Anthem

Medical Policy

Subject: Drug-Eluting Devices for Maintaining Sinus Ostial Patency
Document #: SURG.00132
Status: Reviewed
Publish Date: 04/10/2024
Last Review Date: 02/15/2024

Description/Scope

This document addresses drug-eluting devices placed within the sinuses for the purpose of maintaining sinus ostial patency or for the treatment of nasal polyps (for example, Propel®-brand Mometasone Furoate Implants and SINUVA™ [Intersect ENT, Inc., Menlo Park, CA]).

Note: Non-drug-eluting packing materials and dressings intended to prevent the formation of adhesions and promote hemostasis, including Nasopore and SINU-FOAM, are NOT addressed in this document.

Note: For information regarding other sinus and nasal-related treatments and procedures, please see:

- CG-SURG-18 Septoplasty
- CG-SURG-24 Functional Endoscopic Sinus Surgery (FESS)
- CG-SURG-57 Diagnostic Nasal Endoscopy
- CG-SURG-73 Balloon Sinus Ostial Dilation
- MED.00091 Rhinophototherapy
- SURG.00089 Self-Expanding Absorptive Sinus Ostial Dilation

Position Statement

Investigational and Not Medically Necessary:

The use of drug-eluting devices for maintaining sinus ostial patency or the treatment of nasal polyps is considered**investigational and not medically necessary** for all indications.

Rationale

Sinus surgery is commonly used for the treatment of individuals with chronic rhinosinusitis (CRS), infection and polyposis. FESS is intended to open closed sinus ostia to allow proper drainage and air flow and prevent recurrent sinus infections. Inflammation, polyp recurrence, stenosis of the surgically enlarged sinus ostia, adhesions and middle turbinate lateralization (adhesion of the middle turbinate to the lateral nasal wall) represent suboptimal outcomes following sinus surgery and lead to increased rates of revision. Middle turbinate lateralization may cause obstruction of the middle meatus and result in recurrent infection of the maxillary, ethmoid, or frontal sinuses (Otto, 2010). The standard of care following FESS is to utilize packing, sponges, or gels to provide a barrier to adhesion development and facilitate hemostasis. New types of drug-eluting devices have been developed not only to provide those benefits, but to also deliver drugs to treat tissue inflammation. Additionally, these types of devices have been proposed to be used without FESS to treat nasal polyps.

Propel Mometasone Furoate Implant

The Propel sinus implant, the Propel Mini Steroid-Releasing Implant, and the Propel Contour devices have been approved by the U.S. Food and Drug Administration (FDA) through the premarket approval (PMA) process. They are bioabsorbable drug-eluting stents that may be implanted into the frontal or ethmoid sinus ostia following FESS and are designed to release the corticosteroid mometasone furoate over a period of several weeks as the stent itself is slowly resorbed. It is proposed that this type of stent has the potential to improve surgical results by stabilizing the middle turbinate, preventing obstruction by adhesions and reducing edema. The Propel devices are designed to deliver corticosteroids to the surgical cavity with minimal potential for drug-related complications known to occur with systemic steroids and lessen the need for revision surgery to lyse adhesions. At this time, there are multiple peer-reviewed published clinical trials addressing the use of this device.

The CONSENSUS II feasibility trial, described in the article by Murr and colleagues (2011), was the first clinical trial to evaluate the safety and effectiveness of the Propel device in humans and was presented to the FDA during the pre-market approval (PMA) process. CONSENSUS II was a small, randomized, double-blind, four-center pilot study. The objective was to assess the safety, effectiveness, and performance of the Propel device when used following FESS in participants with ethmoid CRS. All participants were adults with a diagnosis of CRS, with or without nasal polyps, scheduled to undergo primary (bilateral ethmoidectomy with middle meatal antrostomy) or revision FESS. Concurrent septoplasty and surgical treatment of other paranasal sinuses was also permitted. A total of 43 participants received a 23 mm Propel sinus implant while 7 received a shorter version. The study used an intra-patient control design to compare the safety and efficacy of the drug-eluting Propel sinus implant vs. a non-drug-eluting control version of the implant in the contralateral ethmoid sinus ostium. As a result, both ethmoid sinuses received the Propel stent's scaffolding function. Implant delivery was judged successful in 100% of the participants and there was a statistically significant difference in reduction of ethmoid sinus inflammation postoperatively (endoscopic visual analog scale) at days 21-45 ($p \leq 0.003$). Also reported were statistically significant reductions in the frequency of polyp formation and adhesions in the treatment arm. Although a reduced frequency of middle turbinate lateralization was seen on the drug-eluting stent side, the difference was not statistically significant. No device-related adverse events were reported, and eluted steroid was not detectable systemically and no evidence of adrenal suppression was found. The use of a non-drug eluting version of the Propel does not provide any data regarding a comparison of the Propel device with the standard of care, which is an important factor in understanding the clinical utility of this technology.

