

# Chronic Rhinosinusitis

## Objectives

- To define CRS
- Understanding the pathophysiology
- How to treat CRS cases

## Definition

European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS) defines chronic rhinosinusitis as the following:

Inflammation of the nose and paranasal sinuses characterized by two or more symptoms, one of which should be either nasal blockage/obstruction/congestion or nasal discharge (anterior/posterior nasal drip)

+/- Facial pain/pressure

+/- Reduction or loss of smell

and either

### *Endoscopic signs*

- Nasal polyps, and/or
- Mucopurulent discharge primarily from middle meatus and/or
- Oedema/mucosal obstruction primarily in middle meatus and/or

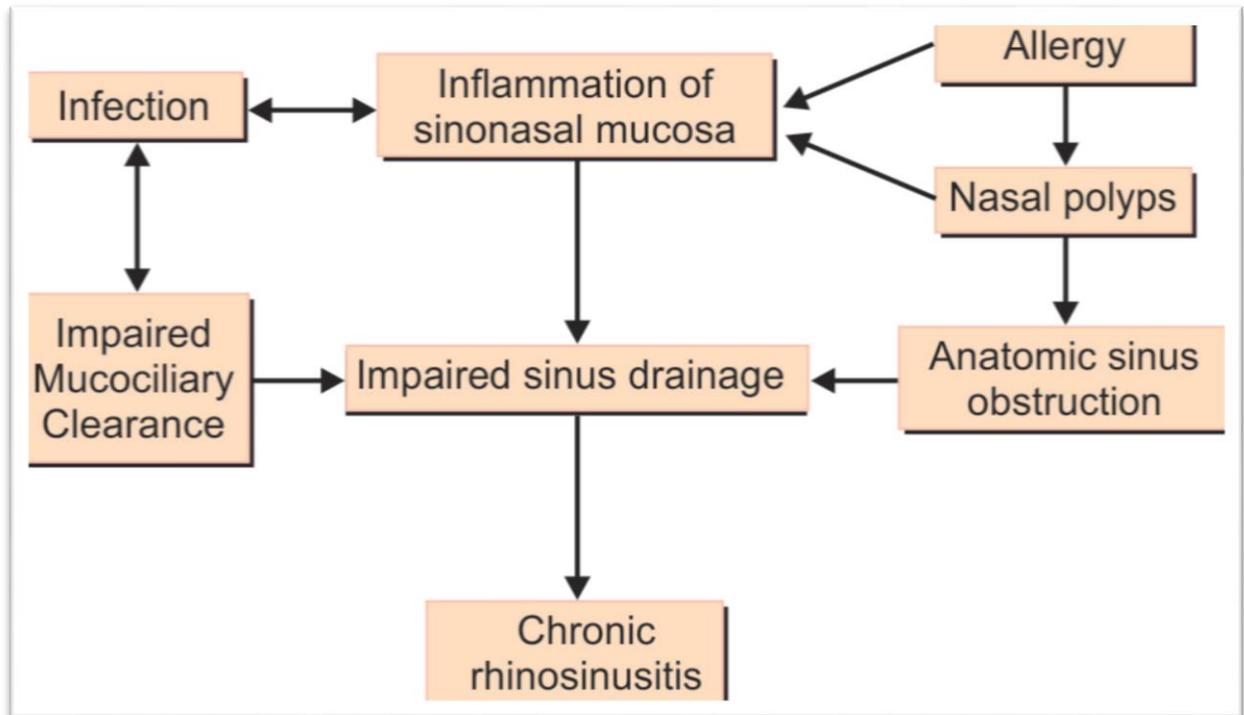
### *Computed tomography (CT) changes*

- Mucosal changes within the osteomeatal complex and/or sinuses

for at least 12 weeks without resolution

## Aetiopathology

The aetiology of CRS is multifactorial. The disease process depends on the complex interactions between the sinus respiratory epithelium, microorganisms, allergy, and external factors such as environmental pollutants and tobacco smoke. The role of micro-organisms in the aetiology of CRS is not fully understood. The most common bacterial pathogen associated with CRS is *Staphylococcus aureus*. The staphylococcal superantigen hypothesis suggests that bacterial toxins produce inflammation in the sinus mucosa. The presence of bacterial biofilms has been implicated as a factor in CRS. The aggregation of bacteria in biofilms renders them more resistant to host defences and antibiotics. The mucosa of the nasal cavity and paranasal sinuses is of a ciliated respiratory type. Diseases in which the function of the nasal and paranasal sinus cilia is impaired are associated with CRS. The most notable of these is cystic fibrosis, which is commonly associated with CRS and nasal polyps. Other ciliary disorders associated with CRS include primary ciliary dyskinesia and Kartegener's syndrome. The role of nasal allergy in CRS is not completely clear. It may be that the inflammation of the nasal mucosa in allergic rhinitis predisposes to CRS, with swelling of the nasal mucosa producing obstruction of sinus ventilation and thereby infection. Patients with immune deficiency are more likely to suffer with CRS. Anatomical variation within the paranasal sinuses and nasal cavity such as nasal septal deviation and an enlarged cystic middle turbinate (concha bullosa) can be associated with CRS, and it is thought that these variations can cause blockage of the sinus ostia. These variations, however, are common in the general population without CRS, and it is unlikely that they can cause CRS in the absence of other aetiological factors.



