NOW APPROVED
for children as young as 4†

The **first and only** device FDA-approved for children with drug-resistant epilepsy

**Patients treated**

- **>30,000** children treated (<18y)
- **>100,000**

**VNS Therapy for epilepsy is both safe and effective for adults and children**
- **AAN Guideline**

**Restoring Wellness**

**Early use of VNS Therapy** offers proven long-term outcomes for children at a critical time in their development (Englot)

Children experienced a significantly higher rate of response than adults

![Graph showing response rate over time](image)

**Patients with less than 10 years of seizure duration responded better to VNS Therapy**

![Graph showing response rate over time](image)

Children treated with VNS Therapy have been shown to have

- **fewer seizures, shorter seizures, and a faster recovery** (Orosz)

**No AED changes**

- **48%** of children had a reduction in seizure duration
- **42%** of children had a reduction in seizure severity
- **40%** of children had a reduction in post-ictal severity

**Predominant Seizure Type (most disabling seizure)**
- **No AED changes**
- **63%** responder rate
- **24 MONTHS** mean follow-up (N=83)

- **65%** responder rate
- **60%** responder rate
- **55%** responder rate
- **50%** responder rate
- **45%** responder rate

- **< 18y**
- **> 18y**

- **< 10y**
- **> 10y**
VNS Therapy can lead to improved wellness by reducing health-related events.

Providing Value

Cost-effective therapeutic solution in pediatric population\(^8\)

- **Net healthcare cost savings with VNS Therapy**

  \[ \text{Net Costs (2010 $)} \]

  \[ \begin{array}{c|c|c|c|c|c|c|c|c|c|c|c|c|c}
  \hline
  \text{Number of Quarters Post VNS Implantation} & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12 \\
  \hline
  \text{Age <12 years (N=238)} & -20k & -10k & 0 & $20k & $10k & 0 & $20k & $10k & 0 & $20k & $10k & 0 \\
  \text{Age 12-17 years (N=207)} & -25k & -15k & -5k & 0 & $5k & $15k & $25k & $30k & $40k & $50k & $60k & $70k \\
  \hline
\end{array} \]

- **Post-VNS Therapy Reductions**\(^8\) (Helmers)

  - Number of Hospital Days
  - Emergency Room Visits
  - Hospitalizations

<table>
<thead>
<tr>
<th>Age &lt;12 years</th>
<th>Number of Hospital Days</th>
<th>Emergency Room Visits</th>
<th>Hospitalizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=238</td>
<td>25%</td>
<td>26%</td>
<td>27%</td>
</tr>
<tr>
<td>Age 12 - 17 years</td>
<td>N=207</td>
<td>48%</td>
<td>56%</td>
</tr>
</tbody>
</table>

While on VNS Therapy, 2/3 of children taking benzodiazepines withdrew completely\(^9\) (Majkowska)

- **Post-VNS Therapy Reductions\(^8\)**

<table>
<thead>
<tr>
<th>Use of benzodiazepines %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-VNS</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>Post-VNS (by 48mo)</td>
</tr>
<tr>
<td>26.3%</td>
</tr>
</tbody>
</table>

- **Incidence of adverse events following stimulation (>5%)** were dysphonia, convulsion, headache, oropharyngeal pain, depression, dysphagia, dyspnea, dyspnea exertional, stress, and vomiting.

Proven safety and tolerability

- Nonpharmacological side effect profile
  - Typically occur during stimulation and generally diminish over time\(^10,11\)
  - May be diminished or eliminated by the adjustment of parameter settings\(^10,12\)

Ease of Use

The latest VNS Therapy technology* with expanded MRI access enables patients to obtain high quality MRI to optimize long-term treatment plans\(^1\)

- Only neuromodulation device for drug-resistant epilepsy that is FDA-approved for MRI\(^13\)
- Patients with the latest VNS Therapy technology* may visit any MRI center and are eligible for more than 90% of scans performed on people with epilepsy\(^2\)

The VNS Therapy System is indicated for use as an adjunctive therapy in reducing the frequency of seizures in patients 4 years of age and older with partial onset seizures that are refractory to antiepileptic medications.

*Aspire4C model 105, AspireSR model 106, SenTiva model 1000

For complete information on MRI safety, please visit www.easy-mri.com

Please see important safety information and references attached.