The ADVANCE study, described in the article by Forwith et al. (2011), was an open-label, prospective case series involving 50 participants with either single or bilateral ethmoid sinus disease requiring FESS at seven study centers. The study allowed bilateral or unilateral Propel steroid-eluting implant placement. Oral and topical steroids were withheld for 60 days postoperatively. Follow-up assessments occurred prior to hospital discharge or clinic release and at days 7, 14, 21, 30 and 60 post procedure. An additional final visit occurred at 6 months, but only a subject questionnaire was collected. Forty-nine of the 50 participants completed the study through 60 days, representing a follow-up rate of 98%, and 45 participants (90%) completed follow-up through 6 months. Endoscopic follow-up was performed to 60 days post-operatively and self-reported outcomes using three scales (Sinonasal Outcomes Test 22,

Rhinosinusitis Disability Index, and Total Nasal Symptom Scoring) were followed to 6 months. Implants were successfully placed in all 90 sinuses. At 1-month, polypoid edema was 10.0%, significant adhesions 1.1%, and middle turbinate lateralization 4.4%. These results compared favorably with historic controls using other methods: 19% incidence of post-operative lysis of adhesions using absorbable hyaluronic acid packing and 6% incidence of adhesions using nonabsorbable silastic sheets following FESS. Favorable mean changes from baseline to day 60 and 6 months in the three self-reported surveys were statistically significant. The use of only short-term objective follow-up and lack of control groups and blinding in this study do not allow a direct comparison with the standard of care.

The ADVANCE II study, described by Marple and colleagues (2012), was a prospective, randomized, double-blind, intra-patient controlled, multi-center study that enrolled 105 participants at 11 U.S. sites evaluating the safety and effectiveness of the Propel device following bilateral ethmoidectomy for CRS. Participants were randomized to receive the Propel device in one ethmoid sinus and a non-drug-eluting stent device identical in structure and appearance to the Propel device in the contralateral ethmoid sinus. This methodology assisted in the blind nature of the study. The primary effectiveness endpoint was reduction in post-operative interventions. The primary safety endpoint was ocular safety defined as absence of clinically significant sustained elevation (≤ 10 mm Hg) in intraocular pressure through day 90. The primary efficacy endpoint was the reduction in need for post-operative interventions at day 30, as determined from video-endoscopies reviewed by a panel of three independently blinded sinus surgeons. Implants were successfully deployed in all 210 ethmoid sinuses. Follow-up assessments occurred prior to hospital discharge or clinic release and at days 14, 30, 60 and 90 post procedure. A total of 102 participants completed the follow-up visits through 90 days, representing a follow-up rate of 97.1%. Also, 103 of the 105 participants completed the follow-up visits to evaluate ocular adverse events through 90 days (98.0%). No subject required termination from the study due to an adverse event. The primary safety endpoint was met. There were no clinically significant elevations in intraocular pressure and no clinically significant changes in lens opacities through day 90. Recurrent sinusitis was the most frequently reported adverse event type, reported in 34 of the 105 participants (32.4%). Sinusitis was the only event type localized by sinus side; this was possible in 14 of the events, with 6 occurring on treatment sides and 8occurring on the control sides. Two of the adverse events (sinusitis) were determined to be related to the study device, and both resolved without sequelae. There were no serious adverse events reported in the study. Compared with control sinuses with non-drug-eluting implants, the drug-eluting implant provided a 29% (23 vs. 33) relative reduction (p=0.028) in post-operative interventions (composite of either surgical adhesion lysis and/or oral steroids). The reduction in post-operative interventions was driven largely by the reduction in lysis of adhesions. The rate of adhesion lysis was reduced by 52% (p=0.005), and while the need for oral steroids was reduced by 29% this difference did not reach statistical significance. The relative reduction in frank polyposis was 44.9% (16 vs. 29; p=0.002). The results of these controlled studies are promising; however, they were limited to small, heterogeneous populations with short follow-up. In addition, the studies were conducted in a setting where both sinuses had implants, one with steroid and the other without. This trial did not compare post-operative outcomes of the Propel device with outcomes with standard of care, which does not allow adequate understanding of the clinical utility of the Propel device.

