Sinus Surgeries and Interventions

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➲ Instructions for Use

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Related Commercial/Individual Exchange Policy
- Rhinoplasty and Other Nasal Procedures

Community Plan Policy
- Sinus Surgeries and Interventions

Medicare Advantage Policy
- Ear, Nose, and Throat Procedures

Application

UnitedHealthcare Commercial

This Medical Policy applies to UnitedHealthcare Commercial benefit plans.

UnitedHealthcare Individual Exchange

This Medical Policy applies to Individual Exchange benefit plans.

Coverage Rationale

Balloon sinus ostial dilation and/or Functional Endoscopic Sinus Surgery (FESS) are proven and medically necessary when one or more of the following conditions are present:

- Chronic Rhinosinusitis (CRS) that has **all** the following:
  - Lasted longer than 12 weeks
  - Persistence of symptoms despite recent medical management, with administration of full courses of **all** the following treatments:
    - Intranasal corticosteroids (and/or oral corticosteroids when appropriate); and
    - Antibiotic therapy if bacterial infection is suspected; and
    - Nasal lavage/irrigation, if appropriate
  - Confirmation of CRS on a Recent Computed Tomography Scan for each sinus to be treated, meeting **all** the following criteria:
    - Computed tomography (CT) images are obtained after completion of the medical management described above; and
    - Documentation of which sinus has the disease and the extent of disease, including the percentage of opacification or the use of a scale such as the Modified Lund-Mackay Scoring System; and
    - CT findings include one or more of the following:
      - Bony remodeling
      - Bony thickening
      - Opacified sinus
      - Ostial obstruction (outflow tract obstruction) and mucosal thickening
  - Sinonasal symptoms such as pain, pressure, or drainage are present on the same side as CT scan findings of rhinosinusitis
  - For balloon sinus ostial dilation only, the dilation is limited to the frontal, maxillary, or sphenoid sinuses

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- Recurrent Acute Rhinosinusitis (RARS) with **all** the following:
  - Four or more episodes per year, with distinct symptom-free intervals between episodes; and
  - Sinonasal symptoms such as pain, pressure, or drainage are present on the same side as the CT scan findings of rhinosinusitis; and
  - Recent CT Scan evidence of **one** of the following:
    - For balloon sinus ostial dilation, ostial obstruction (outflow tract obstruction) and mucosal thickening in the sinus to be dilated
    - For FESS:
      - For the maxillary, frontal, or sphenoid sinuses, both of the following are present:
        - Ostial obstruction (outflow tract obstruction) in the sinus to be treated
        - Mucosal thickening in the sinus to be treated
      - For the ethmoid sinus, mucosal thickening is present

FESS is also proven and medically necessary when any of the following conditions are confirmed on CT:
- Complications of sinusitis such as abscess
- Symptomatic concha bullosa
- Symptomatic mucocele
- Polyposis with obstructive symptoms (for CRS with polyps, refer to the criteria above)
- Sinonasal tumor

Balloon sinus ostial dilation is unproven and not medically necessary for treating the following due to insufficient evidence of efficacy:
- Sinonasal polyps or tumors
- Cases of CRS or RARS that do not meet the criteria above

FESS is unproven and not medically necessary for cases of CRS or RARS that do not meet the criteria above due to insufficient evidence of efficacy.

Self-expanding absorptive sinus ostial dilation is unproven and not medically necessary for evaluating or treating sinusitis and all other conditions due to insufficient evidence of efficacy.

Medical Records Documentation Used for Reviews

Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. Medical records documentation may be required to assess whether the member meets the clinical criteria for coverage but does not guarantee coverage of the service requested; refer to the guidelines titled Medical Records Documentation Used for Reviews.

Definitions

Acute Bacterial Rhinosinusitis: Acute Rhinosinusitis presumed or confirmed to be caused by bacterial infection, with no improvement in symptoms within 10 days or more after the initial onset of upper respiratory symptoms or worsening of symptoms within 10 days after initial improvement (Payne et al., 2025).

Acute Rhinosinusitis: Inflammation of the nasal cavities and paranasal sinuses accompanied by thick and/or discolored nasal drainage (anterior, posterior, or both) and/or nasal obstruction, facial pain/pressure/fullness, or both that persists for 4 weeks or less (Payne et al., 2025).

Chronic Rhinosinusitis: Inflammation of the paranasal sinuses and nasal cavities that persists for 12 weeks or longer with:
- At least two of the following symptoms:
  - Thick and/or discolored nasal drainage (anterior, posterior, or both)
  - Nasal obstruction (congestion)
  - Facial pain, pressure, or fullness
  - Decreased sense of smell

  and
- Inflammation, as documented, which may include findings from anterior rhinoscopy, nasal endoscopy, or computed tomography (CT), with at least one of the following:
  - Abnormal mucus or edema in the middle meatus or anterior ethmoid region

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- Polyps in the nasal cavity or middle meatus
- Radiological imaging showing inflammation of the paranasal sinuses

(Shin et al., 2025)

Functional Endoscopic Sinus Surgery (FESS): FESS, also known as endoscopic sinus surgery, is a minimally invasive surgical procedure that uses specialized endoscopic instruments to access, diagnose, and treat the sinus passages. FESS aims to restore normal sinus drainage and ventilation while preserving the mucosal lining (Manandhar et al., 2025).

Modified Lund-Mackay Scoring System: The Modified Lund-Mackay Scoring System is a tool designed to objectively evaluate sinus opacification in five sinuses as well as the ostiomeatal complex on CT scans, particularly in the context of diagnosing Chronic Rhinosinusitis. In scoring, the sinuses, right and left sides, are evaluated separately. Scoring consists of the ostiomeatal complex scored from 0 to 2 (0 = no occlusion, 1 = partial occlusion, and 2 = complete occlusion); sinus opacification scored from 0 to 4 (0 = 0% opacification, 1 = 1%-33%, 2 = 34%-66%, 3 = 67%-99%, and 4 = 100%); and nasal cavity opacification scored from 0 to 4 (0 = none, 1 = above middle turbinate, 2 = above inferior turbinate, 3 = at or below inferior turbinate, and 4 = total opacification), for a total maximum score of 44 points (Kuiper et al., 2020).

Recent Computed Tomography Scan: For the purpose of this policy, a CT scan is considered recent when performed within 12 months of the planned procedure.

Recurrent Acute Rhinosinusitis: Acute Bacterial Rhinosinusitis with four or more episodes per year and with no signs or symptoms between episodes (Payne et al., 2025).

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other policies and guidelines may apply.

CPT Code	Description
31240	Nasal/sinus endoscopy, surgical; with concha bullosa resection
31253	Nasal/sinus endoscopy, surgical with ethmoidectomy; total (anterior and posterior), including frontal sinus exploration, with removal of tissue from frontal sinus, when performed
31254	Nasal/sinus endoscopy, surgical with ethmoidectomy; partial (anterior)
31255	Nasal/sinus endoscopy, surgical with ethmoidectomy; total (anterior and posterior)
31256	Nasal/sinus endoscopy, surgical, with maxillary antrostomy
31257	Nasal/sinus endoscopy, surgical with ethmoidectomy; total (anterior and posterior), including sphenoidotomy
31259	Nasal/sinus endoscopy, surgical with ethmoidectomy; total (anterior and posterior), including sphenoidotomy, with removal of tissue from the sphenoid sinus
31267	Nasal/sinus endoscopy, surgical, with maxillary antrostomy; with removal of tissue from maxillary sinus
31276	Nasal/sinus endoscopy, surgical, with frontal sinus exploration, including removal of tissue from frontal sinus, when performed
31287	Nasal/sinus endoscopy, surgical, with sphenoidotomy;
31288	Nasal/sinus endoscopy, surgical, with sphenoidotomy; with removal of tissue from the sphenoid sinus
31295	Nasal/sinus endoscopy, surgical, with dilation (e.g., balloon dilation); maxillary sinus ostium, transnasal or via canine fossa
31296	Nasal/sinus endoscopy, surgical, with dilation (e.g., balloon dilation); frontal sinus ostium
31297	Nasal/sinus endoscopy, surgical, with dilation (e.g., balloon dilation); sphenoid sinus ostium
31298	Nasal/sinus endoscopy, surgical, with dilation (e.g., balloon dilation); frontal and sphenoid sinus ostia
31299	Unlisted procedure, accessory sinuses

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Description of Services

Rhinosinusitis refers to the inflammation of the paranasal sinuses and nasal cavities. It is classified based on duration and presumed etiology. Classification by duration includes Acute Rhinosinusitis, which lasts less than 4 weeks, and key features include thick and/or discolored nasal drainage accompanied by nasal obstruction and/or facial pain, pressure, or fullness. Chronic Rhinosinusitis persists for more than 12 weeks, with or without acute exacerbations, with signs and symptoms that include mucopurulent drainage; nasal congestion or obstruction; facial pain, pressure, or fullness; decreased sense of smell; and evidence of inflammation documented by purulent mucus or edema in the middle meatus or anterior ethmoid region, nasal polyps, or radiological imaging demonstrating sinus inflammation. Recurrent Acute Rhinosinusitis is characterized by four or more episodes of Acute Bacterial Rhinosinusitis per year, with complete resolution of symptoms between episodes. Classification by presumed etiology includes Acute Bacterial Rhinosinusitis that has a presumed or confirmed bacterial origin as well as Acute Rhinosinusitis with symptoms that fail to improve after 10 days or worsen within 10 days following an initial improvement. Viral rhinosinusitis is typically caused by viral infections, with symptoms that are present for less than 10 days and do not worsen during this period (Payne et al., 2025).

