

# Outpatient management of epistaxis during COVID-19 to reduce inpatient stay: a quality improvement project

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## Abstract

**Introduction:** In March 2020, new guidelines allowed patients with epistaxis to be discharged home with nasal packs in situ to reduce the risk of inpatient covid transmission rates. Our objective is to review how successful these new guidelines have been and whether they could be safely maintained in future practice. **Methods:** This was a retrospective data analysis at a local tertiary ENT referral hospital. The study group consisted of patients admitted with epistaxis over one year. The “Pack and Home” criteria pathway was implemented. We reviewed the pathway 6 months pre and 6 months post pathway introduction. **Primary outcome measure** included compliance with the “Pack and Home” criteria and length of inpatient admissions. **Results:** A total of 131 patients required nasal packing, with 72 patients (55%) in loop 1 and 59 patients (45%) in loop 2. In the first loop all 72 patients (100%) were admitted for inpatient care. However, in the second loop 21 patients (36%) were discharged home with nasal pack in situ and 59 patients (64%) were admitted. Of those discharged, 2 patients re-presented after 48 hours with re-bleeding. The average total length of inpatient stay in loop 1 was significantly higher at 45.7 hours and 29.6 hours in loop 2 ( $p < 0.05$ ). All discharged patients attended their outpatient appointment in under 3 days. **Conclusion** The “Pack and Home” criteria can successfully identify patients who are suited for an outpatient management pathway. This could reduce surgical inpatient load and the way we manage epistaxis.

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## Conclusion

The "Pack and Home" criteria can successfully identify patients who are suited for an outpatient management pathway. This could reduce surgical inpatient load and the way we manage epistaxis.

Five key points

- The "Pack and Home" criteria was developed by our local hospital trust to manage epistaxis on an outpatient basis
- Prior to the pandemic all epistaxis cases were admitted as inpatients, whereas the newly implemented criteria resulted in the avoidance of 21 admissions over 6 months
- Only two patients on the "Pack and Home" pathway re-presented with bleeding within 48 hours.
- The new criteria lead to an overall reduction in length of hospital stay for patients presenting with epistaxis
- We recommend continuing outpatient management pathway of epistaxis under the circumstances that clinicians are fully aware of which patients meet the criteria, patients are counselled appropriately and to be seen in clinic within 48 hours of discharge

## Introduction

Epistaxis is a common presentation to Ear, Nose and Throat (ENT) departments across the UK with the majority requiring hospital admission despite most patients requiring no further intervention other than simple nasal packing<sup>1,2</sup>. Due to its involvement with the upper respiratory tract and being described as an aerosol generating procedure, the management of epistaxis posed an increased risk of the spread of Sars-CoV-2 to staff and patients<sup>3</sup>. In March 2020, new guidelines were altered to enable certain patients to be discharged home with nasal packs in situ to reduce the risk of COVID-19 inpatient transmission<sup>4</sup>. The literature has highlighted the implications around safe discharge, reduced hospital stay and re-admission rates for patients with epistaxis<sup>5,6</sup>.

A criterion was created to help identify patients that would be suitable for outpatient management. This included their social circumstances, stability of patients, observation parameters and past medical history. Correct adherence to the new guideline could lead to reduced admission of epistaxis patients and occupancy of beds within the hospital<sup>7</sup>.

## Objectives:

The objective of this audit is to review how successful the new "Pack and Home" Criteria has been during the COVID-19 pandemic and whether they could be safely maintained in future practice use.

## Methods

This manuscript has been prepared with reference to the STROBE checklist for cohort studies

## Ethical consideration

The project was reviewed, approved, and registered by the trust's audit department. The Health Research Authority decision tool determined the study design to fall under the remit of audit, and so no ethical approval was required.

## Study design and setting

This was a retrospective data analysis of pre and post implementation of the new guidelines which were introduced in March 2020. The "Acute Epistaxis COVID guideline" (Appendix 1) with "Pack and Home Criteria" (Appendix 2) were distributed amongst A&E staff and ENT clinicians within the hospital by electronic and paper forms. Firstly, we reviewed the pathway prior to the new guidelines over 6 months (Loop 1 - September 2019 to March 2020) and then reviewed 6 months post the new guidelines (Loop 2 - March 2020 to Sept 2020).

## Participants

The study group consisted of all patients, aged 18 years and older, admitted to A&E with epistaxis requiring nasal packing as a form of management during September 2019 to September 2020.

