Comorbidities of asthma
&
its impact on control

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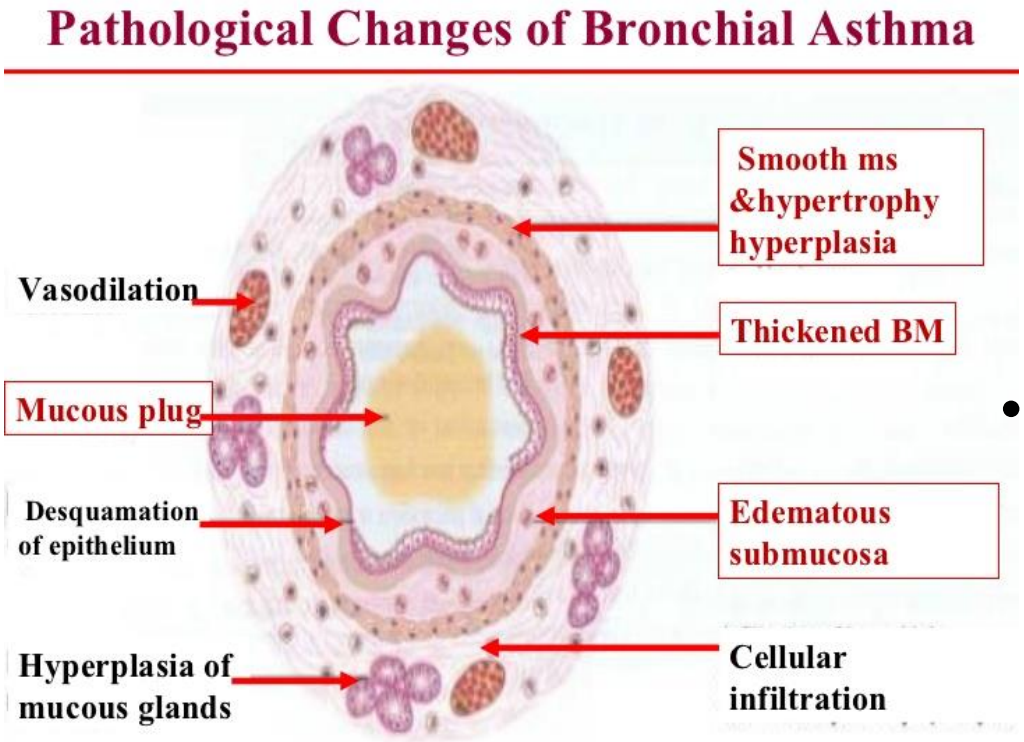
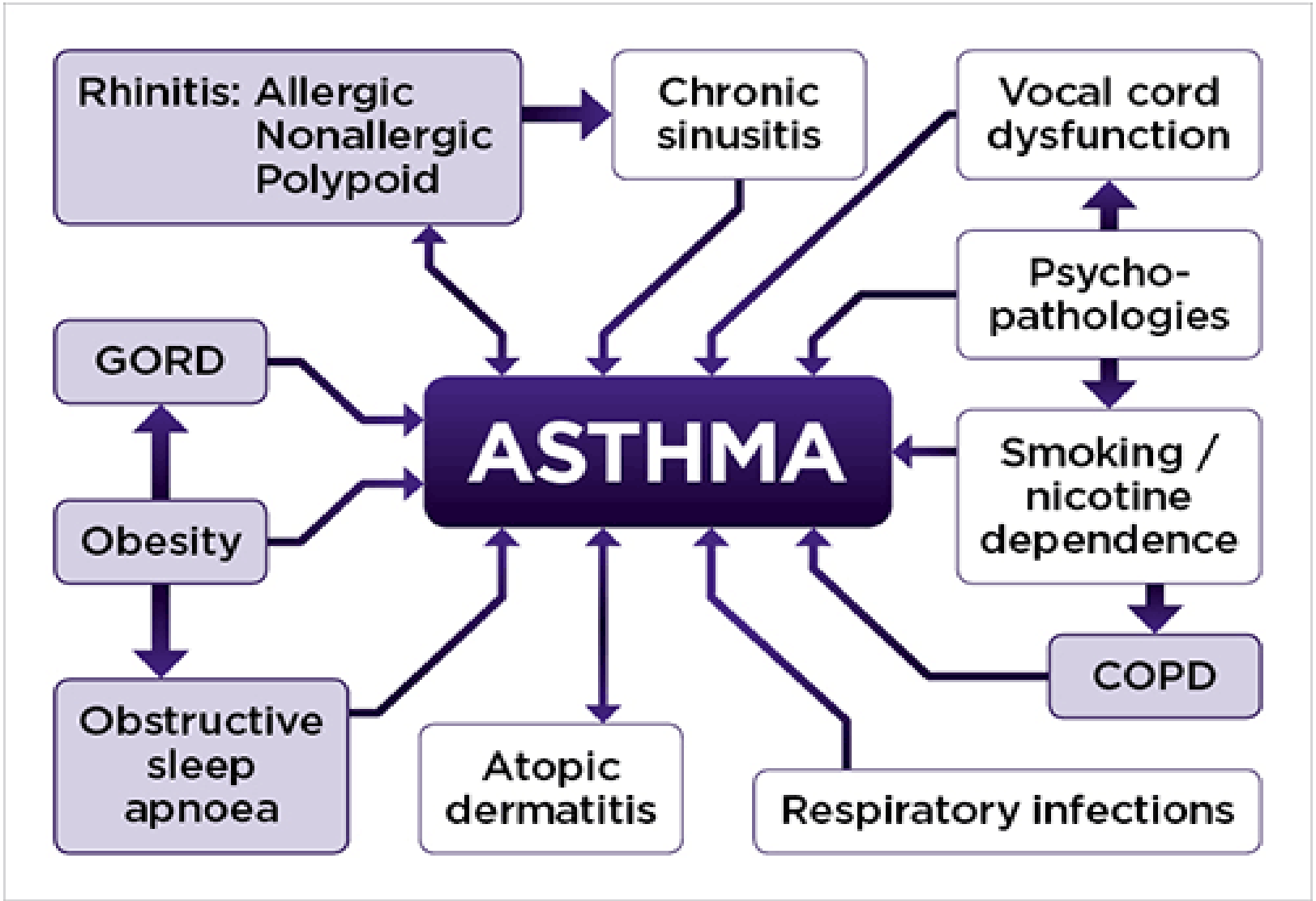
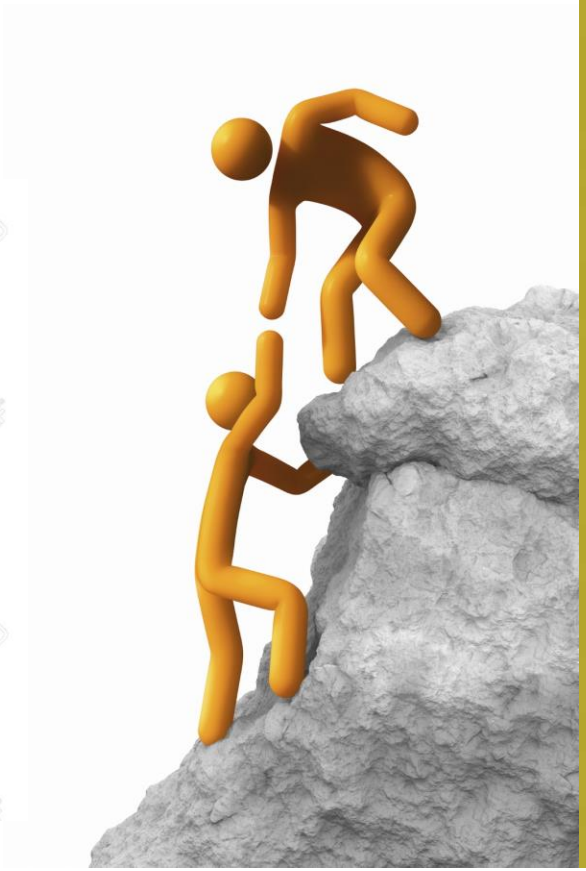


- Wheezing, chest tightness, breathlessness, coughing

Comorbidities of asthma

(Diseases co-existing with asthma)





Misdiagnosis

Aggravation of one or both diseases

Misinterpretation of symptoms

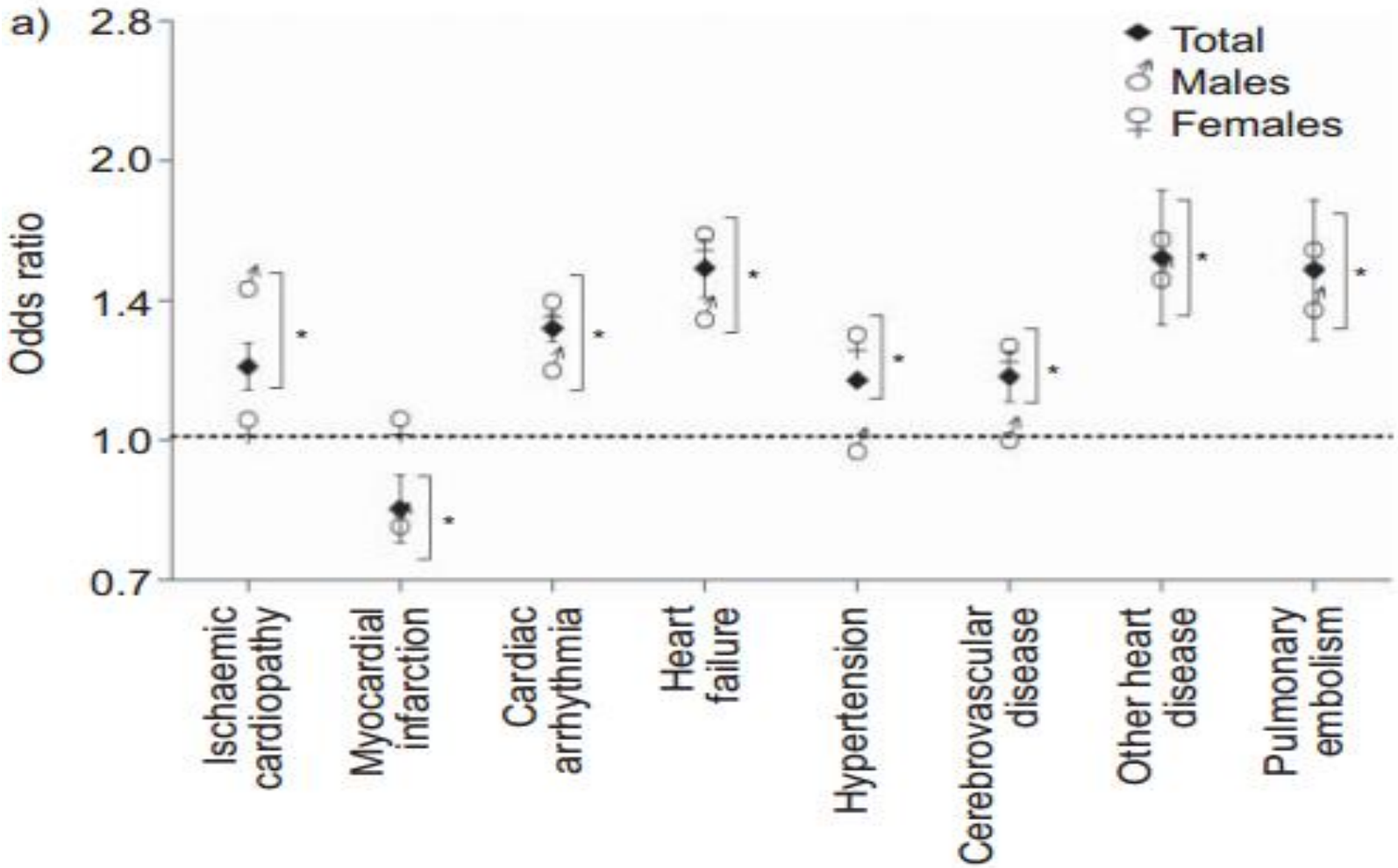
Strongly associated with:

- **Allergic rhinitis**
- **Gastroesophageal reflux disease (GERD)**
- **Infections**
- **Psychological disturbances**

Weakly associated with:

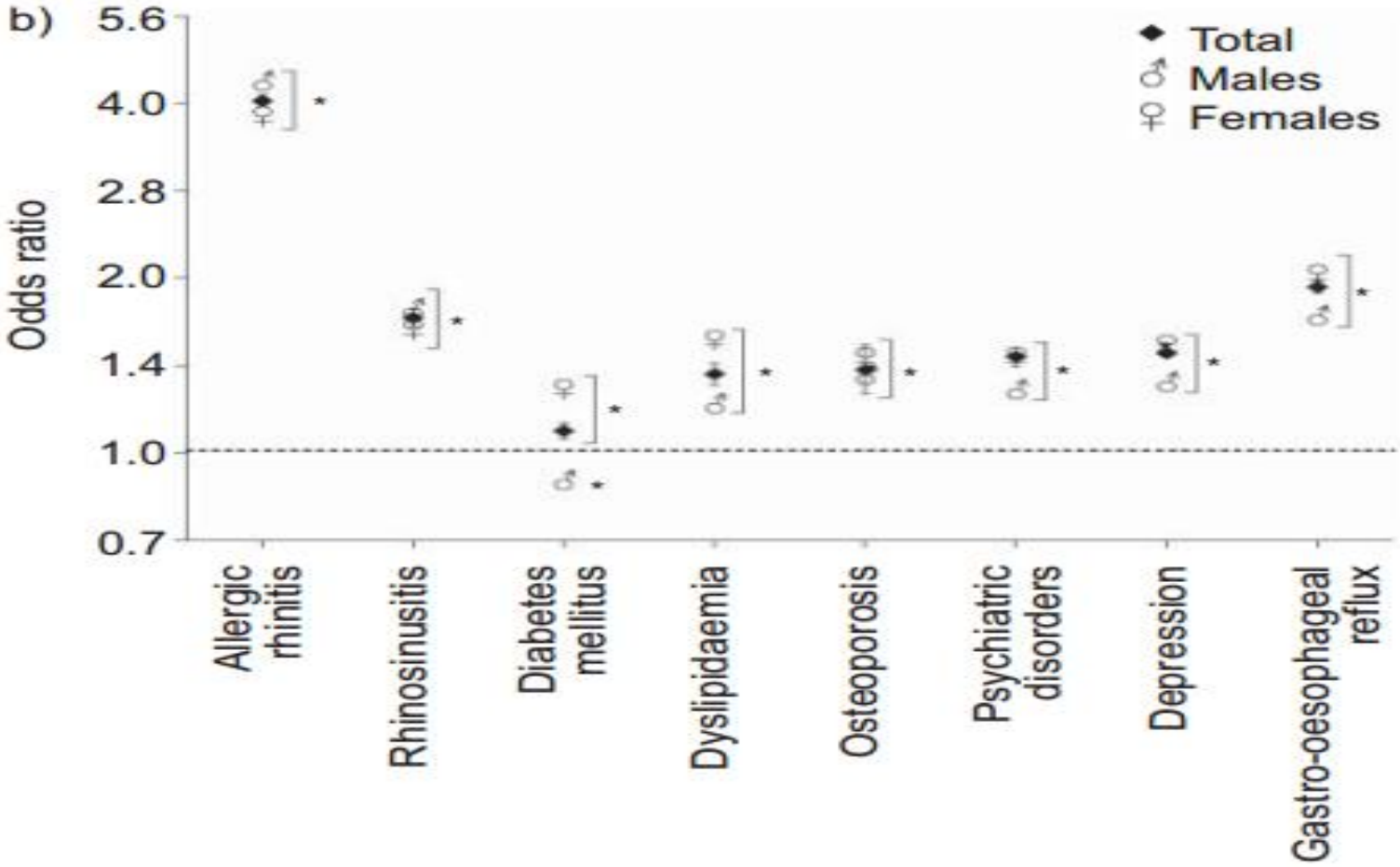
- **Cardiovascular &**
- **Hypertensive diseases**

Cardiovascular comorbidities



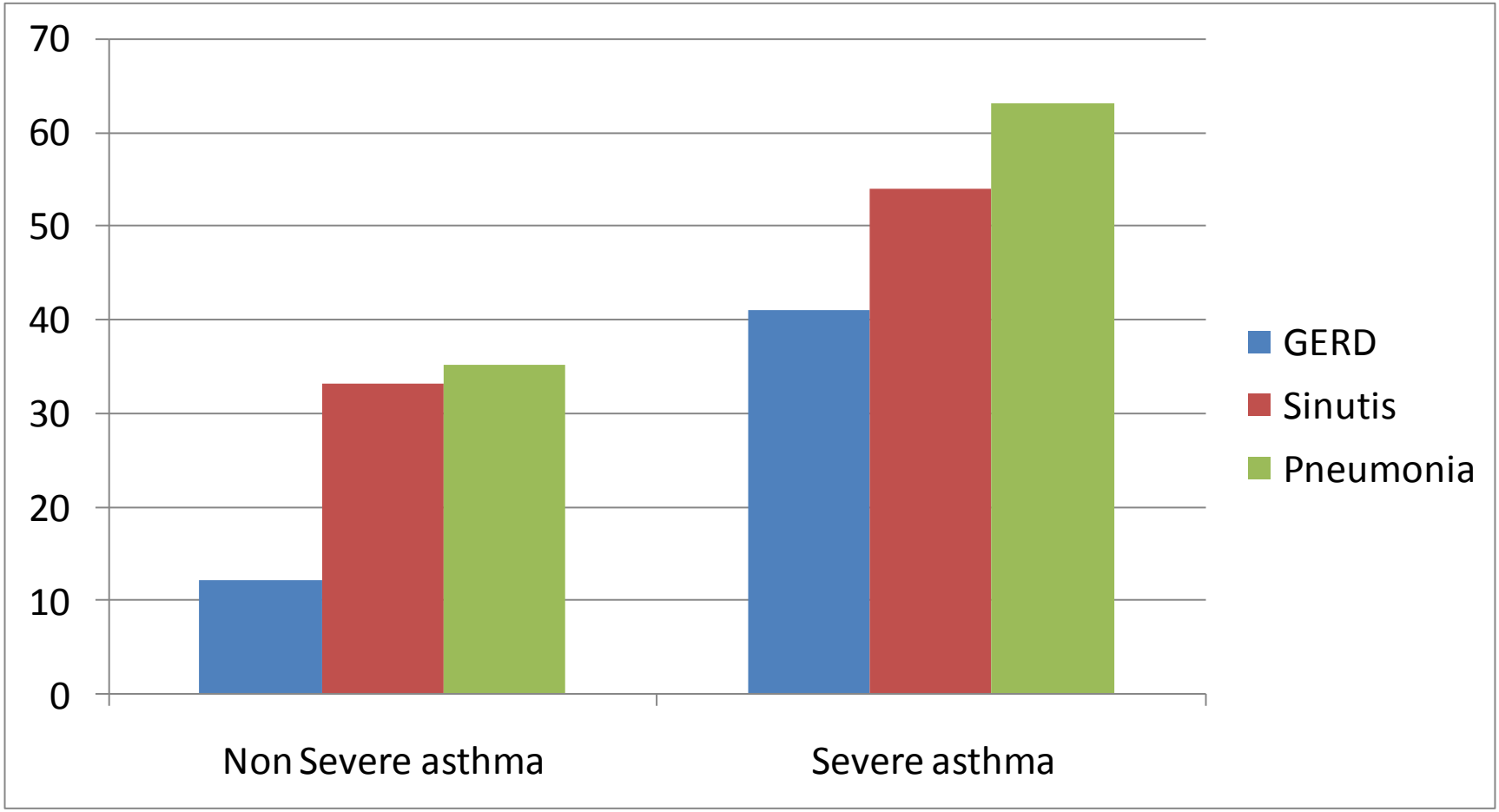
Adjusted odds ratios and 95% confidence intervals of comorbidities in asthma. Total is adjusted for age and sex. Males and females are adjusted for age.

Other than Cardiovascular comorbidities



Adjusted odds ratios and 95% confidence intervals of comorbidities in asthma. Total is adjusted for age and sex. Males and females are adjusted for age.

Effect of Comorbid diseases on severity of asthma



http://erj.ersjournals.com/content/33/4/897.long

Relationship between asthma & Comorbid diseases

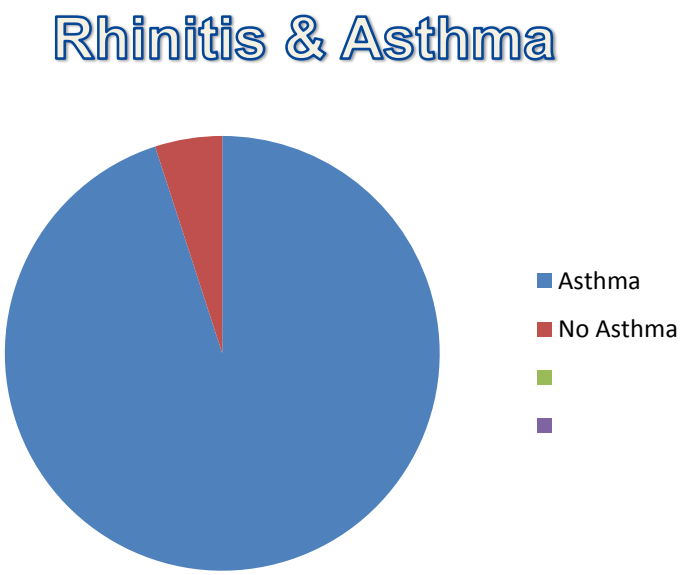
Rhinitis & Asthma

Mediator release

Neural reflexes

Increased inflammatory cells

Increased mouth breathing



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Rhinitis & Asthma cont.

Frequent physician’s visit & hospital admission

increased drug related expences

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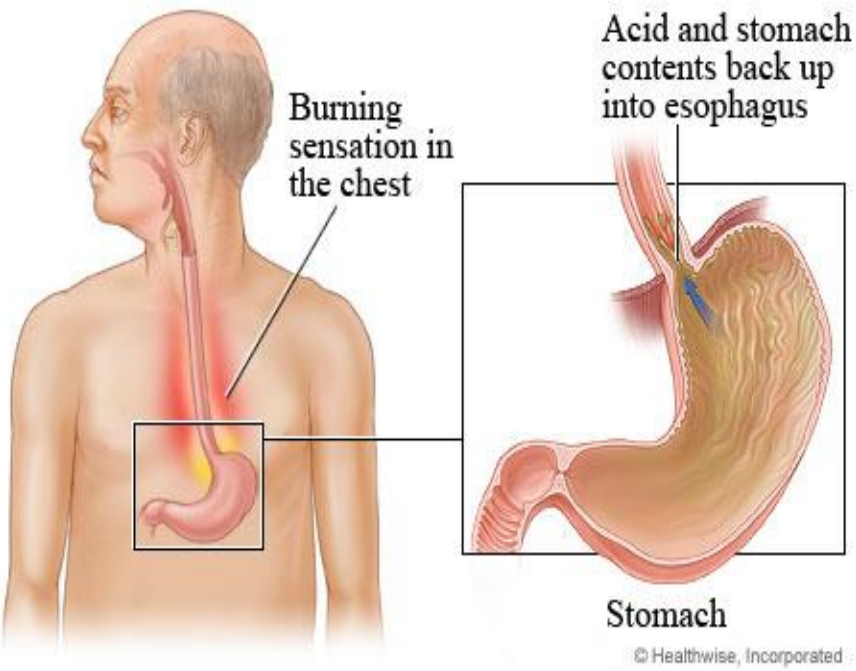
Asthma & GERD



- Acid reflexly cause Bronchospasm
- Increased intrathoracic pressure & theophylline causes relaxtion of spincter.