Balloon sinus ostial dilation, also known as balloon dilation sinuplasty or balloon catheter sinusotomy, has been proposed as an alternative or an addition to traditional endoscopic sinus surgery. Several procedural approaches have been proposed for balloon sinus ostial dilation. The first type of approach is done through the nostrils by inserting a small balloon through a tube placed in the nasal cavity where the blocked sinus is located. Using navigation or endoscopic visualization, the balloon is gradually inflated to compress tissue and bone and widen the sinus ostium or outflow tract. The balloon is then removed, and an endoscope may be used to assess the width of the nasal passage. The second type of approach is the transantral approach, which is done by creating a small entry point under the lip. The balloon catheter is then directly inserted into the target sinus. The potential advantages of sinus balloon catheterization include minimal mucosal damage, minimal intraoperative bleeding, and minimal discomfort. Balloon sinus ostial dilation can be performed as a stand-alone procedure or with Functional Endoscopic Sinus Surgery (FESS). When performed with FESS, it may be referred to as a hybrid procedure.

FESS, also known as endoscopic sinus surgery, is a minimally invasive surgical procedure that uses specialized endoscopic instruments to access, diagnose, and treat the sinus passages. FESS is used to restore normal sinus drainage and ventilation by removing blockages and enlarging the natural openings of the sinuses, all while preserving the mucosal lining. This procedure allows for less tissue disruption, which results in shorter operative and recovery times, less postoperative discomfort, and fewer surgical complications than other sinus surgeries. While FESS is primarily used to treat Chronic Rhinosinusitis, it can also be used to treat other conditions such as complications of sinusitis abscess, concha bullosa, mucocele, polyposis with obstructive symptoms, and sinonasal tumor.

Self-expanding absorptive sinus ostial dilation has been proposed as an alternative to standard balloon sinus ostial dilation. The self-expanding device is inserted into the sinus ostia and starts absorbing moisture and begins to expand, providing gradual dilation of the sinus ostia. When the device is fully expanded, it is removed. The SinuSys Vent-OS Sinus Dilation System is a self-expanding device that has been cleared by the U.S. Food and Drug Administration. These devices are being studied to determine their safety and effectiveness.

Clinical Evidence

Liang et al. (2025) conducted a systematic review and meta-analysis to evaluate the efficacy and safety of sinus balloon catheter dilation (SBCD) compared with those of functional endoscopic sinus surgery (FESS) in the treatment of chronic sinusitis. The study synthesized data from 14 randomized controlled trials (RCTs), systematically analyzing Lund-Mackay scores, Sino-Nasal Outcome Test (SNOT-20) score, complications, operating time, and revision surgery. Overall, 1,060 individuals who were diagnosed with chronic rhinosinusitis (CRS), either with or without nasal polyps, and allergic rhinitis and had not responded to previous drug therapy were enrolled in the study. Individuals were allocated into two groups: 531 individuals who comprised the SBCD intervention group and 529 individuals who were assigned to the FESS control group. There was no significant difference between the two groups in terms of Lund-Mackay scores or the rate of revision surgery. SBCD was associated with significantly improved postoperative outcomes compared with FESS, including a lower postoperative SNOT-20 (standardized mean difference, -0.25; 95% CI, -0.42 to -0.07; $p < 0.01$; $I^2 = 94\%$), shorter operating time (odds ratio, -5.00; 95% CI, -8.08 to -1.91; $p = 0.001$; $I^2 = 50\%$), and a reduced risk of complications (odds ratio, 0.14; 95% CI, 0.08-0.26; $p < 0.01$; $I^2 = 65\%$). Individuals who underwent SBCD resumed regular activities in an average of 2.2 days post operation compared with 5 days in those who underwent FESS. Additionally, SBCD demonstrated a lower incidence of complications such as infection, scab formation, adhesion, scarring, bleeding, and anosmia. The authors concluded that the results demonstrate that SBCD is both effective and safe for treating CRS. However, additional well-designed RCTs are necessary to validate this conclusion. According to the authors, this meta-analysis faced several limitations, including a small number and sample size of RCTs, incomplete reporting of SDs and

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mean differences, and insufficient postintervention data, which reduced statistical power and the reliability of subgroup analyses. Additionally, the RCTs lacked adjustment for major confounders such as baseline comorbidities, nasal polyps, and prior sinus surgery, and many were at a substantial risk of bias due to unclear randomization and blinding procedures. Limitations in the literature search may have led to omitted studies; additionally, missing critical data remained despite attempts to obtain it, and the lack of stratified data prevented thorough subgroup analyses. These factors collectively undermine the strength and reliability of the study's conclusions, highlighting the need for future larger, multicenter RCTs that have improved methodology and standardized data collection. (Kutluhan et al., 2020, Minni et al., 2018, and Marzetti et al., 2017, previously cited in this policy, are included in this systematic review.)

The Sinha et al. (2023) systematic review and meta-analysis compared the outcomes of balloon sinus dilation (BSD) with those of FESS or medical management for CRS. Randomized or observational studies that included adults aged 18 years or older with chronic or recurrent sinusitis who reported BSD outcomes and had traditional FESS, no treatment, or medical therapy as the comparator were included. Change in SNOT-20 score was the most common primary outcome. BSD alone was the intervention in six of nine RCTs and in two of nine cohort studies, with the remainder consisting of BSD with additional procedures such as septoplasty, turbinectomy, uncinectomy, and polypectomy. The inclusion criterion in the RCTs consisted of the *European Position Paper on Rhinosinusitis and Nasal Polyps* or American Academy of Otolaryngology-Head and Neck Surgery guidelines. The results showed that there was significant heterogeneity of many parameters, including the eligibility criteria, the type of intervention, which sinuses were treated, the operative setting, the type of anesthesia and result, postintervention care, and the follow-up duration reported. No clinically significant difference was noted by the authors in SNOT-20 outcomes between BSD and FESS. These limitations preclude definitive conclusions on an individual-related quality of life (QOL) comparison between the two procedures. The authors recommended future research that includes more standardized inclusion criteria and reporting outcomes as well as long-term follow-up. This study included the Plaza et al. (2011), Cutler et al. (2013), Bizaki et al. (2016), and Koskinen et al. (2016) studies that were previously summarized in this policy.

Saltagi et al. (2021) performed a systematic review that reviewed the literature on the management of recurrent acute rhinosinusitis (RARS). Overall, 1,022 titles/abstracts possibly related to RARS were identified. Of these, 69 full texts were selected for review, and 10 met the inclusion criteria (five with level 4 evidence, four with level 3 evidence, and one with level 2 evidence). The studies included a total of 890 individuals (age range, 5.8-53.5 years), with follow-up ranging from 1 to 19 months. The focus or end results were primarily based on symptomatic improvement, although some articles also reported posttreatment endoscopic and radiographic findings. Management options included medical therapy (intranasal steroids, antibiotics, nasal saline irrigations, N-acetylcysteine, allergy treatment, and decongestants), BSD, and endoscopic sinus surgery (ESS). Two included studies focused on BSD, with the level of evidence assessed as 3 and 4. Surgical individuals (BSD and ESS) had a trend toward greater symptom control than medically treated individuals, but meta-analysis was not possible. Although there are study limitations, the authors noted that until better evidence can be obtained, current recommendations are based on expert opinion. Recommendations include considering surgery when the individual experiences four annual episodes [with at least one episode confirmed via computed tomography (CT) or nasal endoscopy] and the individual has either experienced failure of a trial of topical nasal steroids or experienced RARS-related productivity loss. (Sikand et al., 2019, was included in this review.)

