

- Allergic Rhinitis

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- **Rhinitis:** Symptomatic disorder of the nose characterized by itching, nasal discharge, sneezing and nasal airway obstruction or eye lacrimation (one of them)
- **Allergic rhinitis:** Induction of rhinitis symptoms after allergen exposure by an IgE-mediated immune reaction; accompanied by inflammation of the nasal mucosa and nasal airway hyperreactivity.

# Evaluation and diagnosis: **History**

- Classic symptoms of allergic rhinitis:
  - **Nasal congestion or obstruction**
    - Frequently alternates between both sides
    - Persistent unilateral obstruction: Anatomical defects, Inflammatory mass (nasal polyp), Tumor
  - **Sneezing:** in allergic disease often marked is by explosive paroxysms of 5 to 10 sneezes or more
  - **Rhinorrhea:** most often clear to white in color
    - Purulent secretions: chronic sinusitis or atrophic rhinitis
  - **Nasal pruritis**

ISCAR: Allergic Rhinitis. Int Forum Allergy Rhinol. 2018 Feb;8(2):108-352.  
Middletons 's Allergy: Principle and Practice, 8<sup>th</sup> edition

# Evaluation and diagnosis: **History**

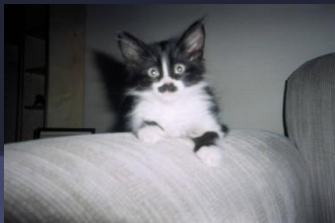
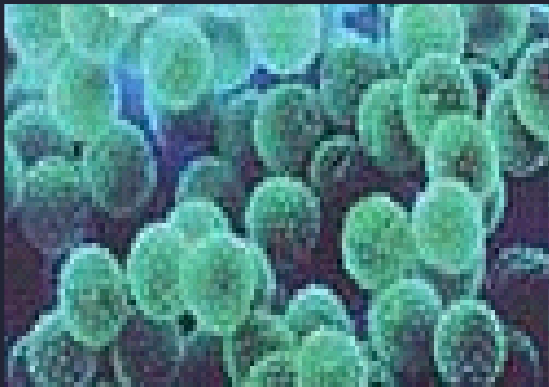
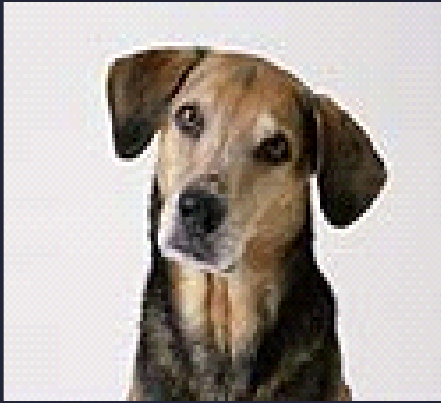
- **Presence of temporal patterns**
  - All rhinitis symptoms are **most intense during the early morning hours** (circadian variations)
  - Decrease in symptoms throughout the day: presence of an **indoor allergen** (HDM, animal dander, mold, cockroach)
  - Clear-cut worsening of symptoms in outside environments: probability of allergy to an **outdoor allergen** (pollen, mold)

Middleton's Allergy: Principle and Practice, 8<sup>th</sup> edition

# What should the physician do?

- Ask about allergic symptoms and the medical **history** of your patient
- Determine the severity** of the disease and impact of the major symptom
- Perform **physical examination**, including anterior rhinoscopy
- Confirm allergy** by skin prick test or serum specific IgE
- Check for lower airway symptoms, especially **asthma**

# Globally important sources of allergens



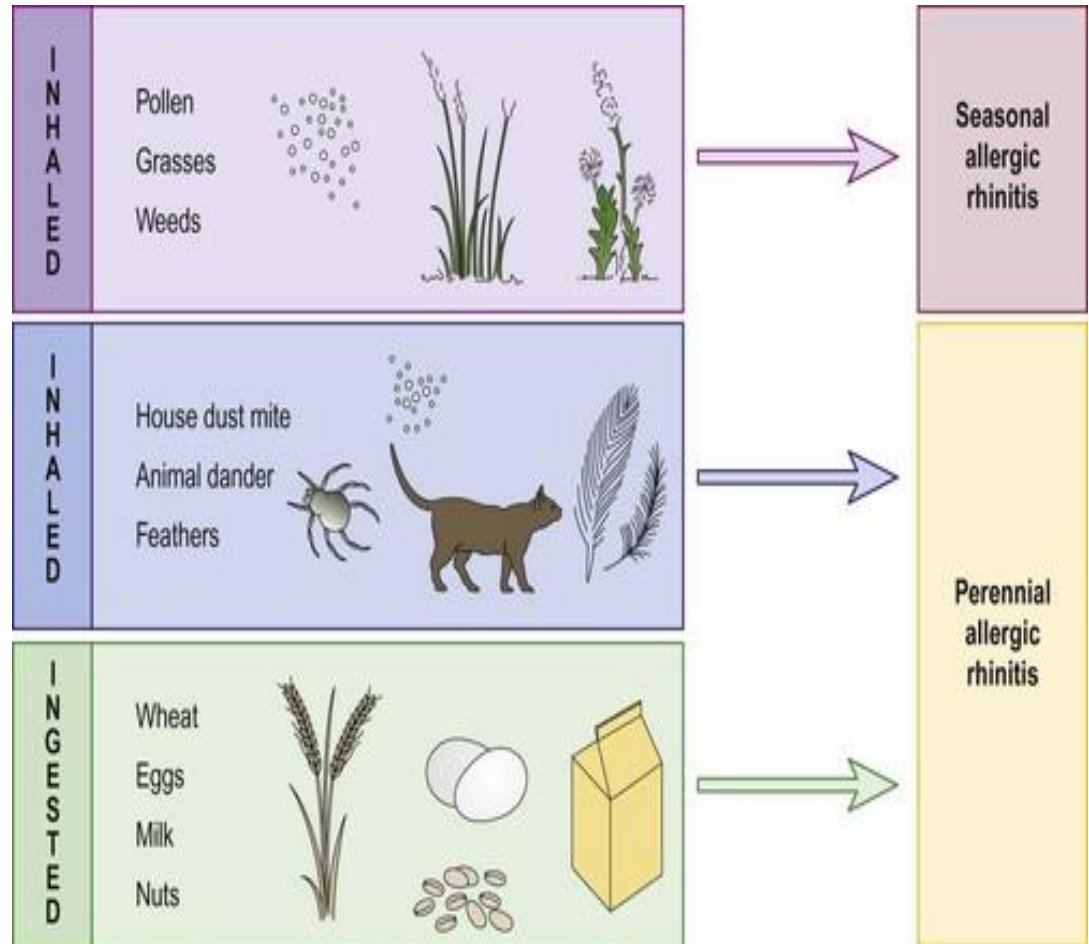
- House dust mites
- Grass, tree and weed pollen
- Pets
- Cockroaches
- Molds

