



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

Applies to all products administered or underwritten by Blue Cross and Blue Shield of Louisiana and its subsidiary, HMO Louisiana, Inc. (collectively referred to as the "Company"), unless otherwise provided in the applicable contract. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.

Note: Baroreflex Stimulation Devices is addressed separately in medical policy 00315.

Services Are Considered Investigational

Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.

Based on review of available data, the Company considers radiofrequency ablation (RFA) of the renal sympathetic nerves for the treatment of resistant hypertension to be **investigational**.*

Background/Overview

Resistant Hypertension

Hypertension is estimated to affect approximately 30% of the population in the U.S. 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, despite treatment with at least 3 antihypertensive agents at optimal doses. Resistant hypertension is also a relatively common condition, given a large number of individuals with hypertension. In large clinical trials of hypertension treatment, 20% to 30% of participants meet the definition for resistant hypertension, and in tertiary care hypertension clinics, the prevalence is estimated at 11% to 18%. Resistant hypertension is associated with a higher risk for adverse outcomes such as stroke, myocardial infarction, heart failure, and kidney failure.

A number of factors may contribute to uncontrolled hypertension, and they should be considered and addressed in all patients with hypertension before labeling a patient resistant. They 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.

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

Also, sometimes it is necessary to address comorbid conditions (ie, obstructive sleep apnea) to control blood pressure adequately.

Treatment

Treatment for resistant hypertension is mainly intensified drug therapy, sometimes with the use of nontraditional 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 events of treatment. As a result, there is a large unmet need for additional treatments that can control resistant hypertension. Nonpharmacologic 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 events 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) 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. This 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 a controlled energy source, most commonly 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.

FDA or Other Governmental Regulatory Approval

U.S. Food and Drug Administration (FDA)

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. Several devices have been developed

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

for this purpose and are in various stages of application for the FDA approval (FDA product code: DQY):

- Symplicity™‡ Renal Denervation System (Medtronic). In April 2018, the FDA approved an investigational device exemption pivotal trial, SPYRAL HTN (NCT02439749). The trial is randomized and sham-controlled and is designed to evaluate the RFA device as an alternative to exercise or lifestyle modification in patients with uncontrolled hypertension not treated with medication. Bohm et al (2020) has already published the 3-month results. The trial remains ongoing, however, with planned follow-up for 3 years for evaluation of long-term efficacy and safety. An additional randomized trial in patients with uncontrolled hypertension despite antihypertensive medication is ongoing (SPYRAL HTN-ON MED, NCT02439775).
- 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 the 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 OneShot™‡ Renal Denervation System (Covidien) is an irrigated RFA balloon catheter, consisting of a spiral-shaped electrode surrounding a balloon. (In 2014, Covidien abandoned development of its OneShot™‡ Renal Denervation program.)
- The Vessix™‡ Renal Denervation System (Boston Scientific; formerly the V2 renal denervation system, Vessix Vascular) is a combination of an 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.

Rationale/Source

Description

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

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

the kidney. This procedure decreases sympathetic activation, decreases vasoconstriction, and decreases activation of the renin-angiotensin system. RFA of the renal sympathetic nerves may act as a nonpharmacologic treatment for hypertension and has been proposed as a treatment option for patients with resistant hypertension.

Summary of Evidence

For individuals who have hypertension resistant to standard medical management who receive RFA of the renal sympathetic nerves, the evidence includes numerous RCTs, numerous systematic reviews of the RCTs, as well as multiple nonrandomized comparative studies and case series. Relevant outcomes are symptoms, change in disease status, morbid events, medication use, and treatment-related morbidity. The largest trial, the Symplicity HTN-3 trial, used a sham-controlled design to reduce the likelihood of placebo effect and demonstrated no significant differences between 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, including Symplicity HTN-2 and the Renal Denervation for Hypertension (DENERHTN) trial, which reported efficacy in reducing blood pressure over a 6 month period compared with a control group. However, results from Symplicity HTN-3 have been supported by a number of subsequent 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 RFA. Single-arm studies with overlapping populations have reported improvements in blood pressure and related physiologic parameters, such as echocardiographic measures of left ventricular hypertrophy, that appear to be durable up to 24 months of follow-up. The strongest evidence comes from sham-controlled trials, the largest of which found no significant benefits with renal denervation. The evidence is insufficient to determine the effects of the technology on health outcomes.

