

Nosebleeds (Epistaxis)

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Aetiology and definition

Anterior epistaxis

Most commonly (85-95%) nosebleeds originate from an area on the nasal septum close to the nostrils (Little's area or Kiesselbach's area). Anterior epistaxis is more common in children and young adults and most often 'spontaneous', mild and easy to control.

Aetiological factors

- Environmental factors: cold, dry air^{1,2} (also associated with posterior epistaxis)⁵
- Local factors: infection¹⁻⁴, rhinitis, sinusitis
- Trauma: picking the nose¹⁻⁴, nasal fractures¹⁻⁴
- Foreign body^{3,4}
- Iatrogenic^{2,3}
- Neoplasia¹⁻⁴
- Chemicals, including cigarette smoke²

Except with severe facial trauma, such as motor vehicle accident, traumatic epistaxis is usually from an anterior nasal source and easily treated.^{2,4}

Posterior epistaxis

Less commonly (5-15%) nosebleeds originate from far back in the nose (far posterior in the inferior meatus).

Posterior epistaxis is more common in elderly patients^{4,5,16} and often moderate to severe and may be difficult to control.^{1,5,16,21}

Posterior epistaxis may reflect an underlying condition which needs further attention:

- Hypertension.^{2,5-10} It is still controversial whether HT is associated with adult epistaxis. But it is recommendable to check BP during an episode of epistaxis and 'treat it straight away because it may exacerbate ongoing nasal haemorrhage, as well as after the episode of epistaxis in order to rule out sustained HT'.⁶
- Arteriosclerosis.^{1,2,4,16}
- Tumour in paranasal sinus or nasopharynx²⁻⁴: (intermittent) epistaxis can be the only symptom.
- Foreign body^{3,4}: as for a tumour, usually presents with unilateral symptoms; foul discharge and epistaxis.
- Chronic renal failure^{2,5}: persistent epistaxis may be encountered in CRF patients.
- Alcohol: patients who have a regular high alcohol consumption have an increased risk for epistaxis.¹¹

- Bleeding tendencies associated with liver disease, aplastic anaemia, leukaemia, thrombocytopenia, hereditary coagulopathies.¹⁻⁵
- Medications: Warfarin, Aspirin.^{3,5,10,12,13}

The association between non-steroidal anti-inflammatory drugs (NSAIDs) and epistaxis is unclear.¹³ Aspirin differs from all other NSAIDs in that it reproduces irreversible acetylation of cyclooxygenase. Hence, its effect is permanent and lasts for five to seven days, the life of the platelet. In contrast NSAIDs have a reversible but variable degree of inhibition of this enzyme.

Management of epistaxis

Acute management

First aid measures should always be performed, independent of the provisional cause, probable location (anterior versus posterior epistaxis) and apparent severity of the epistaxis. First aid measures are designed to stop anterior epistaxis, which is the most common form of epistaxis.

- Calm the patient; sit the patient up, leaning forward.^{2,15,19} This position allows gravity to keep blood flowing out of the nostrils, rather than posteriorly down the throat. Encourage patient to spit out any blood that trickles down the back of the throat to prevent swallowing/aspiration⁴ large amounts of bloods. This allows you to see if there is ongoing blood loss, and swallowed blood can tend to cause vomiting.
- Put on gloves and hold the nose firmly between the full surface of the fingertips of thumb and forefinger (pinch the nasal alae together).^{1-4,15,19} Although so simple as to seem obvious, <50% of emergency department personnel could describe the correct site to apply digital pressure in a nosebleed.²
- Press for five^{1,2} to 10^{1,4,15,19} to 15^{4,14} minutes, continuously (without releasing pressure in the mean time to check for ongoing bleeding). People tend to check too often without giving natural haemostasis mechanisms a really good chance. There was nothing in the literature to recommend one time period over another 10 minutes seems reasonable.
- Giving the patient ice to suck^{15,19}, or holding a cold wet towel over the upper face (a cold compress on the nasal bridge) is recommended by some authorities, however no specific evidence of its efficacy could be found.^{4,15,19} It was not included in the protocol.
- Check BP, pulse and treat if necessary^{1,2,4}: If BP >180/110 give Nifedipine 10 mg S/L or oral. [Editor: Fast-acting nifedipine is unlikely to be available so discuss BP control with a doctor.] If BP low and pulse high, suspect hypovolaemia, shock and give IV fluids.
- When the bleeding stops, tell the patient not to blow the nose for the rest of the day. This is simply to preserve the new blood clot.

