

# Survey Of Current Practices In Peri-Operative Management Of FESS Patients And Review Of Literature

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## Abstract

### Introduction

Functional endoscopic sinus surgery (FESS) is a well-established strategy for management of sinus disease following failure of maximal medical therapy. Preoperative optimisation and postoperative care have impact on the ultimate outcome. However, at present, there is lack of evidence and guideline in terms of the optimal peri-operative care.

### Objective

The aim of this study is to survey the peri-operative management protocols currently used by Otolaryngologists in Singapore and to compare the differences in management between patients with chronic rhinosinusitis with nasal polyps (CRSwNP), chronic rhinosinusitis without nasal polyps (CRSSNP) and recurrent nasal polyps (NP).

### Methods

Questionnaire survey was performed to collect data regarding pre-operative medications, post-operative nasal packing practices as well as post-operative medications.

### Results

Questionnaires were sent to a total of 90 Otolaryngologists registered under the Singapore Medical Council and 25 Otolaryngology registrars. We received a response rate of 61%(70/115). Preoperatively, chronic rhinosinusitis patients received oral steroids less often than those who underwent primary FESS( $p<0.001$ ) and revision FESS( $p<0.001$ ) for nasal polyposis. Preoperative oral antibiotics(59%) were commonly prescribed in all groups of patients. Postoperatively, chronic rhinosinusitis patients received oral steroids less often than those who underwent primary FESS( $p<0.001$ ) and revision FESS( $p<0.001$ ) for nasal polyposis. Although there is a trend towards the use of nasal packing with infusion for primary FESS and revision FESS for nasal polyposis compared to chronic rhinosinusitis, this was not statistically significant. The infusion agent of choice was triamcinolone.

### Conclusion

In conclusion, this survey demonstrates that there are different peri-operative practices in the management of CRSwNP, CRSSNP and revision FESS for nasal polyposis

## INTRODUCTION

Since its conception in the 1980s[1, 2], functional

endoscopic sinus surgery (FESS) has become widely accepted as a treatment of chronic rhinosinusitis without

polyps (CRSsNP) and chronic rhinosinusitis with polyps (CRSwNP) refractory to medical therapy. Studies have since proven that FESS improves symptoms and quality of life[3]. With the refinement of surgical technique and the improvement of optical instruments, the success rate of FESS has increased drastically and current studies report success rate as high as 92% for CRSsNP patients [4].

It is long recognized that optimizing peri-operative care is a fundamental facet in improving outcomes and reducing morbidity following surgery. The same applies to patients undergoing FESS. However, at present, no consensus exists on the optimal peri-operative management for FESS patients. There are studies which have sought to investigate the effectiveness of various peri-operative treatment modalities such as systemic steroids, nasal steroid sprays, oral antibiotics, nasal irrigation and several others [5-8]. More recent studies also explored the use of steroid-infused nasal packing in the post-operative setting [9, 10]. However, results have not been conclusive. Furthermore, most studies investigating peri-operative treatments do not stratify their study subjects into groups according to their indications for surgery. Specifically, CRSwNP and CRSsNP are often analysed collectively. This makes application of evidence to patients undergoing FESS for various indications difficult.

## **OBJECTIVES**

In view of the lack of conclusive evidence, we conducted a nationwide survey on Otolaryngologists in Singapore with the aim to investigate the peri-operative management protocols currently used by Otolaryngologists in Singapore and to compare the differences in management between patients with chronic rhinosinusitis with nasal polyps (CRSwNP), chronic rhinosinusitis without nasal polyps (CRSsNP) and recurrent nasal polyps (NP).

## **HYPOTHESIS**

We hypothesize that peri-operative management regimes are likely to differ between these groups, given the difference in pathogenesis, clinical course and outcomes. Recent papers have demonstrated specific biological differences in the inflammatory profiles of CRSwP and CRSsNP [11-14]. In addition, it is known that presence of NP considerably decreases the surgical success rate [15-17]. Revision FESS cases also have a poorer prognosis after surgery[16, 18]. Hence, on a hypothetical basis, CRSsNP and cases of revision FESS warrants a more aggressive peri-operative management.

