Rhinosinusitis and its treatment

About two thirds of those who get sinusitis do not need to see a doctor and many will seek advice from their pharmacist. This article discusses this common condition

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RHINITIS (inflammation of the mucous membranes of the nose) and sinusitis (inflammation of the mucous membranes of the sinuses in the face) usually coexist so the term “rhinosinusitis” has been adopted. Panel 1 describes the sinuses.

Rhinosinusitis is a common condition that has a high impact on quality of life. It has also been shown to have a significant economic impact. For example, studies in the US have estimated that chronic rhinosinusitis alone costs the economy $5.78bn per year. Most patients (85 per cent) are between the ages of 16 and 65 years, so are likely to be absent from work. Patients with chronic rhinosinusitis make 43 per cent more outpatient appointments and have 43 per cent more prescriptions dispensed than others.

Symptoms and diagnosis

The most common symptoms of rhinosinusitis are:

- Nasal congestion, blockage or stuffiness
- Nasal discharge or postnasal drip (often mucopurulent)
- There may also be reduction or loss of smell, and facial pain or pressure and headache.

These symptoms may be accompanied by pharyngeal, laryngeal and tracheal irritation causing sore throat, hoarse voice (dysphonia) and cough, drowsiness, malaise and fever.

Acute rhinosinusitis is defined as lasting less than 12 weeks, with complete resolution of symptoms. When symptoms last longer, the rhinosinusitis is classed as chronic. Although the symptoms of acute and chronic forms of the condition are similar, acute disease may have more distinct and often more severe symptoms, including facial pain. Chronic rhinosinusitis can fluctuate — a patient can have a low level of long-term disease and experience acute flare ups.

For most patients rhinosinusitis is diagnosed on the basis of symptoms alone. There are, however, a range of tests available to validate the clinical symptoms and signs, the most common being nasal endoscopy, nasal cytology, biopsy and bacteriology.

Causes and risk factors

Acute rhinosinusitis is usually diagnosed and managed in primary care. Studies report a prevalence of 6 to 10 per cent. It is principally viral but up to 2 per cent of patients will develop a secondary bacterial infection.

Prevalence varies with season (higher in the winter months) and climate. It increases in damp environments and in the presence of high levels of air pollution. There is strong evidence to support the hypothesis that cigarette smoking predisposes patients to rhinosinusitis, possibly via changes to ciliary motility and function.

The role of allergy in rhinosinusitis is still under debate but it is postulated that atopy predisposes people to chronic rhinosinusitis. Both conditions share a trend in increasing incidence and frequently co-exist. It is believed that chronic swelling of the nasal mucosa in patients with allergies may obstruct the ostia, leading to decreased ventilation of the sinus, mucus retention and development of infection.

Studies have also shown that there is a strong association — as much as 50 per cent — between patients with chronic rhinosinusitis and asthma. Cytokine patterns in sinus tissue of chronic rhinosinusitis sufferers are similar to those in bronchial...
tissue of asthmatic patients, and increased numbers of eosinophils are found in both conditions. Dental infections have been reported to cause acute maxillary sinusitis. Gum disease, a tooth root projecting into the sinus or dental abscesses have all been identified as sources of sinus infection.

Chronic rhinosinusitis is commonly seen with cystic fibrosis. The primary mechanism is thought to be impaired ciliary clearance of the thickened mucus within the sinus, leading to bacterial infection. Chronic rhinosinusitis is often also associated with nasal polyps (see Panel 2).

Hypertrophy of the adenoid (tonsilar tissue) is thought to contribute to a large number of cases of paediatric chronic rhinosinusitis by blocking airflow through the nose, leading to insufficient ventilation of the sinuses.

When to refer
Rhinosinusitis rarely causes headache or facial pain, except when there is an acute bacterial infection with blockage of the sinus. This is usually preceded by a viral upper respiratory tract infection and results in severe unilateral pain, pyrexia and unilateral nasal obstruction. (So rhinosinusitis is not the problem for most patients who present to primary care with facial pain and headaches, despite these patients frequently labelling themselves as suffering with sinus problems. In fact, a large proportion of patients who suffer from symmetrical frontal or temporal headaches have tension type headache. Unilateral episodic headaches are often vascular.) Most patients with acute bacterial rhinosinusitis respond to antibiotics (see later). Patients who suffer from more than two acute episodes in a year should be offered further investigation.

Chronic bacterial sinusitis rarely causes pain.

Serious complications of acute rhinosinusitis are rare but are potentially serious. They may be classified as orbital, intracranial or oesophageal.

Orbital complications include preseptal cellulitis (affects the eyelid and periorbital soft tissue), orbital cellulitis (behind the orbital septum) and subperiosteal and intraorbital abscesses. Any swelling or redness around the eyes, severe unilateral headache or visual disturbance needs to be investigated urgently.

