

## RECOMMENDATIONS OF FSO

# Clinical practice recommendations " Management of chronic rhinitis "

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# Part 1 : Introduction and classification

## INTRODUCTION

### Definition of chronic rhinitis

The task force unanimously agreed that chronic rhinitis is any chronic non-mechanical disorder affecting the nasal mucosa and associated structures, excluding sinus infections. “Chronic” was defined as symptoms for at least 12 consecutive or non-consecutive weeks per year.

## CLASSIFICATION / NOSOLOGY

The task force developed a classification scheme based on the presumed mechanism of the nasal symptoms. The two main categories are IgE-dependent allergic rhinitis and non-allergic rhinitis. This last category comprises inflammatory rhinitis and non-inflammatory rhinitis.

In mixed rhinitis, several mechanisms combine to generate the symptoms (e.g., allergy, irritation, and neurogenic inflammation).

The present recommendations do not apply to nasal manifestations of systemic diseases (e.g., sarcoidosis, Wegener’s granulomatosis, HIV infection, and lymphomas).

### A. Allergic rhinitis

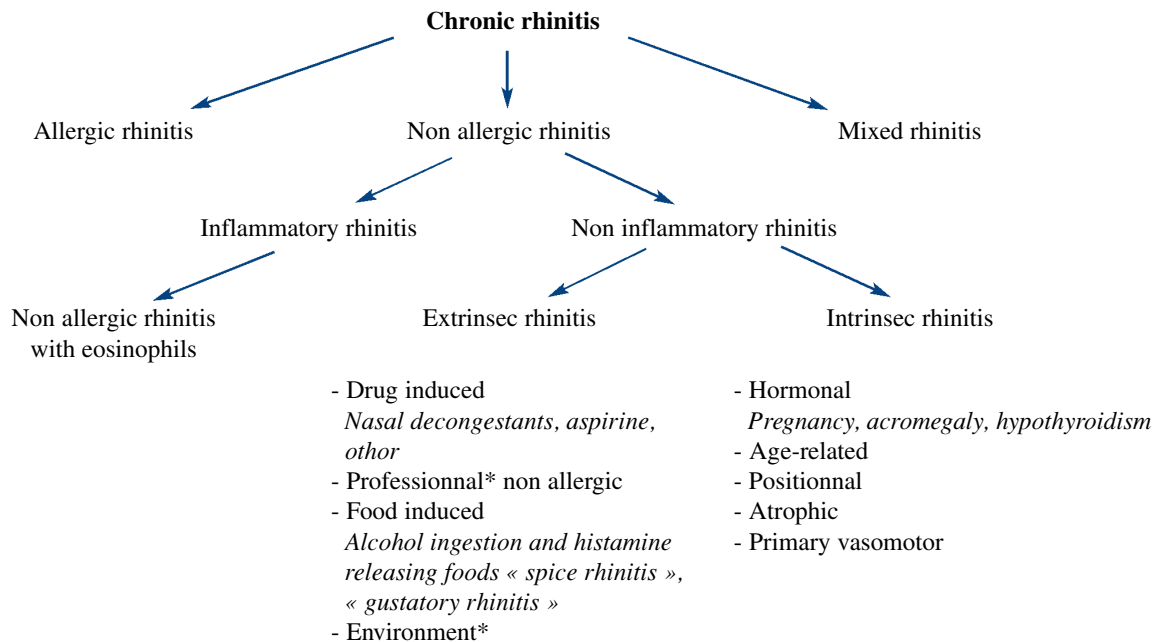
#### Definition - Pathophysiology

Allergic rhinitis is the set of functional nasal symptoms generated by IgE-dependent inflammation of the nasal mucosa in response to various types of allergens.

The main clinical symptoms are rhinorrhea, nasal obstruction, sneezing, nasal pruritus, and postnasal drip. Concomitant ocular or bronchial symptoms are common.

The main culprits are airborne allergens present in the home (house dust mites, pets, cockroaches, and moulds), outdoors (pollen, moulds), or in the workplace. Trophallergens are less often responsible.

Allergic rhinitis is among the leading atopic diseases, and its incidence has increased steadily over the last 30 to 40 years (grade A). Allergic rhinitis is associated with an about 8-fold increase in the risk of



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developing asthma (grade A).

Allergic rhinitis is related to the development of an IgE-dependent allergic reaction, which comprises two phases (grade B):

- a sensitization phase, followed by
- a clinical phase, with an immediate and a delayed response.

During the immediate response, histamine release causes rhinorrhea, nasal pruritus, sneezing, and nasal obstruction. The delayed response is characterized by the development of a polymorphic cellular infiltrate composed of mast cells, lymphocytes (predominantly of the Th2 type), and eosinophils.

### B. Non-allergic rhinitis

#### I. Inflammatory rhinitis

##### 1.1. Non-allergic rhinitis with eosinophilia syndrome (NARES)

###### Definition - pathophysiology

It has been suggested that NARES may be merely non-specific inflammatory rhinitis or incipient polyposis (grade C). The incidence of NARES is unknown. Patients present with perennial rhinitis manifesting as paroxysmal attacks and characterized by a high eosinophil count in nasal secretions. Neither the trigger generating the hyper-eosinophilia nor the mechanism leading to eosinophil accumulation in the nasal mucosa is known (grade C).