## **METHODS**

Ethics approval was obtained from the National Healthcare Group (NHG) Institutional Review Board. Questionnaire survey was performed. All practicing consultant otolaryngologists registered under the Singapore Medical Council specialist registry were invited to participate in the survey. In addition, we included registered otolaryngology registrars working in public hospitals.

In accordance to our study objectives, we designed a questionnaire (Appendix 1) to ascertain the medications used in the peri-operative management of patients with CRSwNP, CRSsNP and recurrent NP.

After obtaining consent, the surveys were delivered to otolaryngologists either by hand or via mail with a prepaid, self-addressed reply envelope included. Questionnaires were sent to a total of 90 Otolaryngologists registered under the Singapore Medical Council and 25 Otolaryngology registrars. Descriptive statistics and chi-squared tests were performed for statistical comparison between different groups of patients.

## **RESULTS**

### **Demographics**

70 out of 115 questionnaires were completed and returned giving a response rate of 61%. The majority of our respondents worked in public hospitals (70%). Most (34%) had been in practice for between 10 to 15 years. Thirty-four percent (34%) had undergone subspecialty training in rhinology (Table 1)

**Table 1**

Demographics of Respondents (n=70)

Where do you practice?	
Public Hospital	49 (70%)
Private Practice	21 (30%)
How long have you been in practice?	
<5 years	11 (16%)
5-10 years	13 (18.5%)
10-15 years	24 (34%)
15-25 years	16 (23%)
>25 years	6 (8.5%)
Is Rhinology your subspecialty?	
Yes	24 (34%)
No	46 (66%)

#### Pre-operative management

Figure 1 shows the frequency and usage of the various treatments preoperatively. CRSwNP (90.0%) or recurrent NP (91.5%) cases commonly receive oral steroids preoperatively. We found that oral steroids are used more commonly in patients with CRSwNP (chi-sq=50.3,  $p<0.001$ ) and recurrent NP (chi-sq=53.2,  $p<0.001$ ) compared to those with CRSsNP (31.5%). There was no statistically significant difference between the preoperative management of CRSwNP and recurrent NP cases. Nasal steroids (78.5%) and oral antibiotics (59%) are commonly prescribed in all groups of patients prior to FESS. 31.3% of otolaryngologists prescribe nasal douching preoperatively.

#### Post-operative management

Similar to preoperative prescription practices, oral steroids are routinely prescribed to patients with CRSwNP and

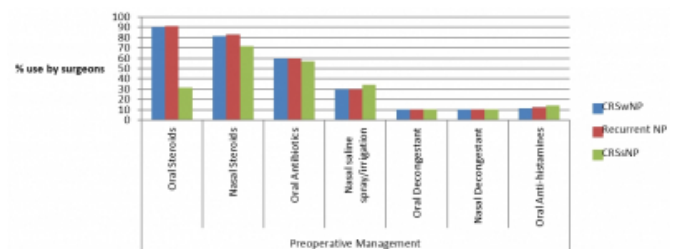
recurrent NP after FESS. Statistical analysis showed that patients with CRSsNP receive post-op oral steroids less often than those who had CRSwNP (chi-sq= 52.8,  $p<0.01$ ) or recurrent NP (chi-sq=52.8,  $p<0.01$ ). Postoperatively, surgeons commonly prescribe oral antibiotics (88.1%) and nasal irrigation (84%) in all groups of patients (Figure 2). Nasal steroids are prescribed by 44.8% of surgeons. There is also no difference between the postoperative management of CRSwNP and recurrent NP cases.

