-service approval is required for all inpatient services for all products. See below for situations where prior authorization may be required or may not be required.

Yes indicates that prior authorization is required.

No indicates that prior authorization is not required.

N/A indicates that this service is primarily performed in an inpatient setting.

<table>
<thead>
<tr>
<th>Outpatient</th>
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<tbody>
<tr>
<td>Commercial Managed Care (HMO and POS)</td>
<td>No</td>
</tr>
<tr>
<td>Commercial PPO and Indemnity</td>
<td>No</td>
</tr>
<tr>
<td>Medicare HMO Blue℠</td>
<td>No</td>
</tr>
<tr>
<td>Medicare PPO Blue℠</td>
<td>No</td>
</tr>
</tbody>
</table>

**CPT Codes / HCPCS Codes / ICD Codes**

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member’s contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity:

**CPT Codes**

<table>
<thead>
<tr>
<th>CPT codes:</th>
<th>Code 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 (eg, 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 (eg, 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 (eg, thalamus, globus pallidus,</td>
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subthalamic nucleus, periventricular, periaqueductal gray), with use of intraoperative microelectrode recording; first array

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>61868</td>
<td>Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (eg, thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray), with use of intraoperative microelectrode recording; each additional array</td>
</tr>
<tr>
<td>95978</td>
<td>Electronic analysis of implanted neurostimulator pulse generator system (eg, 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</td>
</tr>
<tr>
<td>95979</td>
<td>Electronic analysis of implanted neurostimulator pulse generator system (eg, 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</td>
</tr>
</tbody>
</table>

The following ICD Diagnosis Codes are considered medically necessary when submitted with the CPT codes above if medical necessity criteria are met:

### ICD-9 Diagnosis Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>332.0</td>
<td>Paralysis agitans</td>
</tr>
<tr>
<td>333.1</td>
<td>Essential and other specified forms of tremor</td>
</tr>
</tbody>
</table>

### ICD-10 Diagnosis Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G20</td>
<td>Parkinson's disease</td>
</tr>
<tr>
<td>G21.4</td>
<td>Vascular parkinsonism</td>
</tr>
<tr>
<td>G24.02</td>
<td>Drug induced acute dystonia</td>
</tr>
<tr>
<td>G24.09</td>
<td>Other drug induced dystonia</td>
</tr>
<tr>
<td>G24.1</td>
<td>Genetic torsion dystonia</td>
</tr>
<tr>
<td>G24.2</td>
<td>Idiopathic nonfamilial dystonia</td>
</tr>
<tr>
<td>G24.3</td>
<td>Spasmodic torticollis</td>
</tr>
<tr>
<td>G24.4</td>
<td>Idiopathic orofacial dystonia</td>
</tr>
<tr>
<td>G24.8</td>
<td>Other dystonia</td>
</tr>
<tr>
<td>G24.9</td>
<td>Dystonia, unspecified</td>
</tr>
<tr>
<td>G25.0</td>
<td>Essential tremor</td>
</tr>
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**Description**

Deep brain stimulation (DBS) involves the stereotactic placement of an electrode into the brain (ie, hypothalamus, thalamus, globus pallidus, or subthalamic nucleus). The electrode is initially attached to a temporary transcutaneous cable for short-term stimulation to validate treatment effectiveness. Several days later, the patient returns for permanent subcutaneous surgical implantation of the cable and a radiofrequency-coupled or battery-powered programmable stimulator. The electrode is typically implanted unilaterally on the side corresponding to the most severe symptoms. However, use of bilateral stimulation using 2 electrode arrays has also been investigated in patients with bilateral, severe symptoms. After implantation, noninvasive programming of the neurostimulator can be adjusted to the patient's symptoms. This feature may be important for patients with Parkinson disease (PD), whose disease may progress over time, requiring different neurostimulation parameters. Setting the optimal neurostimulation
parameters may involve the balance between optimal symptom control and appearance of adverse
effects of neurostimulation, such as dysarthria, disequilibrium, or involuntary movements.

DBS has been investigated as an alternative to permanent neuroablative procedures, such as
thalamotomy and pallidotomy. DBS has been most thoroughly investigated as an alternative to
thalamotomy for unilateral control of essential tremor (ET) and tremor associated with PD. More recently,
there has been research interest in the use of DBS of the globus pallidus or subthalamic nucleus as a
treatment of other parkinsonian symptoms, such as rigidity, bradykinesia, and akinesia. Another common
morbidity associated with PD is the occurrence of motor fluctuations, referred to as "on and off"
phenomena, related to the maximum effectiveness of drugs (ie, "on" state) and the nadir response during
drug troughs (ie, "off" state). In addition, levodopa, the most commonly used anti-Parkinson drug, may be
associated with disabling drug-induced dyskinesias. Therefore, the optimal pharmacologic treatment of
PD may involve a balance between optimal effects on PD symptoms and the appearance of drug-induced
dyskinesias. The effect of DBS on both PD symptoms and drug-induced dyskinesias has also been
studied.

