Anthem

Medical Policy

Subject: Renal Sympathetic Nerve Ablation
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Description/Scope

This document addresses ablation (e.g., radiofrequency ablation [RFA] or high-intensity focused ultrasound [HIFU]) of the renal sympathetic nerves. Renal denervation may be used as a treatment for resistant hypertension.

Note: For information related to other techniques for the treatment of resistant hypertension, please see:

- SURG.00124 Carotid Sinus Baroreceptor Stimulation Devices

Position Statement

Investigational and Not edically Necessary:

Ablation of the renal sympathetic nerves is considered **investigational and not medically necessary** for all indications.

Rationale

Radiofrequency ablation (RFA) is a minimally invasive surgical procedure utilizing low power radiofrequency (RF) energy to ablate (or destroy) various tissues of the body. Similarly, HIFU ablation is also minimally invasive and uses an ultrasound probe to image an area and deliver timed bursts of heat to create coagulation necrosis in a targeted area without harming adjacent healthy tissue. There are many procedures that utilize specially designed ablation devices to treat multiple organ systems and disorders, such as cardiac arrhythmias, Barrett's esophagus, malignant tumors, varicose veins and for pain management. This document only addresses ablative procedures and devices specifically designed to ablate (or denervate) the renal sympathetic nerves to treat resistant hypertension.

Resistant HTN is defined as blood pressure (BP) above goal despite treatment with three antihypertensive agents of different classes, ideally including a diuretic, all prescribed at optimal dose amounts (Calhoun, 2008). Resistant HTN is a relatively common condition, estimated to affect approximately 30% of the adult population in the United States. In large clinical trials of HTN treatment, up to 20-30% of participants meet the definition for resistant HTN, and in tertiary care HTN clinics, the prevalence has been estimated to be 11-18% (Acelajado, 2010). Resistant HTN is associated with a higher risk for adverse outcomes, such as stroke, myocardial infarction (MI), heart failure (HF), and kidney failure. Notably, resistant HTN is not the same as uncontrolled HTN. Uncontrolled HTN is a lack of BP control due to factors, such as poor adherence to the medication schedule, insufficient doses of antihypertensive medications, excessive salt or alcohol intake, volume overload, drug-induced HTN, and other forms of secondary HTN, due to comorbid conditions (Doumas, 2010).

Ablation for the treatment of HTN is theorized to decrease both the afferent sympathetic signals from the kidneys to the brain and the efferent signals from the brain to the kidneys. This is thought to decrease sympathetic activation, vasoconstriction, and activation of the renin-angiotensin system, which may potentially lower BP (Zile, 2012). There are several devices that have been developed for renal sympathetic denervation (RDN) as a proposed treatment option for resistant HTN. To date, one RFA device and one HIFU device have been cleared by the U.S. Food and Drug Administration (FDA) for ablation of the renal sympathetic nerves as a treatment for HTN; the Symplicity Spyral™ Renal Denervation system (Medtronic, Inc., Santa Rosa, CA) and the Paradise® Renal Denervation Ultrasound System (Recor Medical, Inc., Palo Alto, CA), respectively.

Radiofrequency Ablation Renal Denervation

On November 17, 2023 the Symplicity Spyral™ Renal Denervation system received premarket approval (PMA) by the FDA. The Symplicity RDN System consists of a flexible catheter for percutaneous use in the renal arteries and an external power generator. The basis for the PMA approval decision was data from two single-blind, sham-controlled randomized controlled trials (RCTs); SPYRAL HTN-OFF MED study and SPYRAL HTN-ON MED. The device was approved for the reduction of BP as an adjunctive treatment for HTN in individuals with treatment-resistant BP.