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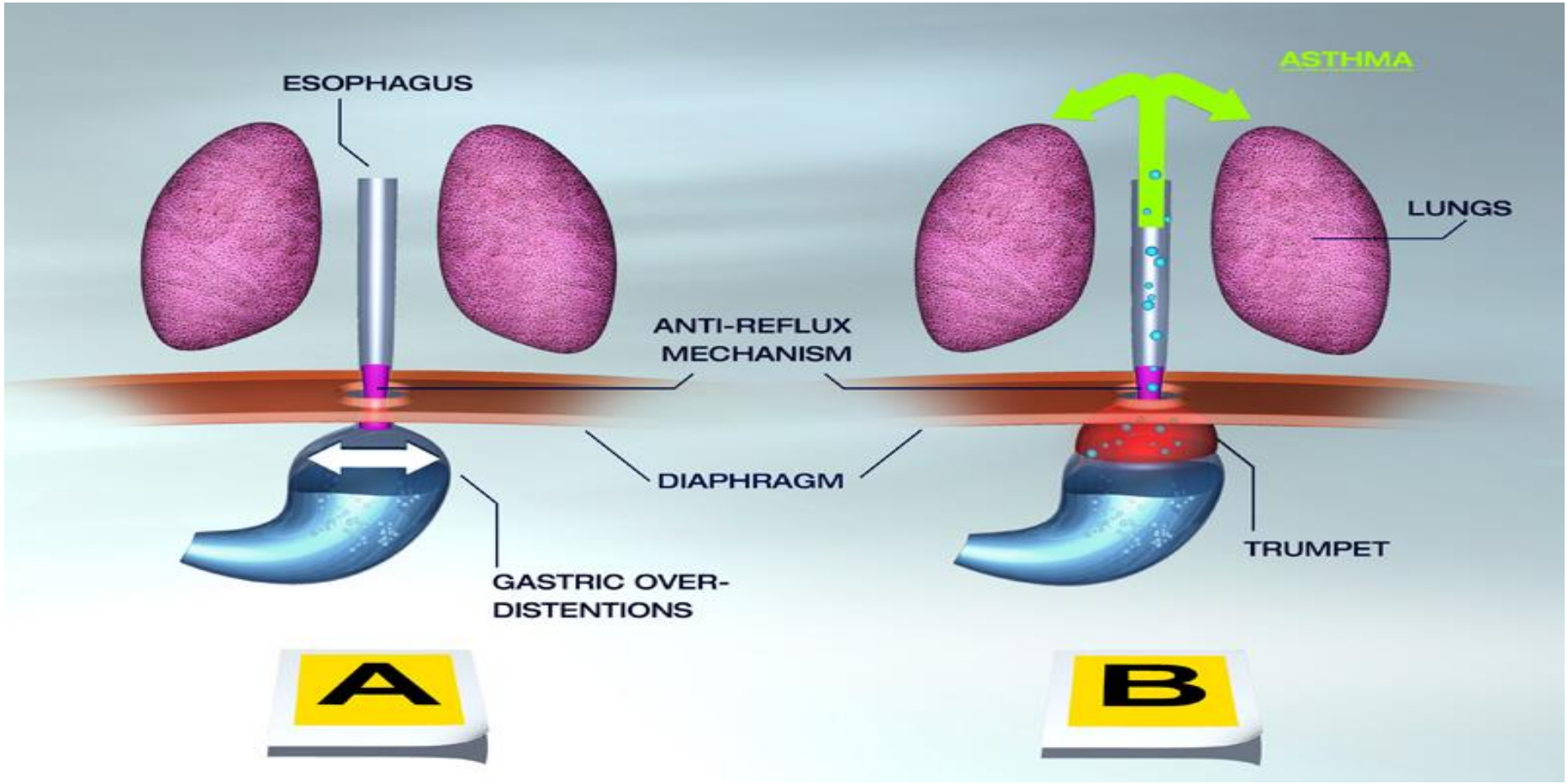
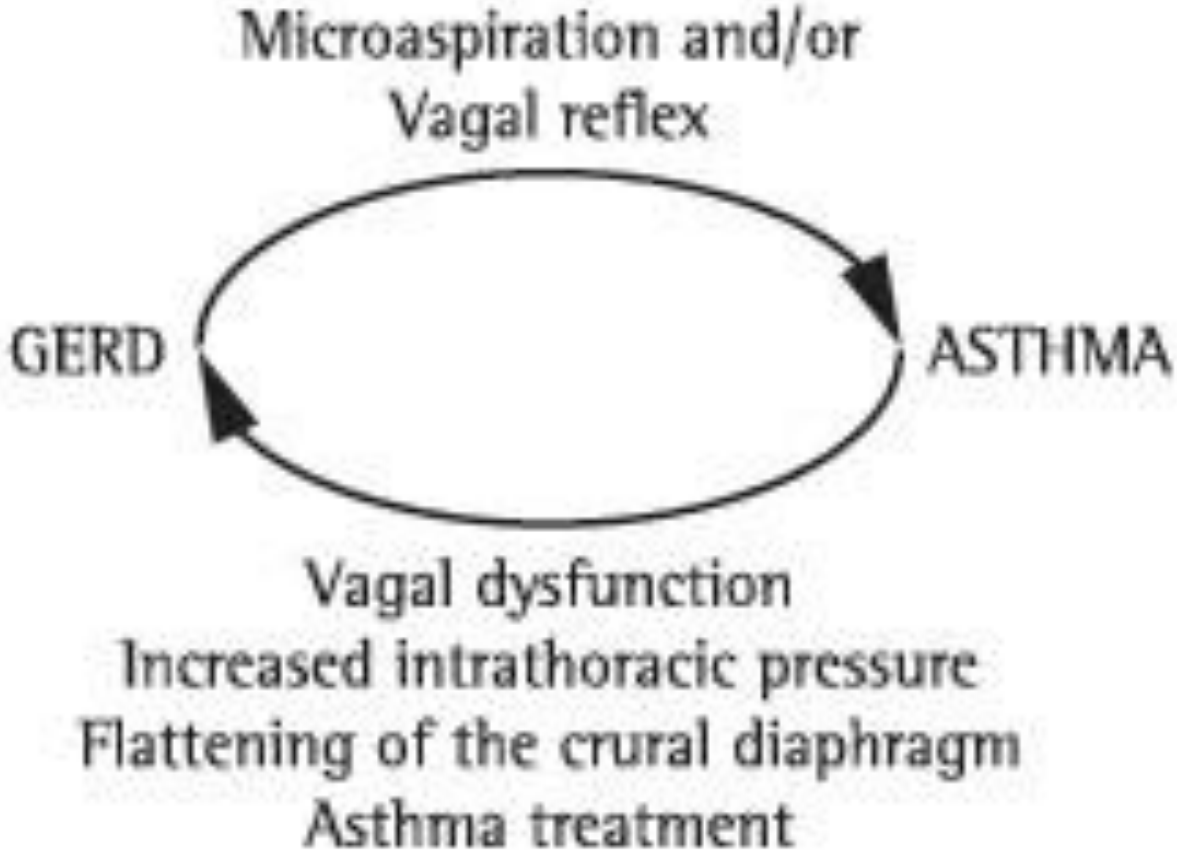
Asthma & GERD

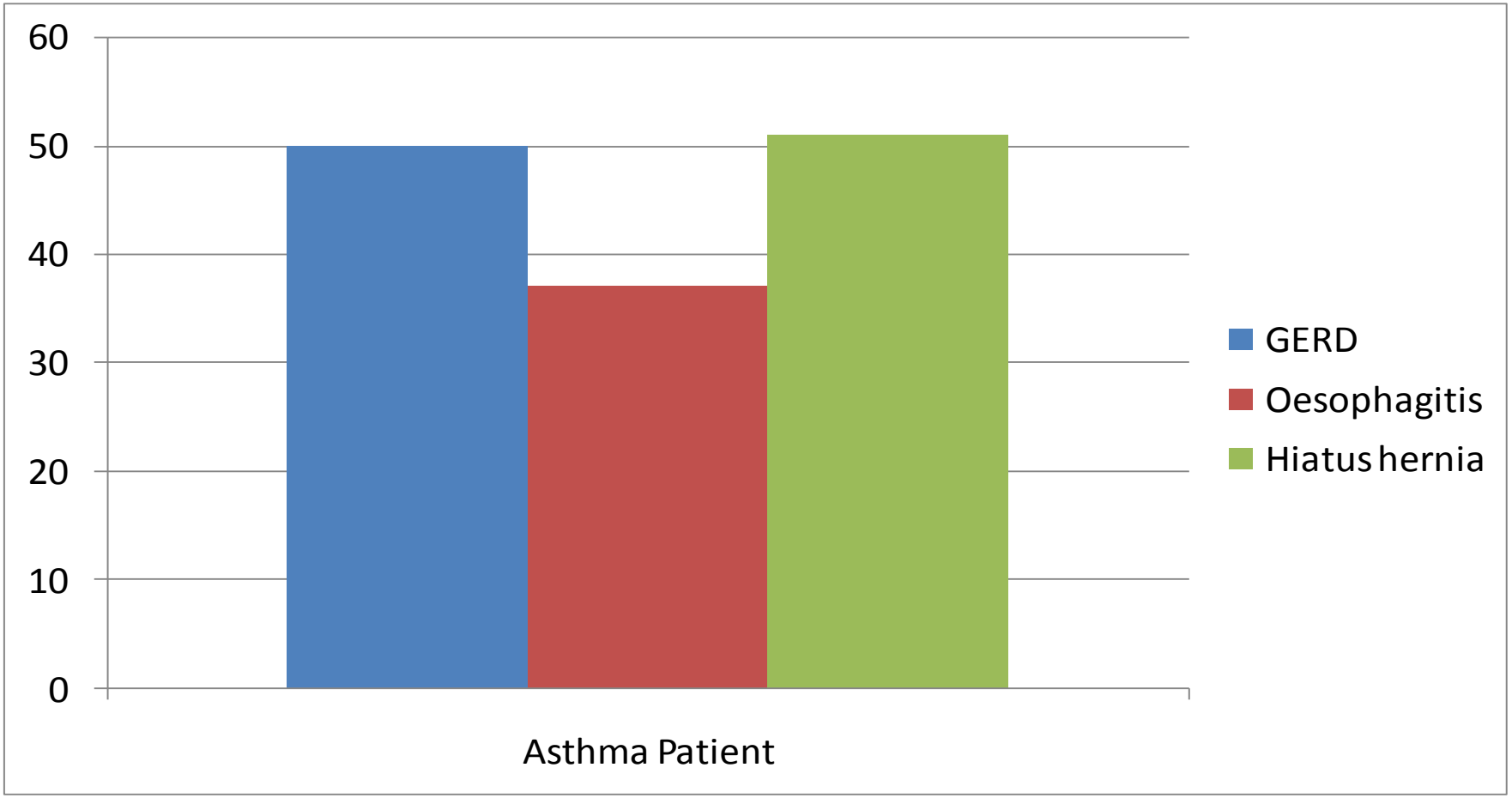


Cough, chest & throat tightness in both conditions



Possible mechanisms to explain the high prevalence of gastroesophageal reflux and gastroesophageal reflux disease (GERD) in asthma.[a]
[a]Adapted from Harding et al.[49]