#### Comparison between preoperative and postoperative management regimes

The preoperative use of topical steroids is more common than postoperative in all groups of patients (chi-sq=19.3,  $p<0.01$ ). In contrast, nasal irrigation (chi-sq=42.1,  $p<0.01$ ) and oral antibiotics are prescribed more often postoperatively (chi-sq=14.4,  $p<0.01$ ).

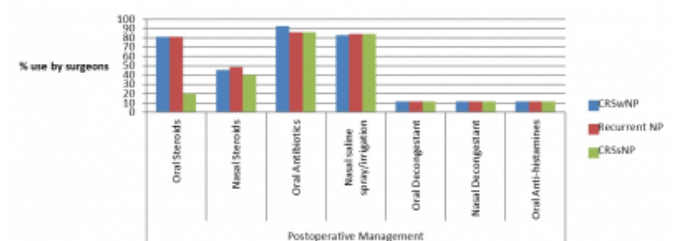
**Figure 1**

Pre-operative Management Regime of FESS patients



**Figure 2**

Post-operative Management Regime of FESS patients



#### Nasal packing practices

Majority of otolaryngologist utilize nasal packing following FESS (CRSwNP-90.0%, recurrent NP-88.6%, CRSsNP-90%). The most preferred nasal packing material was Nasopore (55.7%) followed by Merocel (28.5%) as shown in Figure 3. Most surgeons choose to perform nasal packing without any infusion agent (58.6%). Although there is a trend towards the use of nasal packing combined with infusion agent for CRSwNP (31.4%) (chi-sq=1.30,  $p=0.342$ ) and recurrent NP (37.1%) (chi-sq=3.40,  $p=0.094$ ) compared

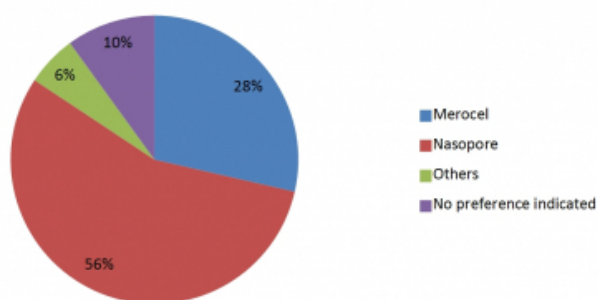
to CRSsNP (22.9%), this was not statistically significant (Figure 6). Triamcinolone was the infusion agent that was used by most surgeons, with the exception of one who used neoderm-infused nasal packing.

#### First follow-up timing

The most common interval to first follow-up in clinic is 1-2 weeks (52.9%) postoperatively. No difference in follow-up timing between the three groups was found. There was no statistically significant relationship between timing of first follow-up and nasal packing preferences.

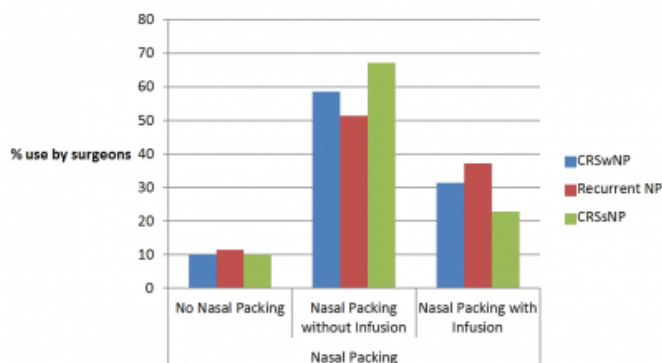
**Figure 3**

Nasal packing material preferences



**Figure 4**

Nasal packing regimes



## DISCUSSION

Meticulous peri-operative care in FESS patients is important to optimize intra-operative condition, aid disease clearance, improve post-operative mucosal healing, reduce symptoms and reduce recurrence. The nature of this study was to review the common practices adopted by otolaryngologists and compare different management regimes for patients undergoing FESS for different indications (CRSwNP, CRSsNP and recurrent NP). In this discussion, we seek to compare the prevailing protocols used by the Otolaryngologists in our survey to the current available

evidence in the literature, as well as to compare our practice to those of other similar cross-sectional survey studies performed elsewhere.

