

7.01.168		Cryoablation, Radiofrequency Ablation, and Laser Ablation for Treatment of Chronic Rhinitis	
Original Policy Date:	November 1, 2021	Effective Date:	March 1, 2024
Section:	7.0 Surgery	Page:	Page 1 of 27

Policy Statement

- I. Cryoablation for chronic rhinitis (allergic or nonallergic) is considered **investigational**.
- II. Radiofrequency ablation for chronic rhinitis (allergic or nonallergic) is considered **investigational**.
- III. Laser ablation for chronic rhinitis (allergic and nonallergic) is considered **investigational**.

NOTE: Refer to [Appendix A](#) to see the policy statement changes (if any) from the previous version.

Policy Guidelines

Coding

The following HCPCS code are available to use for this service:

- **C9771:** Nasal/sinus endoscopy, cryoablation nasal tissue(s) and/or nerve(s), unilateral or bilateral

The following CPT codes are less specific but may also be used for this service:

- **30117:** Excision or destruction (e.g., laser), intranasal lesion; internal approach
- **30999:** Unlisted procedure, nose
- **31299:** Unlisted procedure, accessory sinuses

Effective January 1, 2024, these new codes were created to represent an energy based procedure that interrupts the activity of an overactive posterior nasal nerve for the treatment of chronic rhinitis. The service has been previously billed using unlisted code 30999 or 30117. CPT code 30117 does not reflect the physician work associated with the procedure, including the endoscopic surgical approach, as well as the practice expense. These services may be performed using devices such as Clarifix by Arrinex, Inc; RhinAer by Aerin Medical; NEUROMARK System by Neurent Medical:

- **31242:** Nasal/sinus endoscopy, surgical; with destruction by radiofrequency ablation, posterior nasal nerve
- **31243:** Nasal/sinus endoscopy, surgical; with destruction by cryoablation, posterior nasal nerve

Description

Ablation therapy is proposed as an alternative to medical management for patients with chronic rhinitis symptoms. Ablation therapy includes cryoablation (also known as cryosurgical ablation, cryosurgery, or cryotherapy), radiofrequency ablation, and laser ablation. Ablation therapy is thought to correct the imbalance of autonomic input to the nasal mucosa, thereby reducing nasal antigen responses and vascular hyperreactivity.

Related Policies

- Balloon Ostial Dilation for Treatment of Chronic and Recurrent Acute Rhinosinusitis
- Steroid-Eluting Sinus Stents and Implants

Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. 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.

Some state or federal mandates (e.g., Federal Employee Program [FEP]) prohibits plans from denying Food and Drug Administration (FDA)-approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

Regulatory Status

In February 2019, the ClariFix™ device (Stryker) was cleared for use in adults with chronic rhinitis by the FDA through the 510(k) process (K190356).¹ Clearance was based on substantial equivalence to the predicate device, ClariFix (K162608). The only modification to the subject device was an update to the indications for use to include adults with chronic rhinitis.

In December 2019, the RhinAer™ stylus (Aerin Medical) was cleared by the FDA through the 510(k) process as a tool to treat chronic rhinitis (K192471).² Clearance was based on equivalence in design and intended use of a predicate device, the InSeca ARC Stylus™ (K162810). The RhinAer stylus includes modification of the InSeca ARC stylus shaft components and flexibility.

There are currently no laser ablation devices with FDA clearance for treatment of chronic rhinitis.

Rationale

Background

Medical management is the standard of care for chronic rhinitis. Surgical options have been investigated for patients with chronic rhinitis refractory to multiple medical therapies. Ablation therapy is proposed as an alternative to medical management for patients with chronic rhinitis symptoms. Ablation therapy includes cryoablation (also known as cryosurgical ablation, cryosurgery, or cryotherapy), radiofrequency ablation, and laser ablation. Ablation therapy is thought to correct the imbalance of autonomic input to the nasal mucosa, thereby reducing nasal antigen responses and vascular hyperreactivity.

To quantify the severity of chronic rhinitis and to assess treatment response, various outcome measures can be used, including radiologic scores, endoscopic grading, and patient-reported quality of life measures. The primary outcome measures relevant for the treatment of chronic rhinitis are patient-reported symptoms and quality of life. Examiner evaluation of the nasal and sinus appearance and polyp size may provide some information about treatment outcomes, but these evaluations are limited by the lack of universally accepted standards.

Frequently used outcome measures for treatments of chronic rhinitis in adults are shown in Table 1. A consensus on the minimally clinically important difference (MCID) for some of these outcomes has not been established. The U.S. Food and Drug Administration (FDA) guidance on drugs for rhinitis recommends patient-reported total nasal symptom scores as the primary measure of efficacy. The FDA guidance on drugs for rhinitis does not specify a MCID for patient-reported symptom measures, but notes that a MCID should be prespecified in studies and the rationale explained.

Six months of follow-up is considered necessary to demonstrate efficacy. Adverse events can be assessed immediately (perioperative complications and postoperative pain) or over the longer term.

Table 1. Outcome Measures for Chronic Rhinitis Interventions

Outcome	Measures	Description	Minimal Clinically Important Difference	Timing
Symptoms	reflective Total Nasal Symptom Score (rTNSS)	Sum of 4 individual subject-assessed symptom scores for rhinorrhea, nasal congestion, nasal itching, and sneezing, each evaluated using a scale of 0 = none, 1 = mild, 2 = moderate, or 3 = severe. Maximum 12 points.	Not established; 30% change from baseline has been proposed	At least 6 months or longer
	The Chronic Sinusitis Survey (CSS)	Measure of symptoms and medication usage over an 8-week recall period. Includes 3 questions regarding symptoms and 3 regarding medication usage, yielding a total score, symptom subscore, and medication subscore. Ranges from 0 to 100 in which a low CSS score represents greater symptoms and/or medication usage.	Not established	At least 6 months or longer
	Visual Analog Scale (VAS)	Patient-reported.	Not established	At least 6 months or longer
Disease-Specific Quality of Life	Sino-Nasal Outcome Test-20 (SNOT-20)	Patients complete 20 symptom questions on a categorical scale (0 [no bother] to 5 [worst symptoms can be]). Average rankings can be reported over all 20 symptoms, as well as by 4 subclassified symptom domains. The possible range of SNOT-20 scores is 0 to 5, with a higher score indicating a greater rhinosinusitis-related health burden. SNOT-22, a variation of the SNOT-20, includes 2 additional questions (on "nasal obstruction" and "loss of smell and taste").	SNOT-20: change in score of 0.8 or greater SNOT-22: change in score of 8.9 points	At least 6 months or longer
	Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ)	Measures the functional (physical, emotional, and social) problems associated with rhinitis.	Not established	At least 6 months or longer
	VAS	Patient-reported.	Not established	At least 6 months or longer
Adverse events	Various; patient- and clinician reported	Potential procedure- and device-related adverse events include postoperative pain, epistaxis, and dry eyes.	Not applicable	Immediately post procedure to 6 months or longer

Literature Review

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent 1 or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some

conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial (RCT) is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. Randomized controlled trials are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Promotion of greater diversity and inclusion in clinical research of historically marginalized groups (e.g., People of Color [African-American, Asian, Black, Latino and Native American]; LGBTQIA (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual); Women; and People with Disabilities [Physical and Invisible]) allows policy populations to be more reflective of and findings more applicable to our diverse members. While we also strive to use inclusive language related to these groups in our policies, use of gender-specific nouns (e.g., women, men, sisters, etc.) will continue when reflective of language used in publications describing study populations.