Incdence of GERD, Oesophagitis and Hiatus hernia in asthma patient



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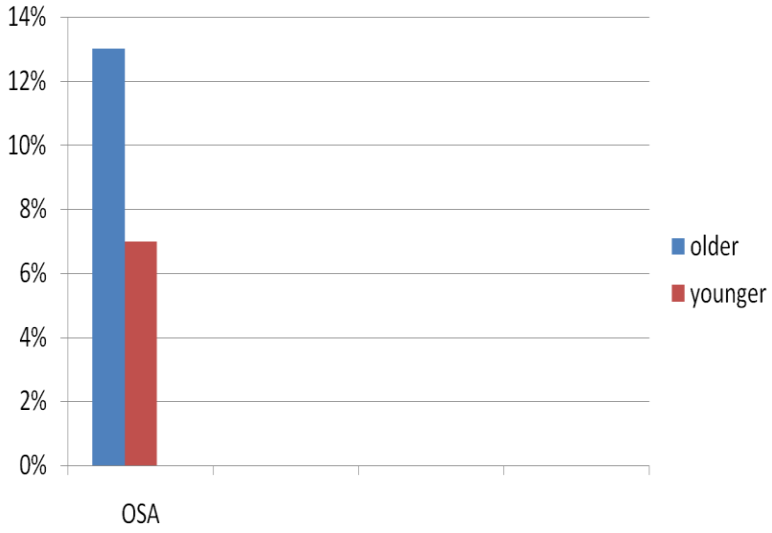
OSA in asthma patient [n=154+659]

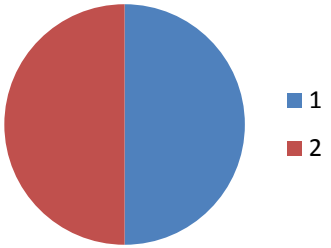


Mechanical factors , increased inflammatory cells

http://dx.doi.org/10.1155/2013/251567

Obesity & asthma

- GERD
- Mechanical Factor
- Increased cytokines
- Decreased response to steroid



30% misdiagnosis of asthma

Asthma and psychiatric disorders

Comorbidity
Asthma – Psychiatric Disorders

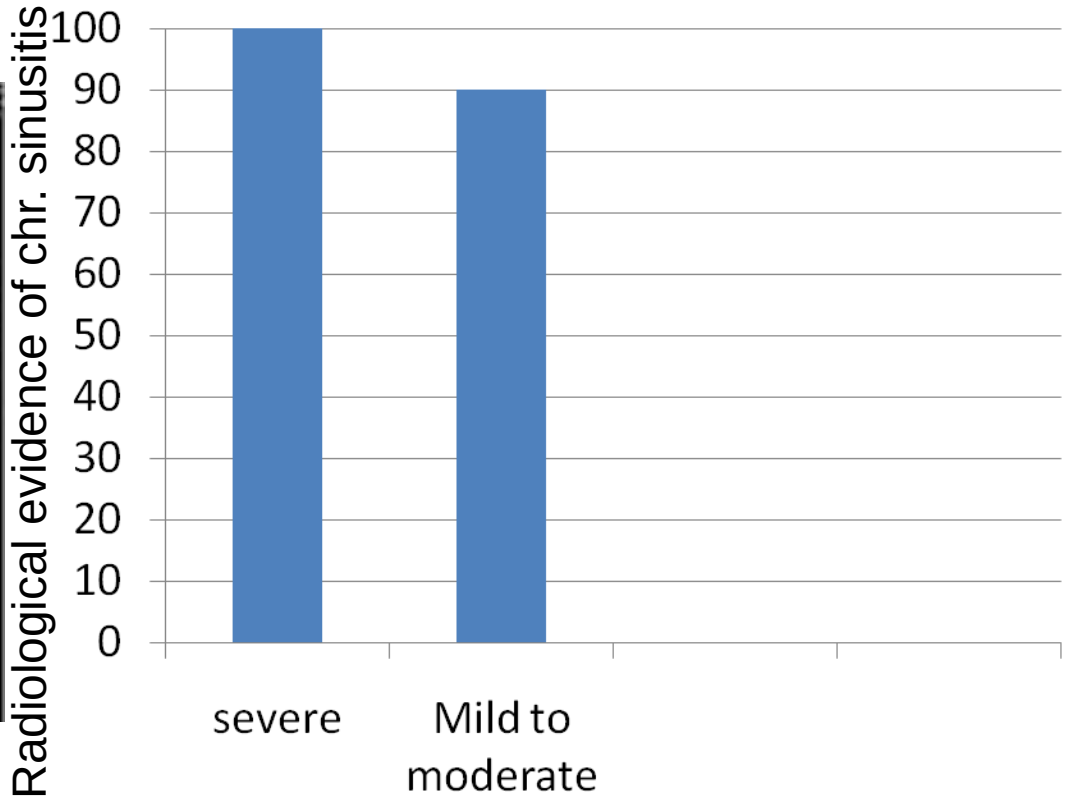
→ 31% - 38%

- Depressive Disorders
- Anxiety Disorders

Sandberg et al.2000; Rimington et al. 2001;
Zielinski et al. 2005; Kim L Lavoie, et al. 2006

- **Triggers asthma symptoms**
- **Affect symptom perception**
- **Influnce drug compliance**

Chronic sinusitis and asthma



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Smoking

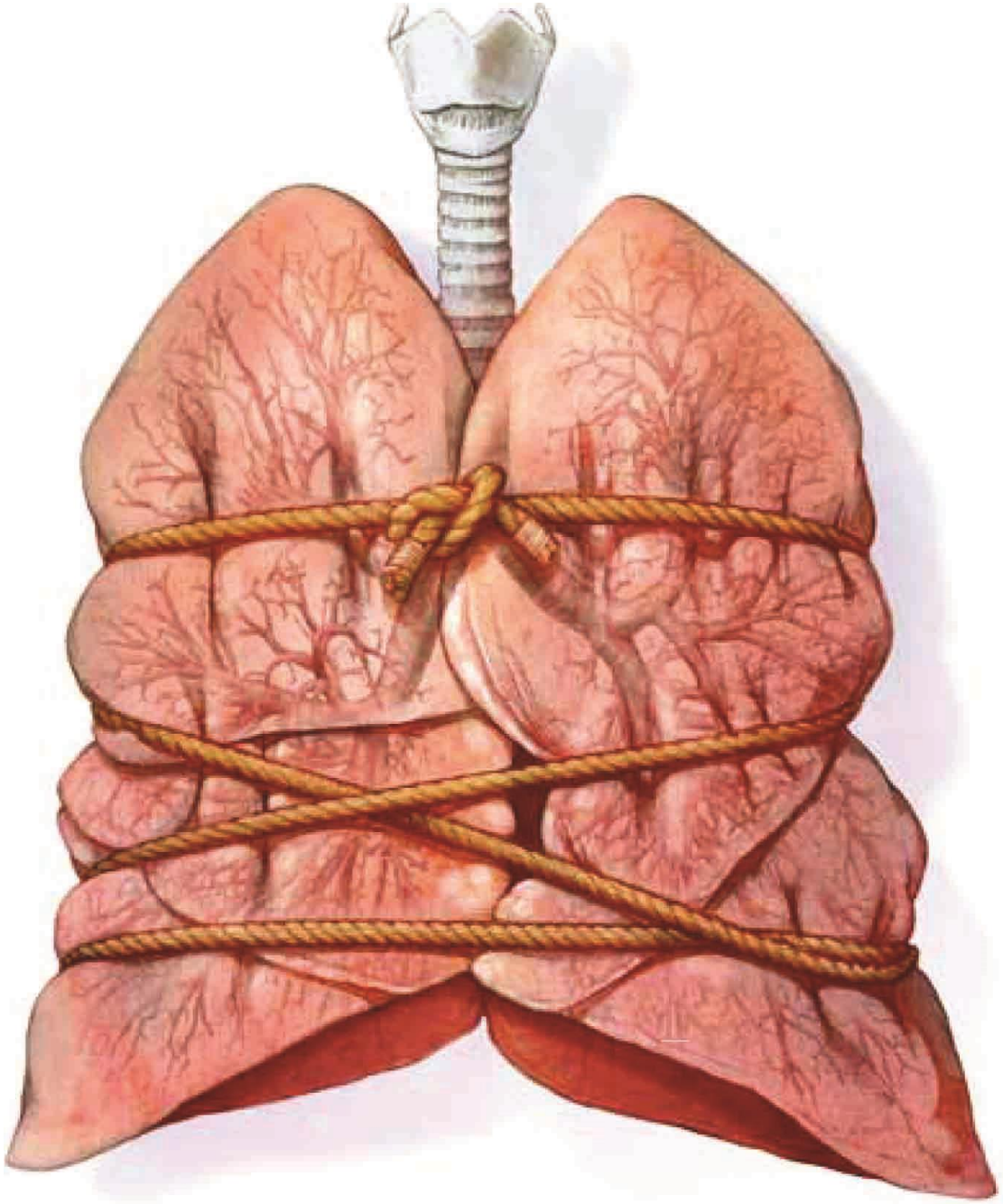
- Increase risk of asthma
- decreased response to steroid

Asthma in pregnancy

- Symptoms improve in pregnancy
- Increased chance of development of GERD related asthma.

Control of asthma

- What is control?
- How it is controlled?
- How much can be controlled?
- Why not controlled?
- How to achieve maximum control?



Treat asthma aggressively initially to help the patient achieve quick control, then gradually cut back to the fewest medications and lowest effective doses required to maintain control.

Defining asthma control

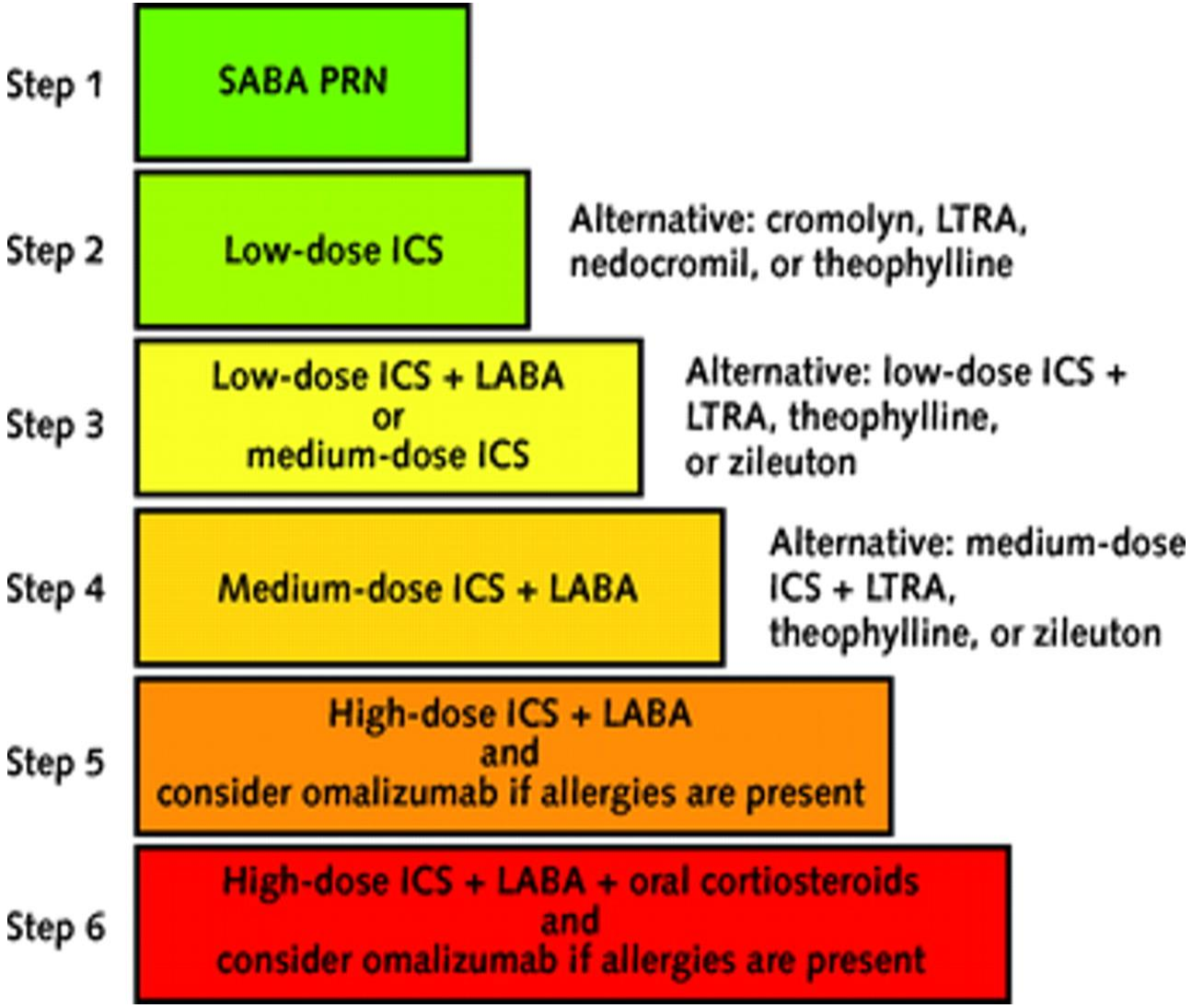
	CONTROLLED (All of the following)	PARTIALLY CONTROLLED (Any measure present in any week)	UNCONTROLLED
Daytime Symptoms	None (twice or less weekly)	More than twice weekly	**3 or more features of partly controlled asthma present in any week.**
Limitation of activity	None	Any	
Nocturnal Symptoms	None	Any	
Reliever medication	None (twice or less weekly)	More than twice weekly	
Lung function.	Normal	<80% personal best or predicted	
Exacerbation	None	Any in past year	**Any in past week**
ACTION	**MAINTAIN CONTROL & FIND LOWEST CONTROLLING STEP**	**CONSIDER STEPPING UP TO GAIN CONTROL**	**STEP UP UNTIL CONTROLLED & TREAT ANY EXACERBATION**