# Etiology

## Inhalant allergens

- Seasonal
- Perennial

## Genetic predisposition



## 2 PHASES OF ALLERGIC IMMUNE RESPONSE

### Acute or early phase

- Within 5-30 min,
- Due to release of vasoactive amines like histamine
- sneezing, rhinorrhea nasal blockage and/or bronchospasm.

### Late or delayed phase

- : 2-8 hours after exposure to allergen without additional exposure.
- Due to infiltration of inflammatory cells at the site of antigen deposition ( E phils, N phils, B phil, monocytes and CD4+ T cells)
- swelling.,congestion, thick secretion

# More suggestive for AR

2 or more of the following symptoms for > 1 hour on most days:

- Runny nose
- Sneezing, especially paroxysmal
- Nasal obstruction
- Nasal itch
- Ocular symptoms like itch, redness or tearing

# Symptoms LESS suggestive for AR

- Unilateral symptoms
- Discoloured secretions
- Facial or nasal pain
- Recurrent epistaxis
- Smell disorder (anosmia)
- Posterior rhinorrhoea (post nasal drip) with thickened mucus
- Isolated rhinorrhoea

**BOX 1** | Rhinitis symptoms are nasal running, blocking, itching, sneezing, all of which are common in children due to viral colds. This Box gives the clues to an AR diagnosis.

Rhinitis may be allergic if

- The eyes are involved
- Itching is noticeable- child gives allergic salute, has allergic crease
- Exposure to a known allergen reliably causes symptoms
- Personal or family history of other allergic diseases
- Some children present with a comorbidity (asthma, atopic eczema, rhinosinusitis, hearing difficulties, sleep disturbance, behavior problems, pollen food syndrome). Always ask about nasal symptoms in such patients
- Always ask about asthma in children with rhinitis and vice-versa.

**BOX 2** | Red Flags- for specialist attention.

- Children with unilateral symptoms, severe nasal obstruction +/- sleep apnoea
- Children under 2 years and those with a history of rhinitis symptoms present continuously since birth (34, 35)
- Children with nasal polyps
- Those refractory to medical management.