#### Difference in Management Regimes between groups

The 3 groups of indications (CRSwNP, CRSsNP, and Recurrent NP) are selected for comparison as they represent the common indications for FESS in Singapore. We hypothesize that peri-operative management regimes are likely to differ between these groups, given the difference in pathogenesis, clinical course and outcomes. Indeed, our results demonstrated the presence of differences between the peri-operative management regime for CRSwNP, CRSsNP and recurrent NP patients. Pre and postoperative oral steroids were prescribed more often in CRSwNP and recurrent NP patients compared to CRSsNP patients. There was also a trend towards the predilection of nasal packing infused with steroids for CRSwNP and recurrent NP patients but this was not statistically significant. There were no other agents that showed a statistical difference in frequency of prescription between the groups. We did not find any other difference in the management of CRSsNP and recurrent NP patients. Tysome et al conducted a cross-sectional survey by postal questionnaire to otolaryngologists in UK. Similar to our results, they reported that oral steroids were used more significantly pre- and postoperatively in patients with polyps compared to non-polyp disease[19]. In addition, they found that nasal steroid drops were used significant more postoperatively in patients with polyps compared to non-polyp disease.

#### Pre-operative Management Regime

As demonstrated in our study, oral steroids, topical nasal steroids, oral antibiotics and nasal irrigation are commonly used in the pre-operative period. The objective of using medications in the pre-operative setting is to optimize surgical field, reduce operative time, lessen intra-operative blood loss and reduce infection.

#### Oral Steroids

Steroids exert anti-inflammatory effect within the nasal cavity lining, thereby reducing tissue oedema. In addition, it activates adrenergic receptor, causing vasoconstriction of the microcirculation[20], thereby reducing intra-operative bleeding. In the pre-operative setting, the theoretic advantage of steroids is that it can reduce polyp size which can aid in navigation of narrow recesses. In addition, it can reduce bleeding, which is can improve visualization of the

surgical field, therefore reduce the possibility of severe complications such as orbital injury or CSF leaks.

In our study, preoperative oral steroids were more commonly prescribed for patients undergoing FESS for CRSwNP (90.0%) and recurrent NP (91.5%), compared to CRSsNP (31.5%). This is supported in evidence by randomized controlled trials done by Wright et al[21] and Siesjiewicz et al[20]. Both Wright and Siesjiewicz reported better surgical field and easier surgery in patients with nasal polyposis who received oral steroids. Khosla[22] performed a meta-analysis to investigate the effectiveness of various techniques in achieving hemostasis during endoscopic sinus surgery and demonstrated that pre-operative steroids administration significantly reduces intra-operative blood loss. However the study did not distinguish between CRSwNP and CRSsNP. Nevertheless, current evidence suggests that there is a role for preoperative oral steroids for FESS patients in terms of improvement in surgical field and reduction of bleeding.

### Topical Nasal Steroids

In a preoperative setting, the theoretical advantage of topical nasal steroids is similar to that of oral steroids, without the systemic side effects. In our survey, majority of the Otolaryngologist prescribes nasal steroids in the preoperative setting. However, one of the limitations is that we have not fully elucidated whether these represent a continuation of the patients' routine medical therapy or if it represents the intention of preoperative optimization.

Although topical nasal steroids have been established as a medical treatment for CRSsP and CRSwP [23, 24], there are few studies looking specifically into the actual efficacy of preoperative topical steroids in improving surgical outcome. The only double-blinded, randomized controlled trial available was one published by Albu et al. The study demonstrated that preoperative use of topical steroid (mometasone furoate) for 4 weeks showed statistically significant reduction in bleeding, decreased operation time and improved endoscopic vision[15]. However, it is important to note that study subjects recruited are patients CRSsNP and CRSwNP with mild polyp disease (grade I). Hence, the results may not fully applicable to all patients, especially those with large polyp load.