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References

1. VNS Therapy Physician’s Manual, September 2016, LivaNova, Houston, TX
2. Data on File, LivaNova, Houston, TX
13. Neuropace RNS System Brief Statement, May 2014, Neuropace, Mountain View, CA
1. INTENDED USE / INDICATIONS

Epilepsy (US)—The VNS Therapy System is indicated for use as an adjunctive therapy in reducing the frequency of seizures in patients 4 years of age and older with partial onset seizures that are refractory to antiepileptic medications.

2. CONTRAINDICATIONS

Vagotomy—The VNS Therapy System cannot be used in patients after a bilateral or left cervical vagotomy.

3. WARNINGS — GENERAL

Physicians should inform patients about all potential risks and adverse events discussed in the physician’s manuals. This document is not intended to serve as a substitute for the complete physician’s manuals.

The safety and efficacy of the VNS Therapy System have not been established for use outside the intended use/indications described above.

The safety and effectiveness of the VNS Therapy System in patients with predisposed dysfunction of cardiac conduction systems (e-entry pathway) have not been established. Post-implant electrocardiograms and Holter monitoring are recommended if clinically indicated.

Postoperative bradycardia can occur among patients with certain underlying cardiac arrhythmias.

VNS Therapy System operation should always be checked by performing device diagnostics after any of the procedures mentioned in the physician’s manuals.

4. WARNINGS — EPILEPSY

It is important to follow recommended implantation procedures and intraoperative product testing described in the Implantation Procedure chapter of the physician’s manuals. During the intraoperative System Diagnostics (Lead Test), infrequent incidents of bradycardia and/or asystole have occurred. If asystole were to occur, it is a requirement to follow guidelines consistent with Advanced Cardiac Life Support (ACLS).

Difficult swallowing (dysphagia) may occur with active stimulation, and aspiration may result from the increased swallowing difficulties. Patients with pre-existing swallowing difficulties and those with a history of choking or hypersalivation are at greater risk for aspiration. Use of the magnet to temporarily stop stimulation while eating may mitigate the risk of aspiration.

Sudden unexpected death in epilepsy (SUDEP) is a term commonly associated with VNS Therapy. Any patient with underlying pulmonary disease or insufficiency such as chronic obstructive pulmonary disease or asthma may be at increased risk for dyspnea.

5. PRECAUTIONS — GENERAL

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Postoperative bradycardia can occur among patients with certain underlying cardiac arrhythmias.

VNS Therapy System operation should always be checked by performing device diagnostics after any of the procedures mentioned in the physician’s manuals.

6. ENVIRONMENTAL AND MEDICAL THERAPY HAZARDS

The VNS Therapy System should only be prescribed and monitored by physicians who have specific training and expertise in the management of seizures and the use of this device. It should only be used in patients who are physically and mentally capable of using the device. It should not be used in patients with severe cognitive impairment who are unable to cooperate with the specified training in the implantation of this device.

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The safety and effectiveness of the VNS Therapy System have not been established for use during pregnancy. VNS Therapy System operation should always be checked by performing device diagnostics after any of the procedures mentioned in the physician’s manuals.

Adverse events reported during clinical studies as statistically significant are listed below in alphabetical order:

- Ataxia (loss of the ability to coordinate muscle movement); dysteapnea (indigestion); dyspnea (difficulty breathing); increase in body weight.
- Hypersensitivity (difficulty breathing); laryngismus (inability to sleep); myoclonus; nausea; paroxysmal depolarization shift with involvement of the skin; pain; pharyngitis; psychoses (delusions or hallucinations); vomiting.
- The patient can use a neck brace for the first week to help ensure proper lead stabilization.

If the patient receives medical treatment for which electric current is passed through the body (such as external cardioversion with a paddle), current could be set to 50 mA for the first 2 weeks post-implantation and then gradually increased to 200 mA. If the patient receives medical treatment for which electric current is not passed through the body (such as defibrillation of the heart), current could be set to 200 mA. If the patient receives medical treatment for which electric current is not passed through the body (such as defibrillation of the heart), current could be set to 200 mA. If the patient receives medical treatment for which electric current is not passed through the body (such as defibrillation of the heart), current could be set to 200 mA.