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Management of acute epistaxis

CLINICAL REVIEW

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Epistaxis, or nosebleed, is a common condition both in and outside hospital settings. Most episodes resolve spontaneously or can be managed with simple measures, but more advanced treatment may be required in some

cases. This article provides a clinical overview of the management of acute epistaxis, with particular emphasis on measures that can be undertaken by healthcare personnel in primary care and in pre-hospital settings.

Epistaxis entails bleeding from the nostrils, nasal cavity and/or nasopharynx (1). The estimated lifetime prevalence in the United States is up to 60 %, with approximately 6 % seeking medical treatment (2). Data from the Norwegian Registry for Primary Health Care indicate an average of more than 5000 annual contacts with out-of-hours primary care services in Norway due to epistaxis (3). In 2025, Western Norway Regional Health Authority registered 116 emergency hospital admissions with epistaxis as the primary diagnosis and 480 acute outpatient consultations (unpublished data from Norway's national reporting portal, personal communication to Anders Hauge Steinbakk).

The nose is highly vascularised, with branches from both the internal and external carotid arteries. Most bleeding originates from the anteroinferior nasal septum, an area supplied by Kiesselbach's plexus (2, 4). This plexus is an anastomotic vascular network formed by branches of the anterior ethmoidal artery (from the internal carotid artery) and branches of the sphenopalatine artery, greater palatine artery and superior labial artery (from the external carotid artery) (Figure 1).

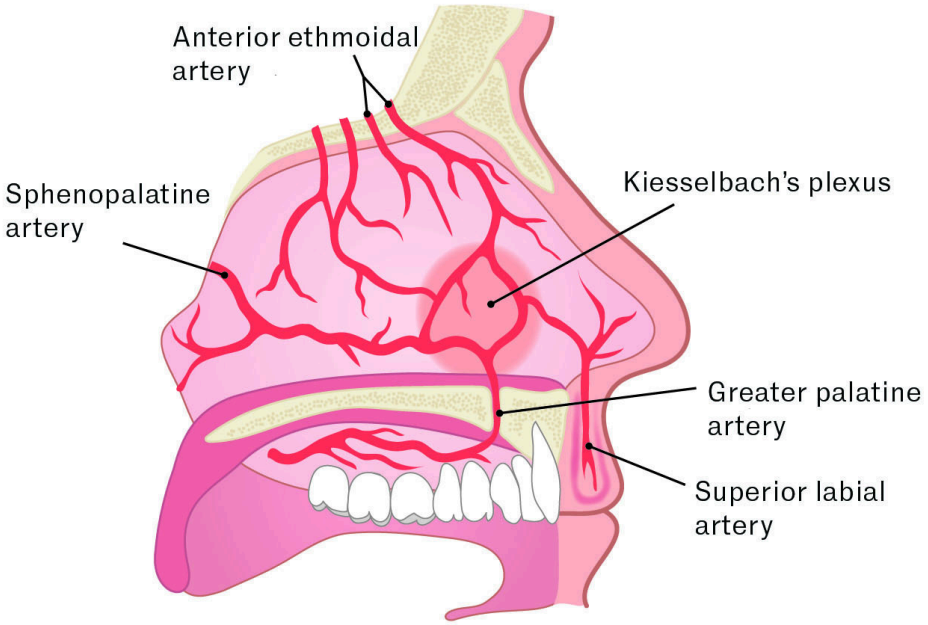

Figure 1 Blood supply to the nose. Illustration: Jeanette Engqvist/Illumedic

The majority of epistaxis cases occur spontaneously (2). The causes can be classified as local, systemic or idiopathic (2). Local causes include dry mucosa, use of intranasal medications, inflammation, infection, tumours and trauma. Systemic causes can include liver failure, haematological and autoimmune conditions, connective tissue disorders, as well as the use of anticoagulants and

antiplatelet agents. Recurrent epistaxis, particularly when unilateral, could indicate malignancy in older patients, whereas in children it is often due to a nasal foreign body (1).