### Postoperative management regimes

#### Oral Steroids

The rationale for postoperative oral steroids is to improve symptoms and prevent recurrence. It is believed that recurrence of nasal polyps after endoscopic sinus surgery may be the result of severe inflammatory reactions during the mucosal healing period [25, 26] and may be minimized by the administration of systemic steroids postoperatively. In our study, oral steroids were prescribed more routinely in patients with CRWsNP and recurrent NP. In a double-blinded randomized-controlled trial conducted in CRSwNP patients by Wright and Agrawal[21], there was statistically significant postoperative endoscopic improvement shown in the treatment group. However, the study did not demonstrate any improvement in postoperative symptoms in the treatment group. In addition, although the study was well designed, sample size of small (N=26).

Given the limited and inconclusive evidence at present, it is important to balance the potential side effects of systemic steroid use with its benefit. Although life-threatening side-effects from short-term steroid use are rare, potential side effects include wound infection, raised intraocular pressure, mood changes and osteonecrosis[27, 28].

#### Nasal steroids

Again, the rationale of postoperative nasal steroid use is similar to that of oral steroids. It serves the intention of improving symptoms and reducing recurrence. However, comparatively, nasal steroids have less systemic side effects. Less than fifty percent of Otolaryngologists in our survey prescribe postoperative nasal steroids. Most studies support the use of postoperative nasal steroids for CRSwNP patients. Most studies reported less polyp recurrence, better endoscopic findings and better symptom control [29-33]. However, it is important to note that the follow up period of these studies only ranged from 6 – 12 months. In addition, the duration of treatment varies significantly between studies. Hence, sustained benefit from postoperative nasal steroids has yet to be established.

#### Nasal Packing

Nasal packing is usually placed after FESS with the intention to control haemorrhage, prevent adhesions and promote healing of damaged mucosa[34]. Our survey revealed that about 90% of surgeons routinely use nasal packing in the postoperative period.

Current available studies reported more pain and discomfort in those receiving packs compared those who did not (35-37). However, there is little investigation into incidence

of adhesions and haemorrhage control. Hence, further studies are required to investigate the necessity of post-FESS nasal packing.

Our results also showed that most surgeons used Nasopore(56%) followed by Merocel (29%). Nasopore is made up of biodegradable synthetic polyurethane foam while Merocel belongs to the group of nonabsorbable packing products. Wang et al[35] found no difference between three different nasal packing materials (Vaseline gauze strip, Merocel, Nasopore) on the formation of synechiae and major postoperative bleeding in patients who had undergone FESS. A RCT showed that absorbable packing did not significantly reduce the risk of bleeding or patient discomfort compared with the traditional nonabsorbable nasal packing[36].

In our survey, nasal packing with infusion was used more frequently, although not statistically significant, in patients with CRSwNP and recurrent NP. The commonest infusion agent of choice was triamcinolone. There is some evidence to support the benefit of infusing steroids into nasal dressing in the management of nasal polyposis after surgery. Cote et al[37] conducted a RCT which demonstrated significant improvement in early and medium-term postoperative healing in nasal cavities receiving triamcinolone-impregnated absorbable nasal packing. Another study reported comparable results between triamcinolone-impregnated packing and oral steroids in the management of nasal polyposis after sinus surgery[38]. More randomized, controlled trials are needed to compare the efficacy of postoperative steroid-infused nasal packing between polyp and non-polyp disease.

#### Nasal douche

Majority of the Otolaryngologists (84%) in our survey advocate the use of postoperative nasal douche. The role of post-operative nasal douching is to remove crusts, improve mucociliary clearance, thereby reduce infection and improving healing. EPOS 2012 recommends use of nasal douche post sinus surgery setting[39].

