Corporate Medical Policy

Radiofrequency Ablation of the Renal Nerves as a Treatment of Hypertension

File Name: radiofrequency_ablation_of_the_renal_nerves_as_a_treatment_of_hypertension
Origination: 10/2012
Last Review: 04/2023

Description of Procedure or Service

Resistant Hypertension.
Hypertension is a widely prevalent condition, which is estimated to affect approximately 30% of the population in the United States. It accounts for a high burden of morbidity related to strokes, ischemic heart disease, kidney disease, and peripheral arterial disease. Resistant hypertension is defined as elevated blood pressure (BP) despite treatment with at least 3 antihypertensive agents at optimal doses. Resistant hypertension is also a relatively common condition, given the large number of individuals with hypertension. In large clinical trials of hypertension treatment, up to 20-30% of participants meet the definition for resistant hypertension, and in tertiary care hypertension clinics, the prevalence has been estimated to be 11-18%. Resistant hypertension is associated with a higher risk for adverse outcomes such as stroke, myocardial infarction (MI), heart failure, and kidney failure.

There are a number of factors that may contribute to uncontrolled hypertension, and these should be considered and addressed in all patients with hypertension prior to labeling a patient resistant. These include nonadherence to medications, excessive salt intake, inadequate doses of medications, excess alcohol intake, volume overload, drug-induced hypertension, and other forms of secondary hypertension. Also, sometimes it is necessary to address comorbid conditions, i.e., obstructive sleep apnea, in order to adequately control BP.

Treatment for resistant hypertension is mainly intensified drug therapy, sometimes with the use of non-traditional antihypertensive medications such as spironolactone and/or minoxidil. However, control of resistant hypertension with additional medications is often challenging and can lead to high costs and frequent adverse effects of treatment. As a result, there is a large unmet need for additional treatments that can control resistant hypertension. Non-pharmacologic interventions for resistant hypertension include modulation of the baroreflex receptor, and/or radiofrequency (RF) denervation of the renal nerves.

Radiofrequency Denervation of the Renal Sympathetic Nerves.
Increased sympathetic nervous system activity has been linked to essential hypertension. Surgical sympathectomy has been shown to be effective in reducing blood pressure but is limited by the adverse side effects of surgery and was largely abandoned after effective medications for hypertension became available. The renal sympathetic nerves arise from the thoracic nerve roots and innervate the renal artery, the renal pelvis, and the renal parenchyma. Radiofrequency ablation (RFA) of the renal sympathetic nerves is thought to decrease both the afferent sympathetic signals from the kidney to the brain and the efferent signals from the brain to the kidney. The procedure decreases sympathetic activation, decreases vasoconstriction, and decreases activation of the renin-angiotensin system.

The procedure is performed percutaneously with access at the femoral artery. A flexible catheter is threaded into the renal artery and controlled low-power RF energy, is delivered to the arterial

walls where the renal sympathetic nerves are located. Once adequate RF energy has been delivered to ablate the sympathetic nerves, the catheter is removed.

Regulatory Status

No RFA devices have been approved by the U.S. Food and Drug Administration (FDA) for ablation of the renal sympathetic nerves as a treatment for hypertension. There are several devices that have been developed for this purpose and are in various stages of application for FDA approval.

- The Symplicity™ Renal Denervation System (Medtronic) is a single-electrode RFA catheter system. The next generation Symplicity Spyral™ Renal Denervation System (Medtronic) is a multielectrode RFA catheter system designed to deliver 4-quadrant ablations.
- The EnligHTN™ Multi-Electrode Renal Denervation System (St. Jude Medical) is an RFA catheter using a 4-point multiablation basket design. In January 2014, the EnligHTN™ Renal Guiding Catheter was cleared for marketing by FDA through the 510(k) process, based on substantial equivalence to predicate devices for the following indication: percutaneous use through an introducer sheath to facilitate a pathway to introduce interventional and diagnostic devices into the renal arterial vasculature.
- The Vessix™ Renal Denervation System (Boston Scientific; formerly the V2 renal denervation system, Vessix Vascular) is a combination of a RF balloon catheter and bipolar RF generator technologies, intended to permit a lower voltage intervention.

Other RFA catheters (eg, Thermocouple Catheter™ [Biosense Webster]) used for other types of ablation procedures (eg, cardiac electrophysiology procedures) have been used off-label for RFA of the renal arteries.

In 2020, the FDA granted breakthrough therapy designation to 2 renal artery denervation systems - SoniVie's Therapeutic Intra-Vascular Ultrasound (TIVUS) System and Recor's Paradise Renal Denervation System - for the treatment of patients with persistently elevated blood pressure. However, ultrasound-based renal denervation systems are outside of the scope of this evidence review.

******Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.***

Policy

Radiofrequency ablation of the renal sympathetic nerves is considered investigational. BCBSNC does not provide coverage for investigational services or procedures.

Benefits Application

This medical policy relates only to the services or supplies described herein. Please refer to the Member's Benefit Booklet for availability of benefits. Member's benefits may vary according to benefit design; therefore member benefit language should be reviewed before applying the terms of this medical policy.