The SYMPLICITY HTN-3 was a Phase 3, single blinded, prospective, sham-controlledRCT that was designed to evaluate the safety and effectiveness of RDN with the Symplicity RDN System in participants with resistant HTN. A total of 535 study participants underwent randomization. The mean (± standard deviation [SD]) change in systolic blood pressure (SBP) at 6 months was -14.13 ± 23.93 mm Hg in the RDN group, as compared with -11.74 ± 25.94 mm Hg in the sham-procedure group ($p<0.001$ for both comparisons of the change from baseline), for a difference of -2.39 mm Hg (95% confidence interval [CI], -6.89 to 2.12; $p=0.26$ for superiority with a margin of 5 mm Hg). The change in 24-hour ambulatory SBP was -6.75 ± 15.11 mm Hg in the RDN group and -4.79 ± 17.25 mm Hg in the sham-procedure group, for a difference of -1.96 mm Hg (95% CI, -4.97 to 1.06; $p=0.98$ for superiority with a margin of 2 mm Hg). There were no significant differences in safety between the two groups. The investigators concluded that this trial did not show a significant reduction in SBP in individuals with resistant HTN 6 months after RDN, as compared with a sham control (Bhatt, 2014). Additional articles have been published with up to 12-month results of the SYMPLICITY HTN-3 trial, in which they also concluded that the trial did not demonstrate a benefit from RDN or reduction in ambulatory SBP in either the 24-hour or day-and-night periods, as compared with sham (Bakris, 2014; Bakris, 2015). Study design limitations which may have contributed to nonsignificant findings included inadequate screening methods that neglected to excluded individuals with a poor medication compliance history or screen for individuals who had not failed standard of care medical treatment, frequent medication changes of participants throughout the trial, inexperienced device operators and use of a version of the Symplicity RDN device that has since been upgraded due to technical flaws.

In January 2014, Medtronic, Inc. announced that its pivotal trial in the U.S., the SYMPLICITY HTN-3 trial, failed to meet its primary and secondary efficacy endpoints, as described above. Since results of the SYMPLICITY HTN-3 trial were published, the manufacturer modified and redesigned the catheter, which is now known as the SYMPLICITY SPYRAL™ System. The catheter device now has more electrodes to deliver up to four simultaneous RFAs in a helical pattern, and treatment of branch vessels has been added to the technique. The FDA approved an investigational device exemption (IDE) for the two initial trials of the SPYRAL

HTN Global Clinical Trial Program, which were randomized, sham-controlled studies evaluating the device in up to 433 participants at 50 sites in the U.S., Europe, Australia, and Japan. The SPYRAL HTN-OFF MED study included primary efficacy and safety endpoints that included 24-hour BP at 3 months and major adverse events through 1 month after randomization, respectively (Bohm, 2020; Townsend, 2017). The second trial utilized a separate cohort of 80 trial participants; the SPYRAL HTN ON-MED study which required eligible participants to be treated with a consistent medical therapy of up to 3 antihypertensive drugs during the study (Kandzari, 2018).

In 2017, Townsend and colleagues published results from the SPYRAL HTN OFF-MED proof-of-concept trial which included a 3- to 4-week drug washout period followed by a 3-month efficacy and safety endpoint in the absence of antihypertensive medications. This study enrolled 80 individuals with a mean 24-hour ambulatory SBP of 140 mm Hg or greater and less than 170 mm Hg at second screening who underwent renal angiography and were randomly assigned to RDN (n=38) or sham control (n=42). Results at 3 months reflected 24-hour ambulatory BP decreased from baseline to 3 months in the RDN group (24-hour SBP -5.5 mm Hg [95% CI, -9.1 to -2.0; p=0.003], and 24-hour diastolic blood pressure [DBP] -4.8 mm Hg [-7.0 to -2.6; p<0.0001]; office SBP -10.0 mm Hg [-15.1 to -4.9; p=0.0004], and office DBP -5.3 mm Hg [-7.8 to -2.7; p=0.0002]). No significant changes were seen in the sham-control group (24-hour SBP -0.5 mm Hg [95% CI, -3.9 to 2.9; p=0.764], 24-hour DBP -0.4 mm Hg [-2.2 to 1.4; p=0.645], and office SBP -2.3 mm Hg [-6.1 to 1.6; p=0.238], and office DBP -0.3 mm Hg [-2.9 to 2.2; p=0.805]). The mean difference between the groups favored RF RDN for 3 month change in both office and 24-hour BP from baseline: 24-hour SBP -5.0 mm Hg (95% CI, -9.9 to -0.2; p=0.041), 24-hour DBP -4.4 mm Hg (-7.2 to -1.6; p=0.002), office SBP -7.7 mm Hg (-14.0 to -1.5; p=0.016), and office DBP -4.9 mm Hg (-8.5 to -1.4; p=0.008). There were no major adverse events in either group.