## Clinical presentation and Diagnosis

Most cases of CRS in primary care are diagnosed on symptoms alone. In secondary care, nasal endoscopy and CT scanning are used as additional diagnostic tools.

By definition symptoms must be present for a period of at least 12 weeks to qualify for a diagnosis of CRS. This differentiates CRS from acute (symptoms less than 4 weeks) and subacute (symptoms of 4–12 weeks). While there are numerous similarities between the presentations of acute and CRS, the symptoms of CRS tend to be less severe.

## **Symptoms of CRS**

<b>Local</b>
Nasal obstruction / congestion / blockage
Nasal discharge
Facial pain / congestion / pressure
Anosmia or hyposmia
<b>Distant</b>
cough
Sore throat
dysphonia
Fever and malaise
halitosis

## **Nasal endoscopy**

Nasal endoscopy can be undertaken in an outpatient setting. A rigid or flexible endoscope can be used, and the examination can be facilitated by the application of topical local anaesthetic and decongestant nasal spray. In CRS the presence of mucosal oedema, mucopurulent discharge and nasal polyps will be noted . In addition anatomical variation such as septal deviation or large turbinates will also be recorded. Endoscopically guided microbiological swabs can be taken if purulent discharge is seen. Anterior rhinoscopy alone, in which the nasal cavity is inspected by means of a torch or headlight, is of limited value in the diagnosis of CRS because only the anterior part of the nasal cavity can be clearly seen.

## **Sinus CT scanning**

CT scanning is the radiological investigation of choice in CRS. however, this investigation is undertaken only when initial medical treatment has failed and surgical treatment is planned, or when complications are suspected. CT finding includes sinus opacity due to swelling and thickening of the sinus mucosa and/or retained secretions. CT scans cannot be used alone to diagnose CRS because radiological abnormalities are common in the 'normal' asymptomatic population. Plain sinus x-rays are of little value in the diagnosis of CRS.

## Treatment

### Medical

#### 1. Antibiotics

Antibiotics are an important treatment for CRS and they can be used in short (<4 weeks ) or long-term courses (>4weeks). broad spectrum drugs such as amoxicillin/ clavulanic acid, cephalosporins, macrolides or doxycycline are options. There is evidence that long-term antibiotics may influence the inflammatory response in CRS in addition to any antimicrobial effects. Macrolide have been most frequently used, although doxycycline is an alternative preparation.

#### 2. Corticosteroids

Corticosteroids act in CRS by moderating the inflammatory processes in the disease, particularly those mediated by eosinophils. These drugs are usually administered in spray or drop form directly to the nasal mucosa. Preparations in common use are beclomethasone, fluticasone and mometasone. Long-term use of intranasal corticosteroids is safe, although side effects can occur, including nasaldryness, crusting and epistaxis.systemic CS is reserved for perioperative period and in case of extensive Sinonasal polyposis interfering with penetration of topical therapy.

#### 3. saline nasal irrigation

Regular saline irrigation produces symptomatic relief possibly through washing away purulent secretions, although the mode of action is not certain. This treatment is well tolerated with minimal side effects.

**surgical****functional endoscopic sinus surgery (FESS)**

In antibiotic failures when CT scan is positive, endoscopic sinus surgery (ESS) is considered. Massive polyps are usually not cured with antibiotics and recurrence usually occurs after surgery, With endoscopic sinus surgery, almost all the paranasal sinus lesions can be managed successfully.

**Maxillary sinus operations**

1. Antral puncture and irrigation.
2. Intranasal antrostomy
3. Caldwell-Luc operation

**Frontal sinus operations**

1. Trephination of frontal sinus
2. External frontoethmoidectomy
3. Osteoplastic flap operation

**Ethmoidal sinus operations**

1. Intranasal ethmoidectomy
2. External ethmoidectomy
3. Frontosphenoethmoidectomy:

**Sphenoid Sinus operations**

Access to the sphenoid sinus is obtained by removing its anterior wall. It can be accomplished by external ethmoidectomy, trans-septal approach, and ESS.