Supplemental Information

Practice Guidelines and Position Statements

American Heart Association et al

The American Heart Association, American College of Cardiology, and American Society of Hypertension (2015) issued joint guidelines on the treatment of hypertension in patients with

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

coronary artery disease. The guidelines noted the Symplicity HTN-3 trial did not find a significant benefit from renal denervation and stated that additional randomized controlled trials would be needed.

The American Heart Association, American College of Cardiology, and 9 additional specialty societies (2018) published joint guidelines on the prevention, detection, evaluation, and management of high blood pressure in adults. In discussing resistant hypertension, the guidelines indicated that studies using catheter ablation of renal sympathetic nerves "have not provided sufficient evidence to recommend the use of these devices."

The American Heart Association (2018) published a Scientific Statement on the detection, evaluation, and management of resistant hypertension. The AHA Statement discussed the lack of benefit found in the Symplicity HTN-3 trial, as well as its methodological limitations. The AHA Statement also referred to the more recent positive data from the SPYRAL HTN-OFF MED trial, but noted that because the enrolled patients did not have resistant hypertension, "at best, this represents a proof-of-principle study demonstrating the role of the renal sympathetic nervous system in hypertension." The AHA Statement concluded that "the role of device-based sympatholytic treatments, as with renal denervation and baroreceptor stimulation, awaits clarification."

Eighth Joint National Committee

The Eighth Joint National Committee (2014), which was appointed to provide recommendations on hypertension treatment, published an evidence-based guideline on the management of hypertension in adults. These recommendations did not discuss the use of renal denervation.

U.S. Preventive Services Task Force Recommendations

Not applicable.

Medicare National Coverage

There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

Ongoing and Unpublished Clinical Trials

Some currently ongoing and unpublished trials that might influence this review are listed in Table 1.

Table 1. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
<i>Ongoing</i>			
NCT02439775	Global Clinical Study of Renal Denervation With the Symplicity Spyral ^{TM‡} Multi-electrode Renal Denervation System in Patients With Uncontrolled Hypertension on Standard Medical Therapy (SPYRAL HTN-ON MED)	106	Feb 2024
NCT01673516	Effect of Renal Sympathetic Denervation on Resistant Hypertension and Cardiovascular Hemodynamic in Comparison to Intensive Medical Therapy Utilizing Impedance Cardiography	60	Aug 2022
NCT02439749	Global Clinical Study of Renal Denervation With the Symplicity Spyral ^{TM‡} Multi-electrode Renal Denervation System in Patients With Uncontrolled Hypertension in the Absence of Antihypertensive Medications (SPYRAL HTN-OFF MED)	433	Mar 2023
NCT02021019	Renal Denervation to Improve Outcomes in Patients With End-stage Renal	100	Dec 2022 (unknown)
NCT04307836	DENEX Renal Denervation in Patients With Hypertension on no or 1-3 Antihypertensive Medications (DENEX HTN-KORAS)	140	Jan 2023

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

NCT No.	Trial Name	Planned Enrollment	Completion Date
<i>Unpublished</i>			
NCT01911078	Renal Sympathetic Denervation in Metabolic Syndrome (Metabolic Syndrome Study)	20	Jun 2016 (completed)
NCT01901549	Renal Denervation in Patients After Acute Coronary Syndrome	80	Jun 2016 (unknown)
NCT02041130	Renal Sympathectomy in Heart Failure (the RESPECT-HF Study) - a Study of Renal Denervation for Heart Failure With Preserved Ejection Fraction	144	Dec 2016 (unknown)
NCT01522430	Denervation of Renal Sympathetic Activity and Hypertension Study	120	Dec 2016 (unknown)
NCT01932450	A Randomized, Open-label Study Investigating the Effect of Bilateral Renal Artery Sympathetic Denervation by Catheter-based Radiofrequency Ablation on Blood Pressure and Disease Progression in Autosomal Dominant Polycystic Kidney Disease	100	Jul 2015 (unknown)
NCT01628172 ^a	Renal Sympathetic Denervation for the Management of Chronic Hypertension	96	Mar 2014 (completed)

NCT: national clinical trial.