Intracranial complications include epidural or subdural abscesses, brain abscess, meningitis, encephalitis and thrombosis of the superior sagittal or cavernous sinuses. These conditions may present with non-specific symptoms and health care professionals should be highly suspicious of them for timely diagnosis.

Osteomyelitis can result from sinus infection spreading to the facial skeleton. Symptoms can include bone pain, fever and swelling.

Treatment
The management of acute rhinosinusitis in primary care is summarised in Figure 1. For symptoms lasting fewer than five days, over-the-counter symptom relief can be offered. For example, paracetamol, ibuprofen or aspirin may be used to relieve any headache, high temperature and any facial pain. A Cochrane report showed benefit when using saline irrigation for treatment. Nasal douching (see Panel 3) appears to be more effective than the use of nasal sprays and the addition of xylitol or hypochlorite to the irrigation solution appears to result in greater improvement in symptoms over the use of saline alone. Simple drops and low volume nasal sprays have poor distribution and should be considered a nasal cavity treatment only. The best distribution is currently found from high volume devices such as squeeze bottles that allow positive pressure irrigation, resulting in more thorough rinsing of the nasal passage and sinus openings.

Decongestant nasal sprays or drops may help relieve a blocked nose but should not be used for more than a week at a time. However, it should be noted that there is no evidence for the use of nasal decongestants, antihistamines, mucolytics and expectorants, herbal medicines and probiotics in the treatment of acute or chronic rhinosinusitis.Steam inhalation is not recommended because of the danger of burns.

Corticosteroids
Corticosteroids bind to and activate intracellular glucocorticoid receptors, resulting in increased expression of anti-inflammatory and inhibition of pro-inflammatory gene transcription. These changes directly decrease the viability and activation of eosinophils and also

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**Panel 2: Nasal Polyps**

Nasal polyps are fleshy, pedunculated masses that arise from the mucous membranes of the nose or paranasal sinuses. There are two main classifications: ethmoidal and antrochoanal.

Ethmoidal polyps are most common. They arise from the ethmoid sinuses and are often multiple and bilateral. Antrochoanal polyps arise from the maxillary sinuses and are more likely to be unilateral.

Each type causes similar symptoms, namely nasal congestion, chronic rhinosinusitis and loss of smell (anosmia).

A general ear, nose and throat rule is that a unilateral polyp should be assumed to be neoplastic until proven otherwise, even though a retrospective study of polyp histology found that only 1 per cent of removed polyps were malignant. It should be noted that nasal polyps are distinct from gastrointestinal polyps, which are often premalignant.

**Cause**
Nasal polyps are a by-product of ongoing inflammation. The cause is not well understood, and probably multifactorial — a result of allergy and infection together with mechanical abnormalities. Analysis of polyps shows oedematous submucosal tissue with a high infiltration of plasma cells, lymphocytes, macrophages and eosinophils. Polyps also contain high levels of histamine, presumably from mast cell degranulation.

Nasal polyps can occur at any age but are less common in children. They are more prevalent in men than in women (approximately 3:1) except in people with asthma, where the prevalence in males and females is equal. Sinner’s triad is a recognised clinical syndrome of aspirin sensitivity, asthma and nasal polyposis and has an estimated prevalence of 1 per cent in the general population and 10 per cent among people with asthma. Polyps are also common in people with cystic fibrosis.

**Management**
Nasal polyposis should be viewed as a chronic condition with a need for ongoing treatment. Topical intranasal steroids are effective at reducing the size and symptoms of most polyps but delivery to the required site can prove problematic. In some cases, short-term oral steroids may be used initially, to shrink large polyps. We often use Flunisolde nes (400µg) for an initial two weeks before changing to Flunisolde spray (50µg) as a maintenance medication. Surgical removal of polyps is considered for patients with no improvement following pharmacological therapy. Regardless of treatment most nasal polyps will recur. Patients who require surgery will require repeat procedures on average every seven years.
How to manage acute rhinosinusitis

Ask if the person has two of the following symptoms:

- Nasal obstruction or discoloured discharge, or both
- Frontal pain, headache
- Smell disturbance
- Cough (especially children)*

**Symptoms for fewer than five days or improving**

Offer symptom relief suitable for a common cold (eg, analgesics, nasal saline irrigation, decongestants)

**Symptoms for over 10 days or worsening after five days**

Moderate (ie, post viral)

Use topical steroids

- No relief after 14 days of treatment

Consider referral to a specialist

Severe (includes bacterial infection)

Use topical steroids, consider antibiotics

- Effect in 48 hours

- No effect in 48 hours

Continue treatment for seven to 14 days

Refer to a specialist

Refer the following immediately:

- Swelling or redness around an eye
- Visual disturbance, a bulging eyeball
- Severe frontal headache or swelling
- Signs of meningitis (eg, fever, non-blanching rash, photophobia)
- Neurological signs (eg, difficult to rouse, confusion, seizure)

*In children bacterial infection should be considered when symptoms are not self-limiting and extend beyond seven to 10 days. In these situations treatment with antibiotics seems to accelerate resolution. Whether this benefit outweighs the risk of frequent antibacterial prescriptions remains to be clarified. Nasal irrigation, antihistamines, decongestants and mucolytics have not been shown to be helpful.