Epistaxis is usually classified as anterior or posterior. Approximately 80–90 % of all nosebleeds are anterior and are generally easy to manage (2). Posterior epistaxis typically originates in the posterior nasal septum, lateral nasal wall or nasal floor. The source of bleeding in most cases is the sphenopalatine artery and the ascending pharyngeal artery. Posterior bleeds are often more severe, with increased blood loss and a risk of airway obstruction (1).

Although most cases of epistaxis respond to simple measures, some can be severe and may be life-threatening. This particularly applies to patients with local causes such as tumours or vascular malformations, disorders affecting coagulation or platelet function, or those taking antiplatelet or anticoagulant medication (2).

Based on a selected body of literature and the authors' clinical experience, we provide an overview of epistaxis and describe measures that can be performed by patients and by healthcare personnel in primary care, prehospital settings and the specialist health service (Figure 2).

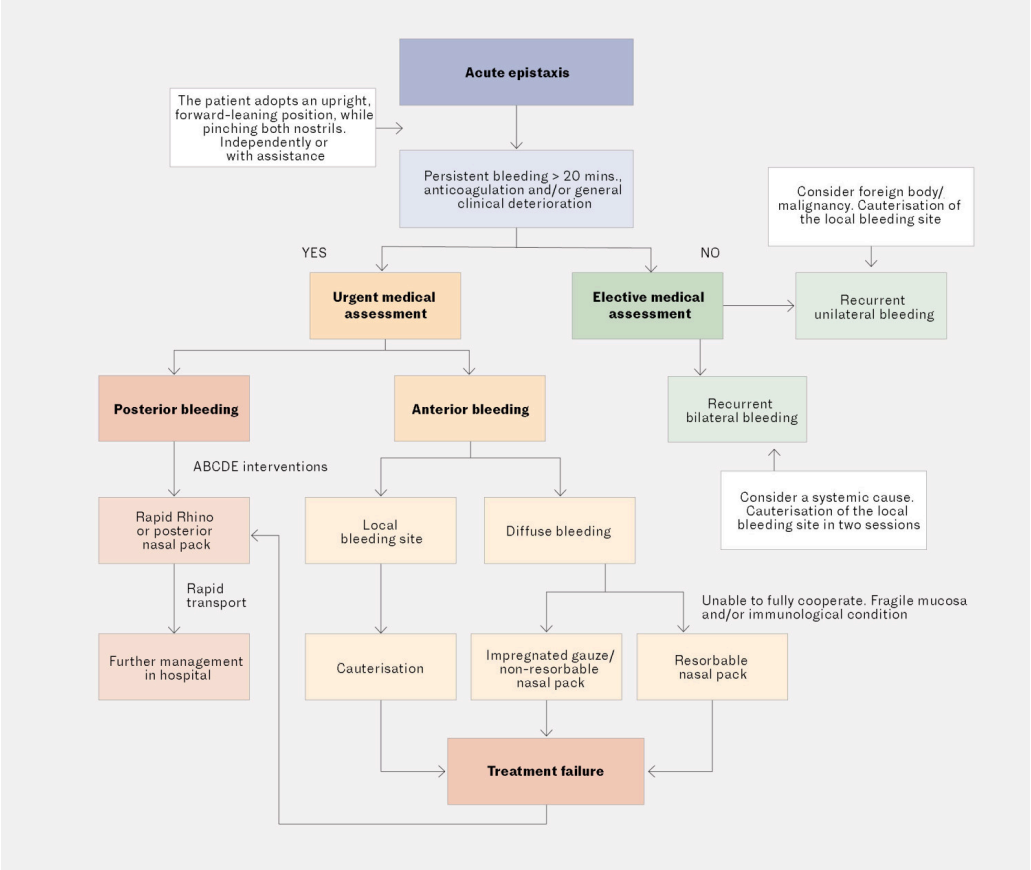

Figure 2 Prehospital decision-making algorithm for acute epistaxis.

First aid

Patients with acute epistaxis should be instructed in simple first aid measures. These measures can also be communicated to patients who call out-of-hours primary care services, Emergency Medical Communication Centres (EMCCs) or their general practitioner (GP), and are referenced in the decision support tool for telephone triage (*Legevaktindeks*), the Emergency Primary Health Care Manual (*Legevakthåndboken*) and the Norwegian Index for Medical Emergency Assistance (a criteria-based dispatch protocol) (5–7). The measures can be performed by the patient themselves or with assistance, as outlined below:

Gently blow your nose to remove clotted blood. Sit upright with the upper body slightly leaning forward. Pinch both nostrils and maintain pressure for at least 15 minutes (time it!). Apply firm pressure, but not so hard that it causes pain. For children, apply pressure for 5 minutes.