In 2020 Rawl reported the results of an RCT involving 40 participants undergoing FESS assigned to receive treatment with either nonabsorbable Merocel packs wrapped in non-latex glove material (n=18) or Propel steroid eluting stents (n=22). Participants underwent four postoperative debridements and were followed for 3 months. The authors reported at least a 50% reduction in total SNOT-20 scores from baseline regardless of packing type (13.3 ± 9.3 in the control group vs. 12.0 ± 5.6 in the Propel group, no p-value provided). No significant differences between groups were reported with regard to middle turbinate lateralization or Lund-Kennedy scores. This is the first published study comparing use of the Propel device to nonabsorbable sinus packing materials. The authors concluded “This study showed that there was no significant improvement in postoperative outcomes with drug-eluting stents when compared to nonabsorbable packing.”

Shah (2021) published the results of a study evaluating the post market adverse events reported between 2012 and 2020 associated with the Propel device using data from the U.S. Food and Drug Administration’s Manufacturer and User Facility Device Experience (MAUDE) database. A total of 25 reports involved the Propel device, detailing 40 adverse events. Thirty-two (32) adverse events were associated with health-related outcomes and another 8 were related to device malfunctions. The most common adverse events were infection (21.8%), oropharyngeal obstruction (15.6%), and headache or pain (12.5%). Device migration and expulsion were the most common device malfunctions reported (87.5%). The authors concluded that adverse events related to the Propel device were rare, but “A more comprehensive understanding of rare post market complications seen with PROPEL sinus stents may further aid informed decision making regarding their usage.” A similar study involving MAUDE reports related to the use of the Propel and other drug eluting sinus stent devices is discussed below (Narwani, 2021).

Another smaller case series study has also been published addressing this device (Matheny, 2014). This study is small, with study population of 20. Due to the weak methodology and data from studies such as the ADVANCE, CONSENSUS II and the ADVANCE II trials, this additional data is not particularly useful.

Overall, the available data do not allow a full understanding of the benefits and clinical utility of the Propel device vs. standard of care. Additional investigation using reasonable, accepted comparison groups in larger, well-designed, long-term trials is needed.

Propel Contour Device and the Propel Mini Device

Use of the Propel Contour device has been published in a single study (Luong, 2017). This blinded, randomized controlled trial (RCT) involved 80 participants with CRS who underwent primary or revision bilateral frontal sinusotomy. For each participant, one sinus ostia was randomly selected to have the Propel Contour device implanted and the contralateral side to receive surgery alone. The device was removed at 21 days, all participants completed the 30 days study period, and 79 (99%) completed the 90-day follow-up. Nasal polyps were present in 44 (55%) of participants. At 30 days, the primary efficacy measure, the need for postoperative intervention in the frontal sinus ostia, was lower in the Contour-treated ostia vs. control ostia (11.5% vs. 32.8%, no p-values provided), as was inflammation scores (23.1 vs. 35.6), and rate of restenosis or reocclusion (16% vs. 28%). Ostial diameter was larger in the Contour-treated ostia (5.7 mm vs. 1.0 mm). The results of this trial indicate there may be some benefit to the use of the Propel Contour device. However, additional studies are needed to confirm these findings and to fully understand the clinical utility of this device.

Use of the Propel Mini device was described in a single-blind prospective RCT study involving 80 participants who underwent bilateral frontal sinusotomy (Smith 2016). Each participant had one sinus ostia treated with the Propel Mini device and the other received standard care. Follow-up endoscopies were conducted at 7, 21, 30, and 90 days post-procedure, and 67 (83.8%) participants were available for all evaluations and included in the per-protocol analysis. The number of sinuses needing postoperative interventions was significantly different between treatment sides, with the Propel side experiencing 38.8% intervention rate vs. 62.7% on the control side (p=0.007). The Propel-treated sides vs. control sides showed a significantly lower inflammation scores (Relative Reduction [RR], 40.4%, p<0.0001), significantly lower number of restenosed or occluded sinuses (RR, 54%, p=0.0002), and a significantly greater ostial diameter (RR, 32.2%, p<0.0001). Endoscopic assessments revealed that the Propel-treated sides had a significantly lower frequency of adhesion and scarring warranting surgical interventions (RR, 75%, p<0.0225) and a significant reduction in expanded polypoid edema vs. control sides at day 30 (RR, 69%, p<0.0226; 60%). No implant-related adverse events in were reported. These results indicate some potential benefit of the Propel device. However, the results of this single study warrant further investigation to demonstrate the durability of the results.