In 2020, Bohm and colleagues published results of the pivotal SPYRAL HTN-OFF MED trial. A total of 331 individuals with office SBP between 150 mm Hg and 180 mm Hg, and mean ambulatory 24-h SBP of 140 mm Hg to 170 mm Hg, were randomly assigned 1:1 to either a renal denervation (n=166) or sham procedure (n=165). The primary efficacy endpoint was baseline-adjusted change in 24-h SBP and the secondary efficacy endpoint was baseline-adjusted change in office SBP from baseline to 3 months following the RF RDN procedure. The treatment difference between the two groups for 24-h SBP was -3.9 mm Hg (Bayesian 95% credible interval [BCI], -6.2 to -1.6; p=0.0005) and for office SBP the difference was -6.5 mm Hg (BCI, -9.6 to -3.5; p<0.0001). Both urine and blood of study participants were tested for the absence of antihypertensive medications at baseline and 3 months. The minimal clinically important difference (MCID) for SBP is 5 mm Hg, which was not met in the study's primary efficacy endpoint (Kandzari, 2022). No major device-related or procedural-related safety events occurred up to 3 months. Durability of effect remains to be determined.

In 2018, Kandzari and colleagues published results from the SPYRAL HTN-ON MED proof-of-concept trial, in which 80 individuals with uncontrolled HTN (office SBP, 150–180 mm Hg; DBP, 90 mm Hg or higher) were randomized to RDN with RFA (n=38) or a sham procedure (n=42) with angiography. Trial participants were taking up to 3 antihypertensive drugs. Office and 24-hour ambulatory BP decreased significantly from baseline to 6 months in the RDN group (mean baseline-adjusted treatment differences in 24-hour SBP -7.0 mm Hg, 95% CI, -12.0 to -2.1; p=0.006, 24-hour DBP -4.3 mm Hg, -7.8 to -0.8; p=0.0174, office SBP -6.6 mm Hg, -12.4 to -0.9; p=0.0250, and office DBP -4.2 mm Hg, -7.7 to -0.7;). The change in BP was significantly greater at 6 months in the RDN group than the sham-control group for office SBP (difference -6.8 mm Hg, 95% CI, -12.5 to -1.1; p=0.021), 24-hour SBP (difference -7.4 mm Hg, -12.5 to -2.3; p=0.005), office DBP (difference -3.5 mm Hg, -7.0 to -0.0; p=0.048), and 24-hour DBP (difference -4.1 mm Hg, -7.8 to -0.4; p=0.029). Evaluation of hourly changes in 24-hour SBP and DBP showed BP reductions throughout 24 hours for the RDN group. At 3 months, BP reductions were not significantly different between groups. It was also noted that medication adherence was about 60% and varied for individual trial participants throughout the study. No major adverse events were recorded in either group.

In 2022, Mahfoud published results of a pre-specified, extended follow-up analysis of the previously described SPYRAL HTN-ON MED study. At 12-months follow-up, participants and physicians were unmasked and 13 participants in the sham group crossed over to the treatment arm. Long-term efficacy was assessed using ambulatory and office SBP measurements up to 36 months at which time 31 participants (originally 38) were in the treatment cohort and 27 (originally 42) in the untreated cohort. Mean ambulatory systolic and diastolic BP were significantly reduced from baseline in the RDN group and were significantly lower than the sham control group at 24 and 36 months, despite a similar treatment intensity of antihypertensive drugs. The medication burden at 36 months did not differ significantly between groups. At 36 months, the ambulatory SBP reduction was -18.7 mm Hg (SD 12.4) for the renal denervation group (n=30) and -8.6 mm Hg (14.6) for the sham control group (n=32; adjusted treatment difference -10.0 mm Hg; 95% CI, -16.6 to -3.3; p=0.004). There were no short-term or long-term safety issues associated with RDN in this unblinded, cross-over extension study. The study is ongoing with a target enrollment of an additional 260 randomized participants (NCT02439775).