Rinse your mouth several times with cold water, suck on an ice cube, or place a cold cloth over your nose during compression and afterwards. If a topical nasal decongestant spray or drops (e.g. xylometazoline or similar) are available, they should be used before starting compression.

Prehospital management

Patients should be assessed promptly by a doctor if bleeding persists for more than 20 minutes despite the above measures, if they are uncooperative, receiving anticoagulant therapy, or clinically unwell (5–7). The patient should then, independently or with assistance, adopt an upright, forward-leaning position and pinch the nostrils, while equipment is prepared and initial assessment is undertaken (Figure 3). The patient can be covered to limit blood soiling, and the clinician should use appropriate protective equipment. If the situation allows, information should be obtained regarding the volume and laterality of bleeding, comorbidities, medication use and any previous nasal or facial surgery or trauma. In non-life-threatening bleeding in patients receiving anticoagulant therapy, local measures are recommended as first-line treatment, with consideration of temporary interruption of anticoagulation rather than prolonged discontinuation or reversal (1).

Figure 3 Items used for acute epistaxis: a) Resorbable nasal pack, b) Silver nitrate, c) Impregnated gauze strips, d) Nasal speculum, e) Local anaesthetic, f) Non-resorbable nasal pack with balloon, g) Non-resorbable nasal pack without balloon, h) Nasal clip, i) Tongue depressor, j) Kidney dish with cotton strip, k) Ointment, l) Urinary catheter

The nasal cavity should be examined under good lighting using a nasal speculum. Suction can be used if available. The posterior pharyngeal wall should be examined using a tongue depressor, both at presentation and after bleeding from the nostrils has ceased, to check for possible posterior bleeding. Although epistaxis is normally uncomplicated, substantial blood loss can occur, and posterior bleeds in particular can compromise the airway. In patients showing signs of major blood loss or general clinical deterioration, a systematic assessment according to the ABCDE approach should be undertaken. Vital signs should be measured, and the patient's clinical condition assessed. Where appropriate, intravenous access should be established early, and arrangements made for rapid transport to hospital.

Local anaesthetic is useful before painful procedures and can be administered using moistened cotton strips (Video 1). Anaesthetic agents containing adrenaline also have a haemostatic effect and improve visualisation of the bleeding site. Tranexamic acid can be used in addition to adrenaline and xylometazoline (1, 2, 8) and administered orally, intravenously or topically within the nasal cavity. A moistened gauze swab or anterior nasal pack can be applied to reduce the risk of rebleeding and as an adjunct to other measures (8).

Video 1 *Cauterisation with silver nitrate and placement of impregnated gauze strips for epistaxis*

If the bleeding site can be identified, cauterisation may be attempted. Outside hospital settings, chemical cauterisation, for example with silver nitrate, is commonly performed, whereas electrocauterisation, which has a lower failure rate, is generally available in hospitals (2). Both techniques require relatively dry conditions and adequate visualisation. When using silver nitrate, it is advisable to first cauterise the mucosa surrounding the bleeding site, as direct application to the bleeding site can trigger further bleeding (Video 1). Excessive cauterisation can cause cartilage injury and septal perforation and should therefore be restricted to one side of the septum. If necessary, treatment of the other side can be undertaken after mucosal healing. Particular caution is needed in patients with underlying conditions predisposing to mucosal injury (2). Following chemical cauterisation, application of a moisturising or lubricating agent can reduce postoperative crusting (1).

In more diffuse bleeding, non-resorbable nasal packing may be appropriate. This can also be used as an adjunct following cauterisation. A narrow strip of gauze is often used for this. The gauze strip may be impregnated with an ointment such as Terra-Cortril (Terra-Cortril, Pfizer). The nasal cavity is then packed in layers using the impregnated gauze strips (Video 1). It is important to insert the strips parallel to the nasal floor, ideally building the packing upwards towards the nasal roof. Merocel (Merocel, Medtronic Xomed) is a non-resorbable expanding nasal pack composed of polyvinyl foam, which can be lubricated with Terra-Cortril ointment or petroleum jelly to facilitate insertion.

