

MEDICAL POLICY

POLICY TITLE	RESPONSIVE NEUROSTIMULATION FOR THE TREATMENT OF REFRACTORY FOCAL EPILEPSY
POLICY NUMBER	MP 1.156

CLINICAL BENEFIT	☒ MINIMIZE SAFETY RISK OR CONCERN. ☐ MINIMIZE HARMFUL OR INEFFECTIVE INTERVENTIONS. ☐ ASSURE APPROPRIATE LEVEL OF CARE. ☐ ASSURE APPROPRIATE DURATION OF SERVICE FOR INTERVENTIONS. ☒ ASSURE THAT RECOMMENDED MEDICAL PREREQUISITES HAVE BEEN MET. ☐ ASSURE APPROPRIATE SITE OF TREATMENT OR SERVICE.
Effective date:	8/1/2026

POLICY

Responsive neurostimulation may be considered **medically necessary** for individuals with focal epilepsy who meet **all** of the following criteria:

- Are 18 years or older; **and**
- Have a diagnosis of focal seizures with 1 or 2 well-localized seizure foci identified; **and**
- Have an average of 3 or more disabling seizures (e.g., motor focal seizures, complex focal seizures, or secondary generalized seizures) per month over the prior 3 months; **and**
- Are refractory to medical therapy (have failed ≥ 2 appropriate antiepileptic medications at therapeutic doses); **and**
- Are not candidates for focal resective epilepsy surgery (e.g., have an epileptic focus near the eloquent cerebral cortex; have bilateral temporal epilepsy); **and**
- Do not have contraindications for responsive neurostimulation device placement (see Policy Guidelines section).

Responsive neurostimulation is considered **investigational** for all other indications, as there is insufficient evidence to support a general conclusion concerning the health outcomes or benefits associated with this procedure.

POLICY GUIDELINES

Contraindications for responsive neurostimulation device placement include 3 or more specific seizure foci, presence of primary generalized epilepsy, or presence of a rapidly progressive neurologic disorder.

Cross-Reference:

MP 1.042 Deep Brain Stimulation

PRODUCT VARIATIONS

This policy is only applicable to certain programs and products administered by Capital Blue Cross and subject to benefit variations. Please see additional information below.

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FEP PPO - Refer to FEP Medical Policy Manual. The FEP Medical Policy manual can be found at: <https://www.fepblue.org/benefit-plans/medical-policies-and-utilization-management-guidelines/medical-policies>.

DESCRIPTION/BACKGROUND

Approximately one-third of individuals with epilepsy do not respond to typical first-line therapy with antiepileptic medications. Seizures that occur in these individuals are referred to as refractory or drug-resistant. In individuals with refractory epilepsy, combination antiepileptic therapy often results in increased risk of adverse events. Other nonpharmacologic treatment options are available, including surgical approaches, ketogenic diet, and responsive neurostimulation. One responsive neurostimulation device, the NeuroPace RNS System, has U.S. Food and Drug Administration (FDA) approval for the treatment of refractory focal (formerly partial) epilepsy.

Medical Therapy for Focal Seizures

Focal seizures (previously referred to as partial seizures) arise from a discrete area of the brain and can cause a range of symptoms, depending on the seizure type and the brain area involved.

Standard therapy for seizures, including focal seizures, includes treatment with 1 or more of various antiepileptic drugs, which include newer antiepileptic drugs, such as oxcarbazepine, lamotrigine, topiramate, gabapentin, pregabalin, levetiracetam, tiagabine, and zonisamide. Currently, response to antiepileptic drugs is less than ideal: 1 systematic review comparing newer antiepileptic drugs for refractory focal epilepsy reported an overall average responder rate in treatment groups of 34.8%. As a result, a substantial number of individuals do not achieve good seizure control with medications alone.

Surgical Therapy for Seizures

When a discrete seizure focus can be identified, seizure control may be achieved through resection of the seizure focus (epilepsy surgery). For temporal lobe epilepsy, a randomized controlled trial (RCT) has demonstrated that surgery for epilepsy was superior to prolonged medical therapy in reducing seizures associated with impaired awareness and in improving quality of life. Surgery for refractory focal epilepsy (excluding simple focal seizures) is associated with 5-year freedom from seizure rates of 52%, with 28% of seizure-free individuals able to discontinue antiepileptic drugs. Selection of appropriate individuals for epilepsy surgery is important, because those with non-lesional extratemporal lobe epilepsy have worse outcomes after surgery than those with non-lesional temporal lobe epilepsy. Some individuals are not candidates for epilepsy surgery if the seizure focus is located in an eloquent area of the brain or other region that cannot be removed without risk of significant neurologic deficit.