Diagnose asthma

Assess asthma severity

Initiate medication & demonstrate use

Asthma management



How much can be controlled?

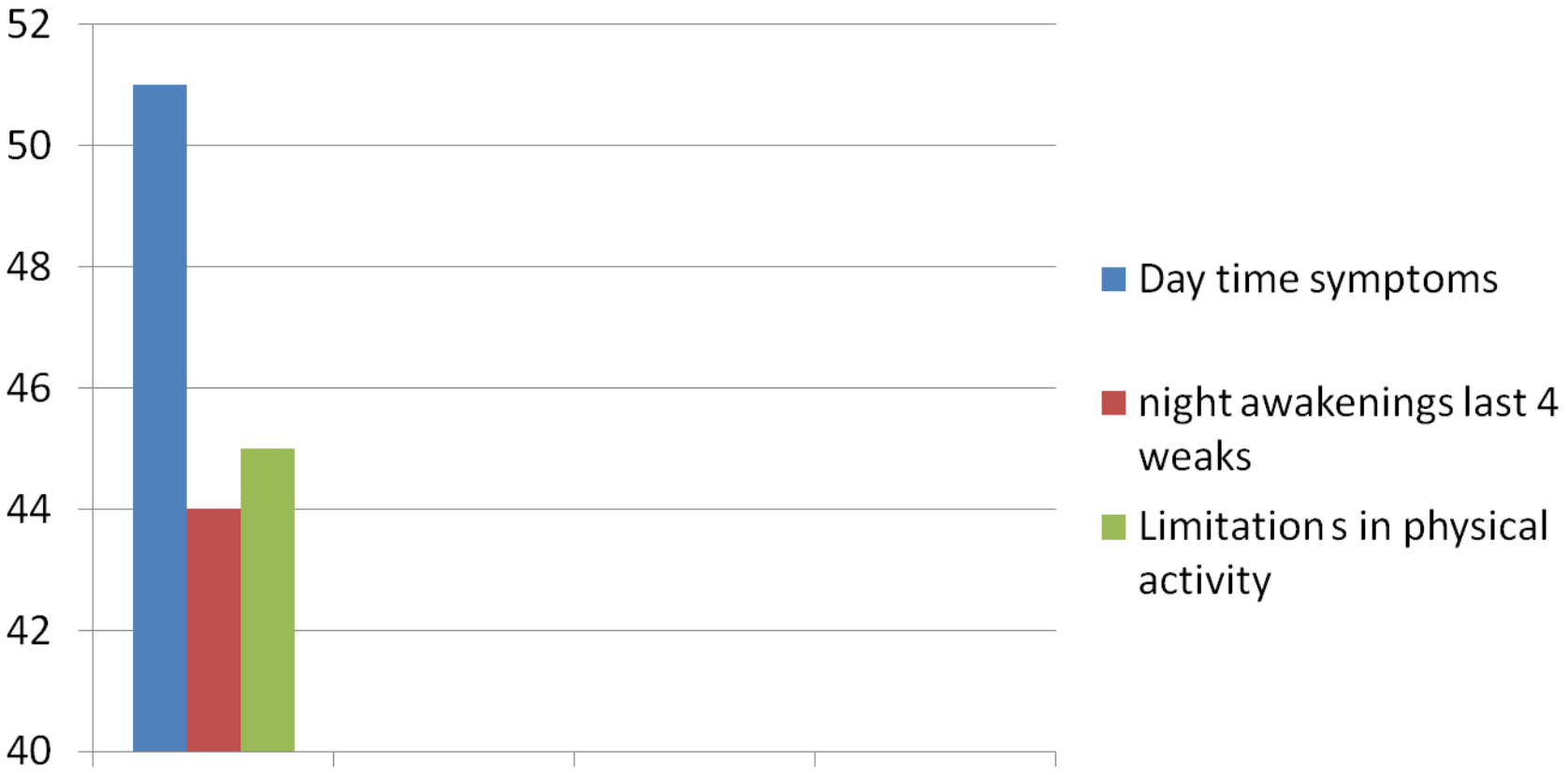
Asthma control rate

3000 asthma out patient, 36 general hospitals, 10 large Chinese cities, from April 2007 to march 2008

http://dx.doi.org/10.1155/2013/549252

Asthma control rate

2323 adult patients & 884 children patients



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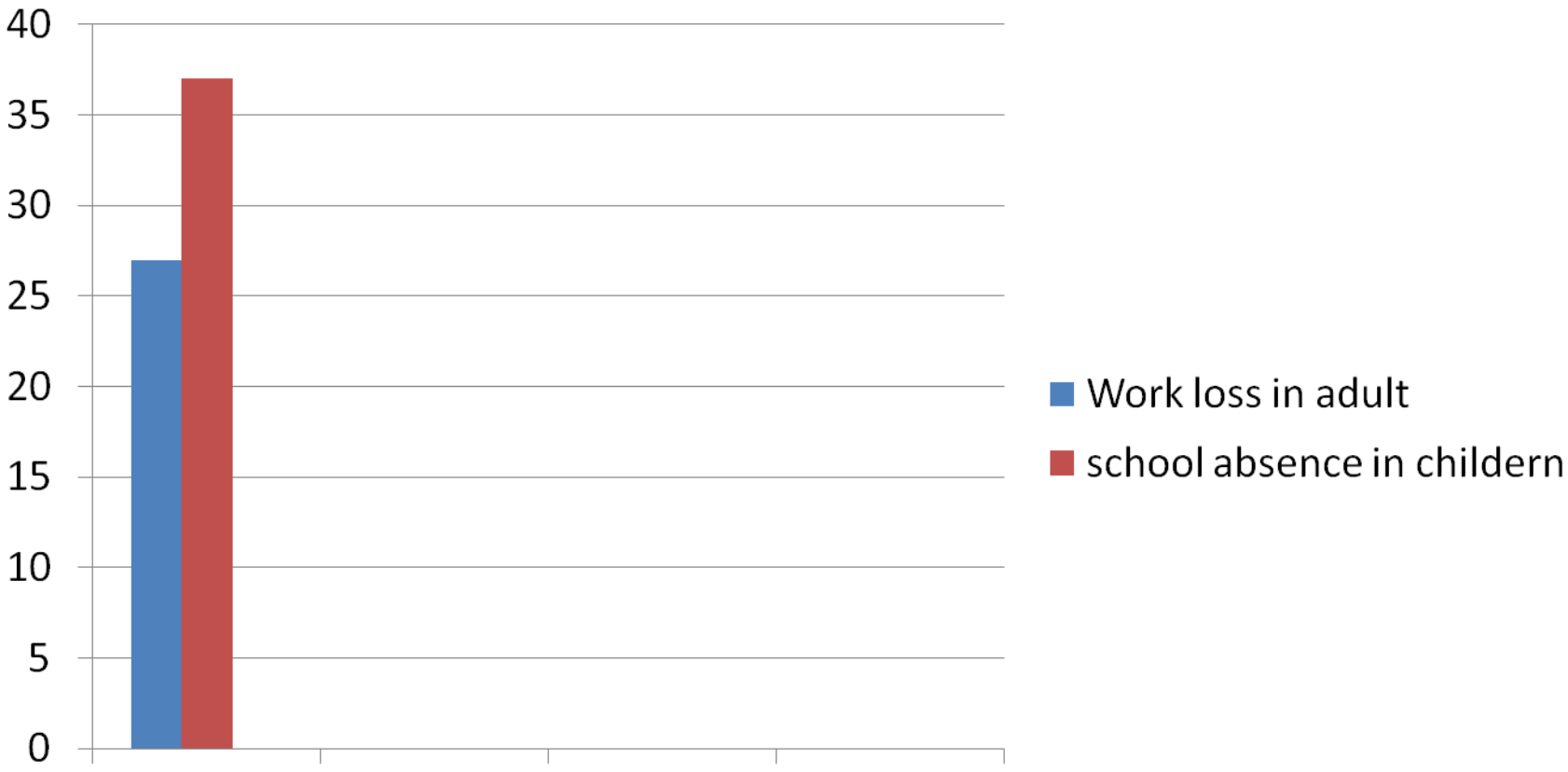
Work loss or school absence



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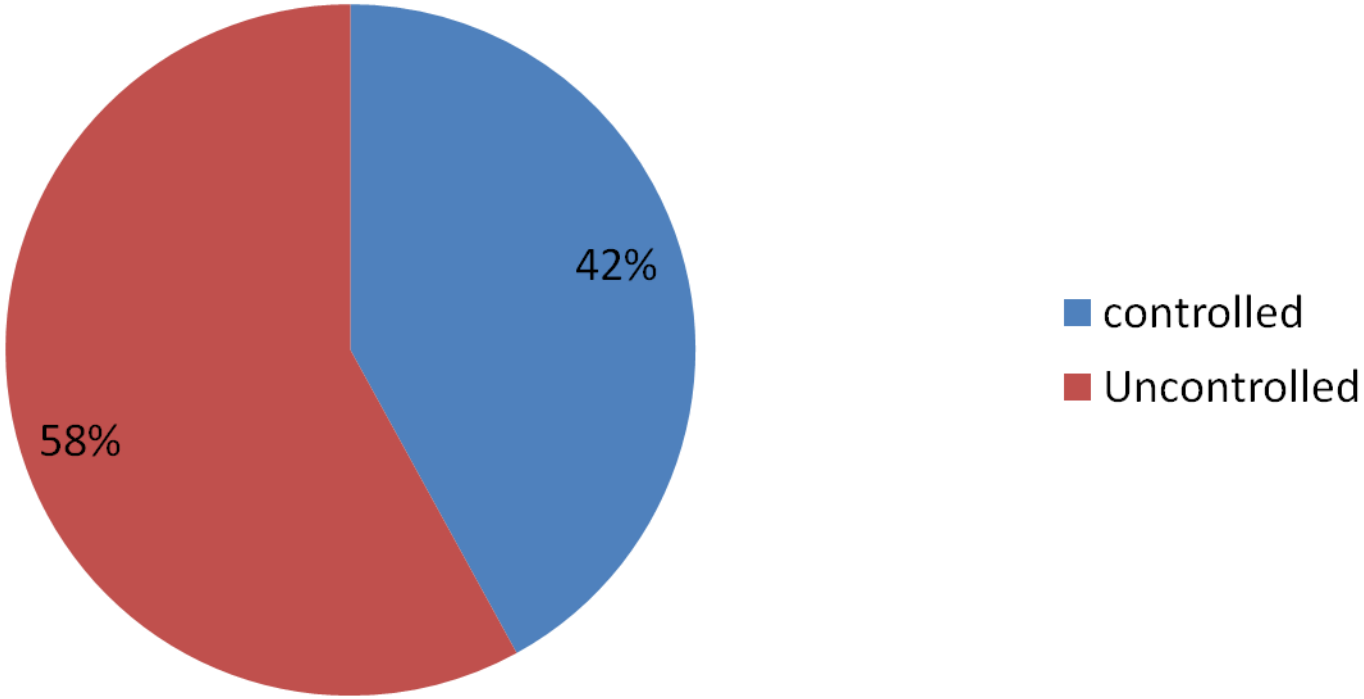
Asthma control, weighted prevalance, n=2238



http://dx.doi.org/10.1155/2013/549252

Why can not be controlled?