## Data analysis

Primary outcome measure included:

Compliance to “Pack and Home” Criteria

Length of inpatient admission

Secondary outcome measures included:

- Re-bleeding post pack removal
- Re-presentation with bleeding within 48 hours
- Re-presentation within 1 month

A descriptive analysis was performed of the baseline clinical characteristics between patients studied in loop one and loop one of the audit. Percentages were used for the categorical variables whilst mean and standard deviations for the continuous variables. The t-test was used to investigate for associations between continuous variables, whereas chi-squared test of association was used for categorical variables. Non-parametric testing (Mann Whitney U test) had been used for length stay. The level of statistical significance was set at  $p < 0.05$  and confidence intervals were reported at the 95% level. SPSS version 28 was used for statistical analysis.

The terms “Pack and Home” criteria and “outpatient management pathway” are used synonymously in this paper. Patients that were deemed not to be successfully managed on the outpatient pathway were those that did not meet the criteria for the “Pack and Home” pathway or re-presented with bleeding within 48 hours of discharge.

## Results

414 patients presented to A&E with epistaxis in the first loop and 309 patients in the second, of which 72 (17.4%) and 59 (19.1%) patients required nasal packing respectively. This made up the final study population, their clinical characteristics being demonstrated in table 1. No significance in difference ( $p > 0.05$ ) were demonstrated between age, sex, and nasal pack types. However patients in loop one were more likely to be on an anticoagulants including DOACS (direct oral anticoagulants), warfarin and antiplatelets. Patients in loop one were more likely to have a past medical history of Atrial Fibrillation (AF) whereas no difference was demonstrated in the prevalence of other comorbidities between the two groups.

Table 2 shows the outcome measures for patients in loop one and loop two of the audit study. 59 patients required nasal packing in loop two of the audit of which 38 patients (64.4%) received inpatient care whereas 21 patients (35.6%) had outpatient care, thus outlining those that had met the “Pack and Home” criteria. In loop two of the audit study, 56 patients (94.9%) were successfully discharged while 3 patients (5.1%) represented within 48 hours. These 3 patients were all on the “Pack and Home” pathway. All patients discharged with a nasal pack were reviewed in outpatient clinic in under 3 days with nearly 1/3<sup>rd</sup> seen within 24 hours of pack removal and consideration for nasal cautery. No difference was demonstrated for those who had represented with epistaxis within 1 month between the two study cohorts. Image 3 demonstrates the average total length of inpatient stay in loop one to be significantly higher at 45.7 hours whereas only 29.6 hours in loop two ( $p < 0.05$ ).

### Presentations unsuccessfully sent home with packs

Image 2 demonstrates 3 patients on the “Pack and Home” criteria to have re-presented within 48 hours of discharge therefore was unsuccessfully sent home with nasal packing. One patient had a background of ischaemic heart disease and valve replacement requiring anticoagulation. One patient had no comorbidities whereas the other had a history of prostate cancer. Two of the patients that returned with bleeding receiving

nasal packing with Merocel®), whereas the third patient returned to hospital complaining of pain from the nasal packing but no bleeding.

### **Re-bleeding post pack removal**

Image 2 also shows 5 patients in loop one to have re-bled post pack removal. Of these, 3 immediately bled, one re-presented at 12 hours and one represented at 24 hours. 3 of these patients had comorbidities including hypertension and were on anticoagulants. 1 patient had nasal polyps and the other was fit and well. In loop two, 7 patients had re-bled of which 3 were on the outpatient pathway and 4 on the inpatient pathway. 2 on the outpatient pathway had no significant comorbidities, 1 had ischaemic heart disease with valve replacement and therefore did not meet the “Pack and Home” criteria. 4 inpatient re-bleeders had a history of hypertension or were on anticoagulants.

### **Re-presentation within month**

No significant difference was demonstrated for this outcome measure between loop one and loop two patients ( $p > 0.05$ ). In loop one, 11 patients all had comorbidities including hypertension and/or taking anticoagulants. In loop two, 5 patients were healthy whereas 4 had hypertension and/or were taking anticoagulants.

### **Discussion**

This audit investigated the compliance rate and safety implications of the new “Pack and Home” criteria guidelines implemented during the COVID-19 pandemic for patients with epistaxis requiring nasal packing. Prior to the pandemic all those with epistaxis were admitted as inpatients, whereas following the introduction of the new guidelines approximately 1/3<sup>rd</sup> with nasal packs in situ met the criteria and did not require inpatient admission. The new “Pack and Home” criteria resulted in the avoidance of 21 admissions over 6 months, therefore demonstrating an adequate compliance rate with the new guidelines. 3 patients on the new pathway re-presented within 48 hours, of which in retrospect one did not meet the criteria and should not have been put on the outpatient pathway whereas one re-presented with pain and the other with bleeding. Thus, with regards to safety implications, only one patient on the “Pack and Home” pathway re-presented with bleeding within 48 hours.