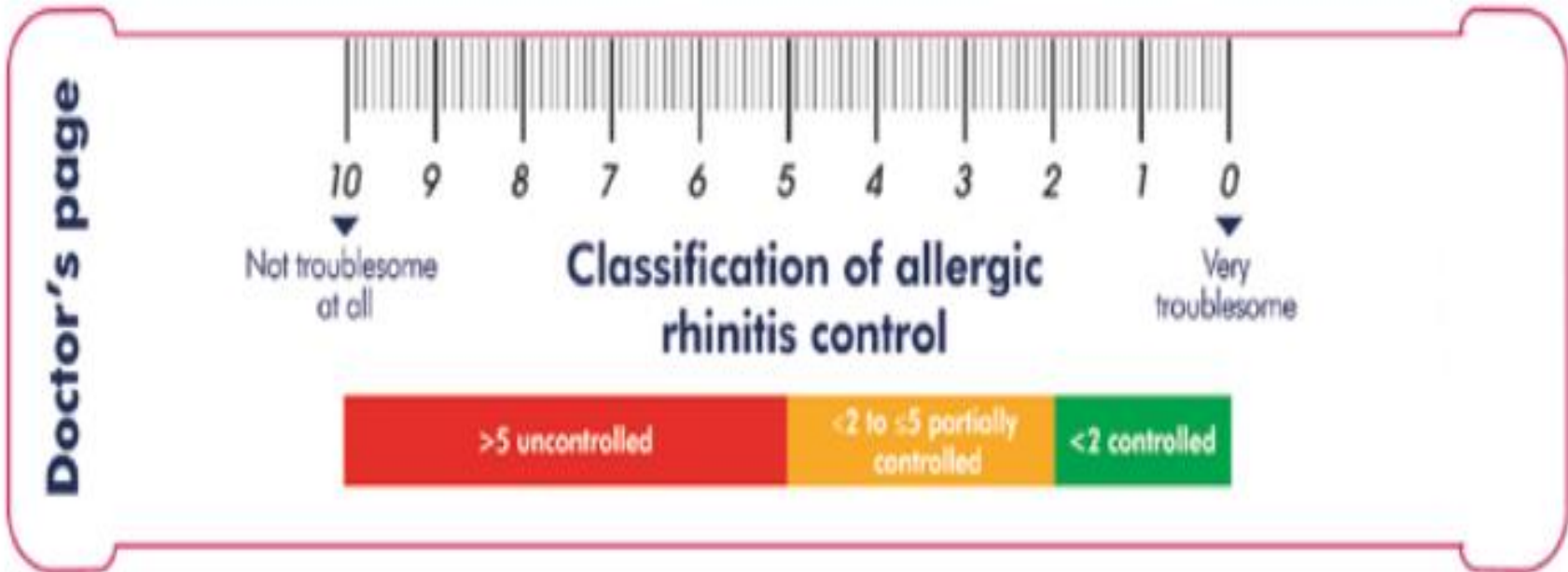


Fig. 2. VAS and its usage

## Nasal Features

### **Nasal Crease**

OR

### **Allergic salute**

**A horizontal crease across the lower half of the bridge of the nose that is caused by repeated upward rubbing of the tip of the nose by the palm of the hand**



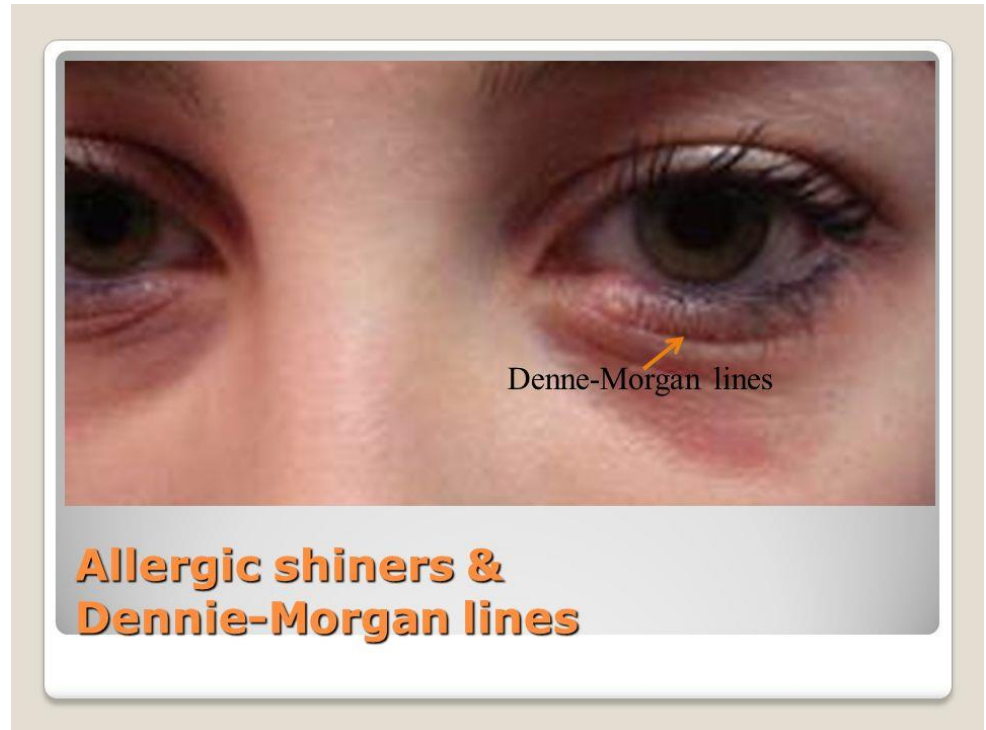
## Eye Features

### “Allergic shiners”

Dark circles around the eyes

### “Dennie-Morgan” lines

prominent creases below the inferior eyelid



## Mouth Features

### "cobblestoning"

streaks of lymphoid tissue on the posterior pharynx, which is commonly observed with allergic rhinitis

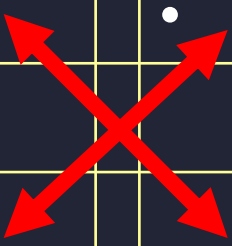
### Malocclusion (overbite) and a high-arched palate