Neurostimulation for Neurologic Disorders

Electrical stimulation at one of several locations in the brain has been used as therapy for epilepsy, either as an adjunct to or as an alternative to medical or surgical therapy. Vagus nerve

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stimulation has been widely used for refractory epilepsy, following U.S. Food and Drug Administration (FDA) approval of a vagus nerve stimulation device in 1997 and 2 randomized controlled trials (RCT) evaluating vagus nerve stimulation in epilepsy. Although the mechanism of action for vagus nerve stimulation is not fully understood, vagus nerve stimulation is thought to reduce seizure activity through activation of vagal visceral afferents with diffuse central nervous system projections, leading to a widespread effect on neuronal excitability.

Stimulation of other locations in the neuroaxis has been studied for a variety of neurologic disorders. Electrical stimulation of deep brain nuclei (deep brain stimulation) involves the use of chronic, continuous stimulation of a target. It has been most widely used in the treatment of Parkinson disease and other movement disorders and has been investigated for treating epilepsy. Deep brain stimulation of the anterior thalamic nuclei was studied in a RCT, the Stimulation of the Anterior Nucleus of the Thalamus for Epilepsy trial, but deep brain stimulation is not currently approved by the FDA for stimulation of the anterior thalamic nucleus. Stimulation of the cerebellar and hippocampal regions and the subthalamic, caudate, and centromedian nuclei have also been evaluated for the treatment of epilepsy.

Responsive Neurostimulation for Epilepsy

Responsive neurostimulation shares some features with deep brain stimulation but is differentiated by its use of direct cortical stimulation and by its use in both monitoring and stimulation. The responsive neurostimulation system provides stimulation in response to detection of specific epileptiform patterns, while deep brain stimulation provides continuous or intermittent stimulation at preprogrammed settings.

Development of the responsive neurostimulation system arose from observations related to the effects of cortical electrical stimulation for seizure localization. It has been observed that electrical cortical stimulation can terminate induced and spontaneous electrographic seizure activity in humans and animals. Individuals with epilepsy may undergo implantation of subdural monitoring electrodes for the purposes of seizure localization, which at times have been used for neurostimulation to identify eloquent brain regions. Epileptiform discharges that occur during stimulation for localization can be stopped by a train of neighboring brief electrical stimulations.

In tandem with the recognition that cortical stimulation can stop epileptiform discharges was development of fast pre-ictal seizure prediction algorithms. These algorithms interpret electrocorticographic data from detection leads situated over the cortex. The responsive neurostimulation process thus includes electrocorticographic monitoring via cortical electrodes, analysis of data through a proprietary seizure detection algorithm, and delivery of electrical stimulation via both cortical and deep-implanted electrodes in an attempt to halt a detected epileptiform discharge.

One device, the NeuroPace RNS® System, is currently approved by the FDA and is commercially available.

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Responsive Neurostimulation for Seizure Monitoring

Although the intent of the electrocorticography component of the responsive neurostimulation system is to provide input as a trigger for neurostimulation, it also provides continuous seizure mapping data (chronic unlimited cortical electrocorticography) that may be used by practitioners to evaluate individuals' seizures. In particular, the seizure mapping data have been used for surgical planning of individuals who do not experience adequate seizure reduction with responsive neurostimulation placement. Several studies have described the use of responsive neurostimulation in evaluating seizure foci for epilepsy surgery or for identifying whether seizure foci are unilateral.

This review does not further address use of responsive neurostimulation exclusively for seizure monitoring.

Regulatory Status

In November 2013, the NeuroPace RNS System (NeuroPace) was approved by the FDA through the premarket approval process for the following indication:

"The RNS System is an adjunctive therapy in reducing the frequency of seizures in individuals 18 years of age or older with partial onset seizures who have undergone diagnostic testing that localized no more than 2 epileptogenic foci, are refractory to two or more antiepileptic medications, and currently have frequent and disabling seizures (motor partial seizures, complex partial seizures, and/or secondarily generalized seizures). The RNS System has demonstrated safety and effectiveness in patients who average 3 or more disabling seizures per month over the three most recent months (with no month with fewer than two seizures) and has not been evaluated in patients with less frequent seizures."

FDA product code: PFN.

