



# Asthma

# Astma

## definition

**Asthma is **chronic inflammatory** disorder in the airways in which many cells and cellular elements play a role**

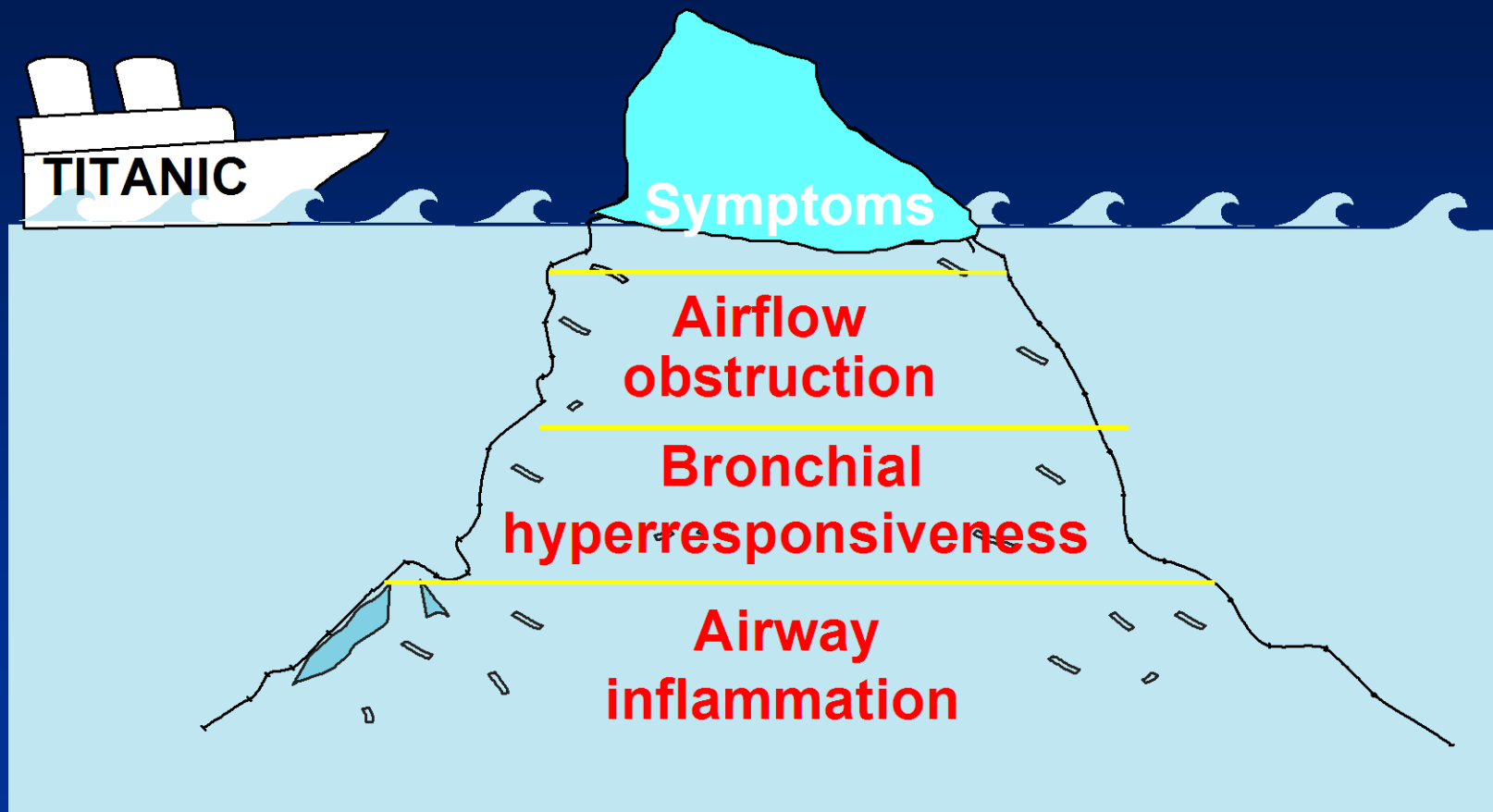
**Chronic inflammation causes an associated increase in airway hyperresponsiveness that in susceptible leads to **recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particular at night or early morning****

**These episodes are usually associated with widespread but variable obstruction that often is **reversible either spontaneously or with treatment****