Early studies investigated confounding factors that potentially affect RFA trials. In 2016, the DENERHTN trial (Renal Denervation for Hypertension) attempted to report the influence of adherence to antihypertensive treatment regimens on BP control. Individual adherence to antihypertensive medical treatment was evaluated at 6 months with drug screening of urine and plasma samples from 85 trial participants. The numbers of trial participants who were fully adherent (20/40 versus 21/45), partially nonadherent (13/40 versus 20/45), or completely nonadherent (7/40 versus 4/45) to antihypertensive treatment did not differ significantly in the RDN and control groups, respectively (p=0.361). The difference noted in the change in daytime ambulatory SBP from baseline to 6 months between the 2 groups was -6.7 mm Hg (p=0.046) in the fully adherent and -7.8 mm Hg (p=0.1) in the nonadherent group (made up of the partially nonadherent plus the completely nonadherent). The between-participant variability in daytime ambulatory SBP was greater for the nonadherent than for the fully adherent participants. The authors concluded that the prevalence of nonadherence to antihypertensive drugs at 6 months was high (≈50%), but not different in the RDN and control groups. Regardless of adherence to medical treatment, RDN plus standardized stepped-care antihypertensive treatment resulted in a greater decrease in BP than with standardized antihypertensive medical treatment alone. The number of responders was greater in the RDN group (20/44, 44.5%) than in the control group (11/53, 20.8%; p=0.01). In the discriminant analysis, baseline average nighttime SBP and standard deviation were significant predictors of the SBP response in the RDN group only, allowing adequate responder classification of 70% of the trial participants. According to the investigators, this analysis indicated that RDN lowers ambulatory BP homogeneously over 24 hours in participants with resistant HTN, which suggests that nighttime SBP and variability are predictors of the BP response to RDN (Azizi, 2016; Gosse, 2017).

Results of a prior small, short-term, RCT, the Symplicity HTN-2 trial, were published in 2010. This trial evaluated RDN using the Symplicity RDN System versus standard pharmacologic treatment for a total of 106 participants with resistant HTN, (defined as having a SBP of at least 160 mm Hg despite regimens of three or more antihypertensive medications). The trial was unblinded, and participants were followed for 6 months with a primary endpoint of between-group differences in the change in BP over the course of the 6-month trial. Secondary outcomes included a composite outcome of adverse cardiovascular events and adverse effects of treatment. Baseline BP was 178/98 in the RFA treatment group and 178/97 in the control group treated with medications alone. At 6 months, the BP reductions in the RFA group were 32 mm Hg systolic (standard deviation [SD] of 23) and 12 mm Hg diastolic (SD of 11). In the control group, there was a 1 mm Hg increase in SBP and no change for DBP (p<0.0001 for both SBP and DBP differences). The percent of participants who achieved a SBP of 140 mm or less was 39% (19/49) in the RFA group, compared to 6% (3/51) in the control group (p<0.0001). There was no difference in renal function, as measured by serum creatinine, between groups at the 6-month follow-up time. In the RFA group, 3 participants reported an adverse cardiovascular event compared to 2 in the control group (p=nonsignificant). Other serious adverse events requiring admission in the RFA group included 1 case each of nausea/vomiting, hypertensive crisis, transient ischemic attack (TIA), and hypotension. In each group, 3 participants were lost to

follow-up. It was noted that larger studies with longer outcomes data are needed to demonstrate the safety and efficacy of RFA of the renal nerves as a treatment of resistant HTN. The additional issue of durability of treatment effect also warrants investigation, due to the potential for post-treatment re-innervation of the treated renal nerves, which could potentially result in diminished therapeutic effect over time following the RFA procedure (Esler, 2010).

Follow-up outcomes data at 36 months were reported in 2014 in 40 of 52 participants in the initial RDN group and at 30 months in 30 of 37 participants who crossed over and received RDN at 6 months. Baseline BP was 184 ± 19/99 ± 16 mm Hg in all treated participants. At 30 months post-procedure, SBP decreased 34 mm Hg (95% CI: -40, -27; p<0.01) and DBP decreased 13 mm Hg (95% CI: -16, -10; p<0.01). The systolic and diastolic BP reduction at 36 months for the initial RDN group was -33 mm Hg (95% CI: -40, -25; p<0.01) and -14 mm Hg (95% CI: -17, -10; p<0.01), respectively. Procedural complications included 1 hematoma and 1 renal artery dissection before energy delivery that were treated successfully. Later complications included 2 cases of acute renal failure, which fully resolved, 15 hypertensive events requiring hospitalization, and 3 deaths that were deemed unrelated to the device or the therapy. The authors concluded that RDN resulted in sustained lowering of BP at 3 years in a selected population of participants with severe, treatment-resistant HTN without serious safety concerns. These longer-term findings were limited by the lack of comparison to a control group, due to the crossover design (Esler, 2014).