Cryoablation for Chronic Rhinitis

Clinical Context and Therapy Purpose

Cryoablation is proposed as an alternative to medical management for patients with chronic rhinitis. The following PICO was used to select literature to inform this review.

Population

The relevant population of interest is adults age 18 and older with chronic allergic or nonallergic rhinitis.

Rhinitis is defined as symptomatic inflammation of the paranasal sinuses and nasal cavity. Chronic rhinitis is usually defined as rhinorrhea with or without nasal congestion symptoms despite medical therapy lasting longer than 3 months. Allergic rhinitis is defined as an immunoglobulin E (IgE)-mediated inflammatory response of the nasal mucous membranes after exposure to inhaled allergens. Symptoms include rhinorrhea (anterior or post nasal drip), nasal congestion, nasal itching, and sneezing. Allergic rhinitis can be seasonal or perennial, with symptoms being intermittent or persistent.

Interventions

The therapy being considered is cryoablation. Cryoablation for chronic rhinitis involves destruction of tissue in the posterior nasal nerve region. The procedure is thought to correct the imbalance of autonomic input to the nasal mucosa, reducing nasal antigen responses and vascular hyperreactivity.

The ClariFix system uses nitrous oxide to freeze nasal tissue, causing nerve damage. The procedure can be performed under local anesthesia.

Comparators

The comparator of interest is medical management.

Options for the medical management of chronic rhinitis include allergen avoidance, nasal saline irrigation, and pharmacologic therapy (e.g., intranasal glucocorticoids, topical antihistamines, oral antihistamines, ipratropium).

For allergic rhinitis, treatment options include evaluation with appropriate allergy testing and the offering of immunotherapy.

Outcomes

The general outcomes of interest are symptoms, change in disease status, quality of life, and treatment-related morbidity.

To quantify the severity of chronic rhinitis and to assess treatment response, various outcome measures can be used, including radiologic scores, endoscopic grading, and patient-reported quality of life measures. The primary outcome measures relevant for the treatment of chronic rhinitis are patient-reported symptoms and quality of life. Examiner evaluation of the nasal and sinus appearance and polyp size may provide some information about treatment outcomes, but these evaluations are limited by the lack of universally accepted standards.

Frequently-used outcome measures for treatments of chronic rhinitis in adults are shown above in Table 1 (see Background). Six months of follow-up is considered necessary to demonstrate efficacy. Adverse events can be assessed immediately (perioperative complications and postoperative pain) or over the longer term.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

Systematic Reviews

Kompelli et al (2018) conducted a systematic review of cryoablation for chronic rhinitis, identifying 15 nonrandomized studies enrolling a total of 1266 patients (Table 2).³ Across all of the studies, 63% to 95.7% of patients noted improvement in overall symptoms, and no serious adverse events were reported. The authors concluded that although the procedure appeared to be safe and efficacious, methodological weaknesses and heterogeneity limited the strength of conclusions that could be drawn from this body of evidence. In addition to their uncontrolled design, most studies were outdated, published between 1977 and 1997. Only 1 study, reported by Hwang et al (2017) used a Food and Drug Administration (FDA)-cleared device and a validated outcome measure.⁴ This study is discussed in detail, along with other recent nonrandomized studies, in the following section.

Table 2. Systematic Review of Cryoablation for Chronic Rhinitis

Study	Literature Search Date	Study Inclusion/Exclusion Criteria	Population Included Inclusion Criteria	Outcomes	Risk of Bias Assessment Method	Statistical Methods	Studies Included	Main Conclusions
Kompelli et al (2018) ³	February 2018	Inclusion: Studies with the primary objective of assessing the efficacy of cryotherapy on chronic rhinitis. Exclusion: Case reports, review articles, and nonhuman studies; studies describing the use of cryotherapy for medical diseases other than	Patients with chronic rhinitis were classified as allergic rhinitis, nonallergic rhinitis (vasomotor rhinitis), or mixed using the original author's criteria.	Complications, treatment efficacy, and length of follow-up.	Cochrane Handbook for Systematic Reviews of Interventions (version 5.1.0)	No meta-analysis or statistical tests performed due to expected heterogeneity in outcome metrics.	N=15 studies (9 nonallergic rhinitis only, 1 allergic rhinitis and 2 cohorts with mixed symptoms and nonallergic	All studies noted improvement in symptoms, with 63% to 95.7% of patients noting improvement in overall symptoms. Among 6 studies reporting complications, 55 patients experienced

Study	Literature Search Date	Study Inclusion/ Exclusion Criteria	Population Included Inclusion Criteria	Outcomes	Risk of Bias Assessment Method	Statistical Studies Methods Included	Main Conclusions
		chronic rhinitis; studies not in English that could not be translated.				rhinitis). N=1266 patients	complications (8.6%); none were considered serious. Most common were epistaxis, nasal obstruction, nasal crusting, and ear blockage.

Randomized Controlled Trials

One RCT conducted by Del Signore et al (2021)⁵, compared cryoablation using the ClariFix device with a sham procedure in 133 adults (age ≥21 years) with chronic rhinitis (Tables 3 and 4). Outcomes assessed included the reflective Total Nasal Symptom Score (rTNSS) and the Rhinoconjunctivitis Quality of Life Questionnaire (RQLQ) score. Duration of follow-up was 3 months. Individuals randomized to active cryoablation were more likely than those in the sham group to respond to treatment (73.4% vs. 36.5%, p<.001), based on a rTNSS reduction of >30%. Active cryoablation was also associated with greater reductions in RQLQ score from baseline at 3-month follow-up (-1.5; 95% confidence interval [CI], -1.8 to -1.2) versus sham cryoablation (-0.8; 95% CI, -1.1 to -0.5; p<.001). There was no difference between groups in use of allergy or rhinitis medication at 3 months. Study limitations are described in Tables 5 and 6.

Table 3. RCT of Cryoablation for Chronic Rhinitis - Characteristics

Study	Countries	Sites	Dates	Participants	Interventions	
					Active	Comparator
DelSignore et al (2021) ⁵	U.S.	12 sites	Not reported	N=133 adults with chronic rhinitis with moderate to severe symptoms (rTNSS rhinorrhea subscore ≥2, congestion subscore ≥2, and total score ≥4) <ul style="list-style-type: none"> • Mean age: 55 years • 58% female • 89% White, 6% Black, 3% Asian, <1% American Indian/ Alaska Native 	Cryoablation with the ClariFix device; n=68	Sham cryoablation; n=65

rTNSS: reflective Total Nasal Symptom Score.

Table 4. RCT of Cryoablation for Chronic Rhinitis - Results

Study	Symptoms (Proportion with $\geq 30\%$ Improvement in rTNSS from Baseline)	Symptoms (rTNSS Mean Change from Baseline)	RQLQ Score (Mean Change from Baseline)	Concomitant Allergy/Rhinitis Medication Use (Proportion with Use at 3 Months)	Adverse Events
DelSignore et al (2021)⁵					
Cryoablation with ClariFix	73.4% (47/64)	-3.7 (95% CI, -4.3 to -3.1)	-1.5 (95% CI, -1.8 to -1.2)	40.0% (26/65)	Post-procedural pain: 36.8% (25/68) Headache: 5.9% (4/68)
Sham cryoablation	36.5% (23/63)	-1.8 (95% CI, -2.5 to -1.1)	-0.8 (95% CI, -1.1 or -0.5)	34.4% (22/64)	Post-procedural pain: 1.5% (1/65) Headache: 0% (0/68)
p-value	<.001	<.001	<.001	.51 ^a	Post-procedural pain: .002 ^a Headache: .15 ^a

^a p-value calculated by BCBSA staff.