A 3 month post-FESS nasal irrigation regime has been found to improve endoscopy score and symptom score in patients with mild CRS[40]. However, this significant benefit was not experienced in patients with severe CRS. Fooanant et al also demonstrated that the use of nasal saline irrigation and dexpanthenol spray improved postoperative symptom score and mucociliary clearance[41]. At present, there is a lack of

long-term studies beyond 3 months to investigate the effect on symptoms or recurrence.

#### Other peri-operative measures

##### Oral Antibiotics

The use of peri-operative antibiotics in otolaryngological surgeries is widespread. In our study, fifty-nine percent of surgeons routinely prescribe oral antibiotic preoperatively while 88.1% of them prescribe them postoperatively. In the setting of FESS surgery, rationale for prescription of antibiotics can be two-fold. Most commonly, objective of using peri-operative antibiotics is to reduce post-operative infection rates. However, antibiotics such as macrolides can be utilized for their immune-modulatory and anti-inflammatory effect. Although there has not been any studies linking the use of macrolides to surgical outcomes in FESS, Ichimura et al and Yamada et al have demonstrated the efficacy of macrolides in shrinkage of polyps[42, 43]. Reduction of polyp size can be useful in improving intraoperative visualisation and reducing operation time.

There is no evidence to justify the use of pre-operative antibiotics. The use of post-operative antibiotics was investigated by Saleh et al[44] in a systematic review and meta-analysis which included 3 RCTs. The study demonstrated a non-significant reduction in the incidence of infection, endoscopic scores or symptoms. Despite the inconclusive evidence, it is reasonable to suggest the use of culture-direct short-term antibiotic should there be any intra-operative finding of pus or overt infection within the sinuses to prevent postoperative infection and to facilitate healing.

##### Decongestants

Our survey shows that only a handful of otolaryngologists routinely prescribe topical (10.9%) or oral decongestants (7.6%) to patients after FESS. There is little evidence reporting the efficacy of topical/oral decongestants in improving outcome after FESS. We identified a randomized trial comparing topical decongestant to normal saline spray following nasal surgery which demonstrated no difference in sinonasal symptoms score between the groups[45]. In addition, the group that received topical decongestant reported worse postoperative pain scores.

##### First outpatient follow-up

We found that the most common time for follow-up at outpatient clinic is 1-2 weeks (52.9%) postoperatively. The



remaining surgeons see their patients after FESS between 2-5 days postoperatively (37.1%) and only a minority (10%) sees their patients the next day after surgery. One of the limitations of our study is we did not elucidate whether endoscopic sinus debridement was performed during the first follow up. This has relevance as most randomized controlled studies have shown that debridement of the nasal cavity postoperatively is vital in reducing crusts and postoperative adhesions as crusting in the middle meatus is associated with postoperative adhesions[46-48]. However, there is limited research regarding the optimum timing and frequency of nasal toileting/debridement after FESS. Study by Lee and Byun[47] showed that patients concluded that optimal frequency of debridement after surgery was at 1-week intervals, which is consistent with the practice of majority of the surgeons surveyed. However, considering the disturbances in socioeconomic activity and patient discomfort during outpatient debridement visits, Rudmik et al[6] recommends relating the surgeon's assessment of healing into the clinical need for debridement.

## CONCLUSION

Although no consensus currently exists on the best combination of practices for peri-operative management of FESS patients, certain trends are noted from this study. Otolaryngologists are more inclined to prescribing oral steroids pre and postoperatively in patients undergoing FESS for both primary and recurrent nasal polypsis compared to patients without polyps. The peri-operative management of primary and recurrent polyps is similar. Certain prescribing practices by otolaryngologists are supported by strong evidence while others are not supported by existing literature. More randomized, controlled studies are required to draw conclusive evidence regarding some of the prescribing practices by otolaryngologists.