Chandra et al. (2016) reported the final results from the REMODEL full-study cohorts and performed meta-analyses of stand-alone BSD studies to explore long-term outcomes in a large sample of individuals. Final outcomes from the REMODEL randomized trial, which included a larger cohort of 135 individuals treated with FESS or in-office balloon dilation, were evaluated. Overall, 130 individuals had 12-month data, 66 had 18-month data, and 25 had 24-month data. In addition, a meta-analysis evaluated outcomes from six studies, which included 358 individuals with stand-alone balloon dilation, with up to 24 months of follow-up. Outcomes out to 2 years from the REMODEL full-study cohort were consistent with the 6-month and 12-month outcomes. In the meta-analysis of stand-alone balloon dilation studies, technical success was 97.5%, and mean SNOT-20 scores were significantly and clinically improved at all time points. There were significant reductions in work/school days missed, homebound days, physician/nurse visits, acute infections, and antibiotic prescriptions. The mean recovery time was 1.4 days. The comparison of 12-month symptom improvements and revision rates between the REMODEL FESS arm (n = 59), REMODEL balloon dilation arm (n = 71), and pooled single-arm stand-alone balloon dilation studies (n = 243) demonstrated no statistical difference. The meta-analysis included a subgroup analysis in individuals with CRS (n = 191) vs RARS (n = 52). Both groups experienced statistically significant and clinically meaningful improvements in mean SNOT-20 scores, with no significant difference between groups. The authors concluded that all outcomes were comparable between FESS and balloon dilation at all time points from 6 months to 24 months. According to the authors, balloon dilation produces faster recovery, less postoperative pain, and fewer debridements than FESS. This study is limited by the large loss to follow-up, which may have been differential and introduced biases in the findings, as well as a sample size that may have been too small to detect clinically significant differences between groups. (Cutler et al., 2013, and Bikhazi et al., 2014, are included in this report.)

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Balloon Sinus Ostial Dilation

Sainio et al. (2023) performed a retrospective single-center study that evaluated predictive factors of postoperative outcome of frontal sinus balloon dilation. During the study, the electronic medical records of 258 technically successful or attempted frontal balloon sinuplasties (50.4% male; 158 bilateral operations and 100 unilateral operations) were reviewed. The median follow-up time was 54 months, 65.5% of patients underwent more than one sinonasal procedure, and there were 19 surgeons who performed the procedures. Indications for surgery were infection or inflammation (49.2%), pain (34.4%), problems adjusting pressure (13.9%), and enlargement of a previously dilated frontal recess (2.5%). The authors reported that the overall success rate was 93.6%, with 16 bilaterally failed balloon sinuplasties and 14 unilateral failed balloon sinuplasties in those patients who had bilateral operations; all 100 unilateral operations were successful. The authors also reported that there were 27 complications (10.5%) within the first 30 days after surgery, of which 23 occurred after hybrid surgery and three occurred after a balloon-only procedure. Overall, 38 patients (15.7%) underwent reoperation, including seven patients who underwent 17 reoperations (15 balloon-only procedures and two hybrid procedures). While age, sex, body mass index, smoking status, aspirin intolerance, environmental allergy, bronchial asthma, Elixhauser Comorbidity Index, imaging findings, preoperative use of peroral corticosteroids, and intraoperative sinus findings did not affect the reoperation rate, a higher reoperation rate was noted in patients who were recommended nasal corticosteroids post operation, those with forehead pain during infections, and those who had no reason for their pain. A follow-up questionnaire was sent out to the 242 patients who had a successful balloon sinuplasty, with 156 (64.5%) returning the questionnaire. The median time interval between surgery and the questionnaire was 4.5 years. Those who responded to the questionnaire had similar characteristics to those who did not respond, except for the number of patients who had concomitant procedures (76.8% in the responding group vs 58.5% in the nonanswering group). The authors reported that (1) the patient satisfaction rate was 91.7% in the balloon-only group and 87.4% in the hybrid procedure group and that (2) subjective patient satisfaction was associated with a low SNOT-22 score. Patient satisfaction was also reported to be higher in those who did not require antibiotics for sinusitis, used nasal corticosteroids during the previous 12 months, or were currently asymptomatic. The authors concluded that postoperative use of nasal corticosteroids was associated with higher patient satisfaction; additionally, they concluded that previous sinonasal surgeries presented as a predicting factor for a higher reoperation rate, and balloon sinuplasty seems insufficient in revision cases. Limitations of the study include the single-center, retrospective design; heterogeneity of the procedures performed; risk of selection bias due to the use of the questionnaire; and recall bias from the long duration between the procedure and the answering of the questionnaire.

Han et al. (2023) conducted a prospective, nonrandomized, single-arm, multicenter study to assess the safety and efficacy of the NuVent™ EM BSD system. The study included 50 adults who were ≥ 18 years of age (58% female; mean age, 58.0 years; 88% Caucasian; 98% non-Hispanic), had CRS that was unresponsive to medical therapy, and had undergone previous sinus surgery. Indications for surgery included scarring [38 of 51 (74.5%)], polyps [30 of 51 (58.8%)], adhesions [20 of 51 (39.2%)], missing or altered structures [18 of 51 (35.3%)], and granulations [seven of 51 (13.7%)] in at least one sinus cavity. Overall, 121 sinuses (77 frontal, 34 sphenoid, and 10 maxillary sinuses) were treated in the study participants at one of six clinical sites in the United States. The authors reported that the device performed as expected in 100% of the treated sinuses and that the surgeon was able to both navigate and dilate the desired sinus ostia in 100% of the cases. Overall, 47 of the study participants underwent a follow-up endoscopy at 14 days (+2/-5 days) post treatment during their follow-up appointment (three participants completed the 14-day follow-up via phone call) to assess for any postoperative adverse events (AEs). The authors reported that there were 10 mild AEs; however, none of the AEs were directly attributed to the device. The authors concluded that the targeted frontal, maxillary, or sphenoid sinus ostium were safely dilated in every participant, with no AEs directly attributed to the device. Limitations of the study include the small sample size, short follow-up period, use of other surgical devices in conjunction with the NuVent system, and homogeneity of the study population in relation to race.

Castro et al. (2021) conducted a single-center retrospective analysis in 110 patients who underwent balloon sinuplasty for CRS and were evaluated for 4-year outcomes and effectiveness. The authors determined that balloon sinuplasty appears to be safe and effective, with great long-term outcomes. The authors divided the patients into two subgroups, CRS with nasal polyps (CRSwNP; n = 28) and CRS without nasal polyps (CRSsNP; n = 82), and evaluated their sinus findings based on their results from the SNOT-22, endoscopic examination using the modified Lund-Kennedy score, and CT scan of paranasal sinuses, with evaluation through Lund-Mackay scores. The first follow-up was obtained at 2 years and then at 4 years after balloon sinuplasty. The authors determined that the data demonstrated a significant improvement in CRS symptoms after balloon dilation when measured through SNOT-22 from baseline and at all time points. Additionally, the improvements were maintained over at least a 4-year time period regardless of the presence of nasal polyposis. They stated that these results were objectively confirmed through the significant reduction in the endoscopic modified Lund-Kennedy and Lund-Mackay CT scores. The authors concluded that BSD can be a safe alternative to conventional FESS, with significant improvement in CRS symptoms that are maintained over the long term. Study limitations noted by the authors include the absence of a control group, retrospective nature, and significant loss to follow-up of 55 patients, which could bias the outcomes.

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Mirza et al. (2020) performed a systematic review and meta-analysis of the efficacy and safety of balloon catheter sinuplasty (BCS) in pediatric CRS. Of 112 articles identified, 10 articles were included: two interventional controlled trials and eight observational studies that evaluated the efficacy of BCS for CRS. All studies evaluating QOL by using the Sinus and Nasal Quality of Life Survey (SN-5) showed a remarkable reduction in SN-5 score post operation. Improvement in the CT and endoscopic findings for up to 1 year after operation was reported. Additionally, the majority of individuals treated with BCS did not receive any course of sinusitis-indicated antibiotics during the long-term follow-up; they had low surgical revision rates and an overall improvement in QOL. Minor side effects were described, most commonly synechia. The studies' evidence suggests that BCS is safe and effective for the treatment of CRS in pediatric individuals. The limited number of studies available was a limitation. While the age range was identified, the number of individuals aged under 7 years was not known. Future randomized controlled studies that include a large sample size and long-term follow-up are needed. Such studies can further determine the efficacy of BCS in managing children with CRS. (Liu et al., 2017, and Soler et al., 2017, are included in this review.)