CI: confidence interval; RQLQ: Rhinoconjunctivitis Quality of Life Questionnaire; rTNSS: reflective Total Nasal Symptom Score.

The purpose of the study limitations tables (see Tables 5 and 6) is to display notable limitations identified in each study. This information is synthesized as a summary of the body of evidence following each table and provides the conclusions on the sufficiency of evidence supporting the position statement. Specifically, regarding the intended use population, study authors stated that cryoablation appeared to be effective in "patients who have been refractory to other medical and surgical therapies" but this population was not clearly defined at enrollment, nor was there any subgroup analysis undertaken limited to treatment-refractory patients. Based on the current RCT evidence, it is unclear if cryotherapy is intended to be adjunctive to or a replacement for medical management.

Table 5. Study Relevance Limitations

Study	Population ^a	Intervention ^b	Comparator ^c	Outcomes ^d	Duration of Follow-up ^e
DelSignore et al (2021)⁵	1. The intended use population is unclear. Specifically, it is unclear if the intended use population includes any patients with chronic rhinitis or is limited to those with treatment		2: An optimal comparator would be carefully controlled medical management; use of concomitant medication was not limited in		1, 2: Follow-up limited to 3 months

Study	Population ^a	Intervention ^b	Comparator ^c	Outcomes ^d	Duration of Follow-up ^e
	refractory chronic rhinitis.		either group in the study.		

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Population key: 1. Intended use population unclear; 2. Study population is unclear; 3. Study population not representative of intended use; 4. Enrolled populations do not reflect relevant diversity; 5. Other.

^b Intervention key: 1. Not clearly defined; 2. Version used unclear; 3. Delivery not similar intensity as comparator; 4. Not the intervention of interest (e.g., proposed as an adjunct but not tested as such); 5. Other.

^c Comparator key: 1. Not clearly defined; 2. Not standard or optimal; 3. Delivery not similar intensity as intervention; 4. Not delivered effectively; 5. Other.

^d Outcomes key: 1. Key health outcomes not addressed; 2. Physiologic measures, not validated surrogates; 3. Incomplete reporting of harms; 4. Not establish and validated measurements; 5. Clinically significant difference not prespecified; 6. Clinically significant difference not supported; 7. Other.

^e Follow-Up key: 1. Not sufficient duration for benefit; 2. Not sufficient duration for harms; 3. Other.

Table 6. Study Design and Conduct Limitations

Study	Allocation ^a	Blinding ^b	Selective Reporting ^c	Data Completeness ^d	Power ^e	Statistical ^f
DelSignore et al (2021) ⁵		2, 4: Patients were blinded; blinding was not reported for study staff or outcome assessors.				

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Allocation key: 1. Participants not randomly allocated; 2. Allocation not concealed; 3. Allocation concealment unclear; 4. Inadequate control for selection bias; 5. Other.

^b Blinding key: 1. Participants or study staff not blinded; 2. Outcome assessors not blinded; 3. Outcome assessed by treating physician; 4. Other.

^c Selective Reporting key: 1. Not registered; 2. Evidence of selective reporting; 3. Evidence of selective publication; 4. Other.

^d Data Completeness key: 1. High loss to follow-up or missing data; 2. Inadequate handling of missing data; 3. High number of crossovers; 4. Inadequate handling of crossovers; 5. Inappropriate exclusions; 6. Not intent to treat analysis (per protocol for noninferiority trials); 7. Other.

^e Power key: 1. Power calculations not reported; 2. Power not calculated for primary outcome; 3. Power not based on clinically important difference; 4. Other.

^f Statistical key: 1. Analysis is not appropriate for outcome type: (a) continuous; (b) binary; (c) time to event; 2. Analysis is not appropriate for multiple observations per patient; 3. Confidence intervals and/or p values not reported; 4. Comparative treatment effects not calculated; 5. Other.

Nonrandomized Studies

Three recent, single-arm, nonrandomized studies including 149 patients, reported in 4 publications, have evaluated cryoablation for patients with chronic rhinitis. Characteristics and results of these studies are shown in Tables 7 and 8. The largest study (N=98) was reported by Chang et al (2020),⁶ with 2-year follow-up data on a subset of patients (n=62) reported by Ow et al (2021)⁷. Scores on the rTNSS improved significantly over baseline at 1 month, 3 months, 6 months, and 9 months, and improvements were sustained for up to 2 years among those patients who enrolled in the follow-up study. Smaller single-arm studies reported by Hwang et al (2017)⁴ and Gerka Stuyt et al (2021)⁸ also reported improvements in symptoms from baseline (Table 8). Chang et al (2020) reported 2 serious procedure-related adverse events: severe epistaxis occurring on posttreatment day 19 due to a pledget inadvertently left in the nasal cavity from the day of treatment, and 1 case of mild epistaxis occurring on posttreatment day 36, which resolved with in-office cautery. Of 72 patients completing a telephone questionnaire about procedure-related discomfort, 56 (77.8%) experienced some degree of pain or discomfort. Seventeen patients reported severe headache, 5

reported severe nasal pain, and 2 reported severe sinus pain.⁶ No serious adverse events were reported in the other studies (Table 8).

Key limitations of these studies are summarized in Tables 9 and 10. A major limitation was their uncontrolled, open-label design. Additionally, loss to follow-up was high and minimally clinically important differences (MCID) were not prespecified for important outcome measures. Randomized controlled trials are needed to confirm improvements in symptom scores observed in nonrandomized studies.

Table 7. Nonrandomized Studies of Cryoablation for Chronic Rhinitis - Characteristics

Study	Study Design	Location Dates	Inclusion/Exclusion Criteria	Patient Characteristics	Treatment	Duration of Follow-up
Hwang et al (2017)⁴	Prospective, 3 sites, single-arm, US open-label	Not reported	<p>Inclusion: Adult patients with rhinorrhea with or without nasal congestion symptoms despite medical therapy longer than 3 months; minimum rhinorrhea and/or congestion subscores of 2 as part of the TNSS.</p> <p>Exclusion: Patient-reported history of chronic rhinosinusitis, severe septal deviation precluding visualization of the middle meatus, endoscopic findings of polyps or purulence in the middle meatus, septal perforation, or prior sinus or nasal surgery that significantly altered the anatomy of the posterior nasal cavity.</p>	<p>N = 27</p> <p>Mean age, 53.3 (SD, 3.3) years; 63% female; race not reported; 48% were atopic</p>	Cryoablation performed in an office setting under local anesthesia	1 year
Chang et al (2020)⁶, Ow et al (2021)⁷; NCT03181594	Prospective, 6 sites, single-arm, US open-label	2017-2020	<p>Inclusion: Age 21 years or older, with all of the following:</p> <ul style="list-style-type: none"> Moderate-to-severe symptoms of rhinorrhea (defined as individual symptom rating of 2 or 3 on the rTNSS) Mild-to-severe symptoms of congestion (individual symptom rating of 1, 2, or 3 on the rTNSS) and 	<p>N = 98</p> <p>Mean age, 58.6 (SD, 16.2) years; 64.3% female; 91.8% identified as Caucasian; 70 (71.4%) with nonallergic rhinitis and 28 (28.6%) with allergic rhinitis</p>	Cryoablation performed in an office setting under local anesthesia	2 years (n = 62) Primary data collection at 9 months

Study	Study Design	Location Dates	Inclusion/Exclusion Criteria	Patient Characteristics	Treatment	Duration of Follow-up
Gerka Stuyt et al (2021)^B	Prospective, 7 sites, single-arm, US open-label	Not reported	Inclusion: Age over 18 years, diagnosis of chronic rhinitis, and failure of medical therapy for a duration of at least 3 months	N = 24 Mean age 60.04 (SD, 16.7) years; 50% female; race	Cryoablation performed in an office setting under local anesthesia	1 year

Study	Study Design	Location Dates	Inclusion/Exclusion Criteria	Patient Characteristics	Treatment	Duration of Follow-up
			Exclusion: Active or chronic nasal/sinus infections, structural abnormalities restricting device from accessing the posterior middle meatus, cerebrospinal fluid leaks, rhinitis medicamentosa, confounding systemic conditions (i.e. granulomatosis with polyangiitis, Sjogren's syndrome, cystic fibrosis, primary ciliary dyskinesia), active intranasal recreational drug use, recurrent history of epistaxis, coagulopathy, pregnancy, or nasopharyngeal malignancy	not reported; 16 (67%) with non-allergic rhinitis; 3 (12.5%) with allergic; 5 (20.8%) with mixed		

rTNSS: reflective Total Nasal Symptom Score ; SD: standard deviation; TNSS: Total Nasal Symptom Score.

