Allergic Rhinitis and ARIA Guidelines

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Objectives

- Introduction
- Theories
- Classifications
- Diagnosis
- Management (based on ARIA guidelines)
- Vidian neurectomy
Allergic rhinitis is a symptomatic disorder of the nose induced after allergen exposure by an IgE-mediated inflammation.

- Prevalence of 10-20%.
- Affects 20-40 million individuals in the United States annually.
INTRODUCTION

- Normally, harmless particles elicit an unnecessary immune response in patients with allergies.
- It is the inflammation that causes their symptoms.
- Atopy is the genetic predisposition to develop allergic hypersensitivity reactions.
Examples of allergic diseases are:
  - **allergic rhinitis**
  - allergic asthma
  - atopic dermatitis
  - food allergies

One atopic condition tends to put individuals at risk for others.
INTRODUCTION

- **AR is higher in children and adolescents** than in adults.
- **Rarely occurs in children younger than 2 years**, because AR require low-dose exposure to an offending allergen over many years before development of symptoms.
- **Severity of AR remains relatively constant throughout childhood and early adulthood**, usually improves in middle age, and is seldom a problem in the elderly.
INTRODUCTION

- A family history of AR increases the odds that a child will have the disease.

- Atopy occurs in:
  - 13% of children for whom neither parent is atopic
  - 29% of children with one atopic parent or sibling
  - 47% for whom both parents are atopic.

- AR is up to 4-6 times more likely to develop in individuals with asthma than in the general population.
Hygiene Hypothesis

- Epidemiologic data provide strong evidence of a steady rise in incidence of allergic diseases (asthma, rhinitis, atopic dermatitis) in developed countries since 1970.
- Concomitantly, incidence of many infectious diseases in developed countries has decreased as a result of antibiotics, vaccination, or improved hygiene.
Hygiene hypothesis suggested that the decrease in infectious diseases is causally linked to the increase in the incidence of allergic disease.
Hygiene Hypothesis

- Strachan observed that the risk of *allergic rhinitis* was inversely linked to birth order and the size of the family.
- He proposed that infections within households in early childhood have a role in preventing allergic rhinitis.

Hygiene Hypothesis

- Administration of **antibiotics** to children has been suspected to raise the risk of asthma and allergy.
- Droste and colleagues observed that the use of antibiotics in the first year of life increased the risk of asthma or other allergic diseases in children with a genetic predisposition to atopy.

Antibiotics might act by decreasing the number of infections or by modifying intestinal flora.

Large number of studies have documented that people raised on farms have a lower prevalence of hay fever and atopic sensitization in childhood and in adulthood.
BASIC IMMUNOLOGY OF ALLERGY
A Allergen enters the body.

B Antigen-presenting cell (macrophage, dendritic cell, langerhans cell) takes up the allergen molecule through the MHC-II receptor. The activated antigen presenting cell then migrates to the nearest lymph node.
C where **its activates T cells** that recognize the allergen. They then give the decision for the T cell to **differentiate to Th2 cell**.

D at the same time, **B cells** recognize the allergen and through the activated Th2 cell.
E the B cell would be activated.

F and differentiate into plasma cells, at which point they would actively synthesize IgE antibodies.
**G** IgE antibody recognizes epitopes of the allergen molecule, circulates around the body through the lymphatic and cardiovascular systems and finally binds to its FcεRI receptor on mast and basophil cells.
H when the allergen re-enters the body at a later time it binds to the IgE, which is on the cell surface, resulting in degranulation of basophils and mast cells and releasing inflammatory mediators such as histamine and IL-4.
Histamine binds to histamine receptors on endothelial cells and vascular smooth muscle causing vasodilation and increased permeability.

Patients then experience rhinorrhea, sneezing, and nasal congestion.
IL-4 affects more B cells to differentiate into plasma cells and produce more IgE and thus the vicious cycle continues.
2-24 hours after antigen challenge, release of pro-inflammatory including IL-5, which recruit eosinophils and leukotrienes causing recurrence of symptoms, most notably nasal congestion; this is termed the late response.
Classification of allergic rhinitis
Classification of Allergic rhinitis

- Classically, AR been divided as:
  1. **Seasonal AR**: Symptoms that occur during exposure to seasonal allergens such as ragweed, grasses, outdoor molds, and tree pollens.
  2. **Perennial AR**: Symptoms that occur for more than 2 hours per day for more than 9 months of the year, when allergies develop to house dust mites, indoor molds, animal dander, and cockroaches.
Classification of Allergic rhinitis

3. **Episodic AR**: Symptoms that occur on exposure to allergens not normally present in the environment, such as a cat-allergic individual.
Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines recommend a new classification:

1. **Intermittent AR**: Symptoms present for <4 days a week or <4 consecutive weeks.