##### 1.2. Non-allergic rhinitis without eosinophils

Data from the literature (grade C) fail to provide convincing evidence that non-allergic rhinitis without eosinophils is an independent entity. Consequently, the Task Force excluded this condition from the present recommendations.

#### 2. Non-inflammatory rhinitis

##### Definition - Pathophysiology

This time-honoured term encompasses a group of conditions that are probably heterogeneous and whose pathophysiology is unknown or incompletely understood. Patients present with perennial non-allergic rhinitis. No evidence of inflammation is found upon examination of the nasal mucosa and/or nasal cytology. The incidence of non-inflammatory rhinitis is difficult to evaluate.

Disorders belonging to this group can be classified according to clinical criteria (setting, patient-related factors, and symptoms) that can be evaluated by most of the physicians who see patients with chronic rhinitis.

#### 2.1. Extrinsic rhinitis

##### 2.1.1. Drug-induced rhinitis

The symptoms of rhinitis are induced by systemic or nasal administration of a medication. Drug-induced rhinitis may occur as a side effect of a treatment initiated for another condition.

##### 2.1.1.a. Rhinitis induced by nasal decongestants

The cause is overuse of nasal sympathomimetics, chiefly oxymetazoline and phenylephrine derivatives (grade B).

##### 2.1.1.b. Rhinitis induced by aspirin and other NSAIDs

Isolated rhinitis occasionally occurs as a manifestation of intolerance to aspirin. The symptoms can be induced by all drugs in the NSAID class. The main pathophysiological mechanism is overproduction of cysteine-containing leukotrienes (LTC<sub>4</sub>, LTD<sub>4</sub>, LTE<sub>4</sub>) (grade B).

##### 2.1.1.c. Other patterns of drug-induced rhinitis

Many medications (grade B) can interfere with the mechanisms that maintain nasal homeostasis, including antihypertensive drugs (most notably alpha adrenoceptor antagonists), acetylcholinesterase inhibitors, and recently introduced medications for erectile dysfunction.

##### 2.1.2. Food-induced rhinitis

The symptoms occur during or shortly after the ingestion of food (grade B). Triggers include alcohol and histamine-releasing foods such as fish and chocolate. Symptoms may occur in response to vasoactive agents such as tyramine (in chocolate and some red wines), caffeine, theobromine, alcohol, sulphites (E 220 to E 228), tryptamine, serotonin, and other substances. Rhinitis in response to ingestion of hot pepper is mediated by a cholinergic mechanism.

Gustatory rhinitis is due to the ingestion of hot food or of substances that irritate the trigeminal nerve (mustard, pepper, horseradish).

##### 2.1.3. Non-allergic occupational rhinitis

The symptoms occur only in the workplace, and there is no convincing evidence of an IgE-dependent mechanism (grade C). Epidemiological data are scant; No specific studies were identified by the literature review. More than 450 substances responsible for occupational rhinitis have been identified to date.

See the database of occupational disease tables at <http://inrs.dev.optimedia.fr/mp3> on the Health and

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Safety at Work site (Institut National de Recherche et de Sécurité, [www.inrs.fr](http://www.inrs.fr))

### 2.1.4. Environment-related rhinitis

The symptoms are triggered by specific environmental factors, which may or may not be work-related (air conditioning, irritants, continuous positive airway pressure therapy, smoking, stress, and other factors). The incidence is unknown. The broad variety of pathophysiological mechanisms (grade C) includes changes in the properties of inhaled air (e.g., hygrometry, temperature, inert or dynamic particle content, and pressure).

### 2.2. *Intrinsic rhinitis*

#### 2.2.1. Hormonal rhinitis

The symptoms are related to normal or abnormal changes in hormone levels.

About 20% to 30% of pregnant women may report nasal symptoms (grade C). The pathophysiological mechanisms are controversial but may include hormone level changes, stress or psychosomatic factors, an increase in circulating blood volume, or smoking (grade C). Hormonal rhinitis may be related to a non-inflammatory mechanism.

#### 2.2.2. Age-related rhinitis

Age-related rhinitis manifests as intermittent rhinorrhea with abnormal nasal secretion or dryness. Among individuals older than 65 years of age, less than 3/1000 seem affected (grade C).

Autonomic system dysregulation has been suggested, but few studies are available.

#### 2.2.3. Posture-related rhinitis

In this condition, nasal patency is diminished in specific positions, usually recumbency. The incidence is unknown. Adults seem predominantly affected (grade C). Posture-related rhinitis is ascribed to a combination of

two factors, namely, abnormal adjustment of nasal resistance to the supine position and abnormalities of the septum or turbinates.

#### 2.2.4. Atrophic rhinitis

Atrophic rhinitis manifests as widening of the nasal cavity due to atrophy of the nasal mucosa, which is covered with foul-smelling crusts. The cause is unknown.

Atrophic rhinitis may be primary (ozena) or secondary (to radiation therapy or surgery, for instance). The incidence of secondary atrophic rhinitis is unknown. The cause and mechanism of ozena remain very poorly understood, and the presence of *Klebsiella ozaenae* may be a consequence rather than a cause of the disease (grade C).

The exact mechanisms underlying secondary forms are unknown.

