

# Evaluation of Emergency Physician's Role in the Management of Epistaxis in Emergency Department

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## Abstract

**Background:** The most common ENT presentation to the ER in the UK is epistaxis, which is defined as bleeding from the nose in general. This presentation has a prevalence of up to 60% of the people that will have at least one episode of epistaxis in their life. Fortunately, only around 6% will need to seek medical attention and only around 0.2% will require hospitalization. Having a great understanding of this disease is important for every clinician especially in emergency settings. **Objectives:** Our aim is to discuss epistaxis, its pathophysiology, causes, risk factors, and the management done for such patients in general with special focus on the emergency setting. **Methodology:** PubMed database was used for articles selection, and the following keys used in the MeSH ("Epistaxis"[MeSH]) AND "Management"[MeSH]). **Conclusion:** Over the past years, there have been significant breakthroughs in the management of epistaxis and the physicians now have a wider variety of options. However, nowadays more classical options such as nasal packing are still applied and are easier to do. Referral of cases to the ENT is a viable option and should be considered in special cases, as well as hospitalization of epistaxis patients.

**Keywords:** Epistaxis, Pathophysiology, Etiology, Management, Emergency, Review

## INTRODUCTION

There are many common presentations in the emergency department and we usually divide it based on the specialty. The most common ENT presentation to the ER in the UK is epistaxis, generally defined as nasal bleeding <sup>[1]</sup>. This presentation has a prevalence of up to 60% of the people that will have at least one episode of epistaxis in their life. Fortunately, only around 6% will need to seek medical attention and only around 0.2% will require hospitalization <sup>[2, 3]</sup>. This disease is more seen in both age-extreme groups, elders and children as the main population presenting. The emergency physician needs to have a good understanding of the issue and how to manage it in the emergency setting. Even when this presentation seems simple, in rare cases it can be fatal or reflect a more serious pathology and disease, thus, knowing the possible cause and timing of the patient's referral to ENT care is of utmost importance <sup>[1]</sup>. In this paper, we will review the studies relevant to anatomy, pathophysiology, clinical features, diagnosis, management, and referral time of the cases, with a focus on the emergency setting.

## METHODOLOGY

PubMed database was used for articles selection, and the following keys were used in the mesh ("Epistaxis"[MeSH]) AND "Management"[MeSH]). In regards to the inclusion criteria, the articles were selected based on the inclusion of one of the following topics; epistaxis, epistaxis management, and epistaxis evaluation. Exclusion criteria were all other

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articles, which did not have one of these topics as their primary endpoint.

## REVIEW

### Anatomy and Pathophysiology:

Epistaxis is a very common condition encountered in the emergency setting and daily life. In order to correctly assess epistaxis presentation, background knowledge about the blood supply of the nose and having a well-trained physician to deal with such patients is essential <sup>[4]</sup>. The nasal cavity and its structures receive their blood supply from branches of the posterior and anterior ethmoidal arteries, which are branches of the ophthalmic artery that came from the internal carotid when passing toward the skull. Another supplement came from branches of the maxillary artery, the greater palatine, and sphenopalatine arteries. Finally, the superior labial artery branch of the facial artery represents the external carotid supplementation to the nose <sup>[5]</sup>. The meet up of these branches forms a highly supplied area that is more prominent to bleed in case of epistaxis, known as Kiesselbach's plexus (Little's area). Anterior epistaxis results in bleeding through the nose, representing 90% of cases, where the posterior epistaxis may result in bleeding through the mouth and toward the throat. Posterior is more aggressive, with an increased risk of clotting, irritation to the esophagus and stomach, inducing vomiting and aspiration. The etiology of epistaxis is often idiopathic, but could possibly be due to dryness of the nares (more in winter and at nights), allergies and inflammatory processes, hypertension, trauma, tumors, and postoperative bleeding. Patients having hypertension, and or coagulation/vessel defects are the main suspected mechanisms behind epistaxis attacks <sup>[6-8]</sup>.

### Management:

The management of epistaxis has multiple goals, starting from stopping the bleeding, stabilizing the patient, and diagnosing the possible causes. Thus, an emergency physician needs to have a good understanding of the disease, and how to manage it due to the fact that treatment differs based on the situation. However, resuscitation is still the first step that needs to be done, and checking airway patency, signs of hypovolemia, along with fast initiation of suitable therapy is important <sup>[1]</sup>. Initial management in cases of mild bleeding consists of compression of both nostrils and plugging of the affected nostril. The compression is done via direct application of pressure into the septal area while plugging can be done with cotton or gauze after soaking them in topical decongestants. The ER physician should instruct the patient to tilt the head forward (thus preventing blood pooling in the posterior pharynx) and to apply the pressure for a period between 5 and 20 minutes <sup>[9]</sup>.

If the initial management fails, the localization of bleeding is essential and should be done by the ER clinician. Localization simply means the visualization of the bleeding source, and this is done after proper nasal preparation. Nasal preparations are done to ensure good visualization of the nose, this usually

includes asking the patient to forcefully blow through the nose in order to clear any clots. Anterior rhinoscopy with Thudicum's speculum is used to view the nasal cavity in order to evacuate any persistent clots by means of suction. Lab tests can be done in epistaxis patients in the emergency setting including complete blood count, full coagulation profile, and if needed blood typing and cross-matching for possible blood transfusion. In cases of anterior bleeding, and after the failure of the initial management, chemical cautery is usually attempted if the source of bleeding was visualized. Silver nitrate stick is usually used, with the physician applying it on the source of bleeding for five to ten seconds, and further cautery of the feeding vessels limit the recurrence rate <sup>[10]</sup>. Furthermore, anesthetizing (along with vasoconstrictor) the little's area is done via cotton wool or nasal spray, after a proper time, the nasal cavity is viewed starting from little's area. Some findings upon visualization may give the physician a hint towards the cause of bleeding, for example, diffuse oozing along with multiple and recurrent bleeding sites indicate a systemic disease like hypertension or coagulopathy. Another option for cautery is using the electrocautery, but this option is usually done by the otolaryngologists, moreover, one study suggested no major difference between the two options. However, this technique is not perfect with complications such as septal perforation, and heat damage to the anterior nares and inferior turbinate seen in some cases <sup>[9, 11]</sup>.