Singh and colleagues (2019) reported the pooled analysis of the two RCTs previously reported by Smith (2016) and Luong (2017) involving 160 participants. At day 30 post-procedure, Propel treated ostia were reported to have significantly reduced need for postoperative interventions, surgical interventions, and oral steroid interventions (no p-value provided). At 90 days the need for postoperative interventions, restenosis/occlusion rate, and inflammation score were all reported to be statistically better in the Propel treated side ($p<0.05$ for all). Subgroup analyses of the pooled data showed statistically significant improvements at 90 days in restenosis/occlusion rate and estimated sinus ostia diameter ($p<0.05$ for both), with no statistically significant subgroup-by-treatment interactions. The authors concluded that Propel improved outcomes of frontal sinus surgery through 90 days, irrespective of asthma status, previous endoscopic sinus surgery, extent of surgery, extent of polyps, or Lund-Mackay computed tomography stage. However, the combination of data from the trials of two different devices does not provide much in the way of understanding the benefits of either.

Schneider (2022) published the results of a prospective, non-randomized, controlled study involving 52 participants with CRS who underwent FESS. At the surgeon's discretion, a Propel Mini stent (n=8, 24%) or Propel Contour stent (n=24, 76%) was inserted into the frontal sinus of 33 participants. No Propel stent was placed in the frontal sinus in 19 participants. Nearly all participants underwent full bilateral FESS. A total of 27% of Propel participants and 11% of non-implant group participants underwent an endoscopic modified Lothrop procedure. All participants were followed for 12 months postoperatively. At baseline, compared to the non-implant group, the Propel group participants had a higher rate of purulence (46% vs. 11%, $p=0.01$) and eosinophilic mucin (58% vs. 11%, $p=0.001$). The post-procedure measure results on all measurement tools, including total modified Lund-Mackay score (MLM), Chronic Rhinosinusitis Patient-Reported Outcomes survey (CRS-PRO), SNOT-22 survey, and an endoscopic severity measure (polyp recurrence, MLK endoscopic severity), were similar between groups. A significant decrease in frontal MLM scores post-procedure was reported in both groups vs. baseline, with a decrease of 50% ($p<0.05$) in the non-implant group and >75% in the Propel group ($p<0.0001$). Similarly, both groups were reported to have significant improvement in total MLM at 12 months vs. baseline ($p<0.0001$). At baseline, middle meatus type 2 inflammatory mediators were significantly higher in the Propel group compared to the non-implant group (median 10.06 pg/mL vs. 2.90 pg/mL, $p<0.05$). Baseline eosinophil cationic protein concentrations (ECP) were also significantly higher in the Propel group vs. the non-implant group (1143.0 ng/mL vs. 272.8 ng/mL, $p<0.05$). Measures of both IL-4 and IL-5 were not significantly different between groups at baseline. Post-procedure, middle meatus type 2 inflammatory mediator, specifically IL-4 and IL-13, were higher in the non-implant group compared to the Propel group ($p<0.05$ for both). At 12 months, middle meatus type 2 inflammatory mediators broadly decreased in the Propel group and increased in the non-implant group, with IL-5 and IL-13 significantly decreasing in the Propel group (IL-5, $p<0.05$; IL-13, $p<0.001$) and IL-4 significantly decreasing in the non-implant group ($p<0.05$). These results indicate no significant clinical difference between the two groups based on the outcomes on several standardized assessment tools. However, significant changes between groups in inflammatory marker concentrations were noted. The meaning of these findings is unclear. Due to the weak methodology of this trial, including lack of randomization, no blinding, low power, and other issues, these findings should be investigated further in a more rigorous trial.

SINUVA

SINUVA is a memetasone furoate drug-eluting stent device approved by the FDA through their drug approval process. It is indicated "for the treatment of nasal polyps in patients ≥ 18 years of age who have had ethmoid sinus surgery."

The RESOLVE study was a subject blinded RCT involving 100 participants with CRS who were scheduled to undergo revision FESS following prior ethmoidectomy due to recurrent obstruction related to polyposis (Han, 2014). Participants were assigned to undergo treatment with the SINUVA device (n=53) or sham procedure (n=47) and followed for 90 days. In the SINUVA group, the implant was planned to be removed at 60 days to avoid unblinding by inadvertent dislodgement of the device due to their gradual softening and resorption. The mean percentage of implants remaining in place at 30, 45 and 60 days was 92.5%, 86.5% and 56.7%, respectively. No serious adverse events were reported. At 90 days, compared to the control group, the SINUVA group had significantly better bilateral polyp grade ($p=0.016$) and less ethmoid obstruction ($p=0.0001$). The authors reported a significant improvement in the patient-reported symptom outcomes, with a two-fold reduction seen in the SINUVA group vs. controls ($p=0.025$). However, no validated tool was used to make this assessment, so these results are of uncertain value. During the post-operative period, fewer SINUVA group participants required oral steroids for ethmoid obstruction (11% vs. 26%; no p-value provided), and fewer SINUVA group participants met the criteria for FESS (47% vs. 77%; no p-value provided). One control participant and 2 SINUVA participants underwent FESS before the end of the trial period. This study, while only single-blinded and limited in follow-up time, was fairly well conducted and the reported results are promising. However, further research in warranted in larger populations.