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**PANEL 3: NASAL DOUCHING**

Nasal douching means sniffing a solution (we advise one teaspoon sugar, one teaspoon bicarbonate of soda in a pint of water that has been boiled and cooled to room temperature) into each nostril, from a cupped hand, allowing it to go down the back of the nose and spitting it out. Not all the mixture needs to be used — four sniffs should be enough.

Nasal douching should be done two to three times a day.

Sprays such as Sterimar and products such as NeilMed Sinus Rinse are alternatives.

Patients using nose drops should use them after douching rather than before.

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**PANEL 4: SURGERY**

Sinus surgery is normally effective in aiding symptomatic relief in patients with genuine rhinosinusitis unresponsive to medical therapy. It involves the removal of polyloid tissue and enlarging the ostia to facilitate drainage.

In an analysis of 1,713 patients 91 per cent experienced symptom improvement following surgery. Surgery is indicated when medical management of chronic rhinosinusitis fails but can be avoided in many cases by improving compliance and correcting spray use.

Adenoidectomy can improve symptoms of chronic rhinosinusitis in 50 per cent of children, but is only indicated if the adenoid is enlarged and symptoms are not responding to correct management.

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The surgical state of the sinus cavity, types of delivery device, fluid dynamics and delivery technique all play a role in achieving effective topical treatment with intranasal steroid sprays. Delivery of topical steroid to the sinus mucosa in patients who have not had sinus surgery (see later) is thought to be less than 2 per cent of the total irrigated volume. (Surgery to open the sinus ostia increases distribution to the sinuses; see panel 4.)

Panel 5 (p602) explains how pharmacists can help patients with rhinosinusitis get the most out of intranasal steroids by making sure products are used correctly.

There is a lack of evidence for the use of oral corticosteroids to treat chronic rhinosinusitis. The few studies that have been performed have shown a small additional benefit from treatment with oral corticosteroids together with intranasal corticosteroids but the long-term nature of this condition together with the side effects of long-term oral corticosteroid administration...
mean that the risk-benefit profile is not likely to be favourable.

In children, intranasal corticosteroids may be useful adjuncts to antibiotic therapy in acute rhinosinusitis.

In chronic rhinosinusitis, use of corticosteroids beyond seven to 14 days may be required, under the care of an ENT specialist. There is a theoretical risk of growth retardation that has not been proved but the BNF recommends that the height of children is monitored. There is a higher risk of systemic effects with drops compared with sprays. There are no randomised controlled trials for use of intranasal corticosteroids in children with chronic rhinosinusitis, but their proven efficacy in adults and their safety record from use in allergic rhinitis in children makes them first-line therapy, albeit unlicensed.

Prescribers preference and experience tends to govern what is used.

**Antibiotics**

It has been proven that acute rhinosinusitis resolves without antibiotics in most cases. Antibiotics should be reserved for patients who present with high fever or severe unilateral facial pain. Most patients with acute bacterial rhinosinusitis will respond well to a short course of antibiotics (eg, penicillin V or amoxicillin for seven to 14 days). Common causative pathogens are *Streptococcus pneumoniae* and *Hemophilus influenzae* and, less commonly, *Staphylococcus aureus* and *Moraxella catarrhalis*. Co-amoxiclav or cephalexin should be considered for acute cases not resolved by one course of antibiotics.

Chronic infections are more likely to be caused by staphylococci or anaerobes. There is little evidence to support the short-term use of antibiotics for chronic rhinosinusitis. There is, however, increasing interest in the use of long-term antibiotics in chronic rhinosinusitis following the publication of a study of long-term, low-dose erythromycin use.

**Further reading**


**KEY POINTS**

- Common symptoms of rhinosinusitis are nasal congestion, nasal discharge, and loss of smell. Symptoms can be chronic.
- Evidence-based treatments for rhinosinusitis include nasal irrigation, intranasal corticosteroids, antibiotics and sinus surgery. Over-the-counter analgesics and decongestants may be offered for symptoms lasting for fewer than five days.
- Patients need detailed counselling on the correct use of nasal sprays in order to achieve good outcomes.

**PRACTICE POINTS**

Reading is only one way to undertake CPD and the regulator will expect to see various approaches in a pharmacist’s CPD portfolio.

1. Ensure all patients collecting prescriptions for intranasal steroid preparations know how to use them correctly (see Panel 5).
2. Educate counter staff on the effectiveness of saline nasal douches in management of rhinosinusitis.
3. Ensure all staff are aware which patients presenting with possible sinusitis should be referred.

Consider making this activity one of your nine CPD entries this year.

**References available online.**