Table 8. Nonrandomized Studies of Cryoablation for Chronic Rhinitis - Results

Study	Symptoms	Quality of Life	Concomitant Medication Use	Adverse Events	Periprocedural Pain
Hwang et al (2017)⁴	Mean reduction from baseline in rTNSS (SD): <ul style="list-style-type: none"> 30 days (n=27): 2.6 (0.3); p<.001 90 days (n=27): 2.7 (0.4); p<.001 180 days (n=21): 2.3 (0.5); p<.001 1 year (n=15): 1.9 (0.3); p<.001 	Not assessed	Not assessed	Day 1 post procedure: 100% reported no or mild bleeding, 44% severe ear blockage, 4% severe nasal dryness; there was 1 moderate nosebleed 27 days post-procedure	74% reported no or mild pain/discomfort
Chang et al (2020)⁶ (Outcomes through 9 months), Ow et al (2021)⁷ (Outcomes from 12 through 24 months); NCT03181594	Mean change from baseline in rTNSS score (SD): <ul style="list-style-type: none"> 30 days (n = 97): 2.9 (1.9); p<.001 	Mean change from baseline in RQLQ score (SD) <ul style="list-style-type: none"> 90 days (n = 96): 1.5 (1.2); p<.001 	5 patients started using ipratropium bromide during the study period due to persistent	31 treatment-related adverse events (2 serious: nosebleed)	16 of 72 (22.2%) patients assessed reported no pain or discomfort 17 reported

Study	Symptoms	Quality of Life	Concomitant Medication Use	Adverse Events	Periprocedural Pain
	<ul style="list-style-type: none"> 90 days (n = 96): 3.0 (2.3); p<.001 180 days (n = 95): 3.0 (2.1); p<.001 270 days (n = 92): 3.0 (2.4); p<.001 Median change from baseline in rTNSS score (IQR): <ul style="list-style-type: none"> 12 months (n = 54): -3.0 (-4.0, -1.0); p<.001 18 months (n = 54): -3.0 (-5.0, -2.0); p<.001 24 months (n = 57): -4.0 (-5.0, -2.0); p<.001 	Median change from baseline in RQLQ score (IQR) <ul style="list-style-type: none"> 18 months (n = 54): -2.1 (-3.1, -1.1); p<.001 24 months (n = 57): -2.1 (-3.0, -0.8); p<.001 	rhinitis symptoms. Of 154 medications that 98 patients were using at baseline, 33 (21.4%) medications were discontinued during the study period		severe headache, 5 severe nasal pain, 2 severe sinus pain
Gerka Stuyt et al 2021⁸	Mean 12-hour TNSS score (SD): <ul style="list-style-type: none"> Baseline: 6.92 (2.8); p<.001 30 days: 3.17 (2.4); p<.001 90 days: 2.92 (1.4); p<.001 1 year: 3.08 (2.6); p<.001 Mean 2-week TNSS score (SD): <ul style="list-style-type: none"> Baseline: 7.75 (3.1); p<.001 30 days: 3.79 (2.1); p<.001 90 days: 3.88 (1.8); p<.001 1 year: 3.76 (2.1); p<.001 	Not assessed	12/18 patients assessed (66.7%) had eliminated or reduced the use of medication to manage their rhinitis when compared to their preoperative baseline	No patients developed epistaxis, palate numbness, or dry eye complications	Patients experienced only minimal discomfort during and post-procedure

IQR: interquartile range; RQLQ: Rhinoconjunctivitis Quality of Life Questionnaire; rTNSS: reflective Total Nasal Symptom Score ; SD: standard deviation; TNSS: Total Nasal Symptom Score.

Table 9. Study Relevance Limitations

Study	Population ^a	Intervention ^b	Comparator ^c	Outcomes ^d	Duration of Follow-up ^e
Hwang et al (2017) ⁴			No comparison group		
Chang et al (2020) ⁶ , Ow et al (2021) ⁷ ; NCT03181594			No comparison group	5. Clinically significant difference for Total Nasal Symptom Score was not prespecified	

Study	Population ^a	Intervention ^b	Comparator ^c	Outcomes ^d	Duration of Follow-up ^e
Gerka Stuyt et al (2021)⁸			No comparison group		

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Population key: 1. Intended use population unclear; 2. Clinical context is unclear; 3. Study population is unclear; 4. Study population not representative of intended use.

^b Intervention key: 1. Not clearly defined; 2. Version used unclear; 3. Delivery not similar intensity as comparator; 4. Not the intervention of interest.

^c Comparator key: 1. Not clearly defined; 2. Not standard or optimal; 3. Delivery not similar intensity as intervention; 4. Not delivered effectively.

^d Outcomes key: 1. Key health outcomes not addressed; 2. Physiologic measures, not validated surrogates; 3. No CONSORT reporting of harms; 4. Not establish and validated measurements; 5. Clinical significant difference not prespecified; 6. Clinical significant difference not supported.

^e Follow-Up key: 1. Not sufficient duration for benefit; 2. Not sufficient duration for harms.

Table 10. Study Design and Conduct Limitations

Study	Allocation ^a	Blinding ^b	Selective Reporting ^c	Data Completeness ^d	Power ^e	Statistical ^f
Hwang et al (2017)⁴	1. Not randomized	1. Open label	1. Not registered	1. 6/27 (22%) lost to follow-up at 180 days, 12 (44%) lost to follow-up at 1 year	1. Power calculation not reported (N = 27); study authors note small sample size as a limitation	
Chang et al (2020)⁶, Ow et al (2021)⁷; NCT03181594	1. Not randomized	1. Open label		1. Through 9 months, 7/98 (7.1%) excluded from analysis: 4 lost to follow-up, 3 excluded due to resumption of ipratropium use during the study period 62 of 98 patients (63.2%) enrolled in the longer-term follow-up study 72/98 (73.5%) patients completed post-procedure pain questionnaire		
Gerka Stuyt et al 2021⁸	1. Not randomized	1. Open label	1. Not registered	1. 6 of 24 lost to follow-up at 1 year (25%)	1. Power calculation not reported (N = 24); study authors note small sample size as a limitation	

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Allocation key: 1. Participants not randomly allocated; 2. Allocation not concealed; 3. Allocation concealment

unclear; 4. Inadequate control for selection bias.

^b Blinding key: 1. Not blinded to treatment assignment; 2. Not blinded outcome assessment; 3. Outcome assessed by treating physician.

^c Selective Reporting key: 1. Not registered; 2. Evidence of selective reporting; 3. Evidence of selective publication.