The INTEGRATE audit study (1) was able to show that patients can be safely discharged with epistaxis and managed on an outpatient basis. Avoidance of admission has implications towards reduced bed occupancy on surgical wards and reduced opportunities for transmission of hospital acquired infections. Like our study, the INTEGRATE paper demonstrated not being packed in the emergency department and being on antiplatelet medications were significant predictors of re-presentation within 10 days. Our study mainly demonstrated an association between being on an anticoagulant and having certain co-morbidities, such as AF, with epistaxis and potential re-bleed rates. Therefore, these are factors that can impact the chances of successfully managing epistaxis on an outpatient bases, according to the “Pack and Home” criteria.

Our study also revealed a reduced length of inpatient stay in the second loop of the audit compared to the first ( $p < 0.05$ ). Reduced length of stay within the hospital may have positive financial implications. This was demonstrated in a study by McCrossan et al. (8), looking at safely discharging patients home with rapid rhinos in situ, where according to “NICE costings statement” there had been a drop in cost/bed-day expenses by approximately £11000 due to reduced length of inpatient stay. Therefore, the “Pack and Home” criteria may influence financial constraints with regards to the possibility of increasing bed availability on surgical wards.

Strengths of this audit study include the large study cohort analysed during a pandemic under difficult circumstances. A key limitation of this audit is the lack of generalisability of the results. Our study population consists mainly of an elderly population which can impact the risk of re-bleeding<sup>9</sup> and raise safety concerns with regards to appropriate outpatient management. A univariate analysis was not performed in this study therefore we were unable to adjust of potential confounding, despite their being minimal difference in baseline characteristics between the first and second loop cohorts.

In summary, our audit study demonstrates the possibility of safely discharging patients home with epistaxis, requiring nasal packs in situ, and being managed on an outpatient pathway. Consideration must be taken towards clinical characteristics of patients that meet the “Pack and Home” criteria to ensure successful and safe compliance with the pathway.

### Conclusion and Recommendations

The ‘Pack and Home’ criteria successfully identifies patients who are suited to outpatient management pathway. Three patients on the ‘Pack and Home’ pathway re-presented back to hospital within 48 hours of which only one re-bleed and therefore deemed as unsuccessful management. This pathway could reduce inpatient admissions, have positive financial implications, and ultimately impact bed availability for surgical patients.

Therefore we recommend the following:

- Ensure clinicians are fully aware of ‘pack and home’ criteria.
- Continue outpatient management pathway as routine (in non-pandemic times).
- Patients should ideally be seen either the following day or day two of pack insertion (day 3+ not optimal).
- We should ensure patients on the outpatient pathway are adequately counselled about what to do if re-bleed occurs and safety net.

### References

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### Tables

Demographic	Loop 1	Loop 2	Total	p-value
No. A&E Epistaxis Packed n (%)	414 72 (17.4%)	309 59 (19.1)	723 131	n/a
Mean Age +/- SD Range	75.6 (+/- 16.1) 31 - 101	77.4 (+/- 11.6) 38 - 101		0.481

Demographic	Loop 1	Loop 2	Total	p-value
Sex n (%) Male	28 (38.9) 44 (61.1)	28 (47.5) 31 (52.5)	56 (42.7) 75 (57.3)	0.324
Female				
Nasal Pack n (%)	55 (76.4) 17 (23.6)	50 (84.7) 9 (15.30)	105 (80.2) 26 (19.8)	0.233
Unilateral Bilateral				
On Anticoagulant	38 (52.8) 34 (47.2)	17 (28.8) 42 (71.2)	55 (42) 76 (58)	0.006
Yes No				
Comorbidities n	30 (63.8) 27	17 (36.2) 11	47 38 36 10 15	0.127 0.018 0.933
(%) HTN AF CV	(71.1) 20 (55.6) 4	(28.9) 16 (44.4) 6		0.322 0.333
disease Diabetes	(40) 10 (66.7)	(60) 5 (33.3)		
Mellitus CVA				