# Asthma

## *The “Tip” of the Iceberg*

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# ”Classic” asthma allergic reaction Type 1 hypersensitivity



Systemic  
**anafylaksi**

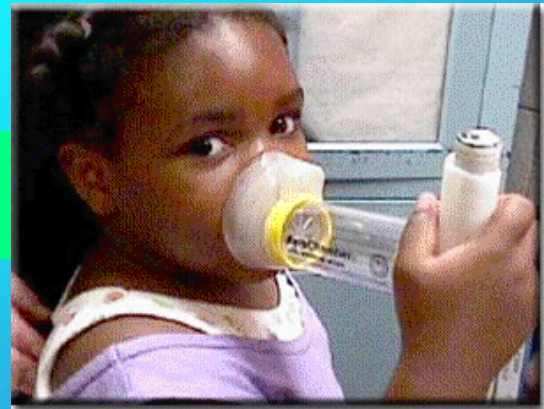
Lokal

**asthma**  
**rhinitis**  
**eksema**

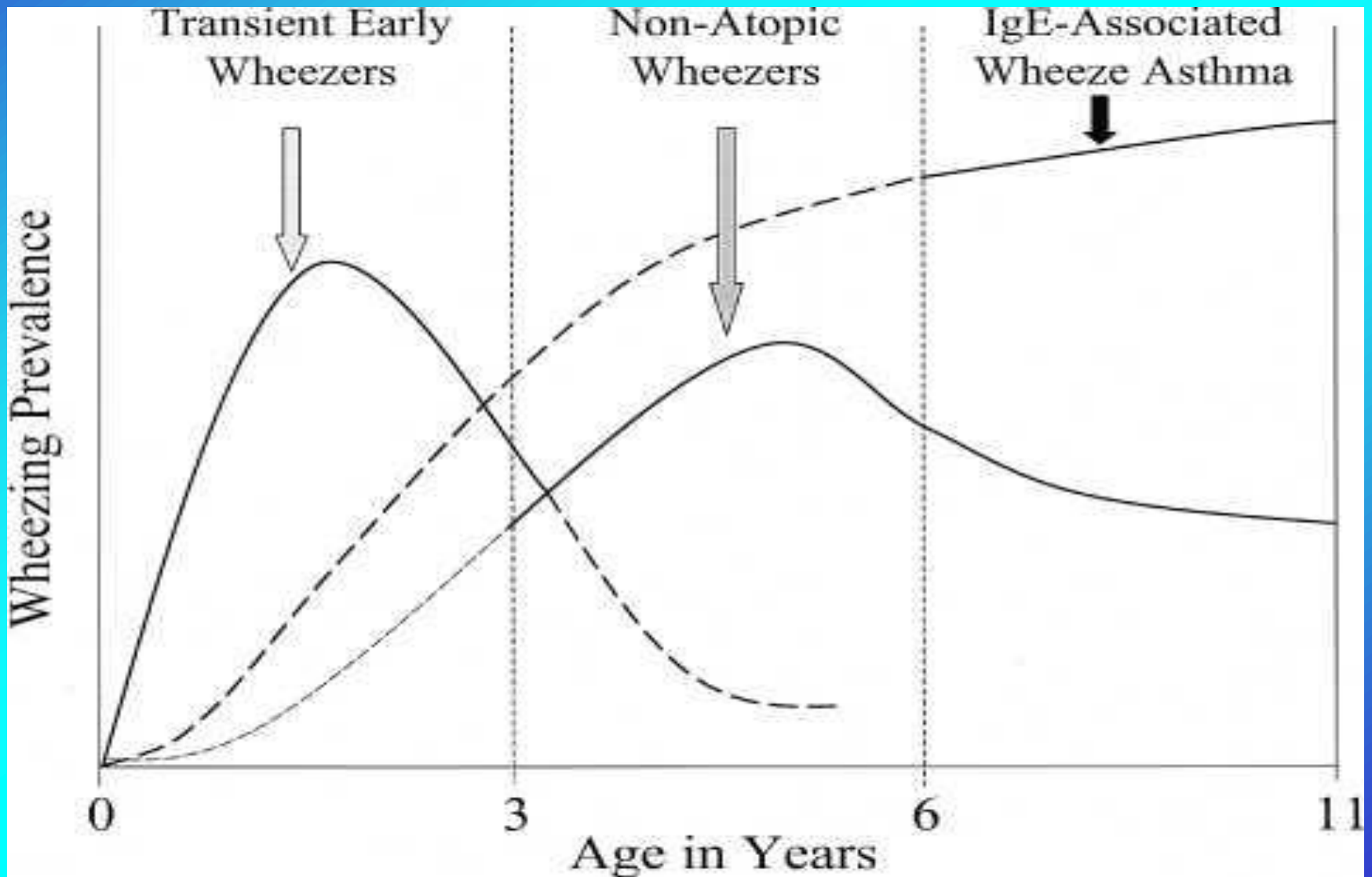




# Asthma – present in all ages



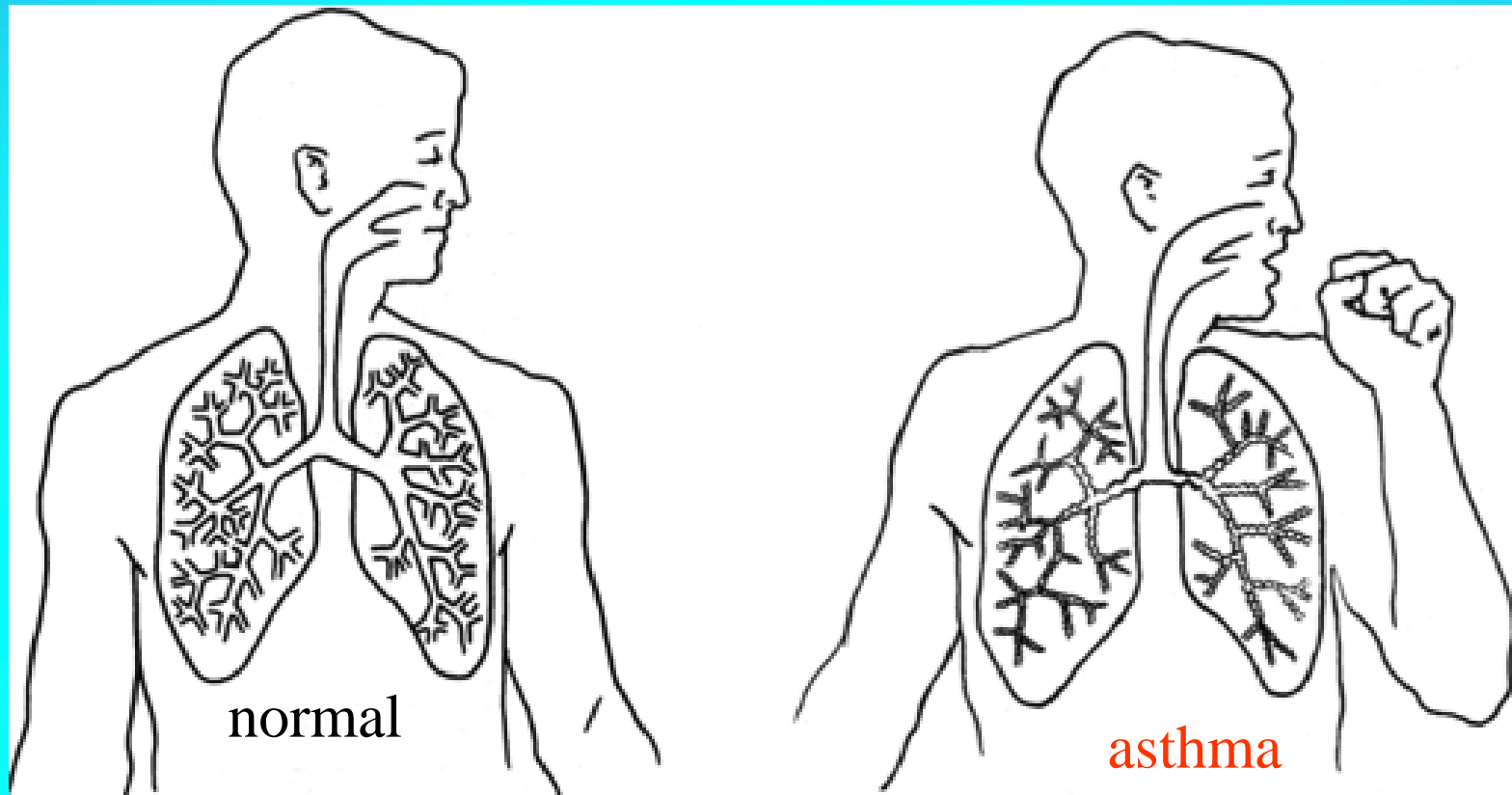
Before 5 years of age the diagnosis is difficult/impossible ?