can be observed in patients who breathe from their mouths excessively



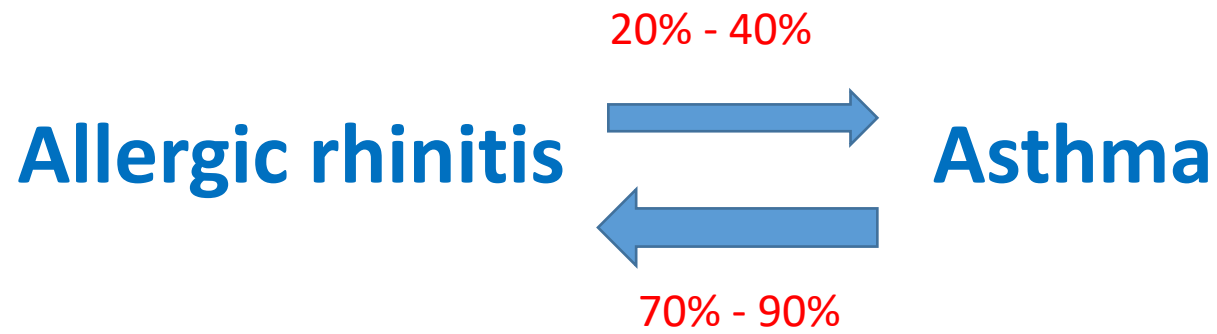
# Allergic rhinitis classification

<b>Intermittent</b>	<b>Persistent</b>
<p>Symptoms</p> <ul style="list-style-type: none"><li>• &lt; 4 days / week</li><li>• or &lt; 4 weeks</li></ul>	<p>Symptoms</p> <ul style="list-style-type: none"><li>• &gt; 4 days / week</li><li>• or &gt; 4 weeks</li></ul>
<p><b>Mild</b></p> <ul style="list-style-type: none"><li>• Sleep: normal</li><li>• Daily activities (incl. sports): normal</li><li>• Work-school activities: normal</li><li>• Severe symptoms: no</li></ul>	<p><b>Moderate- severe</b></p> <ul style="list-style-type: none"><li>• Sleep: disturbed</li><li>• Daily activities: Restricted</li><li>• Work and school activities: disrupted</li><li>• Severe symptoms: yes</li></ul>



## Complications (Co-morbidities)





## When to suspect comorbid asthma?<sub>3</sub>

Have you had an episode or recurrent episodes of wheezing?

Do you have troublesome cough, especially at night/during awakening/exercise?

Do you cough or wheeze after exercise?

Do you experience extended common cold/laryngitis/bronchitis?

Does your chest feel tight or do you feel impaired breathing out?

# Diagnosis

# Allergy skin prick testing

Skin prick test / positive result



## Lab tests:

- **Allergy skin tests** (immediate hypersensitivity testing): An in vivo method of determining immediate (IgE-mediated) hypersensitivity to specific allergens
- **Fluorescence enzyme immunoassay** (FEIA): Indirectly measures the quantity of immunoglobulin E (IgE) serving as an antibody to a particular antigen
- **Total serum IgE**: Neither sensitive nor specific for allergic rhinitis, but the results can be helpful in some cases when combined with other factors
- **Total blood eosinophil count**: Neither sensitive nor specific for the diagnosis, but, as with total serum IgE, can sometimes be helpful when combined with other factors

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# MANAGEMENT OF ALLERGIC RHINITIS

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# Environmental control

## 1. Allergens

- House dust mites
- Pets
- Cockroaches
- Molds
- Pollen

## 2. Pollutants and Irritants

# Allergen avoidance

- **Pets**

- Remove pets from bedrooms and, even better, from the entire home
- Vacuum carpets, mattresses and upholstery regularly
- Wash pets regularly ( $\pm$ )

- **Molds**

- Ensure dry indoor conditions
- Use ammonia to remove mold from bathrooms and other wet spaces

# Allergen avoidance

- **Cockroaches**
- Eradicate cockroaches with appropriate gel-type, non-volatile, insecticides
- Eliminate dampness, cracks in floors, ceilings, cover food; wash surfaces, fabrics to remove allergen
- **Pollen**
- Remain indoors with windows closed at peak pollen times
- Wear sunglasses
- Use air-conditioning, where possible
- Install car pollen filter

# House dust mite allergen avoidance



- Provide adequate ventilation to decrease humidity
- Wash bedding regularly at 60°C
- Encase pillow, mattress and quilt in allergen impermeable covers
- Use vacuum cleaner with HEPA filter
- Dispose of feather bedding
- Remove carpets
- Remove curtains, pets and stuffed toys from bedroom