Impact of co-morbidities

Impact of rhinitis on asthma control, (n=1027)

Impact of rhinitis on asthma control, (n=1027)

Impact of rhinitis on asthma control, (n=256),School children, 2007

Uncontrolled asthma

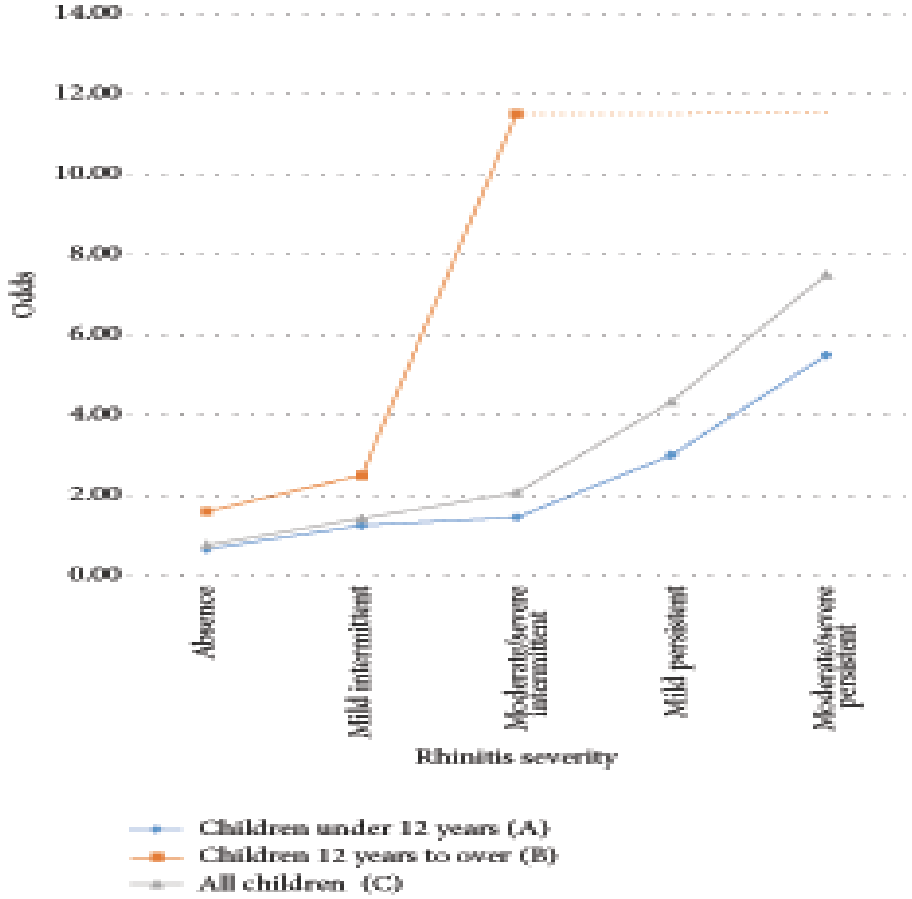
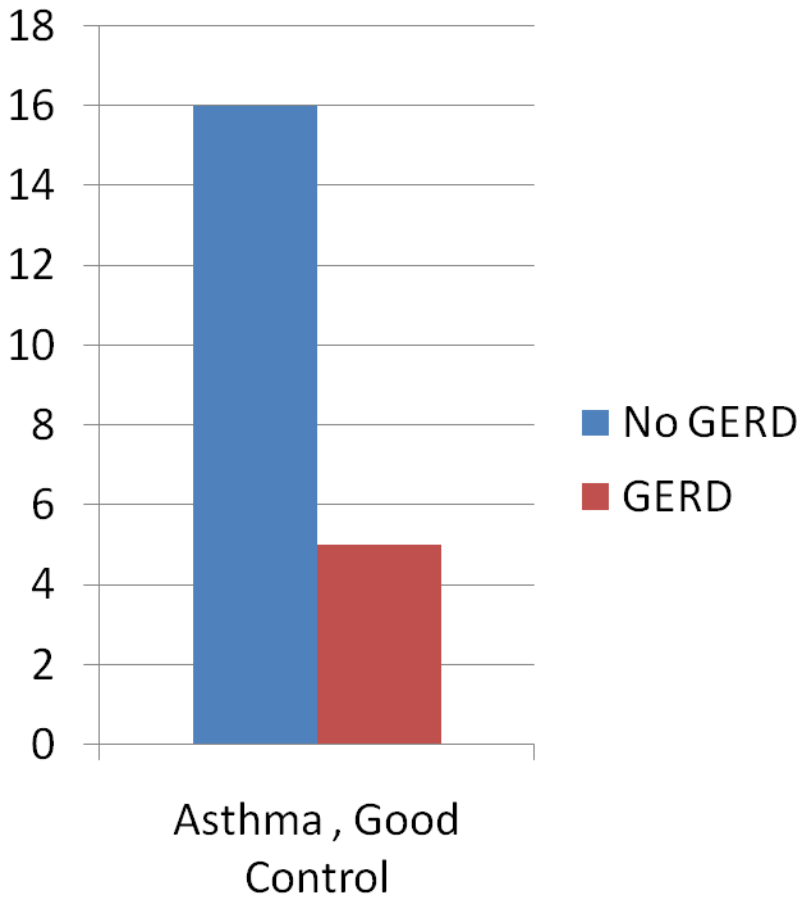
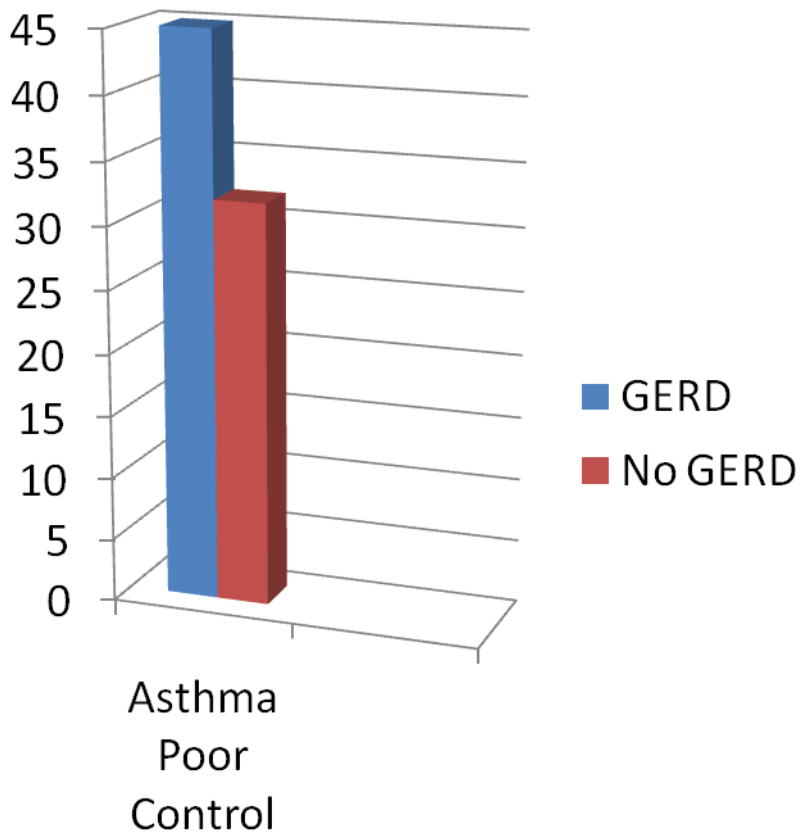


FIGURE 2: Odds tendency to inadequate control of asthma in 256 asthmatic children, by age group. P value for odds homogeneity test: A = 0.007, B = 0.097, and C ≤ 0.001; P value to the score test with tendency of odds: A ≤ 0.001, B = 0.008, and C ≤ 0.001. The dotted line describes a predicted trend (see text).

Asthma & GERD [n-226]

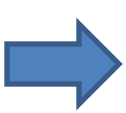




PSYCHIATRIC DISORSERS IN ASTHMA

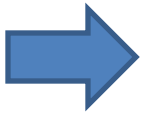
-CONSEQUENCES-

Comorbidity with
Depression and anxiety



Asthma Control

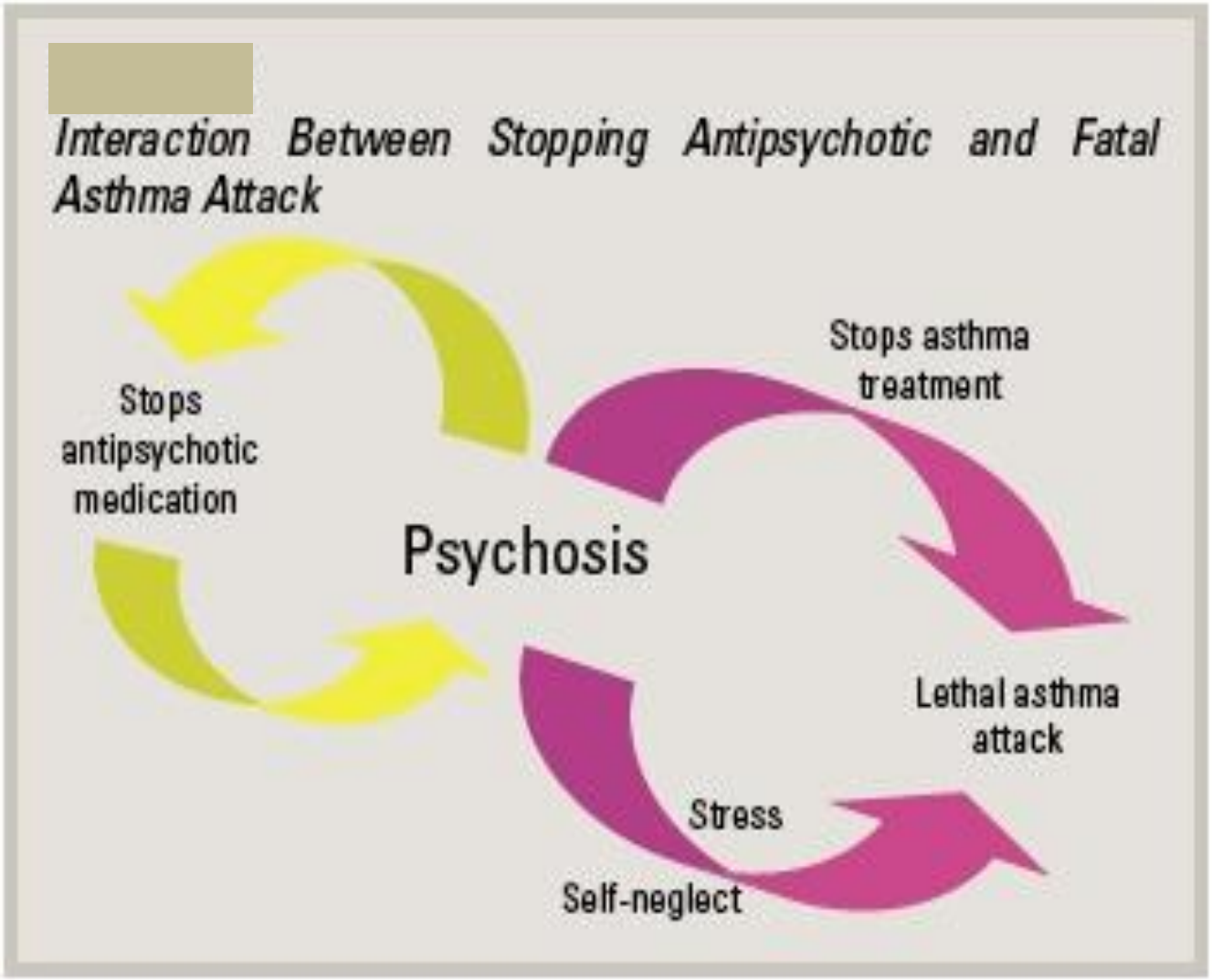
Psychopathology in patients
With sever asthma