# Symptoms in asthma

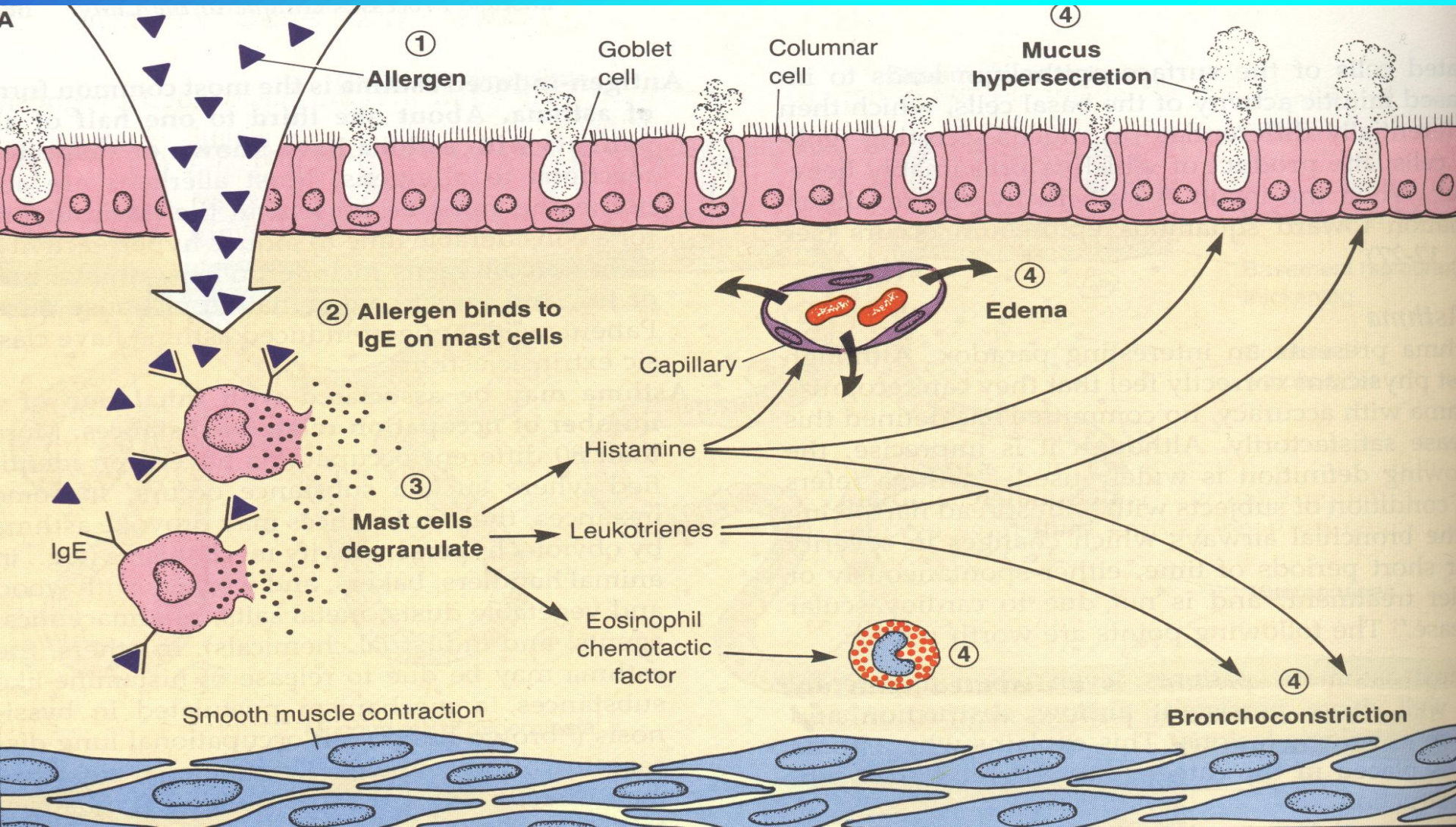
Classic: – sudden wheeze, cough or dyspnoea