Clinical Variable	Loop 1	Loop 2	Total	p-value
Management n (%)	72 (100) 0 (0)	38 (64.4) 21 (35.6)	110 (84) 21 (16)	<0.001
Inpatient				
Outpatient				
Time to		14 (66.7) 5 (23.8)		
outpatient appt 1		2 (9.5)		
day 2 days 3 days				
Representation	0 72 (100%)	3 (5.1) 56 (94.9)	3 (2.3) 128 (97.7)	<0.001
within 48 hours n				
(%) Yes No				
Representation	11 (15.3) 61 (84.7)	9 (15.3) 50 (84.7)	20 (15.3) 111 (84.7)	0.997
within 1 month n				
(%) Yes No				
Re-bled post pack	5 (6.9) 65 (90.3) 2	7 (11.9) 52 (88.1) 0	12 (9.2) 117 (89.3) 2	0.285
removal n (%) Yes	(2.8)	(0)	(1.5%)	
No Unknown				
Total length of	45.7 (+/- 40.1) 12 -	29.6 (+/- 29.8) 6 -		<0.001
inpatient stay	264	144		
(mean hours +/-				
SD) Range				

## Images

Image 1

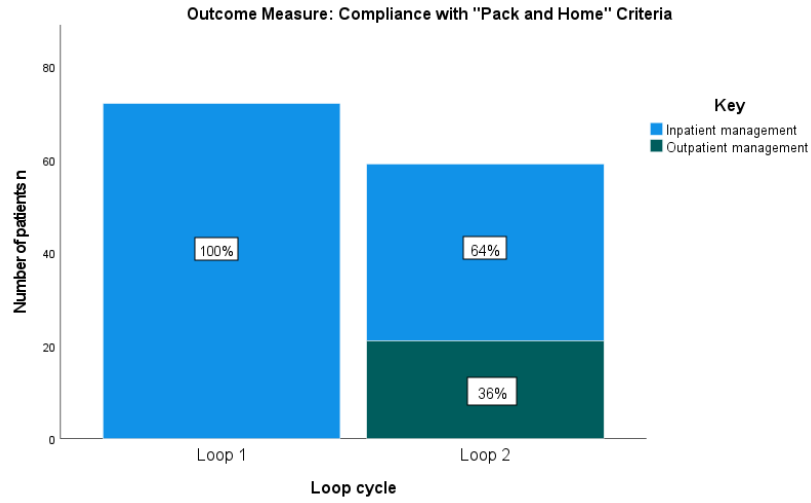


Image 2

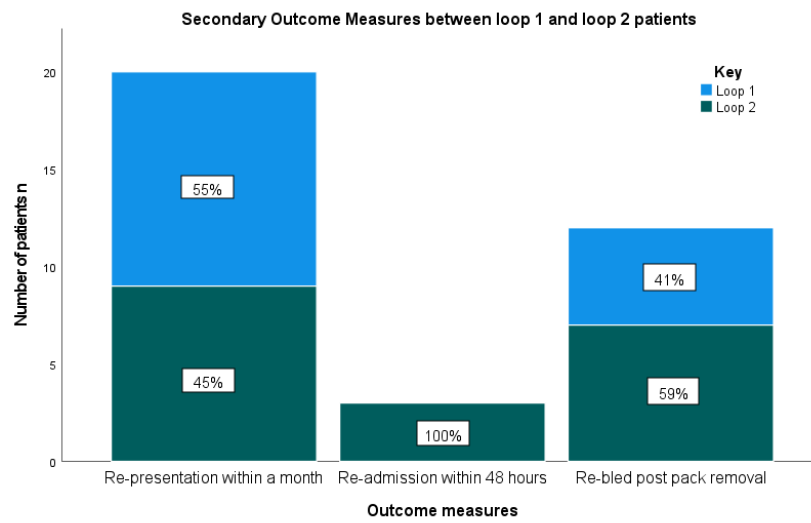
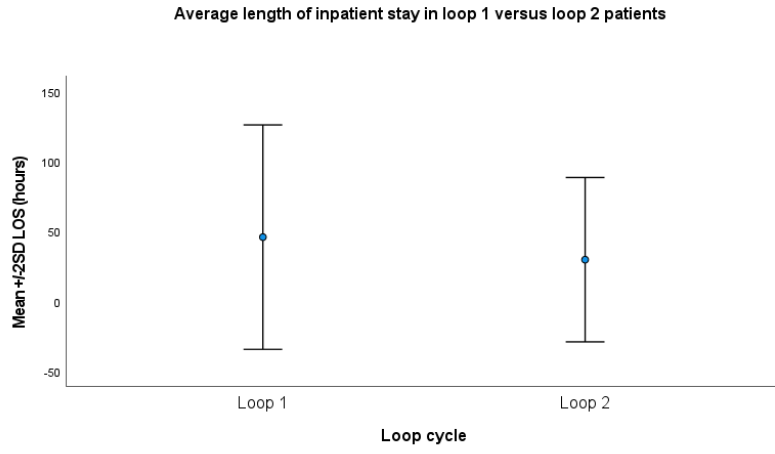