Liu et al. (2020; Liu et al., 2017) performed a prospective study that included 30 children with CRS who had insufficient benefits from medical therapy (such as oral antibiotics, topical steroids, saline nasal irrigation, and/or allergy management) for at least 3 to 6 months and received balloon sinuplasty of selected sinuses. Specific inclusion criteria were, among others, a symptomatic inflammatory condition of the mucosa of the nose and paranasal sinuses for more than 12 weeks; a positive CT scan; and medical management for at least 3 to 6 months that failed. Data were collected, including age, visual analog scale (VAS) score, CT score, and nasal endoscopy findings. In the initial study, the procedure was successful in 61 of 65 sinuses (93.84%). Balloon sinuplasty improved sinus-related QOL scores as well as CT and endoscopic findings for up to 1 year after operation. In the initial study, balloon sinuplasty showed a clinical curative effect in the treatment of children with refractory CRS and was relatively safe. The authors noted that structural abnormalities in the sinus ostia and hypoplastic sinuses may not be amenable to BCS. In the 3-year follow-up, most study participants did not require nose-related medications or auxiliary therapies and were free of symptoms, or the symptoms did not affect their daily activities. Among the 30 children, there were no complications of facial pain, teeth numbness, facial deformity, and dysosmia. The clinical symptoms and QOL in all 29 children were improved during the 3-year follow-up. The VAS scores after 2 years ranged from 0.0 to 5.0 and at 3 years ranged from 0.0 to 9.0. VAS scores were significantly lower at 2 years ($p < 0.001$) and 3 years ($p < 0.001$) after surgery. The QOL in the participants was evaluated by a questionnaire (SN-5 for < 12 years old; SNOT-22 for ≥ 12 years old). The questionnaire scores at 2 years ranged from 0.0 to 7.0 and at 3 years were between 0.0 and 10.0. A statistically significant ($p < 0.001$) score decrease was obtained by the questionnaire between prior to the operation and 2 and 3 years post surgery. These findings suggest that the symptoms, including nasal obstruction and rhinorrhea, were clearly improved and lasted for 3 years after the surgery, suggesting long-term efficacies of balloon sinuplasty in children. The findings are limited by the lack of a comparison group undergoing a different intervention.

A Hayes (September 2019; updated September 2022) Health Technology Assessment for balloon sinuplasty for the treatment of CRS in adults concluded that an overall moderate-quality body of evidence (11 RCTs, one prospective cohort, and one retrospective cohort) suggests that balloon sinuplasty as a stand-alone procedure or as a hybrid procedure combined with FESS leads to significant improvements and achieves similar efficacy rates as FESS, with comparable complication rates. There is little evidence to suggest that balloon sinuplasty procedures are superior to FESS. Additionally, definitive selection criteria for individuals have not been established.

A Hayes (October 2019; updated December 2022) Health Technology Assessment for balloon sinuplasty for the treatment of CRS in children and adolescents identified seven studies of balloon sinuplasty for treating pediatric CRS that was refractory to prolonged medical management and, in some cases, to adenoidectomy. The evidence base included one RCT, two prospective comparative cohort studies, one retrospective chart review, and three pre/post studies. The Health Technology Assessment indicated that there is a small, low-quality body of evidence that suggests that pediatric individuals with CRS treated with balloon sinuplasty have symptom relief and improved QOL after balloon sinuplasty. No firm conclusions could be made regarding the safety of balloon sinuplasty in children because of limited evidence.

Ni et al. (2018) conducted a systematic review and meta-analysis on studies using the SN-5, which is a validated symptom questionnaire in pediatric CRS. Overall, 10 studies, consisting of 13 separate treatment arms of either medical therapy, adenoidectomy, BCS, or FESS, were included in the review. The investigators limited the inclusion of studies to pre/post studies that reported changes in SN-5 scores. Despite the multiple interventions under consideration in this meta-analysis, no treatment comparisons were conducted. Five of the 10 studies that met the inclusion criteria for the meta-analysis reported SN-5 improvement following treatment with BCS. In the BCS-stratified meta-analysis of these five articles that included 172 total individuals, the mean SN-5 score decreased by 1.97 points (95% CI, -2.76 to -1.18), which the authors reported as a statistically significant improvement ($p < 0.00001$). However, these findings are limited by the lack of a direct comparison group in four of the five studies of BCS. (Soler et al., 2017, and Wang et al., 2015, are included in this review.)

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Laury et al. (2018) performed a prospective single-blinded RCT to evaluate if balloon catheter dilation of the sinus ostia affects the severity or frequency of headache among individuals who have barometric pressure–related sinus headache. Participants with a diagnosis of sinus pressure headache, without evidence of mucosal thickening on CT, were included in the study. Participants were blinded and randomized to undergo balloon dilation of the affected sinus ostia (active treatment) or balloon dilation in the nasal cavity (placebo). Two balloon devices were used (Acclarent and Entellus), and outcomes were compared. Participants were followed up with pre- and postprocedure SNOT-22 scores, Headache Impact Test-6 (HIT-6) scores, and medication use logs for 6 months. There was no statistically significant difference in SNOT-22 or HIT-6 scores between the arms at any time point. However, both arms experienced statistically and clinically significant decreases in SNOT-22 and HIT-6 scores from prior to the procedure to 6 months post procedure. There was no statistically significant difference in SNOT-22 or HIT-6 score reductions between the Entellus and Acclarent devices. There was no statistically significant difference in medication use between the groups at any time point. The authors concluded that participants with sinus pressure headache, without evidence of mucosal thickening on CT, had no significant difference in outcomes between active treatment (balloon dilation of the sinus ostia) and placebo (nasal dilation). The authors indicated that further study on the etiology and effective treatment of barometric pressure–related sinus headache is needed.

Clinical Practice Guidelines

American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS)

Payne et al. (2025) published an updated clinical practice guideline for adult sinusitis on behalf of the AAO-HNS Foundation, which supersedes the prior 2015 guideline authored by Rosenfeld et al. Its purpose is to refine and expand on the recommendations of the 2015 guideline. The surgical management of CRS is not covered in this guideline, as it is addressed separately in its own dedicated clinical practice guideline by Shin et al. (2025) titled *Surgical Management of Chronic Rhinosinusitis*.

Piccirillo et al. (2018) published the AAO-HNS expert consensus statement on the use of sinus ostial dilation of the paranasal sinuses. An expert panel of otolaryngologists was assembled to represent general otolaryngology and relevant subspecialty societies. A modified Delphi method was used to distill expert opinion into clinical statements that met a standardized definition of consensus. After three Delphi method surveys, 13 statements met the standardized definition of consensus, while 45 statements did not. Strong consensus was obtained for the following:

- Balloon dilation is not appropriate for patients who are without both sinonasal symptoms and positive findings on CT.
- Balloon dilation is not appropriate for the management of headache or sleep apnea in patients who do not otherwise meet the criteria for CRS or RARS.

Additional statements that reached consensus include the following:

- CT scanning of the sinuses is a requirement before balloon dilation can be performed.
- Balloon dilation is not appropriate for patients with sinonasal symptoms and a CT that does not show evidence of sinonasal disease.
- Balloon dilation can be appropriate as an adjunct procedure to FESS in patients with CRSsNP.
- There is a role for BSD in managing patients with RARS, as defined in the AAO-HNS Foundation guideline, based on symptoms and the CT evidence of ostial occlusion and mucosal thickening.
- Balloon dilation can improve short-term QOL outcomes in patients with limited CRS without polyposis.
- Balloon dilation can be effective in frontal sinusitis.
- There can be a role for balloon dilation in patients with persistent sinus disease who have had previous sinus surgery.

Gould et al. (2014) and Levine et al. (2013) have shown that RARS may be considered an appropriate indication for sinus ostial dilation. The authors indicate that several prospectively collected database studies for sinus ostial dilation include patients diagnosed with RARS. According to the AAO-HNS (2014) balloon dilation of the sinuses consensus statement, these studies report improved sinonasal symptoms with balloon dilation, but they are limited by possible selection bias.

The AAO-HNS (2021) position statement titled *Dilation of Sinuses, Any Method (e.g., Balloon, etc.)* states the following:

- Sinus ostial dilation (e.g., balloon ostial dilation) is a therapeutic option for selected patients with CRS and RARS who have experienced failure of appropriate medical therapy. A clinical diagnosis of CRS and RARS should be based on symptoms of sinusitis and supported by nasal endoscopy documenting sinonasal abnormality or mucosal thickening on CT of the paranasal sinuses. This approach may be used alone to dilate an obstructed sinus ostium (frontal, maxillary, or sphenoid) or in conjunction with other instruments (e.g., microdebrider, forceps). The final decision regarding use of techniques or instrumentation for sinus surgery is the responsibility of the attending surgeon.

Brietzke et al. (2014) published the AAO-HNS clinical pediatric CRS expert consensus statement that concludes that the effectiveness of balloon sinuplasty compared with that of traditional ESS for pediatric CRS cannot be determined based

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on current evidence. It also states that adenoidectomy is an effective first-line surgical procedure for children aged 13 years or older with CRS.