Forwith and others (2016) published the 6-month results of the RESOLVE study described above. Only 1 participant in each group was lost to follow-up. At 6 months, it was reported that Sinuva group participants experienced significant improvement in Nasal Obstruction Symptom Evaluation (NOSE) score ($p=0.021$) and greater than twofold improvement in mean nasal obstruction/congestion score compared to controls (-0.06 ± 1.4 vs -0.44 ± 1.4; $p=0.124$). Endoscopically, SINUVA group participants experienced significant reduction in ethmoid sinus obstruction ($p<0.001$) and bilateral polyp grade ($p=0.018$) compared to controls. Panel review confirmed a significant reduction in ethmoid sinus obstruction ($p=0.010$) and twofold improvement in bilateral polyp grade ($p=0.099$), which reached statistical significance ($p=0.049$), in a subset of 67 participants with baseline polyp burden greater than or equal to 2 bilaterally. The authors reported that at 6 months, control group participants were 3.6 times more likely to remain candidates for FESS than the SINUVA group participants. These results are promising, but the small sample size limits their generalizability.

Stolovitzky (2019) reported on the pooled data of the RESOLVE and RESOLVE II trials. Their study involved 375 participants who successfully completed either study. At day 90, when compared to controls using nasal spray alone, participants receiving SINUVA implants and nasal spray were reported to have experienced significant improvements in nasal obstruction/congestion score ($p<0.0095$), bilateral polyp grade (BPG, $p<0.0008$), and ethmoid sinus obstruction ($p<0.0001$). A lower number of SINUVA participants remained surgical candidates vs. control participants (41.0% vs. 69.3%, $p<0.0001$). All subgroups experienced significant treatment effects, except nasal obstruction/congestion in smokers ($p<0.0509$) and participants without altered smell ($p<0.1873$). Subgroups without asthma and with only one prior FESS experienced the largest treatment effect on nasal obstruction/congestion. Participants who had undergone surgery less than 24 months prior and had a BPG > 5 showed the largest effect on endoscopic end points and need for revision FESS. Control participants with FESS less than 24 months prior to treatment with SINUVA were 7 times more likely to undergo revision FESS ($p<0.0001$). The authors concluded that SINUVA implants, when used in conjunction with nasal spray, resulted in more favorable results than nasal spray alone across several subjective and objective end points at day 90.

In 2018 Kern and others reported the results of the RESOLVE II study, a parallel group, sham-controlled prospective double-blind RCT involving 300 participants with refractory CRS with nasal polyposis assigned in a 2:1 fashion to treatment with either bilateral placement of 2 SINUVA implants (n=201) or a sham procedure (n=99). Follow-up was 90 days post procedure. The treatment group significantly better nasal obstruction/congestion scores ($p=0.0074$) and polyp grades ($p=0.0073$) vs. the sham group at 90 days. Additionally, fewer treatment group participants underwent repeat FESS (39% vs. 63.3%, $p=0.0007$). There were no significant differences between groups with relation to overall rate of adverse events. These results are promising, but the short follow-up and lack of an active control limits the utility of these findings.

Several smaller case series studies have also been published addressing this device (Lavigne, 2014; Ow, 2014). These studies are quite small, with study populations between 5 and 12, and their methodology is weak. Data from such studies are not particularly useful when viewed in the light of the previously available evidence from the RESOLVE trials.

LYR-210

Another device, LYR-210, is a mometasone furoate drug-eluting stent device not yet approved by the FDA. It is being proposed as an alternative to sinus surgery for the treatment of CRS that has failed other medical therapies.