DBS has also been investigated in patients with primary and secondary dystonia, defined as a neurologic
movement disorder characterized by involuntary muscle contractions, which force certain parts of the
body into abnormal, contorted, and painful movements or postures. Dystonia can be classified according
to age of onset, bodily distribution of symptoms, and cause. Age of onset can occur during childhood or
during adulthood. Dystonia can affect certain portions of the body (focal dystonia and multifocal dystonia)
or the entire body (generalized dystonia). Torticollis is an example of a focal dystonia. Primary dystonia is
defined when dystonia is the only symptom unassociated with other pathology. Treatment options for
dystonia include oral or injectable medications (ie, botulinum toxin) and destructive surgical or
neurosurgical interventions (ie, thalamotomies or pallidotomies) when conservative therapies fail.
Secondary dystonia is a dystonia brought on by an inciting event, such as a stroke, trauma, or drugs.
Tardive dystonia is a form of drug-induced secondary dystonia.

DBS has been investigated in patients with chronic cluster headaches. Cluster headaches occur
aseptic attacks of severe pain lasting from 30 minutes to several hours. The pain is usually unilateral
and localized to the eye, temple, forehead, and side of the face. Autonomic symptoms that occur with
cluster headaches include ipsilateral facial sweating, flushing, tearing, and rhinorrhea. Cluster headaches
occur primarily in men and have been classified as vascular headaches associated with high blood
pressure, smoking, alcohol use, etc. However, the exact pathogenesis of cluster headaches is uncertain.
Positron emission tomography scanning and magnetic resonance imaging have shown the hypothalamic
region may be important in the pathogenesis of cluster headaches. Alterations in hormonal or
serotonergic function may also play a role. Treatment of cluster headaches includes pharmacologic
interventions for acute episodes and prophylaxis, sphenopalatine ganglion (SPG) blockade, and surgical
procedures such as percutaneous SPG radiofrequency rhizotomy, and gamma knife radiosurgery of the
trigeminal nerve.

The role of DBS in treatment of other treatment-resistant neurologic and psychiatric disorders, particularly
epilepsy, Tourette syndrome, major depressive disorders, and obsessive-compulsive disorder, is also
being investigated. Ablative procedures are irreversible and, though they have been refined, remain
controversial treatments for intractable illness. Interest has shifted to neuromodulation through DBS of
nodes or targets within neural circuits involved in these disorders. Currently, a variety of target areas are
being studied.

Summary
Deep brain stimulation (DBS) involves the stereotactic placement of an electrode into a central nervous
system nucleus (eg, hypothalamus, thalamus, globus pallidus, subthalamic nucleus). DBS is used as an
alternative to permanent neuroablative procedures for control of essential tremor and Parkinson disease.
DBS is also being evaluated for the treatment of a variety of other neurologic and psychiatric disorders.

For individuals who have essential tremor or tremor in Parkinson disease who receive DBS of the
thalamus, the evidence includes a systematic review and case series. Relevant outcomes are symptoms,
functional outcomes, quality of life, and treatment-related morbidity. The systematic review (a TEC Assessment) concluded that there was sufficient evidence that DBS of the thalamus results in clinically significant tremor suppression and that outcomes after DBS were at least as good as thalamotomy. Subsequent studies reporting long-term follow-up have supported the conclusions of the Assessment and found that tremors were effectively controlled 5 to 6 years after DBS. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have symptoms (eg, speech, motor fluctuations) associated with Parkinson disease (advanced or >4 years in duration with early motor symptoms) who receive DBS of the globus pallidus interna (GPI) or subthalamic nucleus (STN), the evidence includes randomized controlled trials (RCTs) and systematic reviews. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. One of the systematic reviews (a TEC Assessment) concluded that studies of DBS of the GPI or STN have consistently demonstrated clinically significant improvements in outcomes (eg, neurologic function). Other systematic reviews have also found significantly better outcomes after DBS than after a control intervention. An RCT in patients with levodopa-responsive Parkinson disease of at least 4 years in duration and uncontrolled motor symptoms found that quality of life at 2 years was significantly higher when DBS was provided in addition to medical therapy. Meta-analyses of RCTs comparing DBS of the GPI and STN have reported mixed findings and have not shown that 1 type of stimulation was clearly superior to the other. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have primary dystonia who receive DBS of the GPI or STN, the evidence includes systematic reviews, case series, and an RCT. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. A pooled analysis of 24 studies, mainly uncontrolled, found improvements in motor scores and disability scores after 6 months and at last follow-up (mean, 32 months). A double-blind RCT found that severity scores improved more after active than after sham stimulation. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have tardive dyskinesia or tardive dystonia who receive DBS, the evidence includes case series, 1 of which included a double-blind comparison of outcomes when the DBS device was turned on versus off. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Few studies were identified and they had small sample sizes (≤10 patients). Additional studies, especially RCTs or other controlled studies, are needed. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have epilepsy who receive DBS, the evidence includes 1 RCT. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Only 1 RCT was identified; in it, DBS had a positive impact during some parts of the blinded trial phase but not others, and a substantial number of adverse events were reported. Additional trials are required to determine the impact of DBS on the net health outcome. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have multiple sclerosis (MS) who receive DBS, the evidence includes 1 RCT. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. One RCT with 10 MS patients is insufficient evidence on which to draw conclusions about the impact of DBS on health outcomes in this population. Additional trials are required. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have Tourette syndrome who receive DBS, the evidence includes crossover RCTs and systematic reviews. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Several small (≤15 patients) crossover trials and a 2015 meta-analysis have suggested that DBS may improve outcomes in patients with Tourette syndrome. However, the optimal target for DBS is unknown and additional controlled studies in larger numbers of patients are needed. The evidence is insufficient to determine the effects of the technology on health outcomes.
For individuals who have cluster headaches or facial pain who receive DBS, the evidence includes a randomized crossover study and case series. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. In the randomized study, the between-group difference in response rates did not differ significantly between active and sham stimulation phases. Additional RCTs or controlled studies are needed. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have treatment-resistant depression who receive DBS, the evidence includes RCTs and systematic reviews. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. The only double-blind, parallel-group RCT in patients with depression did not find that DBS significantly increased the response rate compared with sham; and 2 other RCTs were stopped due to futility. A crossover controlled trial randomized patients to active or to sham stimulation after a year of open-label stimulation. There was a greater reduction in symptom scores after active stimulation, but only in patients who were responders in the open-label phase; these findings may not be generalizable. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have obsessive-compulsive disorder who receive DBS, the evidence includes RCTs and systematic reviews. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. Among the RCTs on DBS for obsessive-compulsive disorder, only 1 has reported the outcome of greatest clinical interest (therapeutic response rate), and that trial did not find a statistically significant benefit for DBS compared to sham treatment. The evidence is insufficient to determine the effects of the technology on health.