#### 2.2.5. Primary vasomotor rhinitis (idiopathic rhinitis)

These conditions fit in none of the above-listed categories. They are probably heterogeneous. Typically, patients present with perennial non-allergic rhinitis. The term “idiopathic rhinitis” is used in the literature. Females may be affected more often than males (grade C), and onset may occur predominantly after 20 years of age. The pathophysiology is poorly understood but may involve autonomic system dysregulation with decreased sympathetic tone and increased parasympathetic tone.

### C. Mixed rhinitis

In mixed rhinitis, the symptoms are due to a combination of several mechanisms, including IgE-mediated allergy; non-specific inflammation; and triggering, precipitation or exacerbation by heat, cold, hygrometry, weather-related factors, changes in light exposure, stress, pollution, and other factors.

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# Part 2 : Diagnosis and investigations

### DECISION TREE : FROM THE SYMPTOMS TO THE DIAGNOSIS

#### A. Allergic rhinitis

##### Diagnosis

Allergic rhinitis is easy to diagnose in patients who experience a combination of suggestive symptoms when exposed to specific allergens (i.e., at specific times and places). Symptoms include nasal pruritus, sneezing, anterior and/or posterior rhinorrhea, and bilateral nasal obstruction. The offending allergens must be identified, the most common culprits being pollens (tree, grass, and weeds), house dust mites, pets, and moulds.

Referral to an otorhinolaryngologist is recommended when the diagnosis is in doubt, the patient has asthma, an occupational allergy is suspected, or specific immunotherapy is being considered. Examination of the nasal cavity consisting at least in anterior rhinoscopy is recommended. In patients with persistent or atypical symptoms, nasal endoscopy is crucial to look for differential diagnoses or concomitant abnormalities. The only noticeable finding associated with allergic rhinitis is oedema of the inferior and middle turbinates. Imaging studies should be obtained when a tumour or rhinosinusitis is suspected.

##### Documenting the allergy

Blood cell counts and total IgE assays are unhelpful. The most useful investigations are skin tests, specific IgE assays, and multiallergen screening tests (grade A).

##### a. Skin tests

Skin tests are crucial and constitute the first step of the allergy workup. They are not mandatory in patients with typical symptoms of isolated pollen allergy. In other situations, skin tests should be performed routinely to establish the diagnosis, determine whether further investigations are in order, and make decisions regarding allergen evicton and treatments.

Antihistamines should be stopped several days (5 days for the most recent agents) before skin testing. Positive skin tests do not necessarily indicate an allergy: in the population at large, over 25% of individuals have positive skin tests but no clinical symptoms.

##### b. Nasal provocation testing

Nasal provocation testing with allergens should be reserved for difficult cases. The tests should be conducted by experienced specialists, in an appropriate facility.

##### c. Serum assays of specific IgEs

Specific IgE assays are valuable complements to skin testing, as the results are not influenced by medications. However, they should not be used instead of skin tests or as first-line or routine investigations. Sensitivity ranges across allergens and studies from 70% to 90%. The 2004 classification of tests for reimbursement by the French universal health insurance system does not include specific IgE assays among screening tests; furthermore, neither assays of IgEs for more than five allergens nor specific IgE assays in combination with a multiallergen screening test are reimbursed.

##### d. Multiallergen screening tests

These serum tests use radioimmunological or immunoenzymetric methods and provide non-qualitative binary results (positive/negative) or semi-qualitative results. Specificity and sensitivity are greater than 80-90%. A limitation to these tests is that the allergen panel may fail to include local allergens.

#### Look for asthma

The association between rhinitis and asthma is sufficiently well documented (grade A) to warrant routine evaluation for asthma in patients with rhinitis (and vice versa).

In addition to history-taking, lung function testing with an assessment of reversibility is the best investigation for diagnosing asthma.

#### B. Non-allergic rhinitis

##### 1. Non-allergic rhinitis with eosinophilia syndrome (NARES)

Patients present with a sensation of nasal blockage and hyposmia or anosmia. Attacks of profuse watery rhinorrhea, repeated sneezing, and nasal pruritus are common. Headache is not infrequent.

Non-IgE-dependent asthma may be present also. Nasal endoscopy findings are non-specific.

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Skin tests for allergies and specific IgE assays are negative or uncorrelated with the clinical symptoms. Nasal mucus cytology shows an abundance of eosinophils (>20%). Findings from computed tomography are non-specific.

### 2. Non-inflammatory rhinitis

#### 2.1. Extrinsic rhinitis

##### 2.1.1. Drug-induced rhinitis

##### 2.1.1.a Rhinitis induced by nasal decongestants

Bilateral nasal obstruction is the main feature. Rhinorrhea may be present. Bilateral congestion of the inferior turbinates is seen. Patients should be routinely evaluated for an underlying nasal disease (e.g., a morphological abnormality or allergy).

##### 2.1.1.b. Aspirin-induced rhinitis

Nasal obstruction with serous rhinorrhea of variable severity is the classic presentation. The onset after aspirin exposure is the main argument supporting the diagnosis (grade A).

##### 2.1.1.c. Rhinitis induced by other medications

No detailed descriptions are available. The occurrence of symptoms such as nasal obstruction, rhinorrhea, or sneezing upon exposure to the medication suggests the diagnosis. There are no specific investigations.

##### 2.1.2. Rhinitis related to food ingestion

Provocation testing can be performed to confirm alcohol-induced rhinitis. Patients with rhinitis caused by histamine release often exhibit urticaria and/or bronchospasm concomitantly with the nasal symptoms. Allergy tests are either negative or uncorrelated with the clinical symptoms.