Cervin (2021) reported the results of a prospective, multicenter, blinded, controlled, dose-ranging study involving 67 participants with CRS and who were surgically naïve (the LANTERN Phase 2 trial). Originally 150 participants were planned, but the study was curtailed due to the COVID-19 pandemic. All included participants had failure of previous medical management. At baseline all participants had moderate-to-severe disease based on mean SNOT-22 scores of 68.2 and composite 7-day average scores of the 4 cardinal CRS symptoms (4CS) tool of 9.7. Diagnosis was also confirmed by nasal endoscopy and magnetic resonance imaging. Participants were randomized in a 1:1:1 fashion to treatment with either saline irrigation-only (n=23) or bilateral in-office administration of LYR-210 containing either 2500 µg (n=23) or 7500 µg (n=21) of mometasone furoate. Safety and efficacy were evaluated over 24 weeks, with 5 saline-group participants withdrawing, and 1 participant in each of the active drug groups withdrawing before completion of the study. The authors reported that both doses of active drug were safe and well-tolerated throughout the study period. The 7500 µg group reportedly achieved statistically significant improvement vs. the saline group with regard to in nasal blockage at weeks 16, 20, and 24, facial pain/pressure at weeks 12, 16, 20, and 24, and nasal discharge at weeks 16, 20, and 24 ($p<0.05$ for all). Results on the 4CS tool showed that the 7500 µg group had a statistically significant improvement vs. the saline group at weeks 16, 20, and 24 ($p<0.05$ for all). A dose-dependent response was observed in the 7500 µg and 2500 µg groups vs. the saline group throughout the study, and the active drug groups demonstrated rapid, durable, and clinically meaningful improvement in SNOT-22 scores from baseline ($p<0.05$ for all). The 7500 µg group was reported to have had a 19-point improvement in SNOT-22 scores vs. the saline group at week 24. This was stated to be greater than a 2-fold improvement in the minimal clinically important difference (MCID) of 8.9 points. Additionally, all participants in the 7500 µg group were reported to have achieved MCID for SNOT-22 scores, vs. 70% in the 2500 µg group and 65% in the saline group ($p<0.05$ at 8, 12, 16, 20 and 24 weeks). In a sub analysis based upon polyp presence, MCID was achieved in all 7500 µg group participants, regardless of polyp presence. In the 2500 µg group MCID was achieved in 79% and 70% of participants with and without polyps, and in the saline group MCID was achieved in 62% of participants with polyps vs. 07% of participants without polyps (no p-values provided). The most common adverse events reported in the 2500 µg group were chronic sinusitis, epistaxis, and rhinorrhea (n=4 each). In the 7500 µg group the most common adverse events were chronic sinusitis and rhinitis (n=4 each). In the saline group the most common adverse event was chronic sinusitis (n=7). No significant decrease of morning serum cortisol levels was reported at any time point in the study, and no adverse events indicative of adrenal insufficiency were reported.

Rimmer (2023) reported on quality of life outcomes from the LANTERN Phase 2 trial. They reported that at week 24 post-implantation, participants in the 7500 µg group had significant improvements in all SNOT-22 subdomains (rhinologic, ear/facial, extranasal rhinologic, psychological dysfunction, and sleep dysfunction) vs. the saline group ($p<0.05$ for all). The 2500 µg group results indicated significantly improved sleep dysfunction vs. the saline group at week 24 (no p-values provided). Higher proportions of 7500 µg group participants achieved the minimal clinically important difference (MCID) for the SNOT-22 subdomains vs. the saline group at week 24 (no p-values provided). Results from the SF-36v2 tool at week 24 indicated that participants in the 7500 µg group had significantly larger improvements from baseline in the MCS, vitality, social functioning, role-emotional, and mental health scores vs. the saline group ($p<0.05$ for all). The 7500 µg group also achieved significant improvements at week 24 compared to baseline vs. the saline group in physical functioning, role-physical, and bodily pain scores (no p-values provided). The authors stated that significant improvements the 7500 µg group achieved in the MCS, four mental health domains, and three physical health domains of the SF-36v2 at week 24 were clinically meaningful.

These results are promising. However, this product is not yet available in the U.S, and it would be helpful to have these results confirmed in a larger rigorous trial with generalizable data.

Multiple Device Studies

Narwani (2021) described a study evaluating the post market adverse events reported between 2011 and 2020 associated with corticosteroid-eluting sinus stent (CES) devices using the (MAUDE) database. The study included reports related to the Propel, Propel Mini, Propel Contour, and Sinuva devices. The authors state that 28 total adverse events were reported, with all events being related to the Propel family of devices. There were no events reported related to the Sinuva device. Overall, 22 events were determined to be health outcome-related adverse events and 6 were device-related events. The most common adverse event was related to postoperative infection (39%, n=11). Of these, 4 developed periorbital cellulitis and 5 developed a fungal infection. The second-most common adverse event was migration of the stent (21% of all complications, n=6). Reintervention requiring operating room services to remove the device was needed for 8 participants (29%). As with the Shah (2021) study mentioned above, the authors concluded, “An increased awareness of the complications associated with CESs can be used to better inform patients during the consenting process as well as surgeons in their surgical decision making.”