References

1. Blue Cross and Blue Shield Association, Medical Policy Reference Manual, “Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension”, Policy 7.01.136, October 2020.

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

2. Acelajado MC, Calhoun DA. Resistant hypertension, secondary hypertension, and hypertensive crises: diagnostic evaluation and treatment. *Cardiol Clin.* Nov 2010; 28(4): 639-54. PMID 20937447
3. Doumas M, Papademetriou V, Douma S, et al. Benefits from treatment and control of patients with resistant hypertension. *Int J Hypertens.* Dec 22 2010; 2011: 318549. PMID 21234402
4. Zile MR, Little WC. Effects of autonomic modulation: more than just blood pressure. *J Am Coll Cardiol.* Mar 06 2012; 59(10): 910-2. PMID 22381426
5. 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
6. Azizi M, Sapoval M, Gosse P, et al. Optimum and stepped care standardised antihypertensive treatment with or without renal denervation for resistant hypertension (DENERHTN): a multicentre, open-label, randomised controlled trial. *Lancet.* May 16 2015; 385(9981): 1957-65. PMID 25631070
7. Courand PY, Pereira H, Del Giudice C, et al. Abdominal Aortic Calcifications Influences the Systemic and Renal Hemodynamic Response to Renal Denervation in the DENERHTN (Renal Denervation for Hypertension) Trial. *J Am Heart Assoc.* Oct 10 2017; 6(10). PMID 29018027
8. Gosse P, Cremer A, Pereira H, et al. Twenty-Four-Hour Blood Pressure Monitoring to Predict and Assess Impact of Renal Denervation: The DENERHTN Study (Renal Denervation for Hypertension). *Hypertension.* Mar 2017; 69(3): 494-500. PMID 28115517
9. Rosa J, Widimsky P, Tousek P, et al. Randomized comparison of renal denervation versus intensified pharmacotherapy including spironolactone in true-resistant hypertension: six-month results from the Prague-15 study. *Hypertension.* Feb 2015; 65(2): 407-13. PMID 25421981
10. Bhatt DL, Kandzari DE, O'Neill WW, et al. A controlled trial of renal denervation for resistant hypertension. *N Engl J Med.* Apr 10 2014; 370(15): 1393-401. PMID 24678939
11. Bakris GL, Townsend RR, Liu M, et al. Impact of renal denervation on 24-hour ambulatory blood pressure: results from SYMPPLICITY HTN-3. *J Am Coll Cardiol.* Sep 16 2014; 64(11): 1071-8. PMID 24858423
12. Bakris GL, Townsend RR, Flack JM, et al. 12-month blood pressure results of catheter-based renal artery denervation for resistant hypertension: the SYMPPLICITY HTN-3 trial. *J Am Coll Cardiol.* Apr 07 2015; 65(13): 1314-1321. PMID 25835443