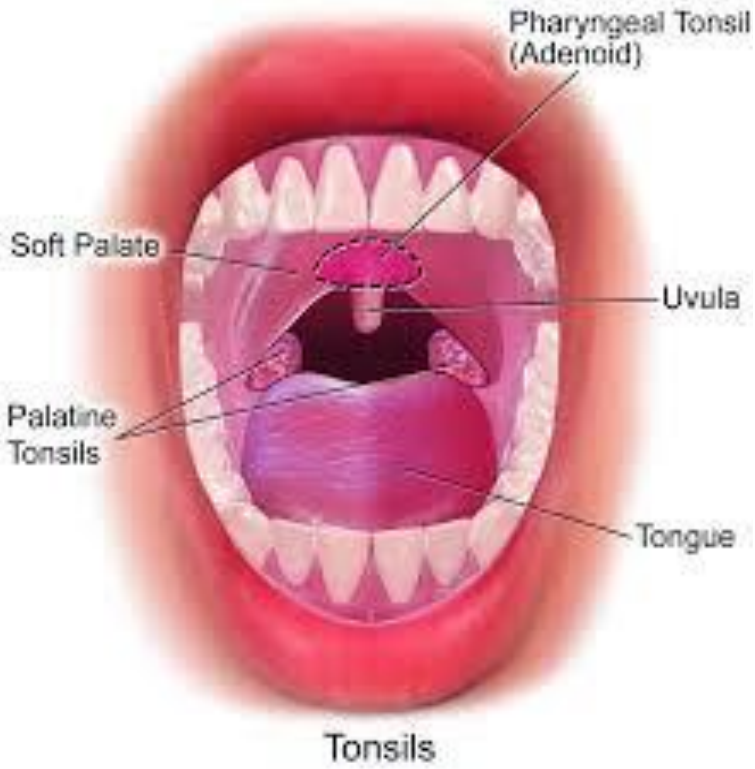
Helth Costs

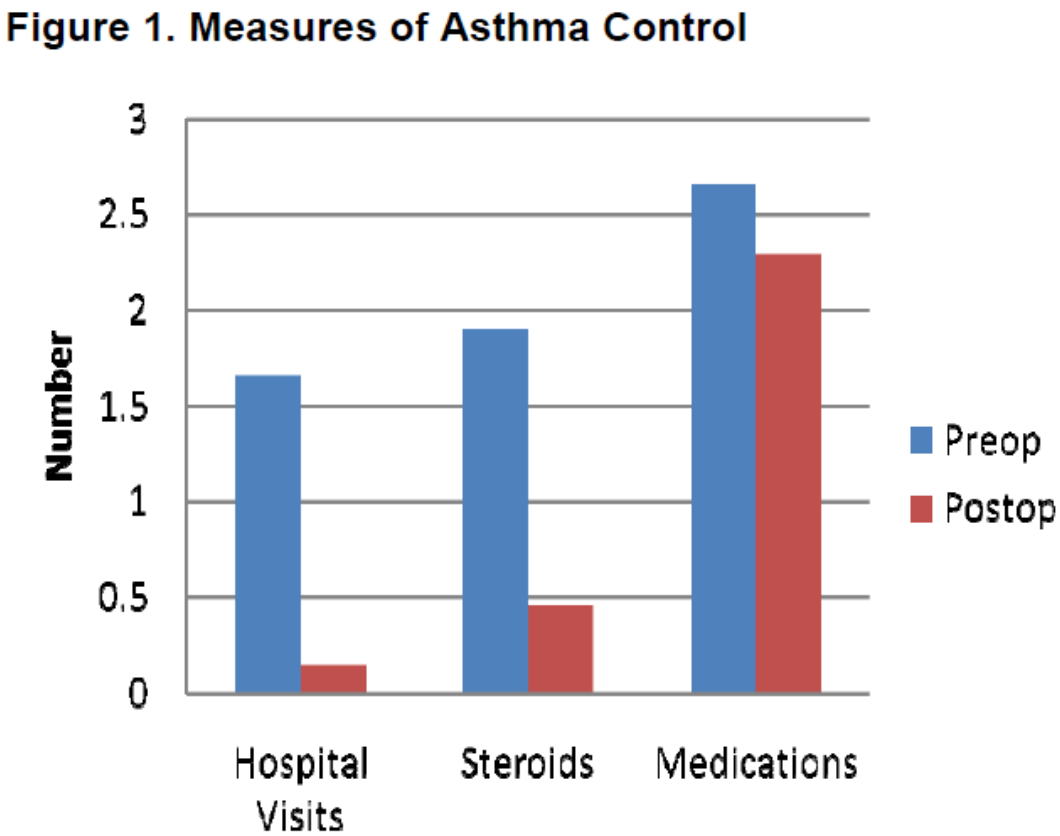
Goldney RD et al. 2003
Lavoie et al 2006; Deshmukh T et al 2008
Ten Brinke et al. 2001

Psychological disturbances & asthma



The Impact of Adenotonsillectomy on Asthma in Children n=465, Dept. of paed. New Jersy Medical school





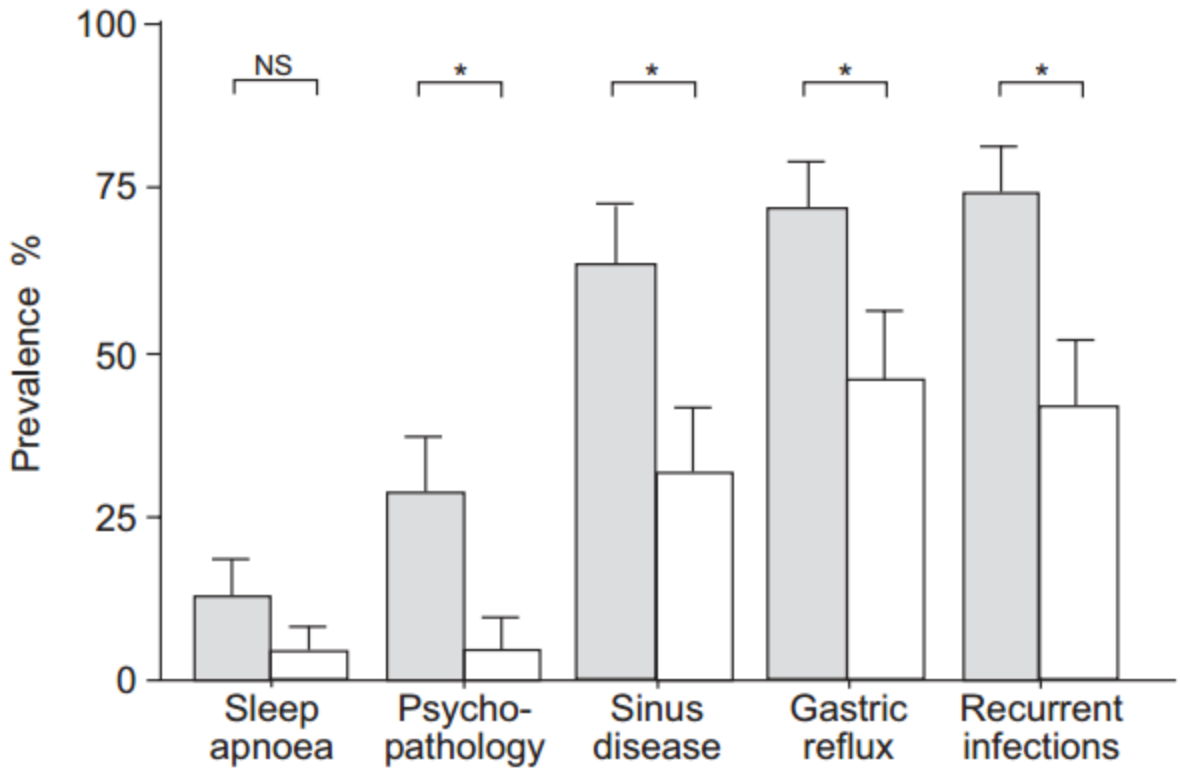
Effect of continuous positive airway pressure (CPAP) on asthma with OSA patients

Functional and clinical characteristics of the subjects at baseline (pre-) and after 6 weeks of treatment (post-) with continuous positive airway pressure (CPAP)

	Pre-CPAP	Post-CPAP
FEV_1 % pred	82.2±13.6	80.4±13.6
FEV_1/FVC %	77.3±8.3	76.3±10.1
PC_{20} $mg \cdot mL^{-1}$	2.2 (1.3–3.5)	2.5 (1.4–4.5)
AHI	48.1±23.6	2.6±2.5***
QOLAs	5.0±1.2	5.8±0.9***
QOLAp	4.1±1.4	6.0±1.0***

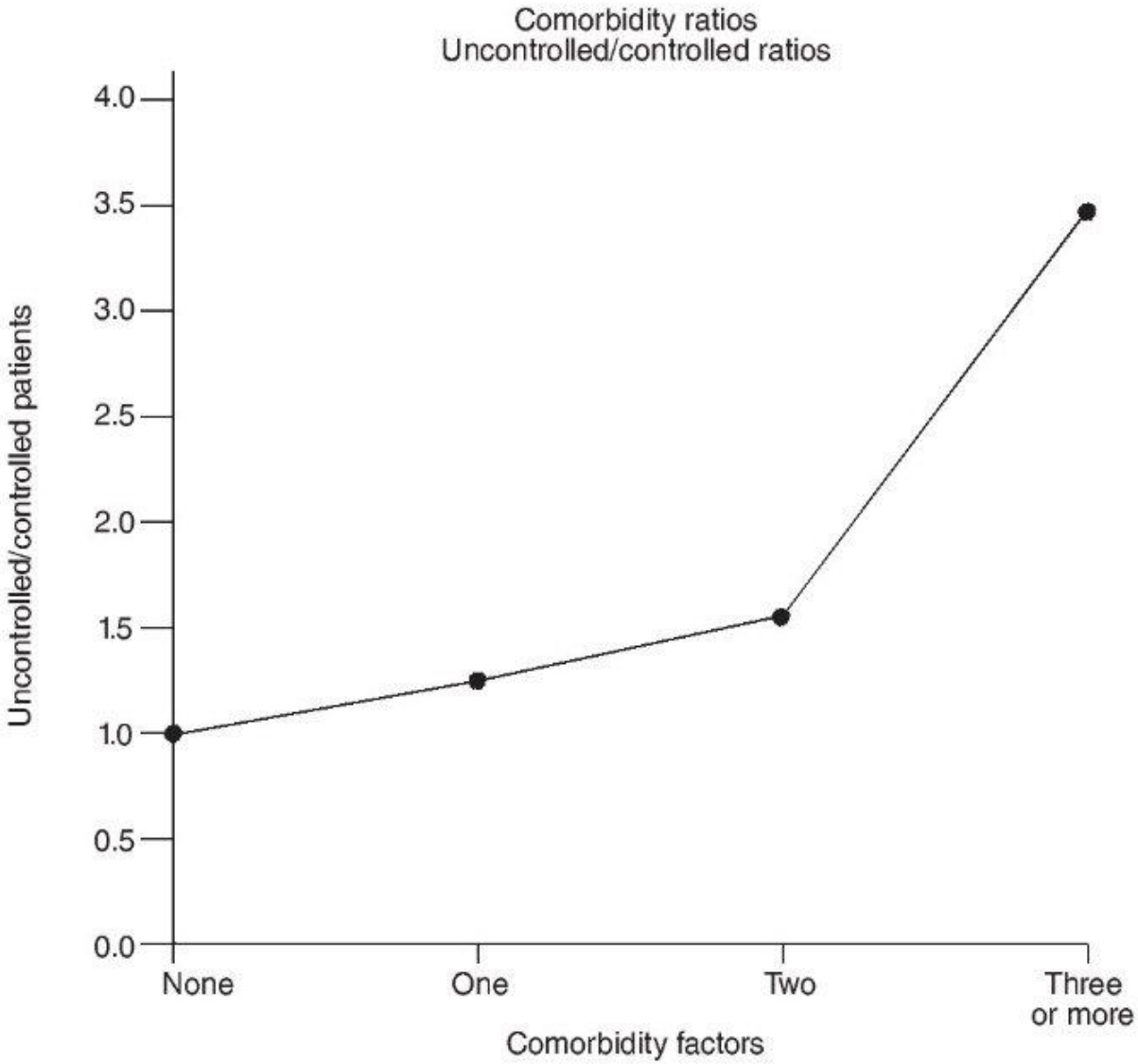
Data are presented as mean±SD or geometric means (95% confidence interval), *i.e.* average of three individual geometric means before and after CPAP. FEV_1: forced expiratory volume in one second; % pred: % predicted; FVC: forced vital capacity; PC_{20}: provocative methacholine concentration causing a 20% fall in FEV_1; AHI: apnoea/hypopnoea index; QOLAs: quality of life specific to asthma; QOLAp: quality of life specific to obstructive sleep apnoea. ***: $p \leqslant 0.001$.