Hoffman (2022) published the results of a retrospective nonrandomized controlled study involving the records of 3966 participants whose electronic health records and claims data were available in the OM1 Real-World Data Cloud. All participants had CRS and had undergone sinus surgery. Participants who had received treatment with corticosteroid-eluting sinus implants (n=1983) were propensity-matched with those that had not received such devices (n=1983). All participants had data available for 18 months prior to and after the index surgical sinus procedure. The authors reported no significant differences between the stent and non-stent groups with regard to repeat surgical procedures ($p=0.273$), debridement ($p=0.716$), polypectomy ($p=1.0$), and imaging ($p=0.2$). Differences between groups in favor of the stent group were found with regard to lower healthcare visits, including all-cause outpatient visits ($p=0.001$), all-cause ENT visits ($p=0.001$), and all-cause ER/urgent care visits ($p=0.007$). Stent group participants also underwent fewer endoscopies ($p=0.0003$) in the overall post-operative period. The report does not provide information with regard to the specific devices used. While this data appears to be favorable to the use of drug eluting sinus stents, the measures reported to be favorable to the stent group are mostly all-cause, not CRS-specific. Such measures do not provide adequate CRS-specific information regarding the impact of these types of devices. The CRS-specific endpoints that were provided, rates of debridement, polypectomy, or sinus imaging, all indicated no significant differences between groups. Additionally, when looking at the data stratified by timepoint, beyond 6 months the significant differences between groups for all-cause outpatient visits and all-cause ER/urgent care visits disappears. Thus, participants who received treatment with stents appear to require the same long-term care as those who did not receive stents. Overall, the data presented in this study does not appear to indicate a CRS-related benefit to the use of drug-eluting stent devices.

Recommendations

The American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS, 2023) published a position statement regarding the use of drug-eluting sinus implants Their statement does include citations, but they do not include any studies not previously discussed

above. The majority of the studies cited do not sufficiently demonstrate the safety and efficacy of these devices.

In 2023 the American Rhinologic Society (ARS) published a position statement titled Criteria for Drug-Eluting Implants". As with the AAO-HNS statement, the ARS does not include any studies not previously discussed above. This document specifies support for the use of such devices based upon the following:

> …a growing level of high-quality evidence on the safety and efficacy of drug-eluting implants in the paranasal sinuses. These studies have demonstrated cost effectiveness as well as improvement of patient centered outcomes by reducing inflammation, maintaining ostial patency, decreasing scarring, and preventing middle turbinate lateralization while limiting the need for administration of oral steroids.."

Other devices

Adriaensen and others (2017) published the results of a small RCT evaluating the use of a product not currently approved for use in the U.S. by the FDA, the drug-eluting version of SinuBand, SinuBand FP, which elutes fluticasone propionate. The standard non-drug-eluting version of SinuBand is FDA approved. This study involved 30 participants with CRS undergoing FESS who were randomized to post-operative treatment with standard nasal packing, standard Sinuband, SinuBand FP. Twenty-seven participants completed the study. The authors reported no significant differences between groups with relation to adverse events. No significant change in 24-hour urine cortisol was reported in the SinuBand FP group. The SinuBand FP group did have a significantly better polyp score vs. the standard care group (p=0.03). Finally, reported adhesions were comparable across groups.

Several RCTs have been published describing the use of devices in China that are not available in the U.S and not approved by the FDA (the BISORB Drug Eluting Sinus Biopolymer Stent System; Huang, 2022; Wang, 2022; Zheng, 2023). These studies report significant improvements in adhesion development, eosinophilia, Lund-Kennedy scores, middle turbinate lateralization, nasal obstruction, pain, polyp formation, and total nasal symptom scores. These results are promising, but until these devices are available and approved for use in the US, they are not applicable to the U.S. population.

Conclusions

Overall, the data addressing the use of drug-eluting devices for post-FESS treatment or treatment of nasal polyposis is limited. Additional data from well-designed and conducted trials are warranted.