## APPENDIX 1

### Appendix 1A

Scenario A: The questions below apply for the management of patients undergoing **Primary FESS for nasal polypsis**

1. What is your routine **immediate PRE-operative** care of patients prior to Primary FESS for nasal polypsis?

	Tick Box if Yes	Drug Name	Dose	Frequency	Duration
Oral Steroids	<input type="checkbox"/>				
Nasal Steroids	<input type="checkbox"/>				
Oral Antibiotics	<input type="checkbox"/>	<input type="checkbox"/> Amoxicillin <input type="checkbox"/> Co-amoxiclav <input type="checkbox"/> Clarithromycin <input type="checkbox"/> Others: _____			
Oral Decongestant	<input type="checkbox"/>				
Nasal Decongestant	<input type="checkbox"/>				
Oral anti-histamines	<input type="checkbox"/>				
Nasal saline spray/irrigation	<input type="checkbox"/>				

2. What is your routine **POST-operative nasal packing** practice for patients after Primary FESS for nasal polypsis?

	Tick Box if applicable	Please specify type	Duration
Nasal Packing material	<input type="checkbox"/>	<input type="checkbox"/> Merocel <input type="checkbox"/> Rapid Rhino <input type="checkbox"/> Ribbon gauze <input type="checkbox"/> Nasopore <input type="checkbox"/> Others: _____	
Infusion Agent added	<input type="checkbox"/>	<input type="checkbox"/> Trisminalone <input type="checkbox"/> Others: _____	
No Nasal Packing	<input type="checkbox"/>		

3. What is your routine **immediate POST-operative** care of patients after Primary FESS for nasal polypsis?

	Tick Box if Yes	Drug Name	Dose	Frequency	Duration
Oral Steroids	<input type="checkbox"/>				
Nasal Steroids	<input type="checkbox"/>				
Oral Antibiotics	<input type="checkbox"/>	<input type="checkbox"/> Amoxicillin <input type="checkbox"/> Co-amoxiclav <input type="checkbox"/> Clarithromycin <input type="checkbox"/> Others: _____			
Oral Decongestant	<input type="checkbox"/>				
Nasal Decongestant	<input type="checkbox"/>				
Oral anti-histamines	<input type="checkbox"/>				
Nasal saline spray/irrigation	<input type="checkbox"/>				

4. When is your first follow-up for patients who have undergone Primary FESS for nasal polypsis?

- ☐ POD 1  
☐ 1-2 weeks  
☐ >1 month  
☐ POD 2-7  
☐ 2-4 weeks

### Appendix 1B

Scenario B: The questions below apply for the management of patients undergoing **REVISION FESS for recurrent nasal polypsis**

Is your perioperative management of **REVISION FESS** identical to **PRIMARY FESS** for CRSwNP patients?  
☐ Yes (If yes, kindly skip to next page) ☐ No

1. What is your routine **immediate preoperative** care of patients prior to revision FESS for nasal polypsis?

	Tick Box if Yes	Drug Name	Dose	Frequency	Duration
Oral Steroids	<input type="checkbox"/>				
Nasal Steroids	<input type="checkbox"/>				
Oral Antibiotics	<input type="checkbox"/>	<input type="checkbox"/> Amoxicillin <input type="checkbox"/> Co-amoxiclav <input type="checkbox"/> Clarithromycin <input type="checkbox"/> Others: _____			
Oral Decongestant	<input type="checkbox"/>				
Nasal Decongestant	<input type="checkbox"/>				
Oral anti-histamines	<input type="checkbox"/>				
Nasal saline spray/irrigation	<input type="checkbox"/>				