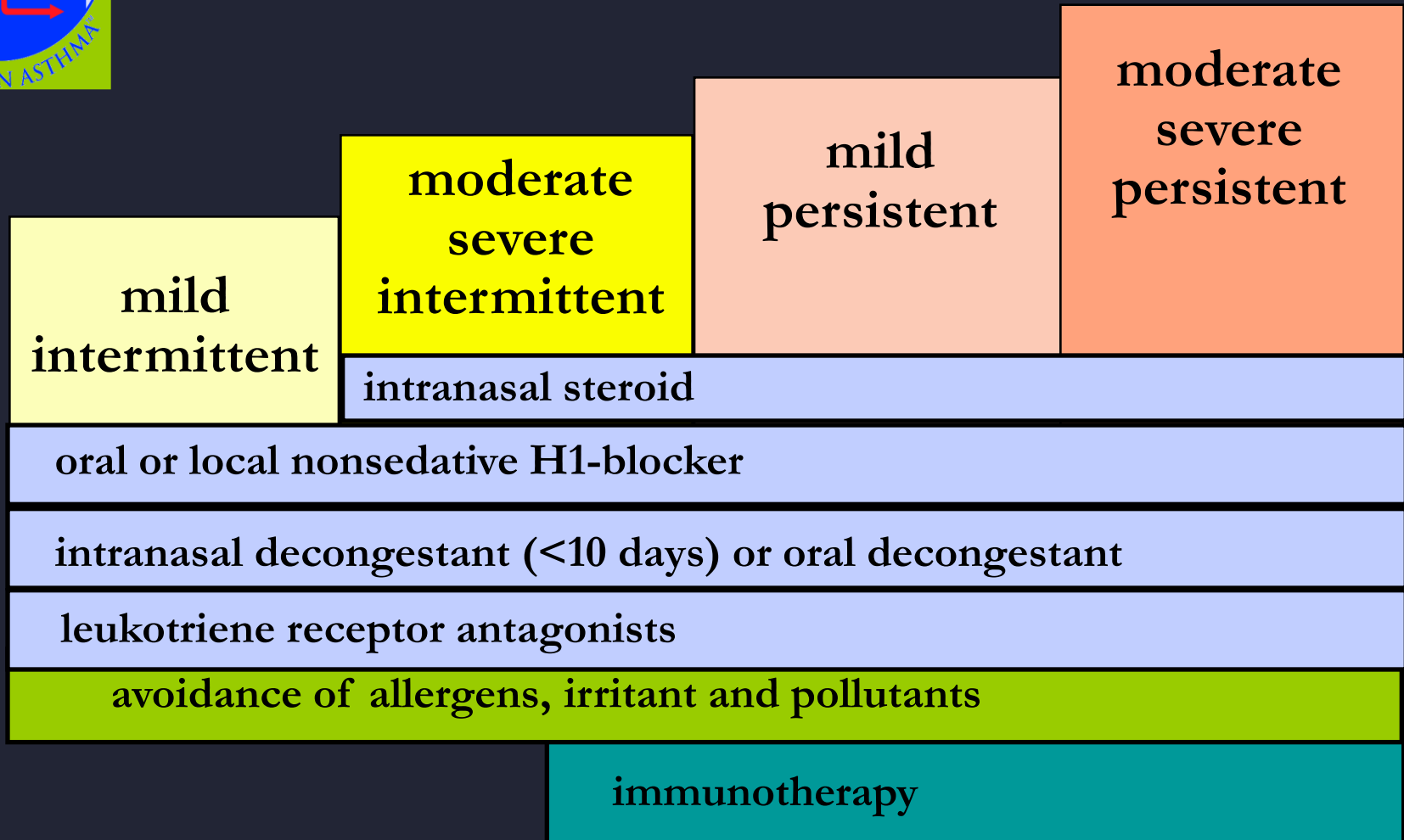
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# PHARMACOTHERAPY OF ALLERGIC RHINITIS

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# Management of Allergic Rhinitis: ARIA Guidelines



# Agents and actions

	Oral antihistamines	Nasal antihistamines	Cys-LT1 receptor antagonists	Nasal steroids	Nasal decongestants	Oral decongestants	Nasal ipratropium	Nasal cromones
<b>Rhinorrhea</b>	++	++	++	+++	0	0	+++	+
<b>Congestion</b>	+	+	+	+++	++++	++	0	+
<b>Sneezing</b>	++	++	++	+++	0	0	0	+
<b>Pruritus</b>	++	++	+	+++	0	0	0	+
<b>Ocular symptoms</b>	++	0	++	++	0	0	0	0
<b>Onset of action</b>	1 hr	15 min	48 hr	12 hr	5-15 min	1 hr	15-30 min	-
<b>Duration</b>	12-24 hr	6-12 hr	24 hr	12-48 hr	3-6 hr	12-24 hr	4-12 hr	2-6 hr

# Oral antihistamines

- First generation agents

Chlorpheniramine

Brompheniramine

Diphenhydramine

Promethazine

Hydroxyzine

- Newer agents

Azelastine

Cetirizine

Desloratadine

Fexofenadine

Levocetirizine

Loratadine

Mizolastine

## Properties of 2<sup>nd</sup> generation antihistamine

Medication	Approved age	Onset (hr)	Duration (hr)	Dose adjustment	Pregnancy category	NED	Price at KCMH
Cetirizine	≥ 6 mo	0.7	≥ 24	Renal and hepatic	B	∅	Cetirizin(10) 1 a/tab Ormist(5mg/5ml, 60ml) 15.5a Zyrtec(5mg/5ml, 75 ml) 100 a
Levocetirizine	≥ 6 mo	0.7	≥ 24	Renal and hepatic	B	X	Xyzal (5) 18.50a/tab
fexofenadine	≥ 2 yr	1-3	24	Renal	C	X	VIFAS(60) 2.75a/tab Telfast (60) 7.50 a/tab Fenafex(180) 6.25a/tab Telfast(180) 23a/tab Telfast suspension (30mg/5ml, 150 ml) 306 a
loratadine	≥ 2 yr	2	24	Hepatic	B	∅ ∅	Lorsedin(10) 1.50 a/tab Claritin syr (5mg/5ml, 100ml) 159a
desloratadine	≥ 6 mo	2-2.6	≥ 24	Renal and hepatic	C	X	Aerius (5) 22.50 a/tab Aerius syr (2.5mg/5ml, 60ml) 204a
Bilastine	≥ 12 yr	2	24	None	NA	X	Bilaxten(20) 16 a/tab
Rupatadine	≥ 12 yr	2	24	Use not recommended	NA	X	Rupafin(10) 39a/tab

Immunol Allergy Clin N Am 2011;31:509-543.