##### 2.1.3. Non-allergic occupational rhinitis

Obtaining a detailed history and having the patient keep a symptom diary are crucial to the diagnosis. Ocular or bronchopulmonary symptoms are often present. The most common offenders are chemicals, such as glue, resin epoxy, isocyanates, and glutaraldehyde. Investigations are not standardized, and eviction may be the only feasible diagnostic test. The characteristics of endonasal lesions vary across irritants (e.g., erythema, perforation, crusting, or increased secretion). Nasal provocation testing is important (grade C). Patients should be routinely evaluated for asthma.

##### 2.1.4. Environment-related rhinitis

Patients present with perennial or sporadic rhinitis

that occurs upon exposure to a specific factor (e.g., cigarette smoke, light, dust, strong smells, or weather changes) described spontaneously by the patient or identified by questioning. Nasal congestion and/or rhinorrhea are the main symptoms. A diary is a useful adjunctive diagnostic tool. Nasal endoscopy may be normal but may show more or less diffuse nasal congestion.

#### 2.2. Intrinsic rhinitis

##### 2.2.1. Hormonal rhinitis

Rhinitis associated with pregnancy usually starts after the first trimester, worsens during the third trimester, and resolves within 2 weeks after delivery. The nasal obstruction is bilateral, particularly in late pregnancy. There is no upper respiratory infection or allergy to explain the obstruction. Most groups recommend reserving etiologic investigations for those patients whose symptoms persist after delivery.

##### 2.2.2. Age-related rhinitis

Watery rhinorrhea in a patient older than 70 years is the typical feature and may be exacerbated by ingestion of a hot meal (grade C). Nasal endoscopy findings are unremarkable. No specific investigations are available for confirming the diagnosis.

##### 2.2.3. Posture-related rhinitis

Bilateral or alternating nasal obstruction is the main symptom. Olfaction is normal. Many patients have postnasal drip. The diagnosis rests on the fact that a specific posture triggers or perpetuates the obstruction.

Nasal endoscopy with the patient lying supine shows diffuse or focal congestion of the inferior turbinates, which is almost consistently reversible after application of a vasoconstricting nasal spray.

Investigations are usually unnecessary.

##### 2.2.4. Atrophic rhinitis

Patients usually complain of nasal obstruction, extensive crusting, and a sensation of nasal dryness. Cacosmia is common. Other disorders of smell or anosmia are not infrequent. Widening of the nasal cavity is found upon endonasal examination, with absence of cavernous tissue over the turbinates, crusting, and a foul odour. Bacteriological studies are helpful in establishing the diagnosis. Nasal biopsy and computed tomography are recommended when the diagnosis is in doubt (grade C).

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2.2.5. Primary vasomotor rhinitis (idiopathic rhinitis)  
The symptoms are non-specific and consist merely in a sensation of nasal congestion with a variable degree of heaviness in the face. The diagnosis rests on the negative results from allergy testing, absence of exposure to irritants, and absence of specific triggers.

### C. Mixed rhinitis

Rhinorrhea, nasal obstruction, sneezing, pruritus, and more rarely disorders of smell are variably combined. Although the triggering factors may suggest an allergy, non-specific factors contribute to precipitate the symptoms (e.g., heat, cold, weather changes, occupational factors, and air conditioning). Allergy testing is essential both for confirming the diagnosis and for ruling out other conditions. Nasal provocation testing is warranted in doubtful cases to minimize misclassification of allergic or non-allergic rhinitis as mixed rhinitis. Computed tomography is rarely useful, and diagnostic questions are usually answered by nasal endoscopy findings.

## BRIEF DESCRIPTION OF THE MAIN INVESTIGATIONS

### I. Nasal endoscopy

A rigid or flexible endoscope is used with the patient in the sitting or supine position. Nasal endoscopy includes an evaluation of the architecture and appearance of the nasal mucosa and secretions.

### 2. Nasal cytology

No reference method is available to date. The sample can be collected using the blowing technique, nasal lavage, or a cytology brush. Cell populations are expressed as percentages of total leukocytes. A percentage of eosinophils greater than 20% is the most widely accepted cytological criterion for diagnosing NARES.

### 3. Rhinomanometry

In rhinomanometry, air flow and nasal resistance are measured during nasal breathing. Active anterior rhinomanometry is the technique available to clinicians. Normally, resistance is in the 0.3-0.6 Pascal/cm<sup>3</sup>/s range and airflow is 150 cm<sup>3</sup>/second.

### 4. Acoustic rhinometry

Cross-sectional areas of the nasal cavities are measured. Results are shown as a graph and as a surface area value.

### 5. Peak nasal inspiratory flow (PNIF)

The maximum inspiratory flow through the nasal cavities is measured with the patient seated or standing. The value is usually greater than 80 litres/min. However, the result is specific of each patient.

### 6. Nasal biopsy

Nasal biopsy is performed during outpatient visits after topical anaesthesia.

### 7. Collection of microbiological samples

Either micro-aspiration or swabbing under optical guidance can be used.

### 8. Nasal mucociliary clearance test

Mucociliary clearance can be evaluated by placing dye or a saccharin particle behind the anterior end of the inferior turbinate. Normally, less than 30 minutes are needed to sweep the dye or saccharin into the nasopharynx.