2. **Persistent AR**: Symptoms present for >4 days a week and for >4 consecutive weeks.
Classification of AR

AR can be further classified by severity:

1. **Mild**: Symptoms are not troublesome.

2. **Moderate to severe**: one or more of the following:
   - Troublesome symptoms
   - Sleep disturbance
   - Impairment of daily activities
   - Interference with work or school.
History and examination
History:

- **Primary symptoms of AR:**
  1. Rhinorrhea
  2. Sneezing
  3. Nasal obstruction
EVALUATION AND DIAGNOSIS

**History:**

- **Allergic vs. Non-allergic??**
- Time and Location that symptoms occur provide clues for differentiation.
- Symptoms occurs during certain seasons of the year can point the diagnosis toward pollen or mold allergy.
- Symptoms occurs in certain locations exacerbate can point the diagnosis toward pet or mold pollen.
History:

Atopy **??**

- Up to **80%** of asthmatics have rhinitis.
- Up to **40%** of rhinitis patients have asthma.
- Food allergies and eczema in childhood can also point toward atopy
EVALUATION AND DIAGNOSIS

History:

- It is important that the treating physician become familiar with the pattern of **environmental allergens in the area** of practice.
- Once allergic symptoms are present, they may be exacerbated by irritants such as strong odors or perfumes, tobacco smoke, paint, newspaper ink, soap powders, and air pollutants.
## History

**TABLE 29.1 TOPICS TO INVESTIGATE WHEN TAKING AN ALLERGIC HISTORY**

- Nasal sneezing, itching, congestion, rhinorhea
- Eye itching, watering, redness, swelling
- Wheezing, urticaria, eczema, ear pressure, cough
- Onset and duration of symptoms
- Episodic vs. perennial symptoms
- Changes in living conditions
- Length of time living in local area
- Symptom changes with travel or vacations
- Symptom changes with seasons
- Animal exposure at home, work, or school
- Medications tried to alleviate symptoms
- Childhood food allergy, asthma, atopic dermatitis
- Family members with allergy
Physical Findings:

Face:

- **Allergic Shiners:** Periorbital cyanosis and puffiness of the eyelids as a result of venous stasis secondary to chronic nasal obstruction.
Physical Findings

Face:
- **Allergic Salute**: Supratip crease at the junction of the upper and lower lateral cartilages is a result of frequent pushing upward of the nasal tip.
Physical Findings

Face:

- **Adenoid face**: Elongated face, open mouth, flattened malar eminences, pinched nostrils, raised upper lips, high arched palate, and retracted jaws associated with longstanding nasal obstruction in children.
Physical Findings

**Nose:**
- No appearance of the nasal mucosa is pathognomonic for AR.
- IT are *pale* and *edematous* and are coated with thin, clear secretions.
Nose:

- Topical decongestant can be applied, then nasal cavity can be examined a few minutes later to allow evaluation of reversibility of nasal congestion and facilitates inspection of middle meatus.

Fig. 3. The inferior turbinate before (A) and after (B) decongestion with oxymetazoline.
Physical Findings

Throat:

- Oral pharyngeal findings may include **postnasal drip**, which tends to drain on the sides.

- **Erythema** and **edema** and **cobblestoning** of the posterior pharyngeal wall may also be observed.
Physical Findings

Ear:

- The ear examination may show **otitis media with effusion**, which is suggestive of **eustachian tube dysfunction** or nasopharyngeal problems.
EVALUATION AND DIAGNOSIS

Diagnostic Tests

- Required to confirm the diagnosis of AR.

- Most common tests:
  1. Skin prick test
  2. Serum IgE level
Diagnostic Tests

- Skin Test:
  - Performed by applying antigen extracts to into the epidermis of the skin.
  - Common areas for testing include the inside forearm and the back.
EVALUATION AND DIAGNOSIS

- Highly **specific and sensitive**, 70-95% and 80-97%, respectively
- Negative predictive accuracy > 95% (negative skin test results essentially confirm the absence of IgE-mediated reactions)
- Always accompanied by an introduction of Negative and positive control.
EVALUATION AND DIAGNOSIS

- **Negative control** is the diluent used to preserve the allergen extract.