When Radiofrequency Ablation of the Renal Nerves is covered

Not applicable.

When is Radiofrequency Ablation of the Renal Nerves not covered

Radiofrequency Ablation of the Renal Nerves as a Treatment of Hypertension

Radiofrequency ablation of the renal sympathetic nerves is considered investigational for treatment of resistant hypertension.

Policy Guidelines

The evidence for the use of radiofrequency ablation (RFA) of the renal sympathetic nerves for individuals with hypertension resistant to standard medical management, includes numerous randomized controlled trials (RCTs), numerous systematic reviews of the RCTs, along with multiple nonrandomized comparative studies and case series. Relevant outcomes are symptoms, change in disease status, morbid events, medication use, and treatment-related morbidity. The Symplicity HTN-3 trial, used a sham-controlled design to reduce the likelihood of placebo effect and demonstrated no significant differences between single-electrode renal denervation and sham-control patients in office based or ambulatory blood pressure at 6-month follow-up. The Symplicity HTN-3 results were in contrast to other studies not using a sham control design but were supported by a number of early smaller sham-controlled trials. Meta-analyses of the RCTs have also reported inconsistent findings, with most analyses showing no significant benefit in blood pressure measurements following single-electrode RFA. Recent evidence focuses on the use of next generation multielectrode RFA catheters. The proof of principle SPYRAL HTN-OFF MED study found that multielectrode renal denervation was superior to sham in the absence of background antihypertensive medication therapy, with between-group differences of -4.0 mmHg for 24-h systolic blood pressure (SBP) and -6.6 for office SBP at 3 months. The unpowered SPYRAL HTN-ON MED study also found significant between-group differences of -7.4 mmHg for 24-h SBP and -6.8 mmHg for office SBP at 6 months; however, results were only significant for the subgroup of patients non-adherent to medications. Long-term data from the SPYRAL HTN-ON MED study suggest that blood pressure reductions with multielectrode renal denervation are progressive and sustained over time. However, study interpretation is complicated by short-term blinded follow-up and imputation of excluded crossover patient data. It is unclear which patients are most likely to derive benefit, and currently, there is no practical method to verify nerve destruction following ablation. The powered SPYRAL HTN-ON MED Expansion study is ongoing. The evidence is insufficient to determine the effects of the technology on health outcomes.

Billing/Coding/Physician Documentation Information

This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at www.bcbsnc.com. They are listed in the Category Search on the Medical Policy search page.

Applicable service codes: 0338T

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

Scientific Background and Reference Sources

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 8/9/12

National Institutes of Health (NIH). Clinical trial #NCT01418261. Renal Denervation in Patients With Uncontrolled Hypertension (SYMPLICITY HTN-3). Retrieved from http://clinicaltrials.gov/ct2/show/NCT01418261?term=NCT01418261&rank=1

Doumas M, Papademetriou V, Douma S et al. Benefits from treatment and control of patients with resistant hypertension. Int J Hypertens 2010; 2011:318549. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3014695/

Thomas G, Shishehbor MH, Bravo EL, Nally JV. Renal denervation to treat resistant hypertension: Guarded optimism. Cleve Clin J Med. 2012 Jul;79(7):501-10. Retrieved from http://www.ccjm.org/content/79/7/501.long

Schlaich MP, Hering D, Sobotka P, Krum H, et al., Effects of renal denervation on sympathetic activation, blood pressure, and glucose metabolism in patients with resistant hypertension. Front Physiol. 2012;3:10. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3270497/

Bunte MC, Infante de Oliveira E, Shishehbor MH. Endovascular Treatment of Resistant and Uncontrolled Hypertension, Therapies on the Horizon. J Am Coll Cardiol Intv. 2013;6(1):1-9. Retrieved from http://interventions.onlinejacc.org/article.aspx?articleid=1487128#topLocation

National Institutes of Health (NIH). Clinical trial #NCT01541865. Treatment of Resistant Hypertension Using a Radiofrequency Percutaneous Transluminal Angioplasty Catheter (REDUCE-HTN). Retrieved from http://clinicaltrials.gov/ct2/show/NCT01541865?term=REDUCE-HTN&rank=1

National Institutes of Health (NIH). Clinical trial #NCT01438229. Safety and Efficacy Study of Renal Artery Ablation in Resistant Hypertension Patients (EnligHTN I). Retrieved from http://clinicaltrials.gov/ct2/show/NCT01438229

Medical Director review 3/2013

Specialty Matched Consultant Advisory Panel review 4/2013

Lambert GW, Hering D, Esler MD et al. Health-related quality of life after renal denervation in patients with treatment-resistant hypertension. Hypertension 2012; 60(6):1479-84.

Ott C, Mahfoud F, Schmid A et al. Renal denervation in moderate treatment resistant hypertension.
J Am Coll Cardiol 2013.