### 9. Imaging studies

#### a) Plain radiographs

Plain radiographs are not recommended for the evaluation of chronic rhinitis.

#### b) Computed tomography

Computed tomography provides detailed information on the nasal structures and sinuses. Specificity of the images is low. This investigation is useful when the diagnosis is in doubt.

### 10. Olfactory testing

Clinical tests can be used in outpatients. They consist in having the patient recognize known liquid or solid substances.

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**Table I - Contribution of investigations to the diagnosis of chronic rhinitis**

	History	Endonasal examination	Nasal endoscopy	Skin tests	Multiallergen tests	Nasal provocation	Nasal cytology	Nasal biopsy	Microbiology	Radiographs of the sinuses	Sinonasal CT
Allergy	+++	++	+	+++	+	+	0	0	0	0	0
NARES	+++	++	++	+++	++	0	++	0	0	0	++
Drug-induced+++	+	++	0	0	0	0	0	0	0	0	
Nonallergic occupational	+++	++	++	+++	+	++	0	0	0	0	+
Pregnancy	+++	++	++	0	0	0	0	0	0	0	0
Age	+++	++	++	0	0	0	0	0	0	0	0
Posture-related	+++	++	++	0	0	0	0	0	0	0	0
Food-related	+++	++	++	++	+	+	0	0	0	0	0
Atrophic	+++	+++	+++	0	0	0	0	++	++	0	++

0: not contributive; +: informative; ++: recommended; +++: indispensable.

NARES: nonallergic rhinitis with eosinophilia syndrome; and CT: computed tomography

Note: see text for the grade associated with each investigation

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# Part 3 : Principles of treatment

### BRIEF DESCRIPTION OF AVAILABLE TREATMENTS (Non-exhaustive list)

#### 1. Topical medications

##### 1.1. Nasal solutions

###### *Saline, spa water, hypertonic solutions*

These solutions can be administered by nebulisation or irrigation. Several recent studies found that hypertonic solutions were superior over the widely used isotonic solutions (grade B). Buffering the solution with sodium bicarbonate is useful to loosen the secretions (grade C).

##### 1.2. Topical corticosteroids

Intranasal administration ensures high local concentrations, while minimizing the risk of systemic adverse effects (grade A). Time to action is short (about 24 hours) but several days are needed to achieve the maximum effect, which is sustained over time. The many corticosteroids approved for chronic allergic rhinitis include beclomethasone, fluticasone, budesonide, triamcinolone acetate, and mometasone furoate (table I). There is no compelling evidence that any of these compounds is superior over the others in terms of clinical effectiveness (grade B).

The local and systemic safety profiles are excellent, particularly with the dosages recommended for chronic rhinitis (grade A). When protracted use is required, most notably in children, the lowest effective dosage must be used.

**Table I – Corticosteroids used intranasally (2004 Vidal drug compendium). The medications are listed by alphabetical order of the non-proprietary names**

Active ingredient	French Brand name	Minimum age	Number of daily applications	Daily dosage in adults	Approved uses in adults
Beclometasone	Béconase	3 years	4	400 mg	SAR, PAR, VR, IR including NARES
Beclometasone	Beclor-Rhino	3 years	2	400 mg	SAR, PAR, NARES
Budesonide	Rhinocort	6 years	1 or 2	256 mg	SAR, PAR
Flunisolide	Nasalide	6 years	2	200 mg	SAR, PAR
Fluticasone	Flixonase	4 years	1	200 mg	SAR, PAR
Mometasone	Nasonex	3 years	1	200 mg	SAR, PAR
Tixocortol	Pivalone	-	2 à 4	4000 mg	SAR, PAR, VR chronic rhinitis
Triamcinolone	Nasacort	6 years	1	220 mg	SAR, PAR,

SAR: seasonal allergic rhinitis; PAR: perennial allergic rhinitis; VR: vasomotor rhinitis; IR: inflammatory rhinitis; NARES: non-allergic rhinitis with eosinophilia syndrome

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### 2. Systemic medications

#### 2.1. Corticosteroids

Patients with severe chronic rhinitis may benefit from an initial course of systemic corticosteroid therapy, which should not exceed 10 days. Prolonged systemic corticosteroid therapy is not recommended. No comparative data are available for determining the optimal route of administration and dosage. Intramuscular injection of a long-acting corticosteroid results in prolonged patient exposure to the drug (15-20 days), which is not warranted in the treatment of chronic inflammatory rhinitis.