### Anterior Packing:

In some cases, bleeding will persist, and then the next step in management is to pack the anterior compartment as a whole, via nasal tampon (Merocel, Doyle sponge, and Rapid Rhino) or ribbon gauze packing. According to a study, there is no significant difference between the two, and tampon is usually chosen in ER, so that it is placed on the floor of the nose and self-expands with any liquid contact (including blood or saline). The physician can apply lubricant to the tampon to facilitate insertion, putting some vasoconstrictor might fasten the effects, and using topical antibiotic ointment on it is done, too. The packing material can be left in the nose for three to five days to be sure that a clot has been formed. The main side effects of this modality of treatment include septal hematoma, abscess, sinusitis, neurogenic syncope while inserting it, pressure necrosis, and possible toxic shock syndrome <sup>[12]</sup>.

### Posterior Epistaxis Management:

If the patient still has bleeding after all the aforementioned therapy, the clinician should immediately suspect posterior epistaxis as the reason and shift the management accordingly. The first step in managing a patient with posterior epistaxis is with posterior packing. This may be done with a balloon (Brighton balloon, Simpson plug, Epistat nasal catheter, and Foley's catheter) or with formal posterior packing <sup>[13]</sup>. The balloon technique helps in stopping the bleeding not only by creating direct pressure on the bleeding site but also by creating a tamponade in the nasal cavity by accumulating the blood in there. This can be done with the regular Foley's catheter by inserting it into the anterior nares, passing it back

till the tip seen on the other side in the oropharynx, then inflated (for 3-4 ml) and pulled forward till the balloon engages with posterior choana. This technique is coupled with anterior packing, and the balloon is clamped at the anterior nares (with umbilical clamp for example), and soft tissue is placed to protect columella. This technique has its own complications such as pressure necrosis, airway compromise (with posterior displacement), deflation in situ (especially if air inflation was chosen), and rupture of the balloon, which may lead to aspiration (if liquid inflation was done). However, nowadays specially made balloons (such as Brighton) for the epistaxis are available, with postnasal and mobile anterior balloons, which are independently inflated and safer.

Another option is the formal posterior packing, however, this procedure is so uncomfortable that it is usually carried out under general anesthesia and by an otolaryngologist. The main process is to insert a gauze pad in the posterior space, and this pad is sutured to a catheter that is inserted in the nose and into the nasopharynx and maneuvered until lodges against the choana. The protection of columella from possible pressure necrosis is usually done via dental roll. Other complications include failure to stem bleeding, toxic shock syndrome, blocking of nasolacrimal duct (leads to epiphora), sinus (leads to acute sinusitis), airway (full obstruction or partial –hypoxia-, and/or sleep apnea), nasovagal reflex, acute airway obstruction (with wrong pack placement into the oropharynx), and induction of bleeding when removing the pack. Once posterior packing is done, the patient is hospitalized while the pack is there (usually between 2 to 5 days), and may even need intensive care for monitoring in the special population (elderly or children) <sup>[14]</sup>.

### Surgical Options:

Further options if the bleeding still persisted are primarily carried out by the otolaryngologist, and are more invasive and require hospitalization. These modalities include diathermy (under general anesthesia), septal surgery, arterial ligation (for sphenopalatine, anterior/posterior ethmoidal, maxillary, or external carotid artery), angiographic embolization, and endoscopic electrocautery. Referral flags to the ENT that should be considered by the ER physician: Firstly, assessment of the bleeding side suspected a unilateral bleeding source. Secondly, the bleeding amount is excessive. Thirdly, often posterior epistaxis required hospitalization due to the accompanying complication risks. Finally, when noticing other areas of bleeding indicating underlying causes and suspected a strong family history of bleeding problems like von wellbore disease <sup>[5]</sup>. Patients with recurrent epistaxis attacks should be educated after stopping the bleeding. This should involve instructing the patient to have proper hygiene, humidified room conditions, and other preventive measures. Some recent breakthroughs have been made in management with new techniques like laser for recurrent epistaxis, along with fibrin glue, and these are being suggested as a more favorable replacement to some modalities <sup>[12]</sup>.

## CONCLUSION

Over the past years, there have been significant breakthroughs in the management of epistaxis and the physicians now have a wider variety of options. This has made them aware of such options and when to use them, especially for emergency physicians. However, the more classical options such as nasal packing are still applied and only made easier to do with the latest electrical and optical devices. Furthermore, the ER physicians should never forget the importance of the systemic approach with resuscitation and getting the relevant labs to rule out major pathologies <sup>[15]</sup>. Referral of cases to the ENT is a viable option and should be considered in special cases, as well as hospitalization of epistaxis patients. The recent horizon in epistaxis management focuses on limiting the side effects of the management options and especially the more complicated ones such as ligation and embolization.

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