If bleeding continues

- Apply pressure from within by inserting a cotton pledget (or small pieces of ribbon gauze) in the nostril(s), impregnated with a vasoconstrictor¹⁴ (to constrict the blood vessels aiming to reduce/ stop bleeding) and a topical anaesthetic¹⁵ (to numb the nasal mucosa, therefore facilitating further inspection and handling, if necessary).^{1,2,4,16}

Agents with combined vasoconstrictor-anaesthetic properties are recommended.

- Commonly used agents with combined vasoconstrictor and anaesthetic properties: co-phenylcaine forte spray²⁸, cocaine 4%.^{4,16} Co-phenylcaine forte spray is widely available, cheap and easily administered.²⁸ However, there are logistical difficulties with storing cocaine-like substances in many remote clinics.
- Commonly used vasoconstrictors: phenylephrine 0.25%^{1,2}, pseudoephedrine², adrenaline (1:10 000)^{2,4,14}
- Commonly used anaesthetics: lidocaine solution⁴ 1¹⁵ -2¹ -4^{2,16}%, lidocaine gel, xylocaine 10% spray^{15,19} tetracaine.⁴

Hold for 10 minutes, then pull pledgets out and look quickly for the bleeding site (suction away blood ^{2,4,14}).

If a bleeding tendency is suspected (see aetiology), electro-cautery is not used.^{1,2,4} Vaseline (petrolatum) gauze is used to apply pressure as atraumatically as possible to the bleeding point. Note that the Royal Darwin Hospital ENT clinic does not see any reason to not use cautery in this situation.

Otherwise, the bleeding point (usually visualised at the anterior nasal septum, Kieselbach's or 'Littles area') may be cauterised by chemical cautery: silver nitrate in a 75% applicator bead^{1,16} or trichloroacetic acid.²

Cautery can be applied to multiple areas in a peripheral to central direction for four or five seconds^{4,16}: the area immediately around (1 mm away from) the bleeding area is cauterised first and then cautery is applied over the bleeding area.²⁸

Up to two or three silver nitrate sticks are needed, but care is necessary since excessive or bilateral septal cautery may cause septal perforation.^{2,4,16} However, the technique most often seems to be effective and safe (even in inexperienced hands) if one limits cautery to one side of the septum (only via one nostril). Moreover, chemical cautery is cheap: Graftco silver nitrate 75% (Sigma) costs A\$10-15 for 100 sticks.²⁸

In children, cautery is said to be very effective. A UK study¹⁷ however, claims the application of a nasal antiseptic cream (Naseptin, possibly similar to Nasalate Nose Cream, a combination of chlorhexidine and phenylephrine in paraffin listed in MIMS-OTC 2000) is equally effective, but easier to apply and therefore treatment of choice. This study compares recurrent epistaxis rate with either option (cautery versus AB cream), which is only one way at looking at effectiveness. Antibiotic cream application after cautery is advised by other literature as well.^{2, 28}

If the above is unsuccessful, nasal packing is needed. Classic anterior nasal packing is performed with narrow gauze^{1,2,4,15,16,19} (1 cm x 20 cm length of gauze), soaked with 10% xylocaine spray or 1% lidocaine solution. Kaltostat as an alternative material for nasal packing showed similar efficacy and patient acceptance.

The gauze should be impregnated with one of the following three alternatives:

- Antibiotic² (e.g. Neosporin, Bacitracin, Kenacomb²⁸). The AB aims to prevent toxic shock syndrome, a rare syndrome that has four major criteria: fever greater than 38.9°C; an exanthema with erythroderma; subsequent desquamation; and orthostatic hypotension and shock.¹⁸
- BIPP18 (Bismuth Iodine Paraffin Paste), is expensive but seems to be the most popular in the UK.^{3,18} This statement seemed to be a general impression from the authors, shared by Dr Alam (ENT, ASH).¹⁸ One study²⁴

discourages its use in combination with Foley catheter ballooning, while another study²² recommends its use in combination with Foley catheter ballooning.