In 2022, Bhatt and colleagues published 36-month follow-up results of the industry-sponsored SYMPLICITY HTN-3 trial, previously described as Medtronic's pivotal trial in the U.S. which failed to meet its primary and secondary efficacy endpoints. The original primary endpoint was the change in systolic BP from baseline to 6 months for the RDN group compared with the sham control group. Following the initial 6-month follow-up, participants were unmasked and those in the sham group who met the inclusion criteria (office BP ≥160 mm Hg, 24 h ambulatory systolic BP ≥135 mm Hg, and still prescribed three or more antihypertensive medications) could cross over to receive renal artery denervation. Changes in BP up to 36 months were analyzed in the original RDN group and in the sham control group, including those who crossed over to RDN and those who did not (remained in the control group). The study's safety endpoints were the incidence of all-cause mortality, end stage renal disease, significant embolic event, renal artery perforation or dissection requiring intervention, vascular complications, hospitalization for hypertensive crisis unrelated to non-adherence to medications, or new renal artery stenosis of more than 70% within 6 months. Follow-up data from 36-months were available for 219 individuals in the original RDN group (originally, n=364), 63 in the crossover group, and 33 in the control group (originally, n=171). At 36 months, the change in office systolic BP and 24 h ambulatory systolic BP was significantly lower in the RDN group ($p \leq 0.0001$, for both outcomes). The rates of adverse events were similar across treatment groups. Given the trials failure to meet its original primary and secondary endpoints, and the high rate of attrition at 36 months, further study is warranted.

High-Intensity Focused Ultrasound Renal Denervation

On November 07, 2023, the Paradise® Ultrasound Renal Denervation System received FDA PMA. The basis for the PMA approval decision was data from three double-blind, sham-controlled, RCTs; RADIANCE-HTN SOLO (SOLO), RADIANCE-HTN TRIO (TRIO) and RADIANCE II. The device was approved for the reduction of BP as an adjunctive treatment for HTN in individuals with treatment-resistant BP.

In 2018, Azizi and colleagues published results from the RADIANCE-HTN SOLO blinded RCT which enrolled 146 individuals with resistant HTN (defined as ambulatory BP between 135/85 mm Hg and 170/105 mm Hg after a 4-week washout of up to 2 antihypertensive medications [AHM]) to undergo RDN with HIFU using the Paradise system (n=74) or a sham procedure (i.e., renal angiography only [n=72]). The primary effectiveness endpoint was change in ambulatory SBP at 2 months. Study participants remained off antihypertensive medications throughout the 2-month follow-up period unless specified BP criteria were exceeded. The reduction in ambulatory SBP was significantly greater in the RDN arm than the sham arm (-6.3 mm Hg; 95% CI, -9.4 to -3.1; p=0.0001). No major adverse events were reported in either group. Long-term follow-up is warranted.

In 2022, Rader and colleagues published long-term durability results from the RADIANCE-HTN SOLO RCT. At 6 months, participants and physicians were unblinded. At 36 months follow-up, 51 of 74 (69%) originally randomized participants from the HIFU RDN arm were available for analysis. At baseline, participants were on an average of 1.2 antihypertensive medications (range: 0-2.0) and at 36 months, the average was relatively unchanged, 1.3 AHM (range: 0-3.0). The percentage of participants with controlled office BP (< 140/90 mmHg) trended upwards (though not significant) from 29.4% at screening to 45.1% at 36 months (p=0.059). Given the 31% loss to follow-up from the original study sample, unblinding, and multiple primary outpoints with insignificant differences from baseline, further study is warranted.

In 2022, Azizi and colleagues published results of a prespecified analysis of the RADIANCE-HTN TRIO RCT, in which 129 individuals were enrolled with resistant HTN (defined as seated office BP of at least 140/90 despite 3 or more antihypertensive medications and an estimate glomerular filtration rate [eGFR] of 40 mL/min/1.73 m^2) and randomized to receive HIFU RDN (n=65) or a sham control procedure (n=64). After 6 months of follow-up, the change in BP was not significantly different between the study arms, although fewer medications were administered in the RDN arm.