- **A reaction should not occur to this solution**

- **Dermatographism** (redness of the skin following a scratch or irritation) may occur if the patient’s skin is excessively sensitive to friction or pressure.
EVALUATION AND DIAGNOSIS

- If patient has this reaction then negative control will also show a wheal and flare.
- Any reading >3mm of negative control will then be read as positive.
Positive control is a 1mg/ml histamine hydrochloride solution and is used to:

- Detect suppression of the immune response by medication. Antihistamines should be avoided for 48-72 hours prior to the test.
- Assess a positive skin reaction to the allergens compared with the reaction to histamine.
EVALUATION AND DIAGNOSIS

- A **positive reaction** occurs if the skin becomes itchy within a few minutes and then becomes **red and swollen** with a 'weal' in the center (**≥ 3 mm**)

- The weal has a raised edge, which slowly expands to reach its maximum size in about 15-20 minutes.
Advantages of Skin test:

- Simple, quick (providing results within 15-20 minutes) and inexpensive.
- Gives useful information about all forms of allergy, and is appropriate for the detection of inhaled, occupational and ingested allergies.
Disadvantages of Skin test:

- Affected by previous ingestion of antihistamines or other drugs.
- Children do not tolerate multiple skin needle pricks.
EVALUATION AND DIAGNOSIS

- **Disadvantages of Skin test:**
- Coexisting **dermatologic conditions** (eczema, dermatographism) may **preclude** the performance of skin tests
- **Systemic and anaphylactic reactions** may occur.
EVALUATION AND DIAGNOSIS

Diagnostic Tests

Serum IgE level:

- **Total** and **specific** serum IgE levels can be measured in vitro.
- **Total IgE determination is of limited use in the diagnosis of AR** because it is elevated only in 30-40% of patients with AR and can be elevated in patients with nonallergic conditions and in normal subjects as well.
Diagnostic Tests

Serum IgE level:

- Specific serum IgE level is useful in the diagnosis of AR.
- Correlate well with the results of skin testing and with clinical picture.
- Eliminate the need for multiple skin pricks.
- Unaffected by antihistamines
- More expensive and results take longer to obtain than those of skin testing.
Clinical history should guide the clinician to test the patient with a panel of the most relevant antigens.

Testing with the six most common antigens is effective in picking up 95% of the allergens to which a patient is sensitive.

Positive in vitro or skin-test result alone does not confirm the diagnosis of allergic rhinitis in the absence of a supporting clinical history.
EVALUATION AND DIAGNOSIS

- Clinical history should guide the clinician to test the patient with a panel of the most relevant antigens.
- Testing with the six most common antigens is effective in picking up 95% of the allergens to which a patient is sensitive.
- Positive in vitro or skin-test result alone does not confirm the diagnosis of allergic rhinitis in the absence of a supporting clinical history.
Management and ARIA guidelines
Medical management of allergic rhinitis consists of 3 major categories of treatments:

1. Environmental control measures and allergen avoidance
2. Pharmacological management
3. Immunotherapy
ARIA guidelines

- 2010 Revision, published in the Journal of Allergy and Clinical Immunology

I. Prevention of allergy
II. Treatment of allergic rhinitis
III. Treatment of asthma in patients with allergic rhinitis and asthma
ARIA guidelines

Treatment of allergic rhinitis

I. Reducing allergen exposure

II. Pharmacological treatment of allergic rhinitis
   I. Oral H1 antihistamine
   II. Intranasal H1 antihistamine
   III. Oral leukotriene receptor antagonists
   IV. Intranasal glucocorticosteroids
   V. Oral glucocorticosteroids
   VI. Intramuscular glucocorticosteroids
   VII. Intranasal chromones
   VIII. Intranasal ipratropium bromide
   IX. Intranasal decongestant
   X. Oral decongestant

III. Specific allergen immunotherapy for allergic rhinitis
Quality of evidence is classified as either high, moderate, low or very low based on methodological characteristics of the available evidence for a specific health care problem.
ARIA guidelines

The GRADE definitions of each category are:

- **High**: Further research is very unlikely to change confidence in the estimate of effect.
- **Moderate**: Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
- **Low**: Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
- **Very low**: Any estimate of effect is very uncertain.
According to the GRADE system the strength of a recommendation is either:

- **Strong recommendation**
- **Conditional (weak) recommendation**
### Table 1. Interpretation of strong and conditional (weak) recommendations

<table>
<thead>
<tr>
<th>Implications</th>
<th>Strong recommendation</th>
<th>Conditional (weak) recommendation</th>
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<tbody>
<tr>
<td>For patients</td>
<td>Most individuals in this situation would want the recommended course of action and only a small proportion would not. Formal decision aids are not likely to be needed to help individuals make decisions consistent with their values and preferences.</td>
<td>The majority of individuals in this situation would want the suggested course of action, but many would not.</td>
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<tr>
<td>For clinicians</td>
<td>Most individuals should receive the intervention. Adherence to this recommendation according to the guideline could be used as a quality criterion or performance indicator.</td>
<td>Recognize that different choices will be appropriate for individual patients and that you must help each patient arrive at a management decision consistent with his or her values and preferences. Decision aids may be useful helping individuals making decisions consistent with their values and preferences.</td>
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<tr>
<td>For policy makers</td>
<td>The recommendation can be adapted as policy in most situations</td>
<td>Policy making will require substantial debate and involvement of various stakeholders</td>
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I. Environmental control measures and allergen avoidance
Should methods aimed at reducing exposure to house dust mites be used in patients allergic to dust mite allergens?

recommend that clinicians do not administer and patients do not use currently available single chemical or physical preventive methods aimed at reducing exposure to house dust mites (strong recommendation | low quality evidence) or their combination (conditional recommendation | very low quality evidence)
Should patients allergic to indoor moulds avoid exposure to these allergens at home?

In patients allergic to indoor moulds, we suggest avoiding exposure to these allergens at home (conditional recommendation | very low quality evidence).
Should patients allergic to animal dander avoid exposure to these allergens at home?

In patients with allergic rhinitis due to animal dander, we **recommend avoiding exposure** to these allergens at home (*strong recommendation | very low quality evidence*)
ARIA

- Should immediate and total cessation of exposure to an occupational agent or exposure control be used in patients with occupational rhinitis and asthma?

- **recommend immediate and total cessation of exposure** to occupational allergen (**strong recommendation** | very low quality evidence)

- When total cessation of exposure is not possible, we suggest specific strategies aimed at minimizing occupational allergen exposure (**conditional recommendation** | very low quality evidence).
II. Pharmacological treatments of allergic rhinitis
Should oral H1-antihistamines be used for the treatment of allergic rhinitis?

- We recommend new generation oral H1-antihistamines that do not cause sedation and do not interact with cytochrome P450 (strong recommendation | low quality evidence).

- We suggest new generation oral H1-antihistamines that cause some sedation and/or interact with cytochrome P450 (conditional recommendation | low quality evidence).
Should new generation oral H1-antihistamines versus old generation oral H1-antihistamines be used for the treatment of allergic rhinitis?

In patients with AR, we recommend new generation over old generation oral H1-antihistamines (strong recommendation | low quality evidence).
Should new generation oral H1-antihistamines versus intranasal H1-antihistamines be used for treatment of allergic rhinitis?

I suggest new generation oral H1-antihistamines rather than intranasal H1-antihistamines in adults with seasonal allergic rhinitis (conditional recommendation | moderate quality evidence).

In adults with perennial/persistent allergic rhinitis (conditional recommendation | very low quality evidence).
Should intranasal H1-antihistamines be used for treatment of allergic rhinitis?

- Suggest intranasal H1-antihistamines in adults with **seasonal allergic** rhinitis (**conditional recommendation** | low quality evidence).
- And in children with seasonal allergic rhinitis (**conditional recommendation** | very low quality evidence).
- In adults and children with **perennial/persistent** AR, we suggest that clinicians **do not administer** until more data on their relative efficacy and safety is available (**conditional recommendation** | very low quality evidence).
Should intranasal H1-antihistamines be used for treatment of allergic rhinitis?

In children with intermittent or persistent allergic rhinitis we also suggest new generation oral H1-antihistamines rather than intranasal H1-antihistamines (conditional recommendation | very low quality evidence).
Should oral leukotriene receptor antagonists be used for treatment of allergic rhinitis?

- Suggest oral leukotriene receptor antagonists in adults and children with seasonal allergic rhinitis (conditional recommendation | high quality evidence).

- In preschool children with perennial allergic rhinitis (conditional recommendation | low quality evidence).
Should oral leukotriene receptor antagonists be used for treatment of allergic rhinitis?