- Vaseline^{4,16} (non-adhering fine mesh gauze impregnated with white petrolatum) is widely available, cheap, effective and atraumatic (ideal in case of bleeding tendencies – see above)

The general goal is to place the packing from the back and bottom of the nose forward.⁴ Gauze should be inserted with a thin forceps (bayonet or Tilley's nasal packing forceps^{2,16,19}) until sufficient pressure exists to tamponade the bleeding, leaving 3 cm of the gauze outside the nostril and taped to the face. The most common error is failure to adequately pack the posterior aspects of the anterior nasal cavity.²

Merocel nasal packing

A recommended and frequently used alternative to classic anterior nasal packing is Merocel nasal packing^{2,18,20} (Xomed). Merocel is a compressed, dehydrated sponge, which can be slid into the nasal cavity and then, when rehydrated by blood (or added saline), expands to three times its normal size partially filling the nasal cavity. A Merocel pack meets nearly all the criteria for an ideal nasal pack¹⁸: it is easy and quick to insert (its actual insertion takes only a couple of seconds, but is unfortunately not painless), usually well tolerated when in place and its removal is less painful than its insertion.

Merocel has minimal risk of aspiration and can be used for anterior (8 cm) and posterior (10 cm) epistaxis as well as for bilateral epistaxis.¹⁸ For pragmatic reasons the 10 cm packs could always be used and trimmed with scissors according to the patient's internal nasal anatomy.²⁸

Insertion requires minimal teaching and is effective for stopping epistaxis in over 90% in inexperienced hands.^{2,18} Merocel packing seem to inhibit bacterial proliferation and offer some protection against toxic shock syndrome.¹⁸ Moreover, the packs are cheap¹⁸ (A\$11.00 in 2001)²⁸ for the 10 cm posterior pack and they have a lengthy shelf life (+/- 10 years).

Insertion¹⁸

Merocel is inserted, after lubrication with an antibiotic ointment (e.g. bacitracin), at an angle of 45° for a distance of 1-2 cm. It is then brought into the horizontal plane and with firm pressure quickly pushed straight backwards into the nasal cavity. If the pack doesn't fully rehydrate with blood, rehydrate with saline.

Removal¹⁸

Using an orange needle, inject the end of the pack and rehydrate with 10 ml of saline or water. Leave for five minutes. Grab the end of the pack with forceps and gently withdraw.

- Systemic antibiotics are recommended if a nasal pack has been inserted to prevent sinusitis.^{1,2,4} This is important.²⁸
- A nasal pack usually stays in for two days^{4,28}, except for severe cases where three to four days may be required.^{2,4,1} In one study⁵ one of the factors associated with rebleeding was (posterior) pack removal within 48 hours.

Even when a nasal pack is successfully inserted complications are possible, hence the recommendation to refer to hospital.

After anterior packing, the patient's throat is inspected. If blood is still visible trickling from the nasopharynx (or patient swallows most of the blood)¹⁹, either the anterior pack is not optimally placed (in which case one should try to reinsert a nasal pack) or there is a posterior nasal bleeding source.^{2,4}

Bilateral epistaxis was not helpful in diagnosing posterior epistaxis: equal numbers of patients presented with unilateral and bilateral bleeding.⁵

Continued bleeding suggests posterior bleeding source

Options for controlling a posterior nasal bleed include:

Merocel posterior pack^{18,20}: (Pope Epistaxis Packing #400406, length: 10 cm pack). Other posterior nasal packs are more difficult to insert.

If a Merocel posterior pack is not available, or failed insertion is encountered, it might be justified to try tamponade with a catheter balloon (e.g. Foley catheter). This depends upon one's experience, confidence and available equipment – especially in the case of a remote epistaxis-emergency (a shocked patient or a hypovolaemic patient with significant ongoing epistaxis) – while awaiting evacuation to hospital.