EUROPEAN RESPIRATORY JOURNAL



Comorbid factors associated with recurrent severe exacerbations. Patients with more than three severe exacerbations per year (&) had significantly more prevalent sychosocial dysfunctioning, severe sinus disease, gastric reflux or recurrent respiratory infections compared with patients with only one severe exacerbation (h). Error bars represent SE. NS: nonsignificant. *: p,0.05.

Eur Respir J 2005; 26: 812–818


Comorbidity ratios
Uncontrolled/controlled ratios
Uncontrolled/controlled patients
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
None
One
Two
Three
or more
Comorbidity factors

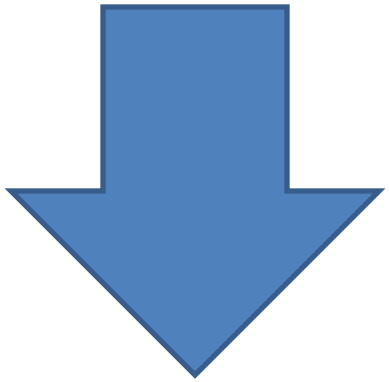
How to achieve maximum control?

Asthma
Well-controlled

Yes

Maintain or step-down therapy

No



Detailed asthma assessment

Review medicine technique & adherence;
assess side effects;
review environmental control

comorbdities

13 comorbid factors considered to be responsible, n=136

Comorbdities

Poor inhaler Technique

- **Severe nasal rhinal disease**
- **GERD**
- **Rec. resp. tract infection**
- **Psychological disturbance**
- **OSA**

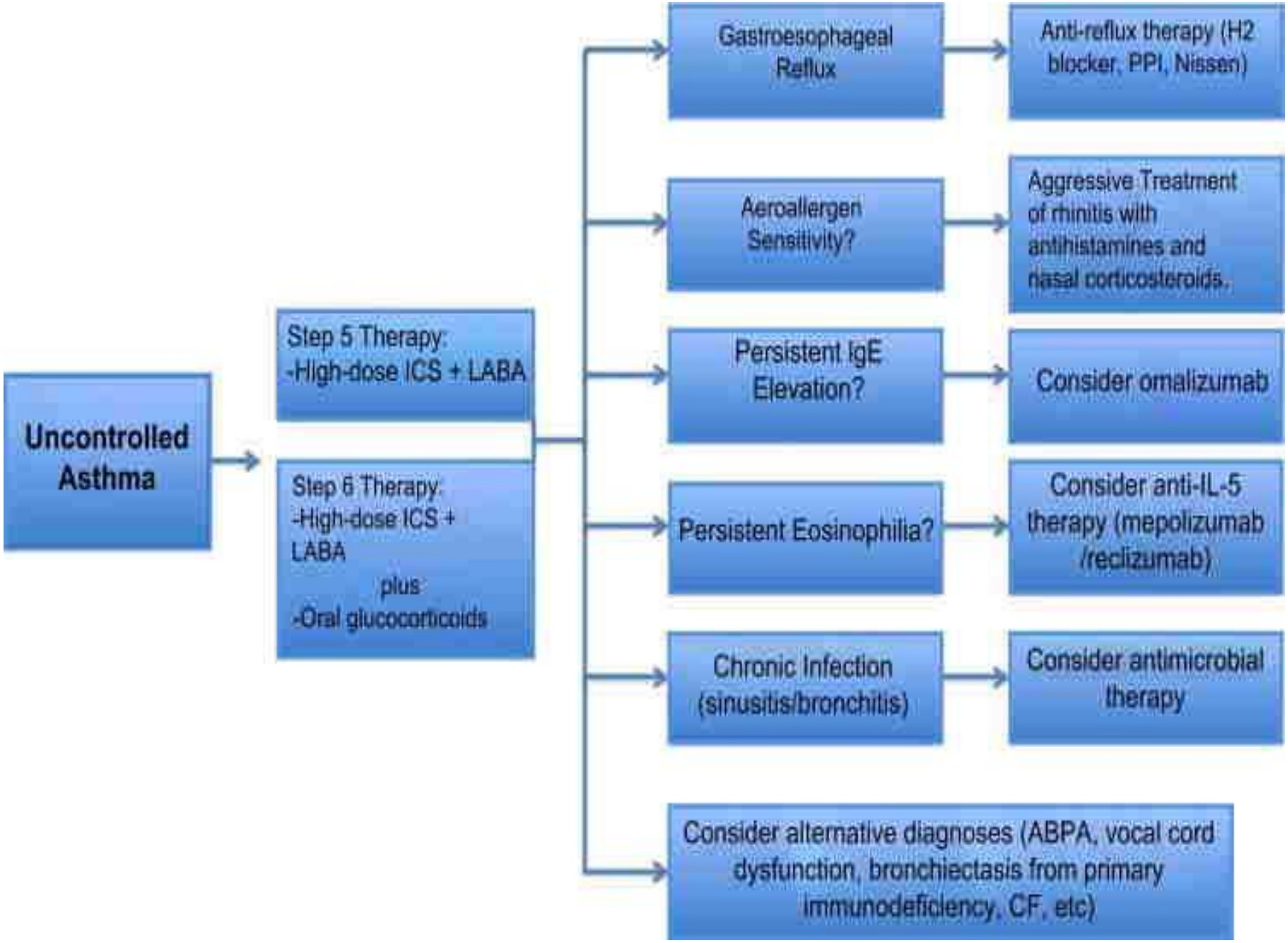
Drugs
Adherance
Allergens
Occupation
Environmental

Hormonal
Immunodeficiency

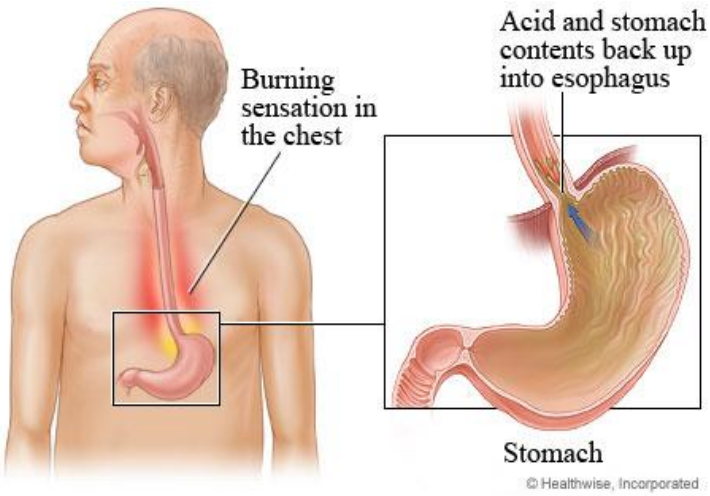
*Eur Respir J 2005; 26: 812-818

Asthma assessment

- Spirometry
- Peak flow
- CXR
- Allergy testing
- Provo cative testing
- Challenge test


Uncontrolled Asthma
Step 5 Therapy:
-High-dose ICS + LABA
Step 6 Therapy:
-High-dose ICS + LABA
plus
-Oral glucocorticoids
Gastroesophageal Reflux
Anti-reflux therapy (H2 blocker, PPI, Nissen)
Aeroallergen Sensitivity?
Aggressive Treatment of rhinitis with antihistamines and nasal corticosteroids.
Persistent IgE Elevation?
Consider omalizumab
Persistent Eosinophilia?
Consider anti-IL-5 therapy (mepolizumab /reclizumab)
Chronic Infection (sinusitis/bronchitis)
Consider antimicrobial therapy
Consider alternative diagnoses (ABPA, vocal cord dysfunction, bronchiectasis from primary immunodeficiency, CF, etc)

Assessment and management of some asthma-related comorbidities cont.



Assessment and management of some asthma-related comorbidities cont.

AYSA
KENNEDY
Ying
GISELE

BANGLADESH
MISRAF
2

Thank you

Assessment and management of some asthma-related comorbidities.[†]

Comorbidity	Potentially useful tests	Management: possible treatment options
Rhinitis		
– Allergic	Allergy skin prick test Serum-specific IgE	Avoid relevant allergen exposure New generation oral H_1 antihistamine Intranasal corticosteroids LTRAs Immunotherapy
– Nonallergic – Associated with nasal polyps – CRS and sinusitis	ENT examination Sinus radiography/CT scan	Intranasal corticosteroids Nasal saline irrigations Nasal anticholinergics Oral corticosteroids Surgical treatment
GERD	Proton-pump inhibitor treatment trial 24-h esophageal measurement Imaging techniques	Management of lifestyle Acid-suppressive therapy – Proton-pump inhibitor – H_2 blocker Surgical intervention

Assessment and management of some asthma-related comorbidities cont.

Obesity	BMI and other obesity measures Detection of metabolic syndrome	Weight loss measures Diet and exercise Baryatric surgery (morbid obesity)
OSA	Polysomnography Oxymetry	CPAP plus other methods Weight loss when relevant
Psychopathologies	Psychological evaluation	Psychotherapy Referral to psychologist/psychiatrist
Dysfunctional breathing	Nijmegen questionnaire [203]	Psychotherapy Breathing retraining
VCD	Visualization of the pharynx Laryngoscopy	ENT referral Speech therapy, and so on

Assessment and management of some asthma-related comorbidities cont.

Hormonal and metabolic disorders	Hormones measurements	Referral to endocrinology and metabolism specialist Treatment of the specific disorder
COPD and smoking	Pulmonary function tests Chest radiography/CT scan Exercise tests	Smoking cessation program Bronchodilators Inhaled corticosteroids Readaptation-exercise program Other measures and Rx
Infections – Viral – Bacterial – Fungal	 Specific serologies Various identification measures Precipitins for Aspergillus/fungal cultures/ Aspergillus serology	 Specific treatment according to the agent, if available and considered clinically significant Systemic corticosteroids if allergic reaction to agent (e.g., ABPA)