Symptoms during nights with awakenings





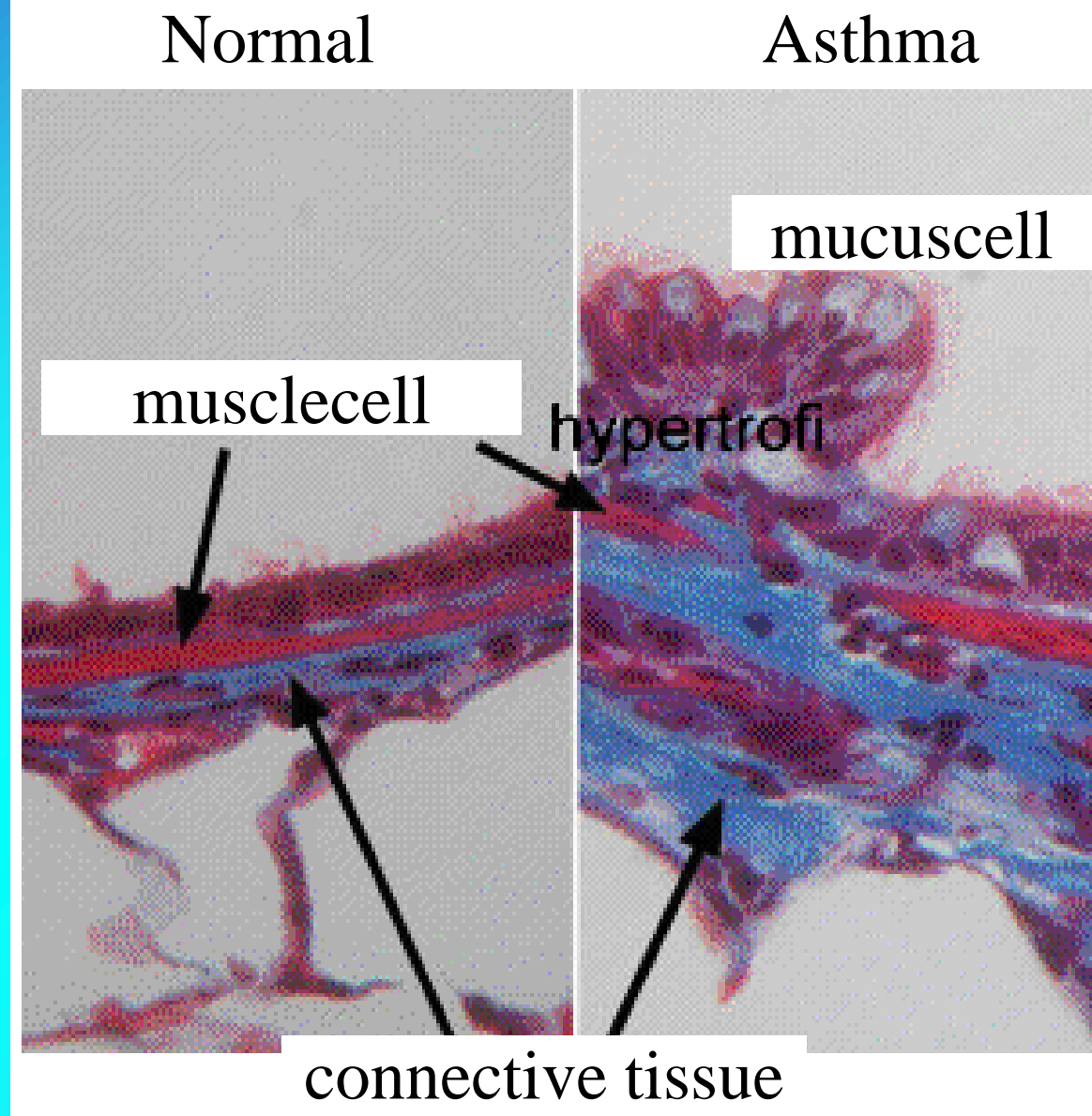
# "Classic" asthma – overview





# Airway remodelling

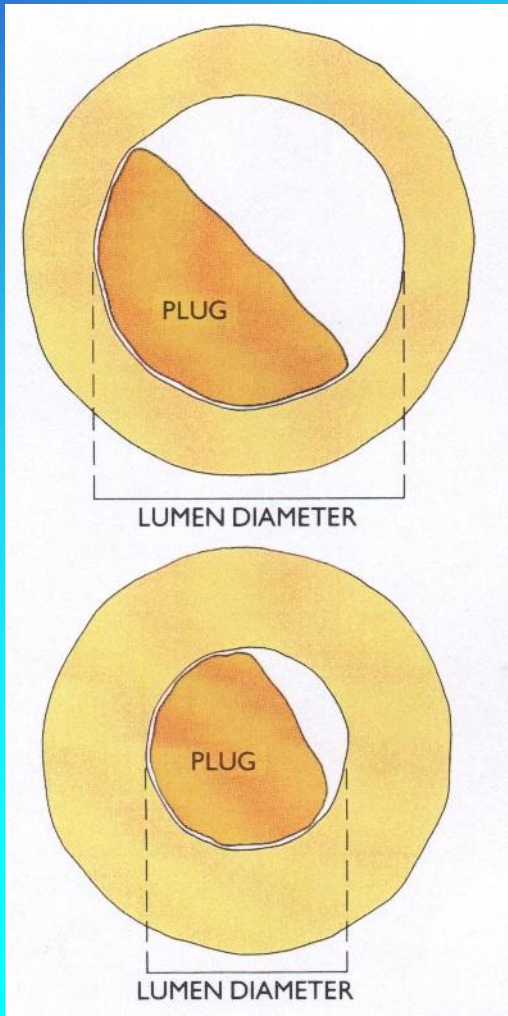
With time the airways might get permanently damaged