In 2023, Azizi and colleagues published results of the RADIANCE II RCT which enrolled participants 2:1; 150 to ultrasound RDN and 74 to a sham procedure. The reduction in daytime ambulatory SBP was greater with RDN (p< 0.001), with a consistent, though not significant, effect of ultrasound RDN throughout a 24-hour day. Among 7 secondary BP outcomes, 6 were significantly improved with ultrasound renal denervation compared to the sham procedure. Follow-up occurred through 2 months, during which time no major adverse events were reported in either group. Long-term follow-up is warranted.

Overall Summary

In 2016, the Agency for Healthcare Research and Quality (AHRQ) issued a technical brief with results of a systematic review of the literature to assess the effectiveness of RDN in the Medicare population. This report was conducted by the Johns Hopkins University Evidence-based Practice Center at the request of the Centers for Medicare and Medicaid Services (CMS). Data was abstracted from 83 studies (n=7660); 9 were RCTs, 8 were comparative cohorts, and 66 were non-comparative cohorts. It was noted that the trial participants within the included studies were only partially comparable to the Medicare-eligible population, due to the multifactorial causes of treatment-resistant HTN. Additional limitations of the literature review included variable eligibility criteria between the studies, the fact that adherence to diet and medications was not routinely assessed in all the studies, and only 10 (12%) of all studies described a run-in period prior to randomization. None of the studies were designed or powered to detect a long-term difference between groups in clinical endpoints, such as stroke, MI, hospitalization, or mortality, and few studies reported these outcomes. Also, beneficial clinical effects of RDN by specific subgroups (age, gender, race/ethnicity) were seldom and inconsistently reported. Details about different RDN techniques used and interventionalist training and experience were not uniformly reported. Only 6-month outcomes data was reported in the majority of included studies. The technical brief provided the following conclusions:

> Limited evidence suggests that renal denervation in patients with treatment-resistant HTN lowers systolic BP, but the results were highly variable and the studies reviewed were not designed to determine improvement in clinical endpoints. The most rigorously conducted RCTs showed much smaller BP reductions, as compared with observational non-comparative studies. Further research is needed to identify optimal candidates for renal

> denervation, refine next generation renal denervation technology, develop methods for assessing completeness of renal denervation procedures, and demonstrate the efficacy of renal denervation in reducing BP and improving clinical endpoints, including the risk of stroke, myocardial infarction, heart failure, and death in patients with HTN (Shafi, AHRQ, 2016).

In 2022, a consensus document from the Hypertension Academic Research Consortium highlighted the following clinical trial design principle recommendations for device-based therapies to treat HTN:

> The advancement of device-based approaches to hypertension has been motivated by clinical implications associated with a persistently high prevalence of both uncontrolled BP and medication nonadherence. The expansion of device technologies and emerging clinical trials imparts the need for consistency in trial design, conduct, and definitions of clinical study elements to allow for trial comparability and data poolability (Kandzari, 2022).

In 2023, the European Society of Cardiology published guidelines entitled, Renal denervation in the management of hypertension in adults. In the guidelines, the following ungraded recommendation is made based largely on the RCTs previously described:

> This expert group proposes that RDN is an adjunct treatment option in uncontrolled resistant hypertension, confirmed by ambulatory BP measurements, despite best efforts at lifestyle and pharmacological interventions. RDN may also be used in patients who are unable to tolerate antihypertensive medications in the long term (Barbato, 2023).

In 2023, the Society for Cardiovascular Angiography & Interventions (SCAI) published a position statement and recommendations on renal denervation for hypertension. The guidelines state the following:

> Renal denervation (RDN) is a minimally invasive endovascular procedure targeting sympathetic nerves adjacent to the renal arteries. Disruption of these nerves has been shown in sham-controlled, randomized trials to produce clinically meaningful and safe short-term reductions in blood pressure, whereas both observational and limited randomized trial data suggest longer term durability and safety. RDN may therefore represent a novel and important adjunct to lifestyle modification and antihypertensive medications for HTN.

The guidelines are predicated on the previously described pivotal RCTs and recommendations are ungraded.

In 2023, Fernandes published a systematic review and meta-analysis which included 9 RCTs comprised of 674 individuals with hypertension who received sham RDN. The primary outcome was systolic and diastolic BP. The sham arms showed a significant decrease in both systolic and diastolic BP, highlighting the importance of RCTs to determine the magnitude of effect of RDN in resistant HTN.

