Diaphragmatic / Phrenic Nerve Stimulation

Policy Number: HS-185

Original Effective Date: 8/19/2010


BACKGROUND

Diaphragmatic/phrenic nerve stimulator devices are indicated for certain ventilator-dependent individuals who lack voluntary control of their diaphragm muscles to enable independent breathing without the assistance of a mechanical ventilator for at least four continuous hours a day.

New FDA approval for distribution of the NeuRx DPS™ RA/4 Respiratory Stimulation System (Synapse Biomedical, Inc., Oberlin, OH) was granted under a Humanitarian Device Exemption (HDE) on June 17, 2008. The FDA-approved indications are: For use in patients with stable, high spinal cord injuries with stimulatable diaphragms, but...
lack control of their diaphragms. The device is indicated to allow the patients to breathe without the assistance of a mechanical ventilator for at least 4 continuous hours a day and is for use only in patients 18 years of age or older. This FDA approval is subject to the manufacturer developing an acceptable method of tracking device implantation to individual patient recipients.¹

The Avery Breathing Pacemaker System (i.e., the Mark IV™ Avery Biomedical Device, Inc., Commack, NY) is the only other diaphragmatic/phrenic stimulator system approved for use by the FDA in the United States. The pacemaker is classified as a Class III neurologic therapeutic device requiring premarket approval (PMA). The device is approved "For persons who require chronic ventilatory support because of upper motor neuron respiratory muscle paralysis (RMP) or because of central alveolar hypoventilation (CAH) and whose remaining phrenic nerve, lung, and diaphragm function is sufficient to accommodate electrical stimulation". Clinical trials that have studied the efficacy of this device have been very limited and of small numbers of subjects.²

The NeuRx DPS™ RA/4 Respiratory Stimulation System is implanted through minimally invasive laparoscopic surgery and provides electrical stimulation to muscles and nerves that run through the diaphragm. This eliminates any direct contact with the phrenic nerve, allows all circuitry and electronics to remain outside the body, and provides direct, selective activation to each hemidiaphragm. According to manufacturer information, when stimulated by the NeuRx DPS, the diaphragm contracts, mimicking natural breathing and allowing air to fill the upper and lower parts of the lungs, rather than forcing air in with a mechanical ventilator. The device uses four electrodes implanted in the muscle of the diaphragm to electronically stimulate contraction; this stimulation allows the patient to inhale. The DPS is lightweight and battery powered, eliminating the need for an external power source.³

### Position Statement

#### Applicable To:
- Medicare – All Markets

### Exclusions

Diaphragmatic/phrenic nerve stimulation is not considered medically necessary when:

- The member can breathe spontaneously for 4 hours or more without the use of a mechanical respirator; OR,
- The respiratory insufficiency is temporary; OR,
- Motor neuron disease, (i.e. amyotrophic lateral sclerosis [ALS]) is present; OR,
- Used in patients whose phrenic nerve, lung, or diaphragm function are not sufficient to achieve adequate diaphragm movement from electrical stimulation.

Diaphragmatic/phrenic nerve stimulation is considered experimental and investigational for all other indications not listed above.

Therapy utilizing a phrenic nerve stimulator is covered by Medicare for selected patients with partial or complete respiratory insufficiency caused by a variety of conditions, including respiratory paralysis resulting from lesions of the brain stem and cervical spinal cord, and chronic pulmonary disease with ventilatory insufficiency. It is intended as an alternative for patients with respiratory insufficiency who are dependent upon a mechanical ventilator as well as maintenance of a permanent tracheotomy stoma. The policy notes that phrenic nerve stimulators are not always effective, and that any patient considered for this technology must have an intact phrenic nerve and diaphragm. The policy does not specifically mention ventilatory support using stimulation provided by electrodes implanted into the diaphragm.⁴

### Coverage

Diaphragmatic/phrenic nerve stimulation is considered medically necessary if ALL of the following criteria are met:

- The device is FDA approved (i.e. NeuRx DPS™, Mark IV™); AND,
- The stimulation is used as an alternative to invasive mechanical ventilation for members with severe, chronic respiratory failure requiring mechanical ventilation caused by brain or high cervical cord lesions;
AND,
- Member is at least 18 years of age; AND,
- Member has ventilatory failure from stable, high spinal cord injuries OR central alveolar hypoventilation syndrome.

AND,

When all of the following criteria are met for direct or phrenic nerve stimulation:

- Diaphragm movement with stimulation is visible under fluoroscopy; AND,
- Stimulation of the diaphragm either directly or through the phrenic nerve results in sufficient muscle activity to accommodate independent breathing without the support of a ventilator; AND,
- The member has normal chest anatomy, a normal level of consciousness, and has the ability to participate in and complete the training and rehabilitation associated with the use of the device.

NOTE: If phrenic nerve stimulation is used, acceptable nerve function must be demonstrated with EMG recordings and nerve conduction times.