# PAEDIATRIC AR Management Algorithm

Patient education on disease and therapy adherence

Avoid irritants and allergens | Advise saline nasal sprays/douching

**FIRST LINE CARE**  
Pharmacist – General Practitioner

**SPECIALIST CARE**  
Specialist

• Two or more nasal symptoms suggestive of allergic rhinitis

Antihistamine (anti-H1)  
non-sedating, oral or nasal



Uncontrolled

(\* Add-on therapies

- Rhinorrhoea in asthmatics: Leukotriene R antagonist
- Ocular itch/skin rash: Oral non-sedating anti-H1
- Ocular symptoms: Intra-ocular anti-H1 or Cromones
- Sudden onset nasal blockage: nasal / oral decongestant  $\leq 7$  days under specialist guidance
- Ocular corticosteroid: short course, 0,5mg/kg, 5 days under specialist guidance

• Nasal congestion  
• Difficult-to-treat AR  
• Failure of previous treatment

Diagnosis of AR

Nasal corticosteroid



Uncontrolled

- Severe AR
- Non-responder to step 2

Re-evaluate diagnosis

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graph TD; A[Severe AR  
Non-responder to step 2] -- Re-evaluate diagnosis --> B["Nasal corticosteroid plus nasal antihistamine if > 6years  
or  
oral antihistamine if < 6years  
and/or  
Add-on therapies (*)  
Consider Allergen Immunotherapy"]; C[Carer and patient aiming for long term relief or cure] --> D["Allergen Immunotherapy  
(AR due to e.g. tree pollen, grass pollen, house dust mite)"]; E[ ] --> B; E --> D;
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Nasal corticosteroid plus nasal antihistamine if > 6years  
or  
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Add-on therapies (\*)  
Consider Allergen Immunotherapy

Carer and patient aiming for long term relief or cure

Allergen Immunotherapy  
(AR due to e.g. tree pollen, grass pollen, house dust mite)

(\*) Depending on availability at national level

# Nasal antihistamines

- Azelastine
- Levocabastine
- Olopatadine

# Newer generation oral antihistamines

- First line treatment for mild allergic rhinitis
- Effective for
  - Rhinorrhea
  - Nasal pruritus
  - Sneezing
- Less effective for
  - Nasal blockage
- Minimal or no sedative effects
- Once daily administration
- Rapid onset and 24 hour duration of action

# LTRA like Montelukast(Airokast)

- Effective in most symptoms but less than INS
- One of best choice in AR and Asthma or hyper reactive cough together