Posterior bleeds can be very difficult to control and are more likely to be associated with other diseases needing expert attention, hence the recommendation to urgently refer any person with a suspected posterior nasal bleed.

Balloon catheters (Foley catheter, Brighton Balloon, Simpson Balloon) are an alternative to tamponade by posterior packs inserted in the nasopharynx via the nostrils and inflated with sterile water or air. The balloons are secured anteriorly using a clamp (e.g. umbilical cord clamp).

The Foley catheter^{4,19,21-24} has been used for decades (since 1956). However, this catheter is not designed and not licensed for arresting epistaxis; it appears to have higher rates of complications than other balloon catheters.²¹

Nevertheless, Foley catheters are frequently successful in arresting epistaxis, especially in combination with an anterior gauze-based pack.^{4,19,21-24} Furthermore, they are cheap and readily available!

Insertion and inflation (of Foley catheter)

The deflated catheter is inserted in the nostril affected by epistaxis (after the tip is removed because it irritates the posterior pharynx and causes gagging). Once the catheter and balloon are visualised intra-orally, the balloon is gradually inflated with air and the catheter is slowly retracted. When the balloon becomes inflated it catches on the posterior choana. The recommended inflation method is the one in which half the required volume is inserted, the balloon is pulled forward to wedge in the posterior choana and the remainder of the volume is then inserted.²² The catheter is then clamped (e.g. umbilical cord clamp) anteriorly (just outside the nostril, with a piece of gauze between the nose and the clamp)²⁸ in a way that continuous traction is assured.

Catheter size, balloon size, inflation volume, air or liquid

There is lack of consensus. One study recommends size 14 catheters with 30 ml balloon, but doesn't mention inflation volume. Another study²³ using size 14 catheters, showed complete sealing in 85% of patients at appropriate inflation volumes and showed that the choana is usually effectively sealed at 8-15 ml inflation volume.²⁸ Another study²² recommends

to us size 12 Foley catheters with a 30 ml balloon, suggesting liquid inflation volumes of 6-9 ml (but recommending further studies as to determine the appropriate volume of inflatant required to occlude the posterior choana). CRANA¹⁹ recommends a size 12 or 14 catheter with a 30 ml balloon, 10 ml inflation volume with air (which is not recommended by most of the other studies^{22,23,24}, as spontaneous deflation of air-inflated balloons is too fast as compared with the liquid-inflated ones). However, air is safer in remote setting in inexperienced hands, as the liquid-inflated balloons can be heavy and tend to fall backwards, inducing gagging and choking.²⁸ Be aware: 3 ml of liquid approximates 4 ml of air in a catheter.²²

A compromise between the different recommendations, and staying essentially consistent with the CRANA Clinical Procedures Manual, is: catheter size 14, balloon size 30 ml, inflation volume 10 ml of air.

Hot-water irrigation^{20,25}

Hot-water irrigation (HWI) was introduced as a treatment of epistaxis more than 100 years ago. It seems to be a less traumatic, less painful and possibly equally effective alternative to tamponade treatment, requiring significantly shorter hospital stay.²⁰ However, this study was carried out by someone with an interest in promoting a device for HWI.

HWI has the risk of aspiration during treatment. This risk may be minimised with a specially designed catheter²⁰, which is nevertheless not widely available.

However, one would think a specially designed catheter could easily be replaced by the use of two Foley catheters: one 30 ml Foley catheter, size 16, inflated with 10 ml of water could be used to achieve posterior choanal sealing and a second uninflated Foley could be connected to a 100 ml syringe to perform the actual HWI. This has not been studied yet.

The actual technique constitutes a simple forceful irrigation of the nasal cavity with 500 ml of hot water (50°C: narrow thermo-therapeutic range: 46-52°C), with the patient sitting up with the head flexed. The procedure is repeated once if the bleeding continues.

More evaluation of HWI is needed before it could be recommended.