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

13. Mahfoud F, Bakris G, Bhatt DL, et al. Reduced blood pressure-lowering effect of catheter-based renal denervation in patients with isolated systolic hypertension: data from SYMPLICITY HTN-3 and the Global SYMPLICITY Registry. *Eur Heart J*. Jan 07 2017; 38(2): 93-100. PMID 28158510
14. Kario K, Bhatt DL, Brar S, et al. Effect of Catheter-Based Renal Denervation on Morning and Nocturnal Blood Pressure: Insights From SYMPLICITY HTN-3 and SYMPLICITY HTN-Japan. *Hypertension*. Dec 2015; 66(6): 1130-7. PMID 26558819
15. Lu D, Wang K, Liu Q, et al. Reductions of left ventricular mass and atrial size following renal denervation: a meta-analysis. *Clin Res Cardiol*. Aug 2016; 105(8): 648-656. PMID 26838292
16. Flack JM, Bhatt DL, Kandzari DE, et al. An analysis of the blood pressure and safety outcomes to renal denervation in African Americans and Non-African Americans in the SYMPLICITY HTN-3 trial. *J Am Soc Hypertens*. Oct 2015; 9(10): 769-779. PMID 26362830
17. Esler MD, Krum H, Sobotka PA, et al. Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 Trial): a randomised controlled trial. *Lancet*. Dec 04 2010; 376(9756): 1903-9. PMID 21093036
18. Esler MD, Krum H, Schlaich M, et al. Renal sympathetic denervation for treatment of drug-resistant hypertension: one-year results from the Symplicity HTN-2 randomized, controlled trial. *Circulation*. Dec 18 2012; 126(25): 2976-82. PMID 23248063
19. Esler MD, Bohm M, Sievert H, et al. Catheter-based renal denervation for treatment of patients with treatment-resistant hypertension: 36 month results from the SYMPLICITY HTN-2 randomized clinical trial. *Eur Heart J*. Jul 2014; 35(26): 1752-9. PMID 24898552
20. Kario K, Ogawa H, Okumura K, et al. SYMPLICITY HTN-Japan - First Randomized Controlled Trial of Catheter-Based Renal Denervation in Asian Patients -. *Circ J*. 2015; 79(6): 1222-9. PMID 25912693
21. de Jager RL, de Beus E, Beeftink MM, et al. Impact of Medication Adherence on the Effect of Renal Denervation: The SYMPATHY Trial. *Hypertension*. Apr 2017; 69(4): 678-684. PMID 28264922
22. de Jager RL, van Maarseveen EM, Bots ML, et al. Medication adherence in patients with apparent resistant hypertension: findings from the SYMPATHY trial. *Br J Clin Pharmacol*. Jan 2018; 84(1): 18-24. PMID 28815689
23. Schmieder RE, Ott C, Toennes SW, et al. Phase II randomized sham-controlled study of renal denervation for individuals with uncontrolled hypertension - WAVE IV. *J Hypertens*. Mar 2018; 36(3): 680-689. PMID 29035942

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

24. Oliveras A, Armario P, Clara A, et al. Spironolactone versus sympathetic renal denervation to treat true resistant hypertension: results from the DENERVHTA study - a randomized controlled trial. *J Hypertens*. Sep 2016; 34(9): 1863-71. PMID 27327441
25. Mathiassen ON, Vase H, Bech JN, et al. Renal denervation in treatment-resistant essential hypertension. A randomized, SHAM-controlled, double-blinded 24-h blood pressure-based trial. *J Hypertens*. Aug 2016; 34(8): 1639-47. PMID 27228432
26. Desch S, Okon T, Heinemann D, et al. Randomized sham-controlled trial of renal sympathetic denervation in mild resistant hypertension. *Hypertension*. Jun 2015; 65(6): 1202-8. PMID 25824248
27. Schneider S, Promny D, Sinnecker D, et al. Impact of sympathetic renal denervation: a randomized study in patients after renal transplantation (ISAR-denerve). *Nephrol Dial Transplant*. Nov 2015; 30(11): 1928-36. PMID 26333545
28. Fadl Elmula FE, Hoffmann P, Larstorp AC, et al. Adjusted drug treatment is superior to renal sympathetic denervation in patients with true treatment-resistant hypertension. *Hypertension*. May 2014; 63(5): 991-9. PMID 24591332
29. Pokushalov E, Romanov A, Corbucci G, et al. A randomized comparison of pulmonary vein isolation with versus without concomitant renal artery denervation in patients with refractory symptomatic atrial fibrillation and resistant hypertension. *J Am Coll Cardiol*. Sep 25 2012; 60(13): 1163-70. PMID 22958958
30. Coppolino G, Pisano A, Rivoli L, et al. Renal denervation for resistant hypertension. *Cochrane Database Syst Rev*. Feb 21 2017; 2: CD011499. PMID 28220472
31. Chen XH, Kim S, Zeng XX, et al. Account for Clinical Heterogeneity in Assessment of Catheter-based Renal Denervation among Resistant Hypertension Patients: Subgroup Meta-analysis. *Chin Med J*. Jul 05 2017; 130(13): 1586-1594. PMID 28639575
32. Pappacogli M, Covella M, Berra E, et al. Effectiveness of Renal Denervation in Resistant Hypertension: A Meta-Analysis of 11 Controlled Studies. *High Blood Press Cardiovasc Prev*. Jun 2018; 25(2): 167-176. PMID 29752703
33. Fadl Elmula FEM, Feng YM, Jacobs L, et al. Sham or no sham control: that is the question in trials of renal denervation for resistant hypertension. A systematic meta-analysis. *Blood Press*. Aug 2017; 26(4): 195-203. PMID 28443356
34. Sun D, Li C, Li M, et al. Renal Denervation vs Pharmacotherapy for Resistant Hypertension: A Meta-Analysis. *J Clin Hypertens (Greenwich)*. Aug 2016; 18(8): 733-40. PMID 26619813