# Decongestants: alpha-2 adrenergic agonists

- Oral

Pseudoephedrine

- Nasal

Phenylephrine

Oxymetazoline

Xylometazoline

# Nasal corticosteroids

Beclomethasone dipropionate

Budesonide

Ciclesonide\*

Flunisolide

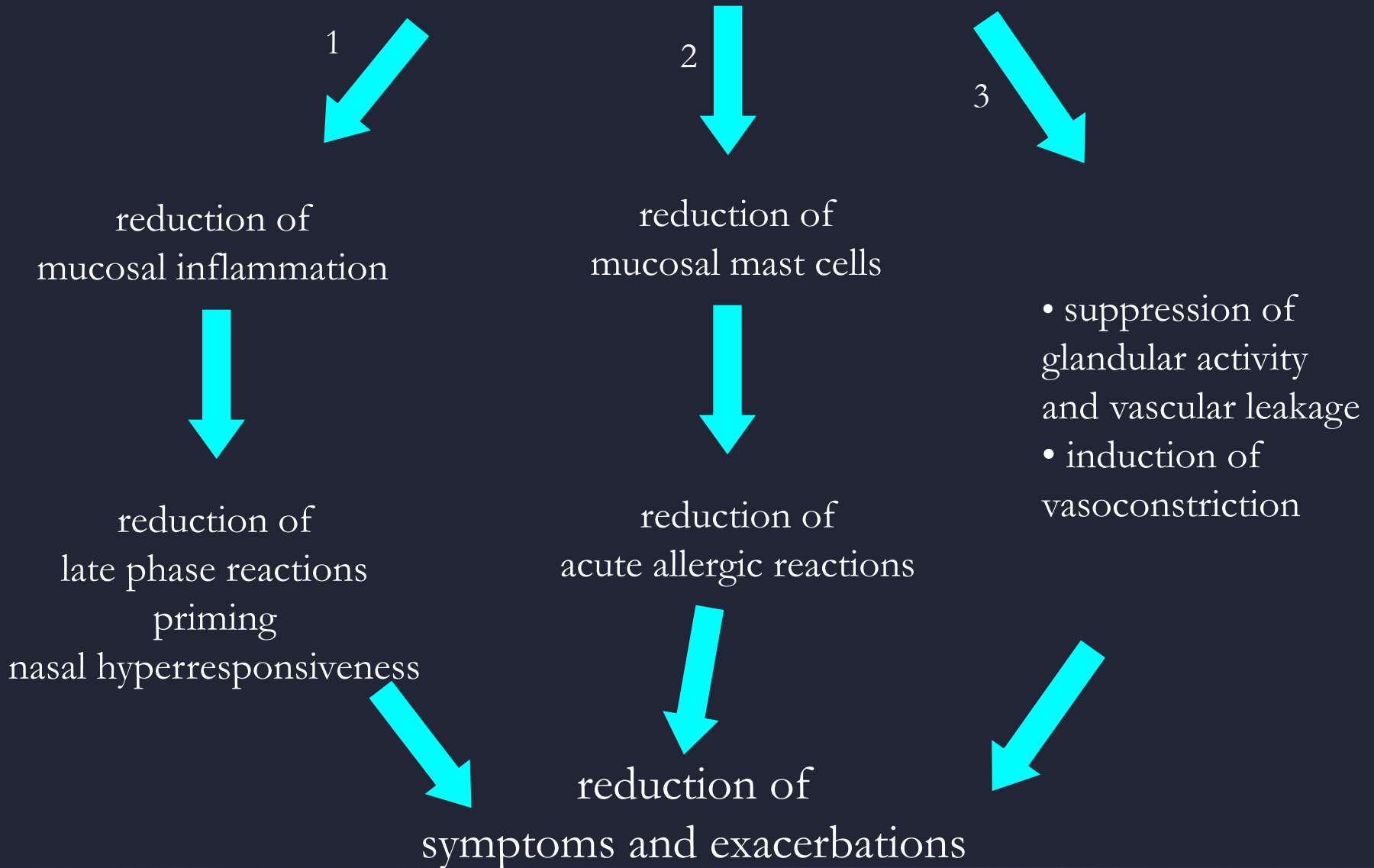
Fluticasone propionate

Mometasone furoate

Triamcinolone acetonide

\* Currently only approved for asthma

# Nasal corticosteroids



# Nasal corticosteroids

- Most potent anti-inflammatory agents
- Effective in treatment of all nasal symptoms including obstruction
- Superior to anti-histamines and anti-leukotienes
- First line pharmacotherapy for persistent allergic rhinitis

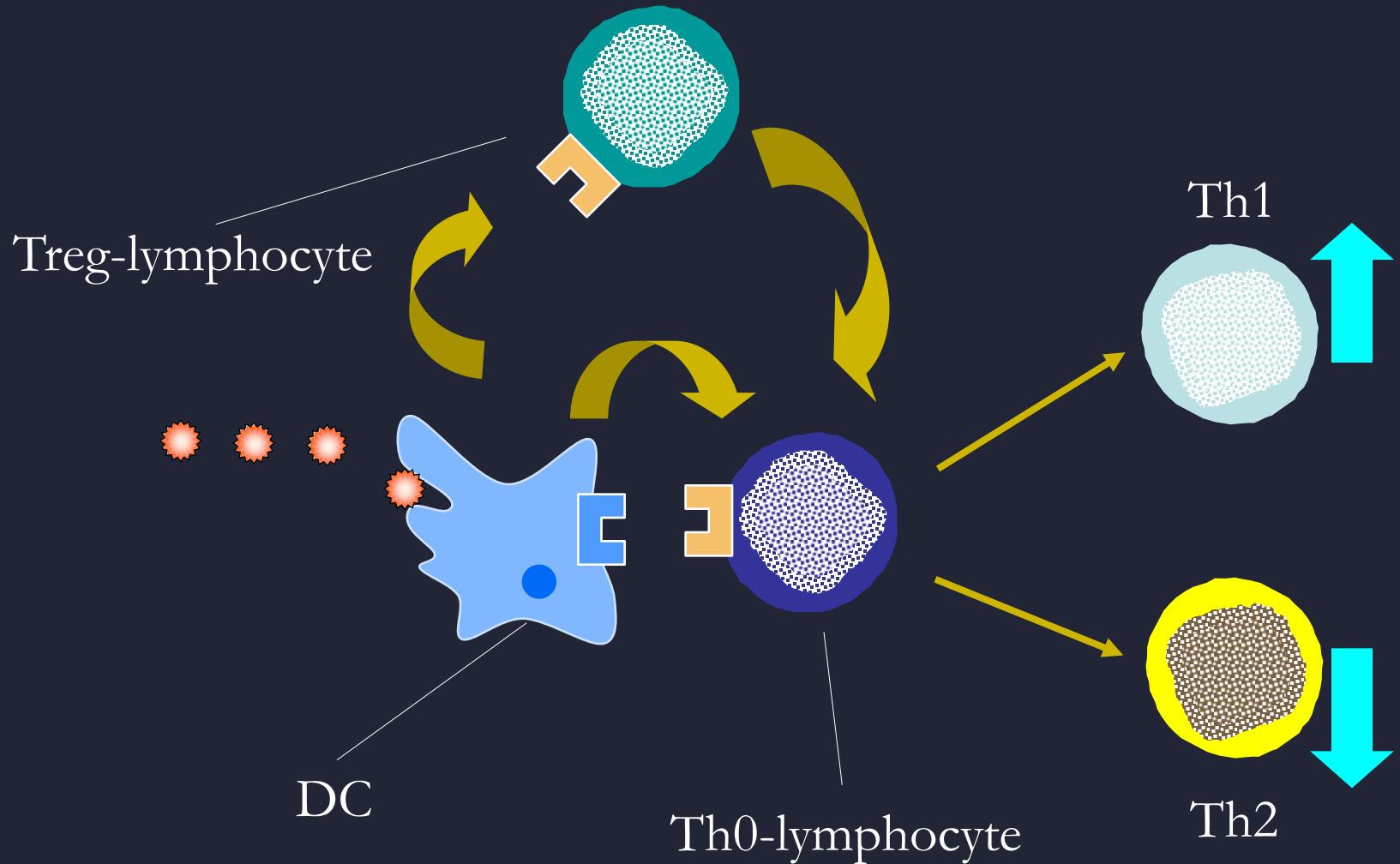
# Nasal corticosteroids

- Overall safe to use
- Adverse Effects
  - Nasal irritation
  - Epistaxis
  - Septal perforation (extremely rare)
  - HPA axis suppression (inconsistent and not clinically significant)
  - Suppressed growth (only in one study with beclomethasone)