American Rhinologic Society (ARS)

The ARS 2023 position statement titled *Criteria for Sinus-Ostial Dilation* states that the ARS supports the use of sinus ostial dilation (e.g., balloon ostial dilation) for selected patients with CRS and RARS who have experienced failure of medically appropriate therapy. The endorsement of this treatment approach relies on clinical consensus statements and findings from primary research. Prior to the consideration of BSD, a clinical diagnosis of CRS or RARS should be established based on sinusitis-related symptoms and substantiated by objective evidence. Such evidence may include nasal endoscopy demonstrating sinonasal abnormalities or mucosal thickening detected through CT imaging of the paranasal sinuses. This approach may be used independently or in combination with conventional ESS. Balloon dilation has been demonstrated to yield postoperative outcomes comparable to those achieved by FESS in appropriately selected patients. The final determination regarding the selection of techniques or instrumentation for sinus surgery rests with the attending surgeon. BSD should remain a viable option for the surgical management of paranasal sinus disease.

American Academy of Allergy, Asthma and Immunology (AAAAI)/American College of Allergy, Asthma and Immunology (ACAAI)/Joint Council of Allergy, Asthma and Immunology (JCAAI)

In a 2014 practice parameter on the diagnosis and management of rhinosinusitis, the AAAAI, ACAAI, and JCAAI recommend that ostial dilatation with a balloon should be considered in a small subsegment of patients with medically unresponsive acute rhinosinusitis, primarily those with early or localized disease (strength of evidence: D; directly based on category IV evidence or extrapolated recommendation from categories I, II, or III evidence). According to the authors, there are different opinions regarding the extent of surgery that should be performed for CRS, ranging from a very minimal procedure or balloon dilatation of the affected ostia to very complete opening of all the sinuses. The authors state that the standard teaching for the functional endoscopic approach is that the surgical procedure should extend beyond the margins of the ostiomeatal disease, and the inflamed bony partitions should be removed. Although symptomatic improvement from balloon dilation has been well documented, in general, patients selected for this approach have only minor disease, a significant proportion of whom might be amenable to medical therapy alone. According to the authors, conclusions regarding the long-term resolution of disease with minimal interventional approaches remain unproved. The authors state that it remains debatable whether balloon sinus ostial dilation is efficacious as an alternative to traditional FESS. In summary, balloon catheter technology has been shown to be a safe method to dilate sinus ostia, but no studies to date can conclude an advantage over FESS.

European Forum for Research and Education in Allergy and Airway Diseases (EUFOREA)

The 2020 EUFOREA evidence-based position paper states that when patients present early, balloon sinuplasty may have a role in milder cases of CRS. EUFOREA also confers support of the National Institute for Health and Care Excellence (NICE) guideline on the use of the XprESS system.

National Institute for Health and Care Excellence (NICE)

In 2016, NICE published guidance on the XprESS multisinus dilation system for treating CRS. NICE indicates that the case for adopting the XprESS multisinus dilation system for treating uncomplicated CRS is supported by the evidence. According to NICE, XprESS should be considered in patients with uncomplicated CRS who do not have severe nasal polyposis. In these patients, XprESS works as well as FESS, is associated with faster recovery times, and can more often be done under local anesthesia (NICE, 2016).

Functional Endoscopic Sinus Surgery

Philpott et al. (2025) studied the clinical effectiveness of ESS compared with that of a 3-month course of clarithromycin in this pragmatic, multicenter, phase 4, three-arm, randomized, parallel-group, placebo-controlled study. The study consisted of a total of 514 participants (181 female and 333 male) who were all diagnosed with CRS with (n = 410) or without (n = 104) nasal polyps and had previously experienced failure of appropriate medical treatment (intranasal corticosteroids, saline nasal irrigations, and a short course of antibiotics). As part of the study, all the participants were given intranasal medication (intranasal corticosteroids and saline irrigation) and randomized into three groups; 171 participants underwent ESS within 6 weeks of randomization, 172 participants were given clarithromycin (250 mg twice a day for 2 weeks, then 250 mg once a day for 10 weeks), and 171 participants were given a placebo (2-week course of placebo capsules twice daily, followed by a 10-week course once daily). The primary outcome was the SNOT-22 test score at 6 months post randomization. Results showed that SNOT-22 scores were significantly lower in the ESS group than both the clarithromycin and placebo groups at the 98.33% confidence level after Bonferroni adjustment (adjusted mean difference

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vs clarithromycin: -18.13, 98.33% CI, -24.26 to -11.99, p < 0.0001 vs placebo: -20.44, -26.42 to -14.46, p < 0.0001). There was no significant difference between the clarithromycin and placebo groups. The secondary outcomes measured clinical effectiveness using subjective self-reporting rating and objective clinical measures. While the study results support recommending ESS when intranasal medication alone is insufficient, the authors concluded that long-term follow-up is needed to assess symptom recurrence and revision surgery rates. The authors indicated that this study has shown that ESS provides significant improvement in disease-specific QOL at 6 months in adults with CRS, while prolonged low-dose clarithromycin does not offer clinically meaningful benefit and is not supported for routine use. Limitations of the study noted by the authors include underrepresentation of non-White ethnic groups and loss of more than 20% of data for secondary outcomes due to COVID-19 lockdowns.

Ismail et al. (2024) conducted a prospective randomized study in which 30 participants underwent a total of 42 concha bullosa surgeries and were divided equally into three groups: group A (lateral laminectomy without mucosal preservation, n = 10), group B (lateral laminectomy with mucosal preservation, n = 10), and group C (crushing technique, n = 10). Surgery for concha bullosa is conducted concurrently with functional endoscopic surgery and is the most effective method for controlling symptomatic concha bullosa; however, there is no clear consensus on the optimal surgical technique. All participants were evaluated prior to, and post operation using the VAS for nasal obstruction and headache, the SNOT-22, and an olfactory detection test, with follow-up at 3 months. Significant improvements were observed across all groups in the VAS, SNOT-22, and smell test scores (p < 0.001). Notably, lateral laminectomy (groups A and B) showed greater advantages than the crushing technique, while no significant differences were found between the two lateral laminectomy approaches. These results indicate that lateral laminectomy, regardless of mucosal preservation, is more effective than crushing for the surgical management of concha bullosa, and both laminectomy techniques yield comparable outcomes. The authors concluded that overall, all three groups had significant improvement over time across all evaluated variables when comparing preoperative and postoperative scores. Additionally, both group A (lateral laminectomy with mucosal preservation) and group B (lateral laminectomy without mucosal preservation) had significant improvements compared with group C (crushing technique). However, there were no significant differences observed between group A and group B for any of the evaluated variables. This study is limited by a small sample size and single-center design, which may restrict the statistical power and generalizability of the results. Long-term outcomes were not assessed, so the sustained impact remains unclear.

The Tran et al. (2024) systematic review and meta-analysis sought to assess and compare limited sinus surgery and full-house, extended, and radical ESS for optimizing CRS outcomes. The review included 47 studies, which included 21 comparative studies and 26 case series. The majority of the studies (n = 37) assessed individuals with diffuse inflammation and investigated ESS in more than one paranasal sinus, while the other 10 studies investigated ESS in one kind of sinus, which was unilateral or bilateral. There were 28 studies that investigated the extent of ESS in CRS, including 17 case series and 11 studies that evaluated full-house ESS with a comparator. The authors reported that full-house ESS resulted in greater improvements in patient-reported outcome measures (SNOT-22) and endoscopy scores over limited ESS and that radical ESS improved nasal symptoms and reduced disease recurrence more than full-house ESS. Extended ESS decreased revision ESS rates compared with full-house ESS. The authors also reported that there was no difference in perioperative complications for all extents of ESS and that when compared with limited ESS, full-house ESS resulted in better symptom outcomes in individuals. Finally, the authors reported that radical ESS demonstrated even greater reductions in nasal symptoms, while extended ESS additionally decreased revision surgery rates. Subgroup analyses by CRS subtype could not be performed due to the limited number of included poolable studies. The authors concluded that a greater extent of ESS leads to better outcomes, while all extents of ESS are relatively safe. Limitations of the study include the lack of consistent, standardized definitions in the extent of ESS and its role in CRS; inclusion of mostly observational studies, without comparators; and heterogeneity of study populations and study designs, including end points and different endotypes and pathophysiology. This systematic review included the Wood et al. (2017) and Zhang et al. (2020) studies, which were previously summarized in this policy.