RATIONALE

SUMMARY OF EVIDENCE

For individuals who have refractory focal epilepsy who receive responsive neurostimulation, the evidence includes an industry-sponsored randomized controlled trial (RCT), which was used for Food and Drug Administration (FDA) approval of the NeuroPace RNS System, as well as several published follow-up analyses. Relevant outcomes are symptoms, morbid events, quality of life, and treatment-related mortality and morbidity. The RCT was well-designed and well-conducted; it reported that responsive neurostimulation is associated with improvements in mean seizure frequency in individuals with refractory focal epilepsy, with an absolute difference in change in seizure frequency of about 20% between groups; however, the percentage of treatment responders with at least a 50% reduction in seizures did not differ from sham control. Overall, the results suggested a modest reduction in seizure frequency in a subset of individuals. The number of adverse events reported in the available studies is low, although the data on adverse events

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were limited because of small study samples. Generally, individuals who are candidates for responsive neurostimulation are severely debilitated and have few other treatment options, so the benefits are likely high relative to the risks. In particular, individuals who are not candidates for resective epilepsy surgery and have few treatment options may benefit from responsive neurostimulation. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

DEFINITIONS

NA

DISCLAIMER

Capital Blue Cross' medical policies are used to determine coverage for specific medical technologies, procedures, equipment, and services. These medical policies do not constitute medical advice and are subject to change as permitted by law or applicable clinical evidence from independent treatment guidelines. Treating providers are solely responsible for medical advice and treatment of members. These policies are not a guarantee of coverage or payment. Payment of claims is subject to a determination regarding the member's benefit program and eligibility on the date of service, and a determination that the services are medically necessary and appropriate. Final processing of a claim is based upon the terms of contract that applies to the members' benefit program, including benefit limitations and exclusions. If a provider or a member has a question concerning this medical policy, please contact Capital Blue Cross' Provider Services or Member Services.

CODING INFORMATION

Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

Covered when medically necessary:

Procedure Codes							
L8680	L8686	L8688	61850	61860	61863	61864	61880
61885	61886	61888	61889	61891	61892	95836	95970
95971							

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ICD-10-CM Diagnosis Code	Description
G40.011	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, with status epilepticus
G40.019	Localization-related (focal) (partial) idiopathic epilepsy and epileptic syndromes with seizures of localized onset, intractable, without status epilepticus
G40.101	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, with status epilepticus
G40.109	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, not intractable, without status epilepticus
G40.111	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, with status epilepticus
G40.119	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with simple partial seizures, intractable, without status epilepticus
G40.201	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, with status epilepticus
G40.209	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, not intractable, without status epilepticus
G40.211	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, with status epilepticus
G40.219	Localization-related (focal) (partial) symptomatic epilepsy and epileptic syndromes with complex partial seizures, intractable, without status epilepticus
G40.841	KCNQ2-related epilepsy, not intractable, with status epilepticus
G40.842	KCNQ2-related epilepsy, not intractable, without status epilepticus
G40.843	KCNQ2-related epilepsy, intractable, with status epilepticus
G40.844	KCNQ2-related epilepsy, intractable, without status epilepticus
G40.C01	Lafora progressive myoclonus epilepsy, not intractable, with status epilepticus
G40.C09	Lafora progressive myoclonus epilepsy, not intractable, without status epilepticus
G40.C11	Lafora progressive myoclonus epilepsy, intractable, with status epilepticus
G40.C19	Lafora progressive myoclonus epilepsy, intractable, without status epilepticus

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POLICY HISTORY

MP 1.156	04/10/2020 Major Review. New policy adopted from BCBSA to provide coverage criteria for neurostimulation in patients with epilepsy refractory to other treatment.
	05/21/2021 Consensus Review. BCBSA full adoption. No change to policy statement. Coding and References reviewed.
	06/17/2021 Consensus Review. No changes to policy statement. FEP and references updated. Coding reviewed.
	08/23/2023 Administrative Update. New ICD 10 codes added to the policy.
	12/12/2023 Administrative Update. Added codes 61889, 61891, and 61892 as MN, effective 1/1/2024.
	01/10/2024 Consensus Review. Updated rationale, references. Coding reviewed, no changes.
	09/12/2024 Administrative Update. Added 4 new ICD-10 codes, effective 10/1/24.
	10/04/2024 Consensus Review. No changes to policy statement. Updated background, rational, references. Coding reviewed, no changes.
	5/16/2025 Consensus Review. No changes to policy statement. Updated References. Added Procedure code 95836.
	08/28/2025 Administrative Update. Removed Benefit Variations Section and updated Disclaimer.

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	04/29/2026 Consensus Review. No changes to policy statement. Updated policy formatting, product variations, rationale, disclaimer, and references. ICD10 table updated.
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