#### 2.2. H1 receptor antagonists

In patients with allergic rhinitis, H1 receptor antagonists are effective (grade A) in alleviating all the nasal

symptoms, including nasal obstruction. H1 receptor antagonists constitute a heterogeneous group of medications that differ in terms of pharmacologic activity, pharmacokinetics, and tissue distribution. However, there are usually no detectable differences across these medications regarding the clinical improvements in ocular, nasal, and cutaneous manifestations. First-generation H1 receptor antagonists (table II) cross the blood-brain barrier; therefore, they induce sedation (central H1 receptor inhibition) and may cause adverse effects (dryness of the mouth, tachycardia, urinary retention, and accommodation disorders). Second-generation H1-receptor antagonists (table II) have no sedative effects. When taken orally, their pharmacokinetic and pharmacodynamic characteristics allow once-a-day dosing (grade B). Preference should be given to H1 receptor antagonists whose

**Table II – Antihistamine agents (2004 Vidal drug compendium). The compounds are listed according to the mode of administration**

French Brand name®	Active ingredient	Minimum age	Number of applications per day	Daily dosage in adults
<i>Nasal route</i>				
Allergodil	azelastine	6 years	2	0,56 mg
<i>Oral route</i>				
<i>Second-generation antihistamines (no sedative effect)</i>				
Virlix, Réactine, Generics	cetirizine	2 years 12 years	1	10 mg
Aérius	desloratadine	1 year	1	5 mg
Kestin	ebastine	12 years	1	10 to 20 mg
Telfast	fexofenadine	12 years	1	120 to 180 mg
Xyzall	levocetirizine	6 years	1	5 mg
Clarytine	loratadine	2 years	1	10 mg
Primalan cp Primalan sirop	mequitazine	6 years -	1 to 2	10 to 20 mg 125 mg/kg
Quitadrill		6 years	1 to 2	10 to 20 mg
Mizollen	mizolastine	12 years	1	10 mg
<i>First-generation antihistamines (sedative effects)</i>				
Théralène	alimemazine	1 year	3 to 4	20 to 40 mg
Dimégan	brompheniramine	12 years	2	24 mg
Aphilan	buclizine	6 years	1 to 2	25 to 50 mg
Allergefon	carbinoxamine	6 years	3	6 to 12 mg
Périactine	cyproheptadine	6 years	3	12 mg
Polaramine Polaramine répétab	dexchlor pheniramine	6 years 15 years	3 to 4 2	6 to 8 mg 12 mg
Atarax Atarax sirop	hydroxyzine	6 years -	2 to 4	50 to 100 mg 1 mg/kg/d
Apaisyl, Istamyl	isothipendyl	adult	2 to 3	24 to 36 mg
Tinset cp Tinset solution buvable	oxatomide	6 years -	2 2 to 3	60 mg 1 mg/kg/dose
Phénergan	promethazine	1 year	3 to 5	75 to 150 mg

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absorption and/or excretion are not influenced by food ingestion or drugs that interact with cytochromes.

### 2.3. Leukotriene inhibitors

Topical corticosteroids have been found more effective than leukotriene inhibitors (grade A). Consequently, leukotriene inhibitor therapy should be used only for seasonal rhinitis, provided the treatment is also warranted by the presence of mild-to-moderate persistent asthma.

### 2.4. Oral vasoconstricting agents

These agents are appropriate only for acute rhinitis. They should not be used in chronic rhinitis.

## 3. Specific allergen immunotherapy

Specific allergen immunotherapy is used with curative intent. The allergen can be administered parenterally or sublingually.

Evidence of efficacy has been obtained with a limited number of allergens, namely, grass, birch, and ambrosia pollen; house dust mites; and *Alternaria*.

## 4. Induction of tolerance to aspirin

The main treatment for aspirin hypersensitivity is prevention, which requires complete eviction of aspirin and other NSAIDs. Induction of tolerance is used only by specialized groups.

## 5. Procedures

When pharmacotherapy fails, reduction of the inferior turbinates can be considered to alleviate the nasal obstruction. Numerous methods have been used (grade C).

### 5.1 Laser vaporization

Six lasers are currently used: CO<sub>2</sub>, Nd:YAG, diode, KTP, Ho:YAG, and argon.

The results and adverse effects (e.g., crusting, dryness, and adhesions) are difficult to compare across lasers, as the energy delivered depends on the procedural characteristics. Laser therapy improves the rhinorrhea in only 50% to 60% of cases. (grade C).

### 5.2. Radiofrequency

Radiofrequency is a simple technique performed under local anaesthesia as an outpatient procedure. Pain is minimal. The rates of bleeding and complications are extremely low. The advantages are preservation of the surface epithelium and of mucociliary transport (grade B).

### 5.3. Submucosal electrocautery

One-year outcomes were disappointing in most studies (grade C).

### 5.4. Bipolar electrocautery under endoscopic guidance

No information is available on long-term outcomes.

### 5.5. Galvanocauterization of the inferior turbinates

Unfortunately, this widely used technique described by Bourdial has not been evaluated (grade C).

### 5.6. Turbinectomy, turbinoplasty

Partial turbinectomy, performed using the conventional method or a microdebrider, and turbinoplasty (or submucosal turbinate reduction) may be useful (grade C).

### 5.7. Cryotherapy

One-year outcomes are less favourable than with other methods (grade C).

## 6. Alternative treatments

Few studies have addressed the efficacy of aromatherapy or acupuncture in chronic rhinitis (grade C).

### 6.1. Spa therapy

Spa stays are useful for educating patients in nasal hygiene. In theory, the water source and spa techniques should be chosen according to the nature and extent of the disorder. No prospective randomized studies are available. Consequently, the effectiveness of spa therapy in chronic rhinitis remains unknown.

### 6.2. Homeopathy

Most studies included small number of patients and suffered from methodological flaws. Consequently, the effectiveness of homeopathy in chronic rhinitis remains unknown (grade C).