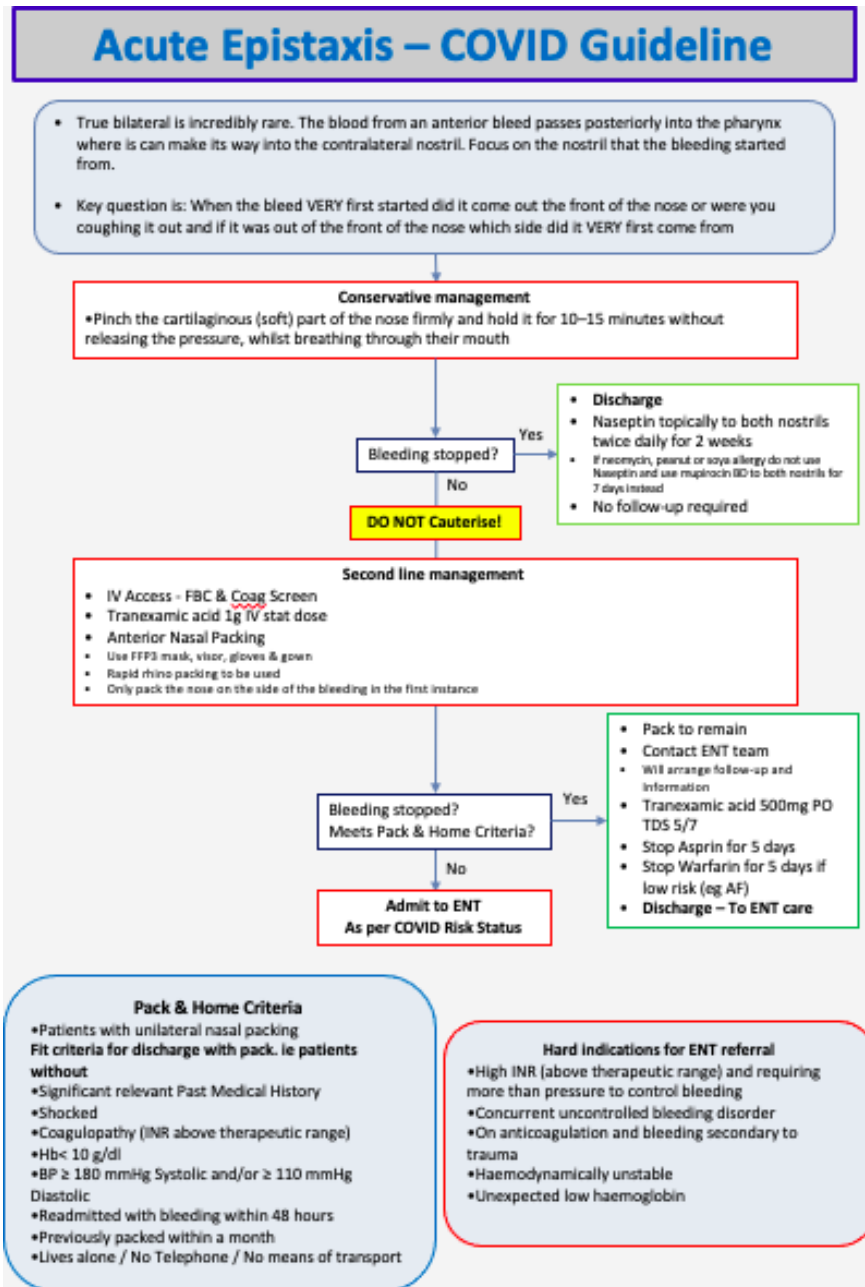
Image 3



## Appendices

### Appendix 1





### **Pack & Home Criteria**

- Patients with unilateral nasal packing
- Fit criteria for discharge with pack. ie patients without**
- Significant relevant Past Medical History
  - Shocked
  - Coagulopathy (INR above therapeutic range)
  - Hb < 10 g/dl
  - BP  $\geq$  180 mmHg Systolic and/or  $\geq$  110 mmHg Diastolic
  - Readmitted with bleeding within 48 hours
  - Previously packed within a month
  - Lives alone / No Telephone / No means of transport