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

35. Zhang X, Wu N, Yan W, et al. The effects of renal denervation on resistant hypertension patients: a meta-analysis. *Blood Press Monit.* Aug 2016; 21(4): 206-14. PMID 26901340
36. Yao Y, Zhang D, Qian J, et al. The effect of renal denervation on resistant hypertension: Meta-analysis of randomized controlled clinical trials. *Clin Exp Hypertens.* 2016; 38(3): 278-86. PMID 27018652
37. Fadl Elmula FE, Jin Y, Yang WY, et al. Meta-analysis of randomized controlled trials of renal denervation in treatment-resistant hypertension. *Blood Press.* 2015; 24(5): 263-74. PMID 26194721
38. Kwok CS, Loke YK, Pradhan S, et al. Renal denervation and blood pressure reduction in resistant hypertension: a systematic review and meta-analysis. *Open Heart.* 2014; 1(1): e000092. PMID 25332808
39. Pancholy SB, Shantha GP, Patel TM, et al. Meta-analysis of the effect of renal denervation on blood pressure and pulse pressure in patients with resistant systemic hypertension. *Am J Cardiol.* Sep 15 2014; 114(6): 856-61. PMID 25084693
40. Davis MI, Filion KB, Zhang D, et al. Effectiveness of renal denervation therapy for resistant hypertension: a systematic review and meta-analysis. *J Am Coll Cardiol.* Jul 16 2013; 62(3): 231-241. PMID 23644092
41. Shantha GP, Pancholy SB. Effect of renal sympathetic denervation on apnea-hypopnea index in patients with obstructive sleep apnea: a systematic review and meta-analysis. *Sleep Breath.* Mar 2015; 19(1): 29-34. PMID 24839239
42. Brandt MC, Mahfoud F, Reda S, et al. Renal sympathetic denervation reduces left ventricular hypertrophy and improves cardiac function in patients with resistant hypertension. *J Am Coll Cardiol.* Mar 06 2012; 59(10): 901-9. PMID 22381425
43. Mahfoud F, Cremers B, Janker J, et al. Renal hemodynamics and renal function after catheter-based renal sympathetic denervation in patients with resistant hypertension. *Hypertension.* Aug 2012; 60(2): 419-24. PMID 22733462
44. Ukena C, Mahfoud F, Kindermann I, et al. Cardiorespiratory response to exercise after renal sympathetic denervation in patients with resistant hypertension. *J Am Coll Cardiol.* Sep 06 2011; 58(11): 1176-82. PMID 21884958
45. Ewen S, Mahfoud F, Linz D, et al. Effects of renal sympathetic denervation on exercise blood pressure, heart rate, and capacity in patients with resistant hypertension. *Hypertension.* Apr 2014; 63(4): 839-45. PMID 24420550