Rodriguez-Van Strahlen et al. (2024) conducted a systematic review and meta-analysis to evaluate the current evidence regarding sinonasal outcomes in long-term follow-ups of 5 years or more post ESS and to define recommendations for future studies. The review included seven studies, with a total of 1,076 individuals (57% male; mean weighted age, 47.6 years in four of the studies) and long-term follow-up after ESS. The confounding factors reported in the studies included asthma, nonsteroidal exacerbated respiratory disease, allergy, previous ESS, and smoking. The authors reported that despite the heterogeneity of reported outcomes that made it difficult to perform comparisons and meta-analysis, ESS improved patient-reported outcome measures, including symptoms, QOL, and olfaction. The authors concluded that objective outcomes such as nasal polyp score, Lund-Mackay score, type of surgery, and recurrence and revision surgery did not have a clear role in long-term results, although clustering individuals suggested that asthma, nonsteroidal exacerbated respiratory disease, allergy, eosinophil count, and interleukin-5 could have a role in predicting recurrence and severe disease. The authors recommended future studies that include standardized reporting of results to allow for better comparisons between treatments. Limitations of the study include the heterogeneity of the methods used to

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express the difference in outcomes; small number of studies, which introduces the potential of some studies being missed; and inaccuracy discerning atopy from allergic disease in individuals with CRSwNP. The Zhang et al. (2020) study, previously summarized in this policy, was included in this systematic review and meta-analysis.

Fu et al. (2023), in their systematic review and meta-analysis, sought to determine the mean change in individuals' scores on the SNOT-22 test, before and after ESS for CRS, to evaluate whether ESS improves the QOL in individuals with CRS. The study included 15 multinational, prospective cohort studies that had an average follow-up of 25.5 months. The authors reported that all studies demonstrated a statistically significant difference in mean SNOT-22 scores between baseline and postoperative time periods, which ranged from 5.1 to 55.4. Additionally the mean SNOT-22 changed significantly across all studies by 26.02, with nine studies having a mean change of ≥ 26.02 and six studies having a mean change of ≤ 26.02. The authors also reported that the risk-of-bias assessment showed that eight of the studies had a low risk of bias, four had a moderate risk of bias, and three had a high risk of bias. According to the stepwise multivariate analysis conducted by the authors, studies with a higher average age and average preoperative SNOT-22 scores had greater changes in SNOT-22 scores following ESS, while the studies with longer average follow-up had less significant changes in SNOT-22 scores post ESS. The authors concluded that ESS leads to enhanced QOL outcomes and that improvement is influenced by the initial SNOT-22 score, average age of the individuals, and duration of the follow-up period. Limitations of the study include the scarcity of studies available for inclusion; heterogeneity of the study designs, with varied inclusion criteria and duration of follow-up; use of aggregated data rather than data from each individual; variability of the delineation of primary outcomes; and inclusion of studies only written in English.

Lourijsen et al. (2022) conducted an open-label multicenter RCT to assess the efficacy of ESS plus medical therapy vs that of medical therapy alone in participants with CRSwNP. Their study included 238 participants, with 142 men (61%) who had a mean age of 50.4 years and who were randomly assigned to either an ESS plus medical therapy group (n = 121) or a medical therapy–only group (n = 117). Adults with CRSwNP and an indication for ESS (failure of appropriate medical treatment) were randomly assigned to either the ESS plus medical therapy group or to the medical therapy–only group. ESS was performed according to local practice, with a mandatory anterior ethmoidectomy. CT-sinus Lund-Mackay score was collected at baseline and follow-up. Concurrent medical therapy was prescribed at the participant's otorhinolaryngologist's discretion and consisted of but was not limited to nasal corticosteroids, nasal lavage, systemic corticosteroids, or systemic antibiotics. The primary outcome was disease-specific health-related QOL at 12 months of follow-up, measured with the SNOT-22 test. The study showed that the mean SNOT-22 score in the ESS plus medical therapy group was 27.9 at 12 months and was 31.1 in the medical therapy–only group, with an adjusted mean difference of -4.9 (95% CI, -9.4 to -0.4). The authors concluded that ESS plus medical therapy is more efficacious than medical therapy alone in individuals with CRSwNP, even though the minimal clinically important difference was not met in their study. They recommended additional studies, with longer-term follow-up, to determine whether the effect persists over time.

Alekseenko and Karpischenko (2020) performed a prospective RCT, along with a comparative analysis of outcomes, in pediatric participants (n = 64) who underwent external sinus surgery with an open approach vs an FESS approach. Examinations of all participants were performed prior to the operation and at 6 months post operation. The examinations performed were QOL, the SNOT-20 questionnaire, an endoscopic examination of nasal mucosa using Lund-Kennedy scoring, and a CT of the sinuses using Lund-Mackay scoring. The cohorts were divided into two groups; 30 pediatric participants underwent external sinus surgery, and the other 34 underwent FESS. Preoperative SNOT-20 scores for external were 46.1 ±8.6 and for FESS were 35.0 ±6.8; Lund-Kennedy scores for external were (rt) 4.57 ±1.87 and (lt) 4.67 ±2.07 and for FESS were (rt) 4.50 ±1.44 and (lt) 4.29 ±1.55; and Lund-Mackay scores for external were 10.47 ±3.88 and for FESS were 9.56 ±5.61. Postoperative SNOT-20 scores for external were 38.6 ±8.9 and for FESS were 22.0 ±2.5; Lund-Kennedy scores for external were (rt) 4.57 ±1.94 and (lt) 4.50 ±2.10 and for FESS were (rt) 1.71 ±1.68 and (lt) 1.38 ±1.48; and Lund-Mackay scores for external were 6.57 ±3.52 and for FESS were 3.17 ±2.89. Postoperative total score outcomes for Lund-Mackay sinus opacification in pediatric participants who underwent external sinus surgery and FESS were reduced by 38 or 67% compared with the preoperative values. The authors concluded that FESS significantly decreased surgery duration by 15% compared with external sinus surgery (98.16 ±20.28 vs 83.08 ±29.89 min; p = 0.024). Both groups that underwent external sinus surgery and FESS had a significant improvement in total Lund-Kennedy, Lund-Mackay, and SNOT-20 scores; however, it was more profound in the FESS group, and FESS appears to be more effective and safer in children with CRS.

Singh et al. (2020) conducted a prospective single-institution study in 30 participants with CRS who experienced failure of maximum medical treatment and underwent FESS. All the participants with CRS had undergone medical management with antibiotics, nasal decongestants, and steroids for 4 to 8 weeks. Each participant had a CT of the paranasal sinuses prior to FESS; CT provides an objective means of evaluation supporting the clinical findings and scoring using the Lund-Mackay CT classification system. There was a total mean Lund-Mackay CT preoperative score of 13.16 ±4.5. The scoring was used to divide the participants into two groups. Group A had a Lund-Mackay score of ≤ 13.1, and group B had a

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score of ≥ 13.1. A statistically significant improvement in symptoms, with good long-term prognosis, was recorded in group B only. The authors concluded that using a CT scan with Lund-Mackay scoring in individuals who have a minimum score of 13.1 or greater is a good long-term predictor for determining the efficacy of FESS for the treatment of CRS.

Kılıç et al. (2018) queried the National Cancer Database for cases of sinonasal squamous cell carcinoma without cervical or distant metastases that were treated surgically between 2010 and 2014. They were divided into two groups based on surgical approach: open or endoscopic. A Cox proportional hazards analysis was performed. Propensity score matching was used to mimic an RCT. In total, 1,483 individuals were identified: 353 (23.8%) received endoscopic surgery, and 1,130 (76.2%) received open surgery. Age, gender, race, geographic region, tumor size, surgical margins, postoperative chemoradiation, and 30-day readmissions did not vary significantly between the two groups. Open surgery was more common in academic centers (62.8% vs 54.2%; p = 0.004), less common for tumors of the ethmoid and sphenoid sinus (p < 0.0001), less common for stage IVB tumors, and associated with longer hospital stay. Five-year overall survival (5Y-OS) was not significantly different between the two approaches (p = 0.953; open: 5Y-OS, 56.5%, 95% CI, 51.3%-61.6%; endoscopic: 5Y-OS, 46.0%, 95% CI, 33.2%-58.8%). In the propensity score matching cohort of 652 individuals, there was also no significant difference in overall survival (p = 0.850). The investigators concluded that endoscopic surgery is an effective alternative to open surgery, even after accounting for confounding factors that may favor its use over the open approach.

Kim and Kwon (2017) conducted a meta-analysis to evaluate the recurrence of sinonasal inverted papilloma (IP) based on the type of surgical approach. Overall, 14 retrospective cohort studies, involving a total of 696 endoscopic approaches and 444 nonendoscopic approaches, were included in the review. The pooled risk ratio for IP recurrence (endoscopic vs external approach) was 0.56 (95% CI, 0.36-0.85; I^2 = 48.3%). The investigators concluded that surgical management of IP via an endoscopic approach reduces the risk of recurrence compared with an external approach. Although further data are needed, early-stage IP requires endoscopic or endoscopic-assisted surgery to reduce the risk of tumor recurrence.