The pack is inserted parallel to the nasal floor, if necessary with slight elevation of the nostril (Video 2). On contact with fluid, the material expands, producing a tamponade effect.

Video 2 *Insertion of Merocel (Merocel, Medtronic Xomed) for epistaxis*

Non-resorbable nasal packing can remain in place for 1–3 days before being removed by the patient or healthcare personnel. Beyond three days, prophylactic antibiotics are often recommended, although the evidence base for this is limited (1).

A common alternative in the prehospital setting is Rapid Rhino (Rapid Rhino, Smith & Nephew), which is a nasal pack coated with carboxymethylcellulose and containing one or more inflatable balloons. The pack is moistened in sterile water for 30 seconds and then inserted along the nasal floor (Video 3). The balloons are then inflated with air using a 20 mL syringe. The pressure is checked after 15–20 minutes and adjusted if necessary. The pressure should be sufficient to stop the bleeding without placing undue stress on the mucosa and cartilage, as this can result in tissue necrosis. The nasal pack is removed after 24–72 hours.

Video 3 *Insertion of Rapid Rhino (Rapid Rhino, Smith & Nephew) for epistaxis*

Insertion of resorbable materials is often less uncomfortable for the patient and relatively straightforward to perform (Video 4). It is also associated with a lower risk of rebleeding, as can occur upon removal of non-resorbable materials (1). This method is therefore particularly suitable for patients with underlying conditions predisposing to mucosal injury and for those unable to fully cooperate, such as children or patients with cognitive impairment (2). Resorbable materials can also be used as an adjunct to concurrent cauterisation.

Video 4 *Insertion of Surgicel (Surgicel, Ethicon) for epistaxis*

If other measures are unsuccessful, posterior nasal packing can be a potentially life-saving intervention (Video 5). The procedure is commonly performed using a urinary catheter passed through the nasal cavity into the oropharynx. The catheter balloon is inflated with 4–5 mL of water, and the catheter is then drawn forward until the balloon becomes lodged in the nasopharynx. The balloon volume is adjusted according to whether bleeding is observed along the posterior pharyngeal wall. An anterior nasal pack is then placed alongside the catheter, for example using impregnated gauze strips. The catheter is secured at the nostril with a clamp, with gauze placed between the clamp and the nasal ala to prevent pressure necrosis. Balloon pressure should be titrated to the minimum effective level in order to avoid mucosal pressure necrosis.

Video 5 *Placement of posterior nasal pack for epistaxis*

Collaboration between prehospital services and hospitals is central to the management of patients with epistaxis. Specialty registrars are expected to learn interventions such as anterior nasal packing, but access to supervision and clinical exposure is likely variable. Structured training and, where appropriate, job shadowing in otorhinolaryngology departments for out-of-hours primary care doctors may help improve expertise and improve collaboration between levels of care.

Treatment in the specialist health service

Patients should be transferred to hospital for further management if the above measures fail or if posterior epistaxis is suspected. In complex cases, transnasal endoscopy may be a treatment option (1). This procedure has a high success rate and is typically performed with clip ligation or electrocauterisation of the sphenopalatine artery (1). Endovascular embolisation is an interventional radiology procedure involving occlusion of the bleeding vessels. This procedure can achieve favourable outcomes but is associated with more serious complications than other treatment options (1, 2, 4).

Patients with spontaneously resolved bleeding may also be suitable for referral and further treatment. In cases of recurrent unilateral epistaxis with an identified bleeding site, GPs can perform cauterisation if they have the necessary equipment and materials. If no bleeding site is identified, referral for

further evaluation by an otorhinolaryngologist should be considered, including assessment for foreign bodies or tumours. In cases of recurrent bilateral epistaxis, cauterisation can be performed in two sessions, and referral should be considered for evaluation of underlying causes, such as coagulation disorders or immunological conditions.

The article has been peer-reviewed.

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