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

46. Rosendorff C, Lackland DT, Allison M, et al. Treatment of hypertension in patients with coronary artery disease: a scientific statement from the American Heart Association, American College of Cardiology, and American Society of Hypertension. *Circulation*. May 12 2015; 131(19): e435-70. PMID 25829340
47. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension*. Jun 2018; 71(6): 1269-1324. PMID 29133354
48. Carey RM, Calhoun DA, Bakris GL, et al. Resistant Hypertension: Detection, Evaluation, and Management: A Scientific Statement From the American Heart Association. *Hypertension*. Nov 2018; 72(5): e53-e90. PMID 30354828
49. James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*. Feb 05 2014; 311(5): 507-20. PMID 24352797

Policy History

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

- 08/06/2015 Medical Policy Committee review
- 08/19/2015 Medical Policy Implementation Committee approval. New Policy
- 08/04/2016 Medical Policy Committee review
- 08/17/2016 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
- 01/01/2017 Coding update: Removing ICD-9 Diagnosis Codes
- 11/02/2017 Medical Policy Committee review
- 11/15/2017 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
- 11/08/2018 Medical Policy Committee review
- 11/21/2018 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

11/07/2019 Medical Policy Committee review
11/13/2019 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
04/02/2020 Medical Policy Committee review
04/08/2020 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.
04/01/2021 Medical Policy Committee review
04/14/2021 Medical Policy Implementation Committee approval. Coverage eligibility unchanged.

Next Scheduled Review Date: 4/2022

Coding

The five character codes included in the Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines are obtained from Current Procedural Terminology (CPT®)‡, copyright 2020 by the American Medical Association (AMA). CPT is developed by the AMA as a listing of descriptive terms and five character identifying codes and modifiers for reporting medical services and procedures performed by physician.

The responsibility for the content of Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines is with Blue Cross and Blue Shield of Louisiana and no endorsement by the AMA is intended or should be implied. The AMA disclaims responsibility for any consequences or liability attributable or related to any use, nonuse or interpretation of information contained in Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines. Fee schedules, relative value units, conversion factors and/or related components are not assigned by the AMA, are not part of CPT, and the AMA is not recommending their use. The AMA does not directly or indirectly practice medicine or dispense medical services. The AMA assumes no liability for data contained or not contained herein. Any use of CPT outside of Blue Cross Blue Shield of Louisiana Medical Policy Coverage Guidelines should refer to the most current Current Procedural Terminology which contains the complete and most current listing of CPT codes and descriptive terms. Applicable FARS/DFARS apply.

CPT is a registered trademark of the American Medical Association.

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

Codes used to identify services associated with this policy may include (but may not be limited to) the following:

Code Type	Code
CPT	0338T, 0339T
HCPCS	No codes
ICD-10 Diagnosis	All related diagnoses

*Investigational – A medical treatment, procedure, drug, device, or biological product is Investigational if the effectiveness has not been clearly tested and it has not been incorporated into standard medical practice. Any determination we make that a medical treatment, procedure, drug, device, or biological product is Investigational will be based on a consideration of the following:

- A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. Food and Drug Administration (FDA) and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or
- B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:
 - 1. Consultation with the Blue Cross and Blue Shield Association technology assessment program (TEC) or other nonaffiliated technology evaluation center(s);
 - 2. Credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community; or
 - 3. Reference to federal regulations.

‡ Indicated trademarks are the registered trademarks of their respective owners.

NOTICE: If the Patient’s health insurance contract contains language that differs from the BCBSLA Medical Policy definition noted above, the definition in the health insurance contract will be relied upon for specific coverage determinations.

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.



Louisiana

Radiofrequency Ablation of the Renal Sympathetic Nerves as a Treatment for Resistant Hypertension

Policy # 00465

Original Effective Date: 08/19/2015

Current Effective Date: 05/10/2021

NOTICE: Medical Policies are scientific based opinions, provided solely for coverage and informational purposes. Medical Policies should not be construed to suggest that the Company recommends, advocates, requires, encourages, or discourages any particular treatment, procedure, or service, or any particular course of treatment, procedure, or service.

©2021 Blue Cross and Blue Shield of Louisiana

Blue Cross and Blue Shield of Louisiana is an independent licensee of the Blue Cross and Blue Shield Association and incorporated as Louisiana Health Service & Indemnity Company.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without permission from Blue Cross and Blue Shield of Louisiana.