2. What is your routine post-operative **nasal packing** practice for patients after revision FESS for nasal polypsis?

	Tick Box if applicable	Please specify type	Duration
Nasal Packing material	<input type="checkbox"/>	<input type="checkbox"/> Merocel <input type="checkbox"/> Rapid Rhino <input type="checkbox"/> Ribbon gauze <input type="checkbox"/> Nasopore <input type="checkbox"/> Others: _____	
Infusion Agent added	<input type="checkbox"/>	<input type="checkbox"/> Trisminalone <input type="checkbox"/> Others: _____	
No Nasal Packing	<input type="checkbox"/>		

3. What is your routine **immediate postoperative** care of patients after revision FESS for nasal polypsis?

	Tick Box if Yes	Drug Name	Dose	Frequency	Duration
Oral Steroids	<input type="checkbox"/>				
Nasal Steroids	<input type="checkbox"/>				
Oral Antibiotics	<input type="checkbox"/>	<input type="checkbox"/> Amoxicillin <input type="checkbox"/> Co-amoxiclav <input type="checkbox"/> Clarithromycin <input type="checkbox"/> Others: _____			
Oral Decongestant	<input type="checkbox"/>				
Nasal Decongestant	<input type="checkbox"/>				
Oral anti-histamines	<input type="checkbox"/>				
Nasal saline spray/irrigation	<input type="checkbox"/>				

4. When is your first follow-up for patients who have underwent revision FESS for nasal polypsis?

- ☐ POD 1  
☐ 1-2 weeks  
☐ >1 month  
☐ POD 2-7  
☐ 2-4 weeks

## Appendix 1C

Scenario C: The questions below apply for the management of patients undergoing Primary FESS for chronic rhinosinusitis without nasal polyposis (CRsNP).

1. What is your routine immediate preoperative care of patients prior to Primary FESS for chronic rhinosinusitis?

	Tick Box if Yes	Drug Name	Dose	Frequency	Duration
Oral Steroids	<input type="checkbox"/>				
Nasal Steroids	<input type="checkbox"/>				
Oral Antibiotics	<input type="checkbox"/>	<input type="checkbox"/> Amoxicillin <input type="checkbox"/> Clarithromycin <input type="checkbox"/> Co-amoxiclav <input type="checkbox"/> Others: _____			
Oral Decongestant	<input type="checkbox"/>				
Nasal Decongestant	<input type="checkbox"/>				
Oral anti-Histamines	<input type="checkbox"/>				
Nasal saline spray/irrigation	<input type="checkbox"/>				

2. What is your routine post-operative nasal packing practice for patients after Primary FESS for chronic rhinosinusitis?

	Tick Box if applicable	Please specify type	Duration
Nasal Packing material	<input type="checkbox"/>	<input type="checkbox"/> Merocel <input type="checkbox"/> Nasopore <input type="checkbox"/> Rapid Rhino <input type="checkbox"/> Others: _____ <input type="checkbox"/> Ribbon gauze	
Infusion Agent added	<input type="checkbox"/>	<input type="checkbox"/> Tricaine/insulin <input type="checkbox"/> Others: _____	
No Nasal Packing	<input type="checkbox"/>		

3. What is your routine immediate postoperative care of patients after Primary FESS for chronic rhinosinusitis?

	Tick Box if Yes	Drug Name	Dose	Frequency	Duration
Oral Steroids	<input type="checkbox"/>				
Nasal Steroids	<input type="checkbox"/>				
Oral Antibiotics	<input type="checkbox"/>	<input type="checkbox"/> Amoxicillin <input type="checkbox"/> Clarithromycin <input type="checkbox"/> Co-amoxiclav <input type="checkbox"/> Others: _____			
Oral Decongestant	<input type="checkbox"/>				
Nasal Decongestant	<input type="checkbox"/>				
Oral anti-Histamines	<input type="checkbox"/>				
Nasal saline spray/irrigation	<input type="checkbox"/>				

4. When is your first follow-up for patients who have underwent Primary FESS for chronic rhinosinusitis?

- ☐ POD 1                      ☐ POD 2-7  
☐ 1-2 weeks                ☐ 2-4 weeks  
☐ >1 month

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