For individuals who have anorexia nervosa, alcohol addiction, Alzheimer disease, Huntington disease, or chronic pain who receive DBS, the evidence includes case series. Relevant outcomes are symptoms, functional outcomes, quality of life, and treatment-related morbidity. RCTs are needed to evaluate the impact of DBS on health outcomes for these conditions. The evidence is insufficient to determine the effects of the technology on health outcomes.

**Policy History**

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
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<tbody>
<tr>
<td>9/2017</td>
<td>BCBSA National medical policy review.</td>
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<tr>
<td></td>
<td>Unilateral or bilateral deep brain stimulation of the globus pallidus or subthalamic nucleus revised to include “OR Parkinson disease for at least 4 years” to medically necessary criteria. New investigational indications described. Clarified coding information. Effective 9/1/2017.</td>
</tr>
<tr>
<td>6/2016</td>
<td>BCBSA National medical policy review.</td>
</tr>
<tr>
<td></td>
<td>Added “upper” to medically necessary statement on DBS for medically unresponsive tremor due to essential tremor or Parkinson disease to clarify that the statement refers to both upper limbs.  6/1/2016</td>
</tr>
<tr>
<td>4/2015</td>
<td>BCBSA National medical policy review.</td>
</tr>
<tr>
<td></td>
<td>New medically necessary indications described. Effective 4/1/2015.</td>
</tr>
<tr>
<td>6/2014</td>
<td>Updated Coding section with ICD10 procedure and diagnosis codes, effective 10/2015.</td>
</tr>
<tr>
<td>12/2013</td>
<td>BCBSA National medical policy review.</td>
</tr>
<tr>
<td></td>
<td>New investigational indications described. Effective 12/1/2013. Removed HCPCS codes L8680, L8685-L8688 as they do not meet the intent of the policy</td>
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<tr>
<td>10/2013</td>
<td>Removed CPT codes 61880, 61885, 61886, 61888, 95970 and diagnosis codes 333.6, 333.83, 333.89 &amp; 723.5 as they do not apply to the policy</td>
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<tr>
<td>4/2012</td>
<td>No changes to policy statements.</td>
</tr>
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Changes to policy statements.

No changes to policy statements.

No changes to policy statements.

No changes to policy statements.

No changes to policy statements.

No changes to policy statements.

Changes to policy statements.

No changes to policy statements.

No changes to policy statements.

Information Pertaining to All Blue Cross Blue Shield Medical Policies
Click on any of the following terms to access the relevant information:
Medical Policy Terms of Use
Managed Care Guidelines
Indemnity/PPO Guidelines
Clinical Exception Process
Medical Technology Assessment Guidelines

References
1. Blue Cross and Blue Shield Technology Evaluation Center. Deep brain stimulation of the thalamus for
tremor. TEC Assessment. 1997;Volume 12:Tab 20.
6. Blue Cross and Blue Shield Technology Evaluation Center. Bilateral deep brain stimulation of the
subthalamic nucleus or the globus pallidus interna for treatment of advanced Parkinson's disease.
TEC Assessment. 2001;Volume 16:Tab 16.
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and metaanalysis of outcomes. Mov Disord. Jun 2006;21 Suppl 14:S290-304. PMID 16892449
associated with deep brain stimulation: A meta-analysis of ten years' experience. Mov Disord. Sep 15
2007;22(12):1722-1728. PMID 17721929
meta-analysis of pallidal and subthalamic stimulation. J Neurol Neurosurg Psychiatry. Sep
2014;85(9):982-986. PMID 24444854