Background/Overview

The Propel sinus implant group devices, including the Propel device, the Propel Mini, and the Propel Contour devices, are bioabsorbable drug-eluting sinus stents designed to maintain patency of the ethmoid sinus ostia following FESS for CRS. It is manufactured from a synthetic bioabsorbable copolymer, poly (L-lactide-co-glycolide, PLG) and impregnated with mometasone furoate, a synthetic corticosteroid with anti-inflammatory activity. The devices are designed to be bioabsorbed over a period of 30-45 days. During that period, the Propel device is proposed to maintain sinus patency by reducing inflammation, significant polyp formation, adhesions, and edema in individuals 18 years of age and older.

The devices are implanted into the ethmoid sinus ostia by a physician under endoscopic visualization. The physician uses a proprietary endoscopic delivery system to position and insert the Propel device in the desired location. Upon insertion, the implant expands radially to conform to the surgically enlarged sinus ostium following FESS. Once the stent is in place, the mometasone furoate is released to the local area surrounding the stent. The Propel device was approved by the FDA as a combination product on August 11, 2011.

SINUVA is also a drug-eluting stent device impregnated with mometasone furoate is implanted into the ethmoid sinus ostia by a physician under endoscopic visualization. The FDA has approved SINUVA for the treatment of nasal polyps following ethmoid sinus surgery. However, unlike the Propel device, is not biodegradable and requires removal by a medical practitioner after 90 days.

Coding

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

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

CPT

31299	Unlisted procedure, accessory sinuses [when specified as insertion of a drug-eluting sinus stent]

HCPCS

J7402	Mometasone furoate sinus implant, (SINUVA), 10 micrograms
S1091	Stent, non-coronary, temporary, with delivery system (Propel)

ICD-10 Diagnosis

	All diagnoses

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LYR-210
Propel Contour
Propel mini sinus implant
Propel sinus implant
SINUVA

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

Document History

Status	Date	Action
Reviewed	02/15/2024	Medical Policy & Technology Assessment Committee (MPTAC) review. Revised Rationale and References sections.
Reviewed	02/16/2023	MPTAC review. Updated Rationale and References sections.
Reviewed	02/17/2022	MPTAC review. Updated Rationale and References sections.
Reviewed	02/11/2021	MPTAC review. Updated Rationale and References sections. Updated Coding section with 04/01/2021 HCPCS changes; added J7402, S1091 replacing C9122, J7401 deleted 03/31/2021.
	07/01/2020	Updated Coding section with 07/01/2020 HCPCS changes; added C9122.
Reviewed	02/20/2020	Medical Policy & Technology Assessment Committee (MPTAC) review. Updated Rationale and References sections.
	10/01/2019	Updated Coding section with 10/01/2019 HCPCS changes; added J7401 replacing S1090; removed C2625, J3490, L8699 no longer applicable.
Reviewed	03/21/2019	MPTAC review. Updated Rationale and References sections.
	12/27/2018	Updated Coding section with 01/01/2019 CPT changes; removed 0406T, 0407T deleted 12/31/2018, added HCPCS C2625, removed C1874.
	06/28/2018	Updated Description/Scope section.
Reviewed	05/03/2018	MPTAC review. Updated References section.

Revised	03/22/2018	MPTAC review. The document header wording updated from “Current Effective Date” to “Publish Date.” Updated Title to add “Drug-Eluting” and remove “Following sinus surgery”. Revised INV and NMN statement to specify “drug-eluting” devices and added “or the treatment of nasal polyps”. Removed mention of the Relieva Stratus MicroFlow Spacer. Updated Rationale, Background, References and Index sections. Coding section updated; added ICD-10-CM codes J33.0, J33.9.
Reviewed	08/03/2017	MPTAC review. Updated References and Index sections.
Reviewed	08/04/2016	MPTAC review. Updated Rationale and Reference sections.
	01/01/2016	Updated Coding section with 01/01/2016 CPT changes; removed ICD-9 codes.
Reviewed	08/06/2015	MPTAC review. Updated Rationale, Coding and Reference sections.
Reviewed	08/14/2014	MPTAC review. Updated Reference section.
Reviewed	08/08/2013	MPTAC review. Updated Reference section.
New	08/09/2012	MPTAC review. Initial document development.

Applicable to Commercial HMO members in California: When a medical policy states a procedure or treatment is investigational, PMGs should not approve or deny the request. Instead, please fax the request to Anthem Blue Cross Grievance and Appeals at fax # 818-234-2767 or 818-234-3824. For questions, call G&A at 1-800-365-0609 and ask to speak with the Investigational Review Nurse.

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 eligibility for coverage. The member’s contract benefits in effect on the date that services are rendered must be used. Medical Policy, which addresses medical efficacy, should be considered before utilizing medical opinion in adjudication. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.