^d Data Completeness key: 1. High loss to follow-up or missing data; 2. Inadequate handling of missing data; 3. High number of crossovers; 4. Inadequate handling of crossovers; 5. Inappropriate exclusions; 6. Not intent to treat analysis (per protocol for noninferiority trials).

^e Power key: 1. Power calculations not reported; 2. Power not calculated for primary outcome; 3. Power not based on clinically important difference.

^f Statistical key: 1. Analysis is not appropriate for outcome type: (a) continuous; (b) binary; (c) time to event; 2. Analysis is not appropriate for multiple observations per patient; 3. Confidence intervals and/or p values not reported; 4. Comparative treatment effects not calculated.

Section Summary: Cryoablation

For individuals with chronic rhinitis who receive cryoablation, the evidence includes a RCT, nonrandomized studies, and a systematic review of nonrandomized trials. Relevant outcomes are symptoms, change in disease status, quality of life, and treatment-related morbidity. Three single-arm, open-label studies enrolling a total of 149 patients reported improvements from baseline in patient-reported symptom scores up to 1 year. Sustained improvement for up to 2 years was observed in 1 study; however, only 62 of 98 patients enrolled in the longer-term follow-up phase. In the largest study, there were 2 serious procedure-related adverse events (2.0%), and 77.8% of patients who responded to a post-procedure questionnaire reported some degree of pain or discomfort. Study limitations, including lack of a control group and high loss to follow-up, preclude drawing conclusions from this body of evidence. The RCT had an unclear intended use population, used a sham control group, and follow-up was limited to 3 months. A systematic review of 15 nonrandomized studies reported improvements with cryoablation; however, only 1 study used an approved device and validated outcome measuring.

Radiofrequency Ablation for Chronic Rhinitis

Clinical Context and Therapy Purpose

Radiofrequency ablation is proposed as an alternative to medical management for patients with chronic rhinitis.

The following PICO was used to select literature to inform this review.

Population

The relevant population of interest is individual with chronic allergic or nonallergic rhinitis.

Rhinitis is defined as symptomatic inflammation of the paranasal sinuses and nasal cavity. Chronic rhinitis is usually defined as rhinorrhea with or without nasal congestion symptoms despite medical therapy lasting longer than 3 months. Allergic rhinitis is defined as an IgE-mediated inflammatory response of the nasal mucous membranes after exposure to inhaled allergens. Symptoms include rhinorrhea (anterior or post nasal drip), nasal congestion, nasal itching, and sneezing. Allergic rhinitis can be seasonal or perennial, with symptoms being intermittent or persistent.

Interventions

The therapy being considered is radiofrequency ablation. Radiofrequency ablation for chronic rhinitis involves destruction of tissue in the posterior nasal nerve region. The procedure is thought to correct the imbalance of autonomic input to the nasal mucosa, reducing nasal antigen responses and vascular hyperreactivity.

The RhinAer Stylus is a handheld device designed for use under local anesthesia. The device delivers radiofrequency energy at a temperature of 60 degrees Celsius to the posterior nasal nerve region.

Comparators

The comparator of interest is medical management.

Options for the medical management of chronic rhinitis include allergen avoidance, nasal saline irrigation, and pharmacologic therapy (e.g., intranasal glucocorticoids, topical antihistamines, oral antihistamines, ipratropium).

For allergic rhinitis, treatment options include evaluation with appropriate allergy testing and the offering of immunotherapy.

Outcomes

The general outcomes of interest are symptoms, change in disease status, quality of life, and treatment-related morbidity.

To quantify the severity of chronic rhinitis and to assess treatment response, various outcome measures can be used, including radiologic scores, endoscopic grading, and patient-reported quality of life measures. The primary outcome measures relevant for the treatment of chronic rhinitis are patient-reported symptoms and quality of life. Examiner evaluation of the nasal and sinus appearance and polyp size may provide some information about treatment outcomes, but these evaluations are limited by the lack of universally accepted standards.

Frequently-used outcome measures for treatments of chronic rhinitis in adults are shown above in Table 1 (see Background). Six months of follow-up is considered necessary to demonstrate efficacy. Adverse events can be assessed immediately (perioperative complications and postoperative pain) or over the longer term.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

Randomized Controlled Trials

Stolovitsky et al (2021) conducted an RCT comparing radiofrequency ablation using the RhinAer device with sham treatment.⁹ The trial enrolled 117 adults (age, 18 to 85 years; mean age, 57 years) with chronic rhinitis. Use of medication to treat chronic rhinitis was allowed in both groups (Table 11). Based on an intention to treat analysis that accounted for all randomized participants, after 3-months follow-up, the proportion of participants with a $\geq 30\%$ improvement in rTNSS score was higher in the active radiofrequency ablation group (66.7%; 95% CI, 55.1% to 76.9%) than in the sham group (41.0%; 95% CI, 25.6% to 57.9%; $p=.01$). A similar number of participants in the active (9.1% [7/77]) and sham (12.8% [5/39]) groups increased their medication use during the study (Table 12). The study was unblinded at 3 months, and individuals in the control group were allowed to crossover to the active intervention group.

Takashima et al (2022) reported 12-month follow-up for patients ($n=77$) initially randomized to the active intervention group.¹⁰ Study results for the active intervention group at 6- and 12-months are reported in Table 12. Treatment response and mean change from baseline remained stable through 12 months in the active intervention group, while concomitant medication use increased. The study is ongoing, with planned 3-year follow-up.

Table 11. RCT of Radiofrequency Ablation for Chronic Rhinitis - Characteristics

Study	Countries	Sites	Dates	Participants	Interventions	
					Active	Comparator
Stolovitsky et al (2021) ⁹ .	U.S.	16 sites	July 2020 to December 2020	N=117 adults with ≥6 months chronic rhinitis with moderate to severe symptoms (rTNSS rhinorrhea subscore 2-3, congestion subscore 1-3, and total score ≥6) <ul style="list-style-type: none"> • Mean age: 57 years • 65% female • 90% White, 6% Black, 1% Asian, 3% mixed race or not reported 	Radiofrequency ablation with the RhinAer device; n=77	Sham radiofrequency ablation; n=39

rTNSS: reflective Total Nasal Symptom Score.

Table 12. RCT of Radiofrequency Ablation for Chronic Rhinitis - Results

Study	Symptoms (Proportion with ≥30% Improvement in rTNSS from Baseline)	Symptoms (rTNSS Mean Change from Baseline)	Concomitant Medication Use (Proportion with Increased Use)	Periprocedural Pain (VAS 0-10)	Adverse Events
Stolovitsky et al (2021) ⁹ and Takashima et al (2022) ¹⁰ .					
Radiofrequency ablation with RhinAer	<ul style="list-style-type: none"> • 3 months: 67.5% (95% CI, 55.9 to 77.8) • 6 months: 75.0% (95% CI, 63.4 to 84.5) • 12 months: 80.6% (95% CI, 69.1 to 89.2) 	<ul style="list-style-type: none"> • 3 months: -3.6 (95% CI, -4.2 to -3.0) • 6 months: -4.4 (95% CI, -5.0 to -3.8) • 12 months: -4.8 (95% CI, -5.5 to -4.1) 	<ul style="list-style-type: none"> • 3 months: 9.1% (7/77) • 6 months: 16.8% (13/77) • 12 months: 20.8% (16/77) 	Immediately post-procedure: 2.1 (95% CI, 1.6 to 2.6)	Any treatment-related adverse event 12 months: 10.4% (8/77)
Sham radiofrequency ablation	3 months: 41.0%	3 months: -2.2 (95% CI, -3.2 to -1.3)	12.8% (5/39)	Immediately post-procedure: 1.4 (95% CI, 0.7 to 2.0)	Not reported

Study	Symptoms (Proportion with $\geq 30\%$ Improvement in rTNSS from Baseline)	Symptoms (rTNSS Mean Change from Baseline)	Concomitant Medication Use (Proportion with Increased Use)	Periprocedural Pain (VAS 0-10)	Adverse Events
p-value	3 months:.009	3 months:.013	3 months:.53 ^a	Immediately post-procedure:.078	Not calculable

^a p-value calculated by BCBSA staff.