Further management considerations

There does not appear to be a role for routine coagulation tests (PT, APTT, platelets) in patients (admitted with) epistaxis.^{26,27} One study²⁶ admits there is paucity of scientific information with regard to this aspect of epistaxis management. Another study²⁷ found that all the abnormal results of those patients on which coagulation test were performed (8.3% of tested patients), were found in patients taking warfarin or those on a combination of warfarin and aspirin. If routine coagulation tests were performed in a more rational way, appropriate tests would include a more complete haemostatic work-up, including bleeding time and assays for Factor VIII and von Willebrand factor, among others. This would significantly increase both cost and workload if applied in a non-targeted manner.

Our conclusion is that only those patients with recurrent or persistent bleeding, despite adequate medical therapy, patients on anticoagulant medication, or those having possible underlying bleeding diatheses based on either history or examination, should be evaluated further. The investigations subsequently chosen should also reflect a sound understanding of haemostatic function.

Approach for habitual nosebleeders⁷

There does not appear to be a need to have a different approach for habitual and episodal nosebleeders. Heredity for recurrent nosebleeds was noted by 42% of the bleeders. The start of the nosebleeds was mostly spontaneous. Common cold and stress or tiredness were frequently experienced before the occurrence of nosebleeds. The blood pressure distribution of the habitual nosebleeders did not differ from that of the population samples used for comparison.⁷ Diseases reported by the habitual bleeders were few, and the routine blood tests revealed only few diseases that could be related to the recurrent nosebleeds. Persistent recurrent nosebleeders to be referred to exclude malignancy, especially if epistaxis is accompanied with foul unilateral nasal discharge.²⁸

There is ongoing controversy whether hypertension is associated with adult epistaxis.⁵⁻¹⁰ But it is recommendable to check BP during an episode of epistaxis and treat it accordingly, as well as after the episode of epistaxis, in order to rule out sustained HT. In one study HT was associated with bleeding from the middle meatus, but not with the severity of the bleeding.⁹

The use of aspirin, epistaxis and untreated hypertension are independent risk factors for primary intracerebral haemorrhage (ICH) in middle-aged and elderly people.^{10,13} (In this study patients were positive for a history of epistaxis if they had had more than one episode of nosebleed during the preceding five years or if they had visited an outpatient ENT clinic or had been hospitalised because of epistaxis.)

Epistaxis is a risk factor for ICH in middle-aged and elderly people, both independently and combined with the use of aspirin. The history of epistaxis and use of aspirin constituted a potential and new risk factor combination, whereas the use of aspirin itself in low dose may not be a significant risk factor (protective for all types of stroke, even if it makes haemorrhagic stroke more common). There is no doubt that daily aspirin should be continued where it is indicated for high-risk cardiovascular patients. The conclusion of the author is a careful one, and indeed the known protective features of aspirin are recognised.¹⁰

Other independent risk factors are untreated HT, previous ischaemic stroke, epilepsy and recent strenuous physical exertion. Epistaxis may be a warning sign of an increased risk for ICH in subjects using aspirin. Self-medicating patients on aspirin, especially when presenting with epistaxis, should be made aware of the significant risk of bleeding. Regular (>once a week), high alcohol consumption is associated with epistaxis.¹¹ Regular alcohol consumption reduces platelet aggregation and prolongs the bleeding time; these effects, coupled with haemodynamic changes such as vasodilatation and changes in blood pressure, may be important in some cases of arterial nosebleeds in adults.

Alcohol consumption was defined as follows: one unit = one half pint (284 ml) of beer = one glass of wine (approx 10 g alcohol).

The patients with nosebleeds drank more alcohol (33 (mean) units a week versus 7).

Furthermore, the patients with nosebleeds were significantly more likely than the controls to have drunk alcohol within the 24 hours prior to admission.

Severe epistaxis and swallowed blood

Severe epistaxis may be caused by liver disease. In this case blood may be swallowed in large amounts and should be eliminated as promptly as possible. The GI tract should be sterilised with nonabsorbable antibiotics (e.g. neomycin 1 g po qid) to prevent the breakdown of blood and the absorption of ammonia, which in turn can cause hepatic encephalopathy.

Upper gastrointestinal bleeding, which can present as epistaxis, should be ruled out.

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