In adults with perennial allergic rhinitis we suggest that clinicians do not administer and patients do not use oral leukotriene receptor antagonists (conditional recommendation | high quality evidence).
ARIA

- Should oral leukotriene receptor antagonists versus oral H1-antihistamines be used for treatment of allergic rhinitis?

- Suggest oral H1-antihistamines over oral leukotriene receptor antagonists in patients with seasonal allergic rhinitis (conditional recommendation | moderate quality evidence)

- And in preschool children with perennial allergic rhinitis (conditional recommendation | low quality evidence)
Should intranasal glucocorticosteroids be used for treatment of allergic rhinitis?

We recommend intranasal glucocorticosteroids for treatment of allergic rhinitis in adults (strong recommendation | high quality evidence)

suggest intranasal glucocorticosteroids in children with allergic rhinitis (conditional recommendation | moderate quality evidence)
Should intranasal glucocorticosteroids versus oral H1-antihistamines be used in patients with allergic rhinitis?

In patients with seasonal AR, we suggest intranasal glucocorticosteroids over oral H1-antihistamines in adults (conditional recommendation | low quality evidence) and in children (conditional recommendation | very low quality evidence).
Should intranasal glucocorticosteroids versus oral H1-antihistamines be used in patients with allergic rhinitis?

In patients with **seasonal AR**, we suggest **intranasal glucocorticosteroids** over oral H1-antihistamines in **adults** (conditional recommendation | low quality evidence) and in **children** (conditional recommendation | very low quality evidence).
Should intranasal glucocorticosteroids versus oral H1-antihistamines be used in patients with allergic rhinitis?

In patients with **perennial/persistent** AR, we suggest **intranasal glucocorticosteroids** over oral H1-antihistamines in adults (conditional recommendation | moderate quality evidence) and in **children** (conditional recommendation | low quality evidence).
Should intranasal glucocorticosteroids versus intranasal H1-antihistamines be used in patients with allergic rhinitis?

In patients with AR, we recommend intranasal glucocorticosteroids rather than intranasal H1-antihistamines (strong recommendation | high quality evidence).
○ Should intranasal glucocorticosteroids versus oral leukotriene receptor antagonists be used for treatment of allergic rhinitis?

○ In patients with *seasonal allergic rhinitis* we recommend *intranasal glucocorticosteroids* over oral leukotriene receptor antagonists *(strong recommendation | low quality evidence).*
Should oral glucocorticosteroids be used for treatment of allergic rhinitis in patients not responding to other therapy?

In patients with allergic rhinitis and moderate to severe nasal and/or ocular symptoms that are not controlled with other treatments, we suggest short course of oral glucocorticosteroids (conditional recommendation | very low quality evidence)
ARIA

- Should intramuscular glucocorticosteroids be used for treatment of allergic rhinitis?
- In patients with AR, we recommend that clinicians do not administer intramuscular glucocorticosteroids (strong recommendation | low quality evidence)
ARIA

- Should intranasal chromones be used for treatment of allergic rhinitis?
- In patients with AR, we suggest intranasal chromones (conditional recommendation | moderate quality evidence).
Should intranasal H1-antihistamines versus intranasal chromones be used for treatment of allergic rhinitis?

In patients with AR, we suggest **intranasal H1-antihistamines** over intranasal chromones (*conditional recommendation* | low quality evidence).
ARIA

- Should intranasal ipratropium bromide be used for treatment of allergic rhinitis?
- In patients with **perennial AR**, we suggest **intranasal ipratropium bromide** for treatment of rhinorrhea (**conditional recommendation** | moderate quality evidence).
Should intranasal decongestant be used for treatment of allergic rhinitis?

In adults with allergic rhinitis and severe nasal obstruction, we suggest a **very short course** (not longer than five days and preferably shorter) of **intranasal decongestant** while **co-administering other drugs** (conditional recommendation | very low quality evidence).
Should intranasal decongestant be used for treatment of allergic rhinitis?

suggest that clinicians do not administer and parents do not use intranasal decongestants in preschool children (conditional recommendation | very low quality evidence).
Should oral decongestant be used for treatment of allergic rhinitis?

In patients with AR, we suggest that clinicians do not administer and patients do not use oral decongestants regularly (conditional recommendation | low quality evidence)
Should combination of oral decongestant and H1-antihistamine versus oral H1-antihistamine alone be used for treatment of allergic rhinitis?