**CODING**

**Covered CPT® Codes**

- 64575 Incision for implantation of neurostimulator electrode array; peripheral nerve, (excludes sacral nerve)
- 64595 Revision or removal of peripheral or gastric neurostimulator pulse generator or receiver

**Covered HCPCS Codes**

- C1778 Lead, neurostimulator (implantable)
- C1816 Receiver and/or transmitter, neurostimulator (implantable)

**Covered 2017 ICD-10-PCS Codes**

Please reference ICD-10 PCS for the complete code description for Insertion of Neurostimulator)

- 01HY0MZ Insertion of Neurostimulator Lead into Peripheral Nerve, Open Approach
- 01PY0MZ Removal of Neurostimulator Lead from Peripheral Nerve, Open Approach
- 01HY0MZ Insertion of Neurostimulator Lead into Peripheral Nerve, Open Approach
- 01HY3MZ Insertion of Neurostimulator Lead into Peripheral Nerve, Percutaneous Approach
- 01HY4MZ Insertion of Neurostimulator Lead into Peripheral Nerve, Percutaneous Endoscopic Approach
- 0DH64MZ Insertion of Stimulator Lead into Stomach, Percutaneous Endoscopic Approach
- 0DH60MZ Insertion of Stimulator Lead into Stomach, Open Approach
- 0DH63MZ Insertion of Stimulator Lead into Stomach, Percutaneous Approach
- 0DH60MZ Insertion of Stimulator Lead into Stomach, Open Approach
- 0DH64MZ Insertion of Stimulator Lead into Stomach, Percutaneous Endoscopic Approach
- 0DH60MZ Insertion of Stimulator Lead into Stomach, Open Approach
- 0DH63MZ Insertion of Stimulator Lead into Stomach, Percutaneous Approach
- 0DH64MZ Insertion of Stimulator Lead into Stomach, Percutaneous Endoscopic Approach
- 0DH60MZ Insertion of Stimulator Lead into Stomach, Open Approach
- 0DH63MZ Insertion of Stimulator Lead into Stomach, Percutaneous Approach
- 0DH64MZ Insertion of Stimulator Lead into Stomach, Percutaneous Endoscopic Approach
- 0DH60MZ Insertion of Stimulator Lead into Stomach, Open Approach
- 0DH63MZ Insertion of Stimulator Lead into Stomach, Percutaneous Approach
- 0BHROMZ Insertion of Diaphragmatic Pacemaker Lead into Right Diaphragm, Percutaneous Approach
- 0BHR3MZ Insertion of Diaphragmatic Pacemaker Lead into Right Diaphragm, Percutaneous Approach
- 0BHR4MZ Insertion of Diaphragmatic Pacemaker Lead into Right Diaphragm, Percutaneous Endoscopic Approach
- 0BHS0MZ Insertion of Diaphragmatic Pacemaker Lead into Left Diaphragm, Percutaneous Approach
- 0BHS3MZ Insertion of Diaphragmatic Pacemaker Lead into Left Diaphragm, Percutaneous Approach
- 0BHS4MZ Insertion of Diaphragmatic Pacemaker Lead into Left Diaphragm, Percutaneous Endoscopic Approach
Covered ICD-10-CM Diagnosis Codes

Additional Diagnoses

Experimental / Investigational / Unproven / Not Covered

ICD-10-CM Diagnosis Codes - This list is not all inclusive

A80.30 - A80.39 Acute paralytic poliomyelitis, other and unspecified
B91 Sequelae of poliomyelitis
G14 Postpolio syndrome
G12.20 - G12.29 Motor neuron disease
G71.11 - G71.19 Myotonic disorders
G71.2 Congenital myopathies
G72.9 – G71.19 Other and unspecified myopathies
J96.10 - J96.12 Chronic respiratory failure, unspecified or with hypoxia or hypercapnia
J96.20 – J96.22 Acute and chronic respiratory failure, unspecified or with hypoxia or hypercapnia

Coding information is provided for informational purposes only. The inclusion or omission of a CPT, HCPCS, or ICD-10 code does not imply member coverage or provider reimbursement. Consult the member's benefits that are in place at time of service to determine co-coverage (or non-coverage) as well as applicable federal / state laws.

REFERENCES


MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/1/2018, 4/6/2017, 4/7/2016</td>
<td>• Approved by MPC. No changes.</td>
</tr>
<tr>
<td>4/2/2015</td>
<td>• Approved by MPC. Addition of ICD-10 codes.</td>
</tr>
<tr>
<td>5/1/2014, 6/6/2013</td>
<td>• Approved by MPC. No changes.</td>
</tr>
<tr>
<td>8/2/2012</td>
<td>• Approved by MPC. Added CMS statement; does not change coverage.</td>
</tr>
<tr>
<td>12/1/2011</td>
<td>• New template design approved by MPC.</td>
</tr>
<tr>
<td>8/2/2011</td>
<td>• Approved by MPC. No changes.</td>
</tr>
</tbody>
</table>