CI: confidence interval; rTNSS: reflective Total Nasal Symptom Score; VAS: visual analog scale.

The purpose of the study limitations tables (see Tables 13 and 14) is to display notable limitations identified in each study. This information is synthesized as a summary of the body of evidence following each table and provides the conclusions on the sufficiency of evidence supporting the position statement. The sole RCT has similar limitations as the cryotherapy RCT, including that the intended use population is unclear.

Table 13. Study Relevance Limitations

Study	Population ^a	Intervention ^b	Comparator ^c	Outcomes ^d	Duration of Follow-up ^e
Stolovitsky et al (2021)⁹.	1. The intended use population is unclear. Specifically, it is unclear if the intended use population includes any patients with chronic rhinitis or is limited to those with treatment refractory chronic rhinitis.		2: An optimal comparator would be carefully controlled medical management; use of concomitant medication was not limited in either group in the study.	3: Only adverse events deemed related to treatment were reported for the active intervention group; there was no adverse event reporting for the control group.	1, 2: Follow-up of randomized active treatment and control groups limited to 3 months; 12-month follow-up reported in Takashima et al (2022) provided for active treatment group only.

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Population key: 1. Intended use population unclear; 2. Study population is unclear; 3. Study population not representative of intended use; 4. Enrolled populations do not reflect relevant diversity; 5. Other.

^b Intervention key: 1. Not clearly defined; 2. Version used unclear; 3. Delivery not similar intensity as comparator; 4. Not the intervention of interest (e.g., proposed as an adjunct but not tested as such); 5. Other.

^c Comparator key: 1. Not clearly defined; 2. Not standard or optimal; 3. Delivery not similar intensity as intervention; 4. Not delivered effectively; 5. Other.

^d Outcomes key: 1. Key health outcomes not addressed; 2. Physiologic measures, not validated surrogates; 3. Incomplete reporting of harms; 4. Not establish and validated measurements; 5. Clinically significant difference not prespecified; 6. Clinically significant difference not supported; 7. Other.

^e Follow-Up key: 1. Not sufficient duration for benefit; 2. Not sufficient duration for harms; 3. Other.

Table 14. Study Design and Conduct Limitations

Study	Allocation ^a	Blinding ^b	Selective Reporting ^c	Data Completeness ^d	Power ^e	Statistical ^f
Stolovitsky et al (2021)⁹.	3: Allocation concealment unclear	2, 4: Patients were blinded; blinding was not reported for study staff or outcome assessors; it is unclear if the				

Study	Allocation ^a	Blinding ^b	Selective Reporting ^c	Data Completeness ^d	Power ^e	Statistical ^f
		treating physician was the outcome assessor; patients were unblinded at 3 months.				

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Allocation key: 1. Participants not randomly allocated; 2. Allocation not concealed; 3. Allocation concealment unclear; 4. Inadequate control for selection bias; 5. Other.

^b Blinding key: 1. Participants or study staff not blinded; 2. Outcome assessors not blinded; 3. Outcome assessed by treating physician; 4. Other.

^c Selective Reporting key: 1. Not registered; 2. Evidence of selective reporting; 3. Evidence of selective publication; 4. Other.

^d Data Completeness key: 1. High loss to follow-up or missing data; 2. Inadequate handling of missing data; 3. High number of crossovers; 4. Inadequate handling of crossovers; 5. Inappropriate exclusions; 6. Not intent to treat analysis (per protocol for noninferiority trials); 7. Other.

^e Power key: 1. Power calculations not reported; 2. Power not calculated for primary outcome; 3. Power not based on clinically important difference; 4. Other.

^f Statistical key: 1. Analysis is not appropriate for outcome type: (a) continuous; (b) binary; (c) time to event; 2. Analysis is not appropriate for multiple observations per patient; 3. Confidence intervals and/or p values not reported; 4. Comparative treatment effects not calculated; 5. Other.

Nonrandomized Studies

The effectiveness of radiofrequency ablation with the RhinAer device has been assessed in 2 industry-sponsored, nonrandomized, uncontrolled, open-label studies.^{11,12} Both studies included patients with chronic rhinitis. Lee et al (2022)¹¹, enrolled 129 patients and reported outcomes of radiofrequency ablation up to 6 months. Ehmer et al (2021) enrolled 50 patients, 47 of whom had 1-year follow-up; 2-year results were subsequently reported in an extension study of 34 patients.^{12,13} Study characteristics and results are summarized in Tables 15 and 16. Both studies found symptom response rates and the proportion of responders durable at time points ranging from 3 months to 2 years. Lee et al reported quality of life outcomes using the miniRQLQ, a validated measure with an established MCID of 0.4 points. At 3 and 6 months post-treatment, the mean change in miniRQLQ scores from baseline was -1.6 and -1.8, respectively, indicating clinically important improvement in symptom-related quality of life. These studies are limited by nonrandomized, open-label designs and lack of control groups (Tables 17 and 18).

Table 15. Nonrandomized Studies of Radiofrequency Ablation for Chronic Rhinitis - Characteristics

Study	Study Design	Location	Dates	Inclusion/Exclusion Criteria	Patient Characteristics	Treatment	Duration of Follow-up
Lee et al (2022) ¹¹	Prospective, single-arm, open label	16 sites, U.S. and Germany	2020-2021	Adults with chronic rhinitis ≥6 months duration and total rTNSS ≥6, rTNSS rhinorrhea subscore 2-3, and rTNSS congestion subscore 1-3	N=129 Mean age 57.9 years (SD, 13.4); 54% female; 91% white, 4% Black, 3% Asian, 2% other race/ethnicity; 72% nonallergic rhinitis, 8%	Radiofrequency ablation with the RhinAer device heated to 60° C performed in an office setting	6 months

Study	Study Design	Location	Dates	Inclusion/Exclusion Criteria	Patient Characteristics	Treatment	Duration of Follow-up
Ehmer et al (2021¹² and 2022¹³)	Prospective, single-arm, open label	5 sites, U.S.	2018-2021	Chronic rhinitis of at least 6 months duration refractory to medical management (defined as an inadequate response after at least 4 weeks usage of intranasal steroids) and rTNSS score ≥ 6	N=50 Mean age 57.9 years (SD, 11.9); 42% female; 94% white, 4% Asian, 2% American Indian/Alaska Native; 42% allergic rhinitis, 34% non-allergic rhinitis, 24% unknown etiology	Radiofrequency ablation with the RhinAer device heated to 60° C performed in an office setting	2 years

rTNSS: reflective Total Nasal Symptom Score.