In patients with AR, we suggest clinicians do not administer and patients do not use regularly a combination of oral H1-antihistamine and an oral decongestant, compared to oral H1-antihistamine alone (conditional recommendation | moderate quality evidence)
ARIA

- Should intraocular H1-antihistamines be used for the treatment of ocular symptoms in patients with allergic rhinitis?

- Patients with allergic rhinitis and symptoms of conjunctivitis, we suggest intraocular H1-antihistamines (conditional recommendation | low quality evidence).
ARIA

- Should intraocular chromones be used for treatment of ocular symptoms in patients with allergic rhinitis?

- In patients with allergic rhinitis and symptoms of conjunctivitis, we suggest intraocular chromones (conditional recommendation | very low quality evidence)
Specific allergen immunotherapy for allergic rhinitis
Should subcutaneous specific immunotherapy be used for treatment of allergic rhinitis in adults without concomitant asthma?

We suggest subcutaneous allergen specific immunotherapy in adults with seasonal (conditional recommendation | moderate quality evidence) and perennial allergic rhinitis due to house dust mites (conditional recommendation | low quality evidence).
Should subcutaneous specific immunotherapy be used for treatment of allergic rhinitis in children without concomitant asthma?

In children with AR, we suggest subcutaneous specific immunotherapy (conditional recommendation | low quality evidence)
Should sublingual specific immunotherapy be used for treatment of allergic rhinitis in adults without concomitant asthma?

We suggest sublingual allergen specific immunotherapy in adults with rhinitis due to pollen (conditional recommendation | moderate quality evidence) or house dust mites (conditional recommendation | low quality evidence).
ARIA

- Should sublingual specific immunotherapy be used for treatment of allergic rhinitis in children without concomitant asthma?

- In children with allergic rhinitis due to **pollens**, we suggest **sublingual allergen-specific immunotherapy** (conditional recommendation | moderate quality evidence). In children with allergic rhinitis due to **house dust mites**, we suggest that clinicians **do not administer** sublingual immunotherapy outside rigorously designed clinical trials (conditional recommendation | very low quality evidence).
Should local nasal specific immunotherapy be used for treatment of allergic rhinitis?

We suggest intranasal allergen specific immunotherapy in adults (conditional recommendation | low quality evidence) and in children with allergic rhinitis due to pollens (conditional recommendation | very low quality evidence)
Alternative and complementary treatment for allergic rhinitis
Should homeopathy be used for treatment of allergic rhinitis?

In patients with AR, we suggest that clinicians do not administer and patients do not use homeopathy (conditional recommendation | very low quality evidence)
Should acupuncture be used for treatment of allergic rhinitis?

In patients with AR, we suggest clinicians do not administer and patients do not use acupuncture (conditional recommendation | very low quality evidence)
Should butterbur be used for treatment of allergic rhinitis?

In patients with AR, we suggest clinicians do not administer and patients do not use butterbur (conditional recommendation | very low quality evidence)
ARIA

- Should herbal medicines other than butterbur be used for treatment of allergic rhinitis?

- In patients with AR, we suggest clinicians do not administer and patients do not use **herbal medicines** (conditional recommendation | very low quality evidence).
Should physical techniques and other alternative therapies be used for treatment of allergic rhinitis?

In patients with AR, we suggest that clinicians do not administer and patients do not use phototherapy or other physical techniques (conditional recommendation | very low quality evidence).
Summary of ARIA

In adults

- New generation antihistamine – recommend
- Oral leukotriene receptor antagonists – suggest (only in seasonal)
- Intranasal glucocorticosteroids - recommends
- Oral glucocorticosteroids (in mod-severe, short course) – suggest
- Intramuscular glucocorticosteroids - do not recommend
- Intranasal chromones - suggest
Summary of ARIA

In adults

- **intranasal ipratropium bromide** - *suggest*
- **intranasal decongestant** – *suggest* (very short course for severe obstruction)
- **oral decongestant** – *do not recommend*
- **intraocular H1-antihistamines** – *suggest* (conjunctivitis symptoms)
- **intraocular chromones**- *suggest* (conjunctivitis symptoms)
Summary of ARIA``

In children

- Oral new generation H1 antihistamine – suggest
- Oral leukotriene receptor antagonists - suggest
- Intranasal glucocorticosteroids - suggest
- Intranasal decongestant - do not recommend
Surgical management

- Inferior turbinate surgeries
- Septoplasty
- Vidian neurectomy