Djukic et al. (2015) evaluated the clinical outcomes and QOL in participants with nasal polyposis after FESS. The prospective study included 85 consecutive adult participants (aged ≥ 18 years) with nasal polyposis who were operated on using FESS after failure of the medical treatment and in certain cases of surgical treatment. The objective finding was presented as endoscopic and CT score. The intensity of each symptom, values of symptom scores (major, minor, and total), values of dimension scales and summary scales of QOL, and values of endoscopic score through three periods of time (prior to surgery and 6 and 12 months after the surgery) were analyzed. Following FESS, mean intensity values of all individual symptoms and symptom scores were significantly lower, and the values of all dimension scales and summary scales of QOL were significantly higher (p < 0.05). There was no statistically significant difference in symptom intensity and QOL after 6 and 12 months of surgical treatment (p > 0.05). Endoscopic score was, on average, significantly lower after 6 and 12 months of FESS (p < 0.05), but the mean score value after 12 months of operation was significantly higher in relation to that after 6 months of surgery (p < 0.05). Nevertheless, the recurrence of nasal polyposis was observed in 28 participants (32.9%) in the follow-up period. In conclusion, FESS in participants with nasal polyposis resulted in significant improvement in symptom intensity, QOL, and endoscopic score. While the intensity of symptoms and QOL tended to be maintained between 6 and 12 months after surgery, endoscopic score showed a tendency of exacerbation in the same period. The findings are limited by the lack of a comparison group.

Scangas et al. (2013) conducted a retrospective case series at a university tertiary referral center to characterize the natural history, clinical characteristics, management principles, and outcomes of paranasal sinus mucoceles. A chart review was performed in 102 patients, with a total of 133 paranasal sinus mucoceles. Patients were diagnosed with a mucocele, on average, 5.3 years following prior FESS, 17.7 years following prior paranasal sinus trauma, and 18.1 years following prior open sinus surgery. The most common presenting symptoms were headache (42.1%) and maxillofacial pressure (28.6%). The most common sites were the frontal, frontoethmoidal, and ethmoid sinuses. Overall, 57 mucoceles (44.9%) had intraorbital extension, intracranial extension, or both. Of 133 mucoceles, 114 underwent ESS without complication. The authors concluded that the endoscopic approach could be safely used for the management of mucoceles.

Higgins et al. (2011) conducted a systematic review with a pooled-data analysis to compare outcomes of endoscopic vs craniofacial resection of sinonasal malignancies. The review included 15 case series, with individual data from 226 individuals. The 5Y-OS rate in the sample was 56.5%. Among low-stage malignancies (T1-2 or Kadish A-B), the endoscopic and open approaches demonstrated no statistically significant difference in outcome results. The 5Y-OS was 87.4% in the endoscopic group vs 76.8% for open approaches; disease-specific survival was 94.7% vs 87.7%; and the locoregional control rate was 89.5% vs 77.2%. The authors concluded that transnasal endoscopic resection appears to be a reasonable alternative to craniofacial resection in the management of low-stage sinonasal malignancies. Because of the paucity of data with endoscopic resection of high-stage malignancies, the outcome results were highly variable, and no useful comparison could be made.

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Clinical Practice Guidelines

American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS)

Shin et al. (2025) published AAO-HNS recommendations regarding the surgical management of CRS. The recommendations were developed by a guideline development group using published evidence from 308 evidence-supporting articles, which included five clinical practice guidelines, 73 reviews, 32 clinical trials, and 198 observational and other studies. The guideline development group included expert representation from comprehensive otolaryngology, rhinology, otolaryngic allergy, and otorhinolaryngological advanced practice provision as well as consumer representatives. This guideline is applicable to adults aged ≥ 18 years who have CRS and are potential candidates for ESS. The recommendations include the following:

- The diagnosis of CRS should be verified using the following criteria:
  - Twelve weeks or longer, with at least two of the following:
    - Nasal drainage (anterior, posterior, or both) that is thick and/or discolored.
    - Nasal obstruction (congestion).
    - Sensation of pain, pressure, or fullness in the face.
    - Diminished sense of smell.

    and
  - Documentation of inflammation, which may include findings from anterior rhinoscopy, nasal endoscopy, or CT, with at least one of the following:
    - Edema or abnormal mucus located in the middle meatus or anterior ethmoid region.
    - Polyps located in the nasal cavity or middle meatus.
    - Inflammation of the paranasal sinuses shown by radiological imaging.
- Candidacy for sinus surgery is based on disease characteristics, QOL, symptoms, and previous medical and surgical therapy.
- Medical therapy (such as antibiotics, steroids, or antihistamines) should be tailored to each patient, as a standard treatment plan may not be effective for all. The surgeon should avoid recommending or mandating predefined medical therapy as a prerequisite to sinus surgery.
- Antibiotics should not be prescribed without significant or persistent purulent nasal discharge (anterior, posterior, or both).
- Identify patients with CRS subtypes that would benefit from surgery over medical therapy alone, including but not limited to CRS polyps, polyps with bony erosion, eosinophilic mucin, or fungal balls.
- Expectations before sinus surgery should be discussed between the surgeon and the patient.
- Sinus surgery should be offered when the expected advantages of surgery outweigh those of nonsurgical treatments alone, the likely outcomes are clearly understood, and the patient is informed about the long-term disease management required after surgery.
- For surgical planning, a CT scan with a fine-cut protocol to examine the paranasal sinuses should be obtained. A maxillofacial CT without contrast is endorsed by the ACR The American College of Radiology (ACR) for sinus surgery.
- The decision regarding the extent of sinus surgery, including which specific sinuses to operate on, should not be made solely based on arbitrary thresholds observed during imaging. Mucosal thickening, sinus opacification, and outflow obstruction identified on a CT scan should not be the only criteria used to determine surgical intervention.
- Education should be provided to patients about postoperative care expectations.
- In patients with sinus polyps, osteitis, bony erosion, or fungal disease, the surgeon should perform sinus surgery that involves complete exposure of the sinus cavity (lumen) and removal of diseased tissue, rather than relying solely on balloon or manual ostial dilation.
- Follow-up evaluations to thoroughly assess the surgical outcomes should occur within a period ranging from 3 to 12 months after surgery and include the patient's medical history and nasal endoscopy.

The AAO-HNS (2012; updated 2021) clinical indicators for ESS also indicate that imaging studies should generally be obtained after optimal medical therapy.

The AAO-HNS (2021) clinical indicators for pediatric ESS state that adenoidectomy should be strongly considered a minimum of 3 months prior to performing pediatric sinus surgery when there is failure of medical management for CRS or RARS.

American Academy of Allergy, Asthma and Immunology (AAAAI)/American College of Allergy, Asthma and Immunology (ACAAI)/Joint Council of Allergy, Asthma and Immunology (JCAAI)

In a 2014 practice parameter on the diagnosis and management of rhinosinusitis, the AAAAI, ACAAI, and JCAAI recommend that although medical therapy is the mainstay of disease management, FESS should be considered when

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medical therapy fails. According to the AAAAI, ACAAI, and JCAAI, indications for surgical intervention include the following:

- When nasal polyps obstruct sinus drainage and persist despite appropriate medical treatment.
- When there is recurrent or persistent infectious rhinosinusitis despite adequate trials of medical management that at least include topical nasal steroids and nasal irrigations.
- For biopsy of sinonasal tissue to rule out granulomatous disease, neoplasm, ciliary dyskinesia, or fungal infections.
- When maxillary antral puncture is required (as for culture-directed therapy).
- When anatomical defects obstruct the sinus outflow tract, particularly the ostiomeatal complex (and adenoidal tissues in children).
- For rhinosinusitis with threatened complications (such as threat of brain abscess, meningitis, cavernous sinus thrombosis, or frontal bone osteomyelitis).

Peters et al. (2014) published, in regard to the medical management of CRS, the AAAAI, ACAAI, and JCAAI indications that state that the role of antibiotics in CRS is controversial. For CRS associated with suspected bacterial infection, a longer duration of therapy beyond the usual 10 to 14 days is suggested; the choice of appropriate antibiotic therapy may need to be made while considering the possible presence of anaerobic pathogens. Because CRS is an inflammatory disease, intranasal corticosteroids are indicated for treatment. Other adjunctive therapy, such as intranasal antihistamines, decongestants, saline irrigation, mucolytics, and expectorants, might provide symptomatic benefit in select cases.