Table 16. Nonrandomized Studies of Radiofrequency Ablation for Chronic Rhinitis - Results

Study	Symptoms	Concomitant Medication Use	Quality of Life	Adverse Events	Periprocedural Pain
Lee et al (2022)¹¹	<p>Mean rTNSS score:</p> <ul style="list-style-type: none"> Baseline: 7.8 3 months: 3.6; mean change from baseline -4.2 (95% CI, -4.6 to -3.7) 6 months: 2.9; mean change from baseline -4.9 (95% CI, -5.5 to -4.3) <p>Proportion of responders based on $\geq 30\%$ improvement from baseline in rTNSS score:</p> <ul style="list-style-type: none"> 3 months: 76.2% (95% CI, 68.1 to 82.8) 6 months: 83.5% (95% CI, 75.8 to 89.0) 		<p>MiniRQLQ score, adjusted mean change from baseline:</p> <ul style="list-style-type: none"> 3 months: -1.6 (95% CI, -1.8 to -1.4) 6 months: -1.8 (95% CI, -2.1 to -1.5) <p>MiniRQLQ, proportion of patients with ≥ 0.4 point improvement from baseline:</p> <ul style="list-style-type: none"> 3 months: 80.3% (95% CI, 72.6 to 86.3) 6 months: 87.7% (95% CI, 80.7 to 92.4) 	<p>Any treatment-related adverse event:</p> <p>6.2% (8/129)</p>	<p>Mean pain score (VAS 0-100): 19.0 (95% CI, 14.7 to 23.3)</p>
Ehmer et al (2021¹² and 2022¹³)	Mean rTNSS score:	Proportion with increased concomitant medication use at 1 year :		1 year: Serious adverse events: 2	Mean post-treatment pain score (VAS 0-100): 18.1

Study	Symptoms	Concomitant Medication Use	Quality of Life	Adverse Events	Periprocedural Pain
	<ul style="list-style-type: none"> Baseline: 8.5 (95% CI, 8.0 to 9.0) 12 weeks: 3.4 (95% CI, 2.8 to 4.1) 1 year : 3.6 (95% CI, 3.0 to 4.3) 2 years: 2.9 (95% CI, NR); mean change from baseline -5.5 (95% CI, -6.4 to -4.6) 	<ul style="list-style-type: none"> Antihistamines/ decongestants: 12.8% Decongestant nasal spray: 4.3% Steroid nasal spray: 6.4% 		(N=not reported; any adverse event: 16 (N=8) 2 years: NR; narrative report of no treatment-related adverse events from year 1 to year 2	
	Proportion of responders based on $\geq 30\%$ improvement from baseline in rTNSS score: <ul style="list-style-type: none"> 12 weeks: 87.8% (95% CI, 75.8 to 94.3) 26 weeks: 91.7% (95% CI, 80.4 to 96.7) 1 year: 80.9% (95% CI, 67.5 to 89.6) 2 years: 88.2% (95% CI, 73.4 to 95.3) 				

CI: confidence interval; miniRQLQ: mini Rhinoconjunctivitis Quality of Life Questionnaire; NR: not reported; rTNSS: reflective Total Nasal Symptom Score ; VAS: visual analog score.

Table 17. Study Relevance Limitations

Study	Population ^a	Intervention ^b	Comparator ^c	Outcomes ^d	Duration of Follow-up ^e
Lee et al (2022) ¹¹			No comparison group		
Ehmer et al (2021) ¹² and 2022 ¹³)			No comparison group		

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Population key: 1. Intended use population unclear; 2. Clinical context is unclear; 3. Study population is unclear; 4. Study population not representative of intended use.

^b Intervention key: 1. Not clearly defined; 2. Version used unclear; 3. Delivery not similar intensity as comparator; 4. Not the intervention of interest.

^c Comparator key: 1. Not clearly defined; 2. Not standard or optimal; 3. Delivery not similar intensity as intervention; 4. Not delivered effectively.

^d Outcomes key: 1. Key health outcomes not addressed; 2. Physiologic measures, not validated surrogates; 3. No CONSORT reporting of harms; 4. Not establish and validated measurements; 5. Clinical significant difference not prespecified; 6. Clinical significant difference not supported.

^e Follow-Up key: 1. Not sufficient duration for benefit; 2. Not sufficient duration for harms.

Table 18. Study Design and Conduct Limitations

Study	Allocation ^a	Blinding ^b	Selective Reporting ^c	Data Completeness ^d	Power ^e	Statistical ^f
Lee et al (2022) ¹¹	1. Not randomized	1. Open label				
Ehmer et al (2021) ¹² and 2022 ¹³)	1. Not randomized	1. Open label				

The study limitations stated in this table are those notable in the current review; this is not a comprehensive gaps assessment.

^a Allocation key: 1. Participants not randomly allocated; 2. Allocation not concealed; 3. Allocation concealment unclear; 4. Inadequate control for selection bias.

^b Blinding key: 1. Not blinded to treatment assignment; 2. Not blinded outcome assessment; 3. Outcome assessed by treating physician.

^c Selective Reporting key: 1. Not registered; 2. Evidence of selective reporting; 3. Evidence of selective publication.

^d Data Completeness key: 1. High loss to follow-up or missing data; 2. Inadequate handling of missing data; 3. High number of crossovers; 4. Inadequate handling of crossovers; 5. Inappropriate exclusions; 6. Not intent to treat analysis (per protocol for noninferiority trials).

^e Power key: 1. Power calculations not reported; 2. Power not calculated for primary outcome; 3. Power not based on clinically important difference.

^f Statistical key: 1. Analysis is not appropriate for outcome type: (a) continuous; (b) binary; (c) time to event; 2. Analysis is not appropriate for multiple observations per patient; 3. Confidence intervals and/or p values not reported; 4. Comparative treatment effects not calculated.

Section Summary: Radiofrequency Ablation

For individuals with chronic rhinitis who receive radiofrequency ablation, the evidence includes a RCT and 2 nonrandomized studies. Results from the RCT suggest that radiofrequency ablation is more effective than sham ablation in improving short-term rTNSS scores. Results from nonrandomized, uncontrolled studies also found radiofrequency ablation associated with improvements in rTNSS scores at timepoints up to 2 years, and symptom-related quality of life up to 6 months. Randomized controlled trials directly comparing radiofrequency ablation with medical management with follow-up for active and control groups ≥ 6 months are needed to confirm the efficacy of radiofrequency ablation for treatment of chronic rhinitis.

Laser Ablation for Chronic Rhinitis

Clinical Context and Therapy Purpose

Laser ablation is proposed as an alternative to medical management for patients with chronic rhinitis.

The following PICO was used to select literature to inform this review.

Population

The relevant population of interest is individuals with chronic allergic or nonallergic rhinitis.

Rhinitis is defined as symptomatic inflammation of the paranasal sinuses and nasal cavity. Chronic rhinitis is usually defined as rhinorrhea with or without nasal congestion symptoms despite medical therapy lasting longer than 3 months. Allergic rhinitis is defined as an IgE-mediated inflammatory response of the nasal mucous membranes after exposure to inhaled allergens. Symptoms include rhinorrhea (anterior or post nasal drip), nasal congestion, nasal itching, and sneezing. Allergic rhinitis can be seasonal or perennial, with symptoms being intermittent or persistent.

Interventions

The therapy being considered is laser ablation. Laser ablation for chronic rhinitis involves destruction of tissue in the posterior nasal nerve region. The procedure is thought to correct the imbalance of autonomic input to the nasal mucosa, reducing nasal antigen responses and vascular hyperreactivity.

There are currently no laser ablation devices with FDA clearance for treatment of chronic rhinitis.

Comparators

The comparator of interest is medical management.

Options for the medical management of chronic rhinitis include allergen avoidance, nasal saline irrigation, and pharmacologic therapy (e.g., intranasal glucocorticoids, topical antihistamines, oral antihistamines, ipratropium).

For allergic rhinitis, treatment options include evaluation with appropriate allergy testing and the offering of immunotherapy.

Outcomes

The general outcomes of interest are symptoms, change in disease status, quality of life, and treatment-related morbidity.