## PRACTICAL GUIDE

### A. TREATMENT OF ALLERGIC RHINITIS

Eviction of the offending allergens is mandatory. Antihistamines and nasal glucocorticoids are the most effective medications. Patients with mild seasonal allergic rhinitis can be given either a second-generation oral antihistamine or a nasal antihistamine (grade B). In mild perennial allergic rhinitis and in moderate-to-severe seasonal rhinitis, either one of the above-

## Clinical practice recommendations “ Management of chronic rhinitis ”

mentioned medications or a nasal corticosteroid can be used. The patient should be re-evaluated 4 to 6 weeks later. Specific allergen therapy (desensitization) is the only currently available method capable of inducing a profound change in the atopic status. It is indicated in patients allergic to a small number of allergens and has been validated for a limited number of allergens (mainly house dust mites and pollens).

### B. TREATMENT OF NON-ALLERGIC RHINITIS

#### 1. Inflammatory rhinitis

##### 1.1. Treatment of NARES

Nasal corticosteroid therapy is usually effective. Follow-up physical and endoscopic examinations are advisable to look for progression to sinonasal polyposis.

#### 2. Non-inflammatory rhinitis

##### 2.1. Extrinsic rhinitis

###### 2.1.1. Treatment of drug-induced rhinitis

Eviction of the offending medications is the main treatment.

###### 2.1.2. Treatment of food-related/gustatory rhinitis

Information is the cornerstone of preventive therapy. Appropriate labelling of foods available to consumers is essential.

###### 2.1.3. Treatment of non-allergic occupational rhinitis

Irritation is a common mechanism in this situation. A discussion with the occupational physician is necessary to determine whether rhinitis is known to occur in association with the patient's occupation and, when possible, to design preventive measures (change in work station or use of a protective mask for instance).

###### 2.1.4. Environment: air conditioning, CPAP, smoke

Eviction of irritants is the mainstay of treatment. In patients who cannot discontinue CPAP (grade C), humidification may improve the symptoms. The role for nasal corticosteroid therapy is incompletely documented, although improvements have been noted.

##### 2.2. Intrinsic rhinitis

###### 2.2.1. Treatment of hormonal rhinitis

###### Endocrinopathy

No specific treatments are available for rhinitis occurring in association with acromegaly or hypothyroidism.

###### Rhinitis associated with pregnancy

Ipratropium (level B for the FDA) is used when wate-

ry rhinorrhea is the main symptom and hypertonic solutions when nasal obstruction predominates. If these measures fail, cauterization of the inferior turbinates under local anaesthesia can be offered. Mometasone furoate can be given during pregnancy if needed.

###### 2.2.2. Treatment of age-related rhinitis

Ipratropium is usually effective.

###### 2.2.3. Treatment of posture-treated rhinitis

Vasoconstricting agents are used during the diagnostic phase but cannot be taken on a long-term basis. All of the local procedures for restoring nasal patency can be considered. The most widely used method is turbinate reduction (cauterization, radiofrequency, turbinoplasty, or turbinectomy). Patients with symptomatic deviated septum may need septal repositioning. There are no studies specifically designed to evaluate these methods in posture-related rhinitis.

###### 2.2.4. Treatment of atrophic rhinitis

The management is not agreed on, and no guidelines are available. Nasal lavage is consistently used. Surgery is performed occasionally but has not been evaluated (grade C).

###### 2.2.5. Treatment of primary vasomotor rhinitis (idiopathic rhinitis)

One of two strategies can be used: either a broad-spectrum treatment aimed at improving all the symptoms can be given or an individual symptom causing marked discomfort can be targeted specifically. The broad-spectrum treatment combines topical corticosteroids with topical antihistamines, most notably azelastine (grade C), or oral antihistamines (grade C). Saline irrigation is effective also. Targeted treatment can consist in a vasoconstricting agent given topically in the short term or systemically in the long term. Treatment-limiting factors include advanced age and co-morbidities (most notably cardiovascular disease). Ipratropium spray can be used when rhinorrhea is the predominant symptom. In addition to medications, numerous instrumental procedures have been used. However, there are no comparative studies or methodologically acceptable evaluations. The main goal when selecting the treatment is to avoid worsening the abnormalities of the nasal mucosa.

### SPECIAL CASES

#### 1. Children

Allergies contribute most cases of chronic rhinitis in

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children. When discontinuation of passive smoke exposure and allergen eviction are not feasible or not adequately effective, oral antihistamines and nasal corticosteroids can be used (table I). Topical decongestants are not approved for children younger than 12 years, the only exception being tuaminoheptane sulphate (combined with acetylcysteine in Rhinofluimucil®) which can be used in children older than 30 months.

### 2. Athletes

The list of banned substances changes continually. The reader is referred to websites on this topic, such as the site of the French Ministry for Youth and Sports. (<http://www.santesport.gouv.fr>)

### 3. Pregnant women

Compounds and treatments that can be used during pregnancy are listed in an article by P. Demoly and V. Piette (Médicaments de l'asthme, de la rhinite et des allergies. Précautions au cours de la grossesse et de l'allaitement. *Rev Fr Allergo Immuno Clin.* 2003; 43(suppl. 1)).