American College of Radiology (ACR)

The ACR Appropriateness Criteria on sinonasal disease (ACR, 2017; revised 2021) indicate the following:

- Most cases of uncomplicated acute and subacute rhinosinusitis are diagnosed clinically and should not require any imaging procedure.
- CT of the sinuses without contrast is the imaging method of choice in patients with RARS or CRS, or it is used to define sinus anatomy prior to surgery.
- Immunocompromised patients are at a high risk for invasive fungal sinusitis.
- In patients with suspected sinonasal mass or suspected orbital and/or intracranial complication of sinusitis, magnetic resonance imaging and CT are complementary studies.
- CT scanning provides the best preoperative information for endoscopic surgery, with excellent delineation of the complex ethmoidal anatomy, ostiomeatal unit, and anatomical variations, including the presence of sphenoethmoidal (Onodi) air cells, which increases the risk of injury to the optic nerves or carotid arteries.

European Forum for Research and Education in Allergy and Airway Diseases (EUFOREA)

A EUFOREA (2020) evidence-based position paper makes the following recommendations regarding ESS for CRS:

- A CT scan showing evidence of disease is mandatory.
- For adult patients with uncomplicated CRSsNP, ESS could be appropriately offered when:
  - The CT Lund-Mackay score is greater than or equal to 1.
  - A minimum trial of at least 8 weeks of a topical intranasal corticosteroid plus either a short course of a broad-spectrum/culture-directed systemic antibiotic or the use of a prolonged course of systemic low-dose anti-inflammatory antibiotic, with a posttreatment total SNOT-22 score of greater than or equal to 20.

International Consensus Statement on Allergy and Rhinology: Rhinosinusitis (ICAR-RS) 2021

Orlandi et al. (2021) published the 2021 ICAR-RS executive summary that provides a compilation of evidence-based recommendations for medical and surgical treatments for CRS, CRSwNP, acute rhinosinusitis, and RARS. The summary states that ESS is recommended for rhinologic diseases that demonstrate a “failure of maximal medical therapy.” Criteria used to confirm maximal medical therapy and eligibility for ESS include but are not limited to:

- Presence of two specific cardinal symptoms for 12 weeks or more, which may vary for CRS, CRSwNP, acute rhinosinusitis, and RARS.
- SNOT-22 test preoperative score of 20 or more.
- Sinus inflammation and/or purulence on nasal endoscopy.
- Sinus inflammation on CT.

Modified Lund-Mackay Scoring System

Likness et al. (2014), in a prospective multicenter study, evaluated CT scans of participants with CRS using a novel, objective, three-dimensional computerized system and compared results with a novel two-dimensional computerized

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analysis of a single coronal slice through the ostiomeatal complex and subjective methods, including Lund-Mackay and Zinreich modified Lund-Mackay. Overall, 46 adults with a diagnosis of CRS underwent CT examination and received an intramuscular triamcinolone injection, dosage weight dependent, followed by a CT scan 4 to 5 weeks later. Scans were evaluated with all four scoring methods over 5 months. The Lin concordance class correlation of the ostiomeatal complex method revealed the best correlation to the three-dimensional volumetric computerized values (0.915), followed by the Zinreich (0.904) and Lund-Mackay methods (0.824). Posttreatment results demonstrated that both the ostiomeatal complex (0.824) and Zinreich (0.778) methods had strong agreement with the three-dimensional volumetric methods and were very sensitive to change, whereas the Lund-Mackay (0.545) had only moderate agreement. The authors concluded that computerized CT analysis provides the most comprehensive, objective, and reproducible method of measuring disease severity and is very sensitive to change induced by treatment intervention. The authors stated that a two-dimensional coronal image through the ostiomeatal complex provides a valid, user-friendly method of assessing CRS and is representative of CRS severity in all sinuses. According to the authors, the Zinreich subjective method correlated well overall, but the Lund-Mackay method lagged behind in disease representation and sensitivity to change.

Self-Expanding Absorptive Sinus Ostial Dilation

The evidence is insufficient to support the use of self-expanding absorptive sinus ostial dilation devices. The existing literature is limited by the lack of a comparison group and small sample size.

Hathorn et al. (2014) conducted a pilot study to determine the safety and performance of a maxillary sinus ostium (MSO) self-dilation device. Twelve individuals with CRS presenting with maxillary sinus inflammation requiring FESS were enrolled. The device was inserted into the MSO at the start of surgery and removed after 60 minutes. Endoscopic evaluation for patency was performed immediately after removal and at 1 week, 1 month, and 3 months. AEs were recorded intraoperatively and at each subsequent visit. The device was successfully inserted in 100% of the cases attempted (19 of 19 MSOs; 12 individuals). Overall, 17 devices (89%) remained in the MSO for 60 minutes and were dilated to a mean diameter of 4.8 ±0.5 mm. One individual was withdrawn from the study. No AEs occurred during insertion or removal of the device. At 3 months post insertion, 14 of 15 of the MSOs dilated (93%) were confirmed patent. The investigators concluded that the placement of an osmotic self-dilating expansion device in a human MSO is safe, achievable, and effective at dilating the ostia. This study is limited by a small sample size and lack of a comparison group.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

The FDA classifies devices used for balloon catheter dilation for treating chronic rhinosinusitis under product code LRC (instrument, ENT, manual surgical). This is a broad product code category that includes a variety of devices used in ear, nose, and throat surgeries (e.g., knives, hooks, injection systems, dilation devices). Additionally, this product code is 510(k) exempt. Although manufacturers may voluntarily submit product information via the 510(k) process, it is not a requirement. All manufacturers are, however, required to register their establishment and submit a Device Listing form; these records can be viewed in the Registration and Device Listing Database (search by product code, device, or manufacturer name). Refer to the following website for more information: http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfRL/rl.cfm. (Accessed February 20, 2026)

In 2013, the FDA granted 510(k) clearance to the SinuSys Vent-OS Sinus Dilation System for dilation of the maxillary sinus ostia and associated spaces in adults. Refer to the following website for more information: https://www.accessdata.fda.gov/cdrh_docs/pdf13/K133016.pdf. (Accessed February 20, 2026)

To view all 510(k) substantial equivalence summaries for ENT manual surgical instruments, search (product code: LRC) at: http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm. (Accessed February 20, 2026)

Functional endoscopic sinus surgery is a procedure and therefore not subject to FDA regulation. However, any medical devices, drugs, biologics, and tests used as a part of this procedure may be subject to FDA regulation.

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Policy History/Revision Information

Date	Summary of Changes

07/01/2026	**Medical Records Documentation Used for Reviews**
	• Updated list of Medical Records Documentation Used for Reviews:
	  ○ Added:
	  ▪ Relevant medical history, including dates
	  ▪ Procedure being requested
	  ○ Removed:
	  ▪ History of illness
	  ▪ Recent CT scan images are the optimal images to show the abnormality of the affected area including, when applicable the use of a scale such as the Modified Lund-Mackay Scoring System to define the severity
	  ○ Replaced:
	  ▪ "Treatments tried, failed, or contraindicated; include the dates and reason for discontinuation" with "treatments tried, failed, or contraindicated; include the dates, duration, and reason for discontinuation"
	  ▪ "Recent CT scan report documents which sinus has the disease, including side" with "recent CT scan report documents which sinus(es) are affected, including laterality"
	  ▪ "Recent CT scan images labeled with the date taken and applicable case number obtained at time of notification or member's name and ID number" with "when

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Date	Summary of Changes

	requested, diagnostic image(s) must be labeled with the date taken and applicable case number obtained at time of notification or member's name and ID number”
	Definitions
	• Added definition of “Acute Bacterial Rhinosinusitis”
	• Removed definition of:
	  ○ Draf Classification System for Endoscopic Frontal Sinus Drainage
	  ○ Rhinitis Medicamentosa (RM)
	• Updated definition of:
	  ○ Acute Rhinosinusitis
	  ○ Chronic Rhinosinusitis
	  ○ Functional Endoscopic Sinus Surgery
	  ○ Modified Lund-Mackay Scoring System
	  ○ Recurrent Acute Rhinosinusitis
	Supporting Information
	• Updated *Description of Services*, *Clinical Evidence*, and *References* sections to reflect the most current information
	• Archived previous policy version 2026T0571T

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, check the member specific benefit plan document and any applicable federal or state mandates. UnitedHealthcare reserves the right to modify its policies and guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

This Medical Policy may also be applied to Medicare Advantage plans in certain instances. In the absence of a Medicare National Coverage Determination (NCD), Local Coverage Determination (LCD), or other Medicare coverage guidance, CMS allows a Medicare Advantage Organization (MAO) to create its own coverage determinations, using objective evidence-based rationale relying on authoritative evidence (Medicare IOM Pub. No. 100-16, Ch. 4, §90.5).

UnitedHealthcare may also use tools developed by third parties, such as the InterQual® criteria, to assist us in administering health benefits. UnitedHealthcare Medical Policies are intended to be used in connection with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice.

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