To quantify the severity of chronic rhinitis and to assess treatment response, various outcome measures can be used, including radiologic scores, endoscopic grading, and patient-reported quality of life measures. The primary outcome measures relevant for the treatment of chronic rhinitis are patient-reported symptoms and quality of life. Examiner evaluation of the nasal and sinus appearance and polyp size may provide some information about treatment outcomes, but these evaluations are limited by the lack of universally accepted standards.

Frequently-used outcome measures for treatments of chronic rhinitis in adults are shown above in Table 1 (see Background). Six months of follow-up is considered necessary to demonstrate efficacy. Adverse events can be assessed immediately (perioperative complications and postoperative pain) or over the longer term.

Study Selection Criteria

Methodologically credible studies were selected using the following principles:

- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs;
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Studies with duplicative or overlapping populations were excluded.

Review of Evidence

Nonrandomized studies

Krespi et al (2020) conducted a nonrandomized study evaluating laser ablation for treatment of chronic rhinitis.¹⁴ The study enrolled 32 adults treated with an endoscopic diode laser in an outpatient setting. Duration of follow-up was 3 months. Mean rTNSS was reduced from 6.0 (standard deviation [SD], 0.7) at baseline to 2.3 (SD, 0.4) at 3-month follow-up. Adverse events were not reported. The study had multiple limitations, including the small sample size, uncontrolled design, and duration of follow-up less than 6 months. Randomized studies comparing laser ablation with medical management and with longer follow-up are needed to determine efficacy and safety.

Section Summary: Laser Ablation

Evidence on laser ablation for chronic rhinitis is limited to a single nonrandomized study with 3 months follow-up. Although laser ablation reduced rTNSS scores, additional studies are needed to determine the efficacy and safety of laser ablation for treatment of chronic rhinitis.

Supplemental Information

The purpose of the following information is to provide reference material. Inclusion does not imply endorsement or alignment with the evidence review conclusions.

Practice Guidelines and Position Statements

Guidelines or position statements will be considered for inclusion in 'Supplemental Information' if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

No clinical practice guidelines on cryoablation, radiofrequency ablation, or laser ablation for chronic rhinitis were identified through clinical consultation or literature searches conducted through December 7, 2022.

American Academy of Allergy, Asthma, and Immunology

A 2020 practice parameter update on rhinitis from the American Academy of Allergy, Asthma, and Immunology did not address ablation techniques, including cryoablation, radiofrequency ablation, or laser ablation.¹⁵

American Rhinologic Society

A position statement issued by the American Rhinologic Society stated that posterior nasal nerve ablation, including cryoablation and radiofrequency ablation, should be considered as an effective option in treating chronic rhinitis and improving patient quality of life.¹⁶ Specific guidance on usage of these techniques was not issued.

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.

Ongoing and Unpublished Clinical Trials

Some currently ongoing and unpublished trials that might influence this review are listed in Table 19.

Table 19. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
<i>Ongoing</i>			
NCT04154605 ^a	ClariFix Rhinitis Randomized Controlled Trial	133	Jul 2022
NCT04533438 ^a	The RhinAer Procedure for Treatment of CHronic RhInitis - A Prospective, MulticeNter Randomized ConTrolled TRial Comparing RhinAer to Sham Control (RHINTRAC)	120	Apr 2023

NCT: national clinical trial.

^a Denotes industry-sponsored or cosponsored trial.

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Documentation for Clinical Review

- No records required

Coding

This Policy relates only to the services or supplies described herein. Benefits may vary according to product design; therefore, contract language should be reviewed before applying the terms of the Policy.

The following codes are included below for informational purposes. Inclusion or exclusion of a code(s) does not constitute or imply member coverage or provider reimbursement policy. Policy Statements are intended to provide member coverage information and may include the use of some codes for clarity. The Policy Guidelines section may also provide additional information for how to interpret the Policy Statements and to provide coding guidance in some cases.

Type	Code	Description
CPT®	30117	Excision or destruction (e.g., laser), intranasal lesion; internal approach
	30999	Unlisted procedure, nose
	31242	Nasal/sinus endoscopy, surgical; with destruction by radiofrequency ablation, posterior nasal nerve <i>(Code effective 1/1/2024)</i>
	31243	Nasal/sinus endoscopy, surgical; with destruction by cryoablation, posterior nasal nerve <i>(Code effective 1/1/2024)</i>
	31299	Unlisted procedure, accessory sinuses
HCPCS	C9771	Nasal/sinus endoscopy, cryoablation nasal tissue(s) and/or nerve(s), unilateral or bilateral

Policy History

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

Effective Date	Action
11/01/2021	New policy.
05/01/2022	Annual review. Policy statement and literature updated. Policy title changed from Cryoablation for Chronic Rhinitis to current one.
04/01/2023	Annual review. No change to policy statement. Literature review updated.
03/01/2024	Coding update

Definitions of Decision Determinations

Medically Necessary: Services that are Medically Necessary include only those which have been established as safe and effective, are furnished under generally accepted professional standards to treat illness, injury or medical condition, and which, as determined by Blue Shield, are: (a) consistent with Blue Shield medical policy; (b) consistent with the symptoms or diagnosis; (c) not furnished primarily for the convenience of the patient, the attending Physician or other provider; (d) furnished at the most appropriate level which can be provided safely and effectively to the patient; and (e) not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of the Member’s illness, injury, or disease.

Investigational/Experimental: A treatment, procedure, or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

Split Evaluation: Blue Shield of California/Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a split evaluation, where a treatment, procedure, or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

Prior Authorization Requirements and Feedback (as applicable to your plan)

Within five days before the actual date of service, the provider must confirm with Blue Shield that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should be directed to the Prior Authorization Department at (800) 541-6652, or the Transplant Case Management Department at (800) 637-2066 ext. 3507708 or visit the provider portal at www.blueshieldca.com/provider.

We are interested in receiving feedback relative to developing, adopting, and reviewing criteria for medical policy. Any licensed practitioner who is contracted with Blue Shield of California or Blue Shield of California Promise Health Plan is welcome to provide comments, suggestions, or concerns. Our internal policy committees will receive and take your comments into consideration.

For utilization and medical policy feedback, please send comments to: MedPolicy@blueshieldca.com

Disclaimer: This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. Blue Shield of California may consider published peer-reviewed scientific literature, national guidelines, and local standards of practice in developing its medical policy. Federal and state law, as well as contract language, including definitions and specific contract provisions/exclusions, take precedence over medical policy and must be considered first in determining covered services. Member contracts may differ in their benefits. Blue Shield reserves the right to review and update policies as appropriate.

Appendix A

POLICY STATEMENT (No changes)	
BEFORE	AFTER
<p>Cryoablation, Radiofrequency Ablation, and Laser Ablation for Treatment of Chronic Rhinitis 7.01.168</p> <p>Policy Statement: Cryoablation for chronic rhinitis (allergic or nonallergic) is considered investigational.</p> <p>Radiofrequency ablation for chronic rhinitis (allergic or nonallergic) is considered investigational.</p> <p>Laser ablation for chronic rhinitis (allergic and nonallergic) is considered investigational.</p>	<p>Cryoablation, Radiofrequency Ablation, and Laser Ablation for Treatment of Chronic Rhinitis 7.01.168</p> <p>Policy Statement:</p> <ol style="list-style-type: none"> I. Cryoablation for chronic rhinitis (allergic or nonallergic) is considered investigational. II. Radiofrequency ablation for chronic rhinitis (allergic or nonallergic) is considered investigational. III. Laser ablation for chronic rhinitis (allergic and nonallergic) is considered investigational.