## CONCLUSION / PERSPECTIVES

The work conducted by the Task Force underlined a number of deficiencies regarding the diagnosis of chronic rhinitis. Although history-taking is an invaluable diagnostic tool, few investigations are available, with the exception of allergy tests, to identify the pathophysiological mechanisms underlying chronic nasal symptoms. Research is needed to develop routine diagnostic tests capable of guiding treatment decisions. Topical corticosteroid therapy is the main validated treatment in a number of disorders including allergic rhinitis and NARES. Antihistamines have been proved effective in allergic rhinitis. Although numerous medications and procedures are available, their indications will remain poorly standardized until validation studies become available. These facts emphasize the need for further research into chronic rhinitis, a condition whose incidence is increasing steadily.

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**Table III - List of nasally administered medications cited in this document.**

INN	French Brand name®	Excipients	License In adults for ORL disorders
azelastine	Allergodil		SAR, PAR
beclometasone	Beclor-Rhino	B, P	SAR, PAR, NARES
	Beconase,	B, P	SAR, PAR, VR, IR including NARES
	Rhinirex	B, P	SAR, PAR, IR including NARES
budesonide	Rhinocort	P	SAR, PAR
cromoglycate	Lomusol	B	SAR, PAR
	Nalcron, Intercron	B	
ephedrine	Rhino-Sulfuryl	Thiosulfate de sodium	Nasal congestion
	Rhinamide	B	Nasal congestion
flunisolide	Nasalide	B, P, G	SAR, PAR
fluticasone	Flixonase	B, P	SAR, PAR
ipratropium	Atrovent	B	VR, PAR, SAR
mometasone	Nasonex	B, P	SAR, PAR
n-acetyl aspartyl glutamic acid	Rhinaaxia	B	
naphazoline = lidocaine	Xylocaine 5% with naphazoline		Preparation for nasal examination
naphazoline + prednisolone	Derinox		Nasal congestion
oxymetazoline	Aturgyl	B	Nasal congestion
oxymetazoline + prednisolone	Deturgylone	B	Nasal congestion
phenylephrine	Humoxal	B, P	Nasal congestion
tixocortol	Pivalone	N acetyl pyridinium	SAR, PAR, VR, chronic rhinitis
triamcinolone	Nasacort	B, P	RAS RAP
tuaminoheptane	Rhinofluimucil	B, acetylcysteine	Nasal congestion

*Excipients: B, benzalkonium chloride; P, polysorbate 80; G, propylene glycol*

*Indications: SAR, seasonal allergic rhinitis; PAR, perennial allergic rhinitis; VR, vasomotor rhinitis (idiopathic rhinitis); IR, inflammatory rhinitis; NARES, non-allergic rhinitis with eosinophilia syndrome*

**List of compounds cited in this document (except for those listed in the table above) with the corresponding brand names**

INN	French Brand name®	INN	French Brand name®
alimemazine	Théralène	loratadine	Clarytine
brompheniramine	Dimégan	mequitazine	Primalan, Quitadrill
buclizine	Aphilan	methyldopa	Aldomet
carbinoxamine	Allergefon	mizolastine	Mizollen
celecoxib	Celebrex	montelukast	Singulair
cetirizine	Réactine, Virlix, Zyrtec**	oxatomide	Tinset
cyproheptadine	Périactine	phenylephrine	Hexapneumine
desloratadine	Aérius	prazosine	Alpress, Minipress
dexchlor		promethazine	Phénergan
pheniramine	Polaramine, Polaramine répétab	reserpine	Tensionorme
donepezil	Aricept	rivastigmine	Exelon
ebastine	Kestin	rofecoxib	Vioxx **
fexofenadine	Telfast	sildenafil	Viagra
galantamine	Reminyl	tadalafil	Cialis
hydroxyzine	Atarax	tamsulosine	Josir, Omix
isothipendyl	Apaisyl, Istamyl	terazosine	Dysalfa, Hytrine
levocetirizine	Xyzall	vardeafil	Levitra

*\*\*no longer marketed*

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### METHODOLOGY

The grades of the recommendations in this document were determined as follows:

- Grade A recommendation: recommendation based on studies producing high-level evidence
- Grade B recommendation: recommendation based on studies producing intermediate-level evidence;
- Grade C recommendation: recommendation based on low-level evidence;
- When no grade is indicated, the recommendation is based on expert opinion (consensus developed during Task Force meetings).

This grading system is intended to clarify the bases for the recommendations. When no proof is available, every effort should be made to conduct further studies. However, the absence of proof does not mean that a recommendation is irrelevant or unhelpful (e.g., no proof is available for mastectomy in breast cancer or antibiotic therapy in tonsillitis). The Task Force used the guide for reviewing the literature and grading recommendations issued in January 2000 by the ANAES (French Agency for Accreditation and Evaluation in Healthcare) to evaluate the level of proof supplied by the literature on rhinitis, based on the criteria below.

Level of proof supplied by the literature	Grade of the recommendations
<b>Level 1</b> Randomized controlled trials with high statistical power Meta-analysis of randomized controlled trials Decision analysis based on well-conducted studies	<b>Grade A</b>  Definitive scientific proof
<b>Level 2</b> Randomized controlled trials with low statistical power Well-conducted non-randomized comparative trials Cohort studies	<b>Grade B</b>  Scientific presumption
<b>Level 3</b> Case-control studies Comparison with historical controls	
<b>Level 4</b> Comparative studies with major sources of bias Retrospective studies Case-series Descriptive epidemiological studies (cross-sectional, longitudinal)	<b>Grade C</b>  Low level of scientific proof