Schlaich MP1, Schmieder RE, Bakris G. International expert consensus statement: Percutaneous transluminal renal denervation for the treatment of resistant hypertension. J Am Coll Cardiol. 2013 Dec 3;62(22):2031-45.
BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 9/12/13

Medical Director review 4/2014

Specialty Matched Consultant Advisory Panel review 4/2014

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 9/11/14

Specialty Matched Consultant Advisory Panel review 4/2015

Medical Director review 4/2015

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 9/10/15

Specialty Matched Consultant Advisory Panel review 4/2016

Medical Director review 4/2016

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 9/2016

Specialty Matched Consultant Advisory Panel review 4/2017

Medical Director review 4/2017

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 9/2017

Specialty Matched Consultant Advisory Panel review 4/2018

Medical Director review 4/2018

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 9/2018

Medical Director review 9/2018

Specialty Matched Consultant Advisory Panel review 4/2019

Medical Director review 4/2019

Specialty Matched Consultant Advisory Panel review 4/2020

Medical Director review 4/2020

BCBSA Medical Policy Reference Manual [Electronic Version]. 7.01.136, 10/2020

Specialty Matched Consultant Advisory Panel review 4/2021

Medical Director review 4/2021

Specialty Matched Consultant Advisory Panel review 4/2022

Medical Director review 4/2022

Townsend RR, Mahfoud F, Kandzari DE, et al. Catheter-based renal denervation in patients with uncontrolled hypertension in the absence of antihypertensive medications (SPYRAL HTN-OFF MED): a randomised, sham-controlled, proof-of-concept trial. Lancet. Nov 11 2017; 390(10108): 2160-2170. PMID 28859944

Bohm M, Kario K, Kandzari DE, et al. Efficacy of catheter-based renal denervation in the absence of antihypertensive medications (SPYRAL HTN-OFF MED Pivotal): a multicentre, randomised, sham-controlled trial. Lancet. May 02 2020; 395(10234): 1444-1451. PMID 32234534

Kandzari DE, Bohm M, Mahfoud F, et al. Effect of renal denervation on blood pressure in the presence of antihypertensive drugs: 6-month efficacy and safety results from the SPYRAL HTN-ON MED proof-of-concept randomised trial. Lancet. Jun 09 2018; 391(10137): 2346-2355. PMID 29803589

Mahfoud F, Kandzari DE, Kario K, et al. Long-term efficacy and safety of renal denervation in the presence of antihypertensive drugs (SPYRAL HTN-ON MED): a randomised, sham-controlled trial. Lancet. Apr 09 2022; 399(10333): 1401-1410. PMID 35390320

Kandzari DE, Kario K, Mahfoud F, et al. The SPYRAL HTN Global Clinical Trial Program: Rationale and design for studies of renal denervation in the absence (SPYRAL HTN OFF-MED) and presence (SPYRAL HTN ON-MED) of antihypertensive medications. Am Heart J. Jan 2016; 171(1): 82-91. PMID 26699604

Specialty Matched Consultant Advisory Panel review 4/2023

Medical Director review 4/2023

Policy Implementation/Update Information

10/30/12 New policy developed. Radiofrequency ablation of the renal sympathetic nerves is considered investigational for treatment of resistant hypertension. Medical Director review 10/2012. (mco)

5/14/13 Specialty Matched Consultant Advisory Panel review 4/2013. Medical Director review 3/2013. New product information added to Description section. References updated. (mco)

12/31/13 Deleted unlisted code 64999 and added CPT codes 0338T and 0339T to Billing/Coding section. (mco)

5/13/14 Description section updated. References updated. Specialty Matched Consultant Advisory Panel review 4/2014. Medical Director review 4/2014. No changes to Policy Statements. (mco)

11/11/14 References updated. No changes to Policy Statements. (td)

5/26/15 Specialty Matched Consultant Advisory Panel review 4/2015. Medical Director review 4/2015. Policy Statements remain unchanged. (td)

10/30/15 Description section: Regulatory Status updated. Policy Guidelines section extensively revised. References updated. (td)

5/31/16 Specialty Matched Consultant Advisory Panel review 4/27/2016. Medical Director review 4/2016. (jd)5/26/17 References updated. Specialty Matched Consultant Advisory Panel review 4/2017. Medical Director review 4/2017. (jd)

5/11/18 References updated. Specialty Matched Consultant Advisory Panel 4/2018. Medical Direcor review 4/2018. (jd)

10/12/18 Minor revisions to regulatory status and policy guidelines. No change to policy intent. Reference updated. Medical Director review. 9/2018. (jd)

5/14/19 Specialty Matched Consultant Advisory Panel review 4/2019. Medical Director review 4/2019. (jd)

12/10/19 The following code was removed from the Billing/Coding section effective 10/1/19: 0339T. (jd)

4/28/20 Specialty Matched Consultant Advisory Panel review 4/2020. Medical Director review 4/2020. (jd)

5/4/21 Minor revisions to regulatory status and policy guidelines. References updated. Specialty Matched Consultant Advisory Panel review 4/2021. Medical Director review 4/2021. (jd)

5/3/22 References updated. Specialty Matched Advisory Panel review 4/2022. Medical Director review 4/2021. (jd)

5/16/23 Description, Policy Guidelines and References updated. Specialty Matched Advisory Panel review 4/2023. Medical Director review 4/2023. (tm)