# Allergen immunotherapy (vaccines)

- Subcutaneous
- Sublingual
- Nasal

# Possible mechanisms of immune response regulation by allergen immunotherapy



## What are the advantages of AIT?<sup>6</sup>

*Efficacy varies between specific products*

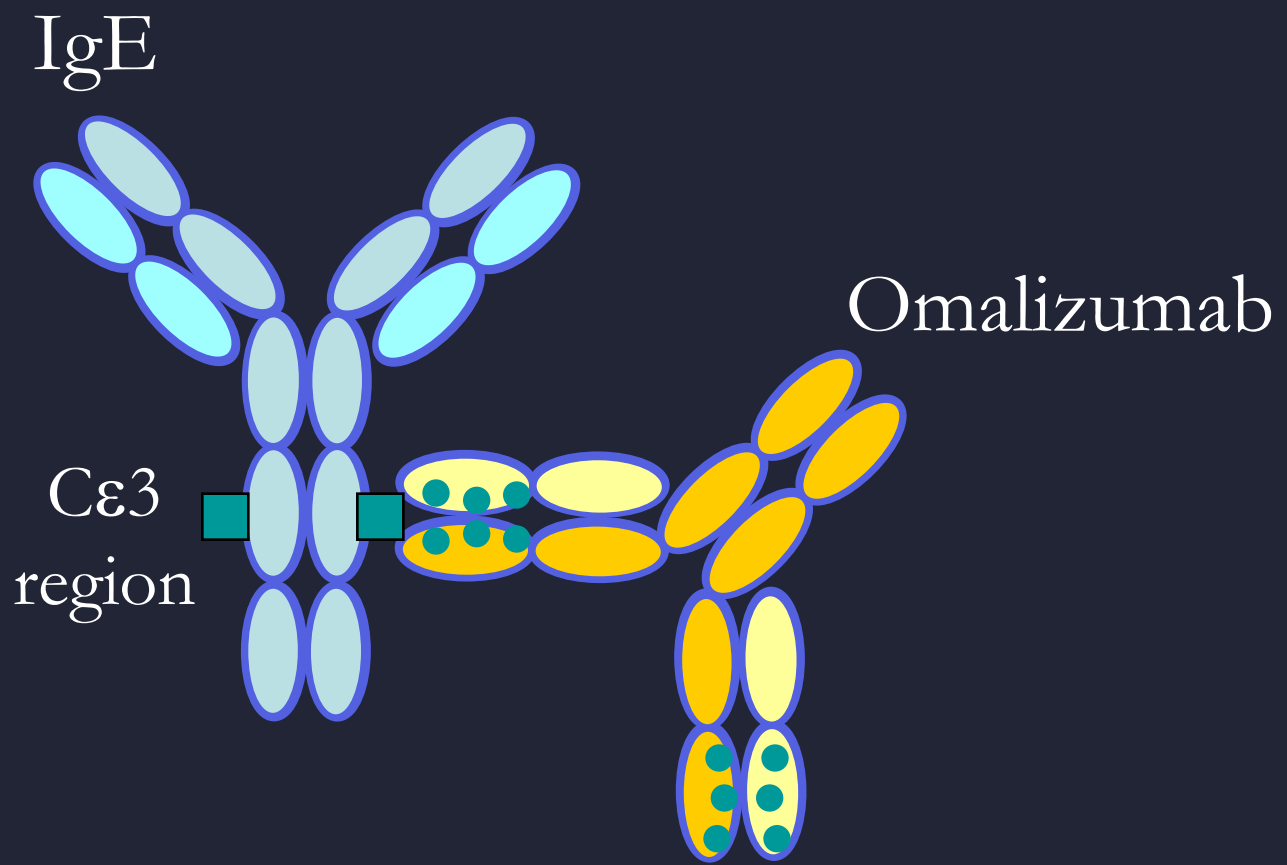
- ✓ Only treatment with disease modifying capacity
- ✓ Reduces nasal and/or ocular symptoms
- ✓ Enhances the quality of life
- ✓ Lowers need for intake of other anti-allergic medication
- ✓ Induces immunological tolerance, providing sustained clinical benefit
- ✓ Has the potential to prevent asthma

## Which patients can benefit from AIT?<sup>5</sup>

*AIT should be considered if ALL are present:*

- ❑ Uncontrolled moderate-to-severe symptoms of AR +/- conjunctivitis, on exposure to clinically relevant allergens
- ❑ Confirmation of IgE sensitisation to clinically relevant allergens (via skin prick test or serum specific IgE)
- ❑ Inadequate control of symptoms despite reliever medication and allergen avoidance measures and/or unacceptable adverse effects of medication

# Humanized monoclonal anti-IgE antibody: omalizumab



**Table 2: “Red flags” and other indications for ENT referral<sup>1,35</sup>**

Speciality

Indication for referral

Red flags

Heavily blood-stained nasal discharge

Nasal pain

Recurrent epistaxis

Unilateral symptoms

Other indications

Nasal blockage inadequately relived by drug treatment

Structural deviations (eg septal deviation) that make drug treatment difficult



**Thank you**