Despite modestly favorable, short-term results for RDN as treatment of drug-resistant uncontrolled HTN from several trials, benefit from renal nerve denervation compared with a sham procedure has not been consistently established, nor has a durability of effect. Additional, well-powered studies with sufficient long-term follow-up to assess net health outcomes data are warranted.

Background/Overview

Ablation of the sympathetic renal nerves is a minimally invasive procedure performed percutaneously with access at the femoral artery. A flexible catheter is threaded into the renal artery, and controlled, low power RF energy or high-intensity ultrasound energy is delivered to the arterial walls where the renal sympathetic nerves are located. Once adequate energy has been delivered to ablate the sympathetic nerves, the catheter is removed. This procedure is performed on an outpatient basis . Potential complications include, but are not limited to, vascular access problems, perforation of the renal artery and renal artery stenosis. Additional information is needed regarding the safety and efficacy associated with ablation of the renal nerves.

Definitions

Radiofrequency ablation (RFA): This minimally invasive surgical procedure utilizes low power radiofrequency energy to ablate (or destroy) various tissues of the body.

Resistant hypertension (HTN): Blood pressure (BP) above goal despite treatment with three antihypertensive agents, of different classes ideally including a diuretic, all prescribed at optimal dose amounts.

Coding

The following codes for treatments and procedures applicable to this document are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

When services are Investigational and Not Medically Necessary:
When the code describes a procedure indicated in the Position Statement section as investigational and not medically necessary.

CPT

0338T	Transcatheter renal sympathetic denervation, percutaneous approach including arterial puncture, selective catheter placement(s) renal artery(ies), fluoroscopy, contrast injection(s), intraprocedural roadmapping and radiological supervision and interpretation, including pressure gradient measurements, flush aortogram and diagnostic renal angiography when performed; unilateral
0339T	Transcatheter renal sympathetic denervation, percutaneous approach including arterial puncture, selective catheter placement(s) renal artery(ies), fluoroscopy, contrast injection(s), intraprocedural roadmapping and radiological supervision and interpretation, including pressure gradient measurements, flush aortogram and diagnostic renal angiography when performed; bilateral

ICD-10 Procedure

	For the following code **when specified as ablation (or destruction) of renal sympathetic nerves**:
015M3ZZ	Destruction of abdominal sympathetic nerve, percutaneous approach

ICD-10 Diagnosis

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Peer Reviewed Publications:

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Index

Ablation, Radiofrequency
Biosense Webster Thermocouple Catheter
EnligHTN Renal Guide Catheter
High-Intensity Focused Ultrasound (HIFU)
Hypertension, Resistant
Radiofrequency Ablation (RFA)
Renal Denervation RDN
St. Jude Medical EnligHTN
Sympathetic Renal Nerves
Symplicity Renal Denervation (RDN) System
SYMPLICITY SPYRAL System
Vessix Guide Sheath

The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

Document History

Status	Date	Action
Revised	02/15/2024	Medical Policy & Technology Assessment Committee (MPTAC) review. Revised INV/NMN statement to include any method of ablation. Updated Description/Scope, Rationale, Background/Overview, References and Index sections.
Reviewed	08/10/2023	MPTAC review. Description/Scope, Rationale and References updated.
Reviewed	08/11/2022	MPTAC review. References updated.
Reviewed	08/12/2021	MPTAC review. References updated.
Reviewed	08/13/2020	MPTAC review. The References were updated. Updated Coding section; removed 015L3ZZ, 015N3ZZ (not applicable).
Reviewed	08/22/2019	MPTAC review. The References updated.
Reviewed	09/13/2018	MPTAC review. The Rationale and References sections updated.
Reviewed	11/02/2017	MPTAC review. The document header wording was updated from “Current Effective Date” to “Publish Date.” The Rationale and References sections updated.
Reviewed	11/03/2016	MPTAC review. Updated Rationale and References sections.

Reviewed	11/05/2015	MPTAC review. The Rationale and References were updated. Removed ICD-9 codes from Coding section.
Reviewed	11/13/2014	MPTAC review. The Rationale and References updated.
Reviewed	11/14/2013	MPTAC review. The Rationale and References updated. Updated Coding section with 01/01/2014 CPT changes.
New	11/08/2012	MPTAC review. Initial document development.