**REVERSIBILITY!?!?!?**

*Asthma:*

*attacks !!!!*



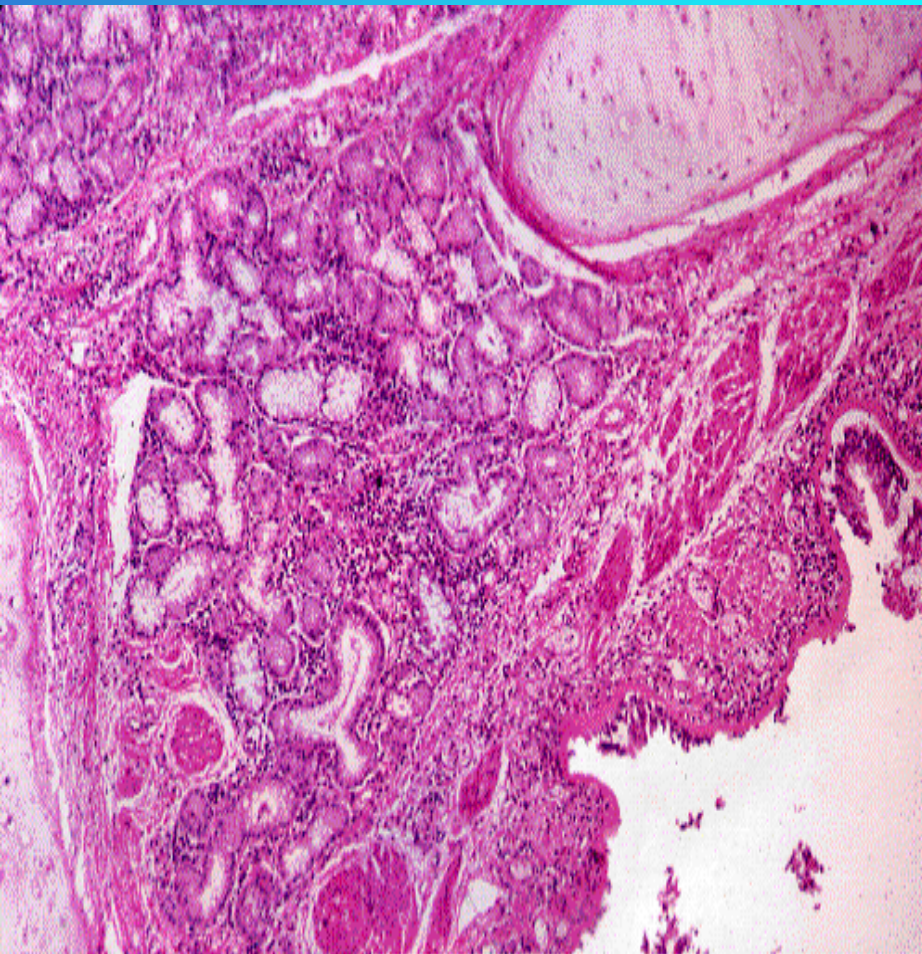
"quiet" phase

Exercerbations

dyspnoea  
wheeze/hvæsende  
sputum  
Night awaikening  
Cough

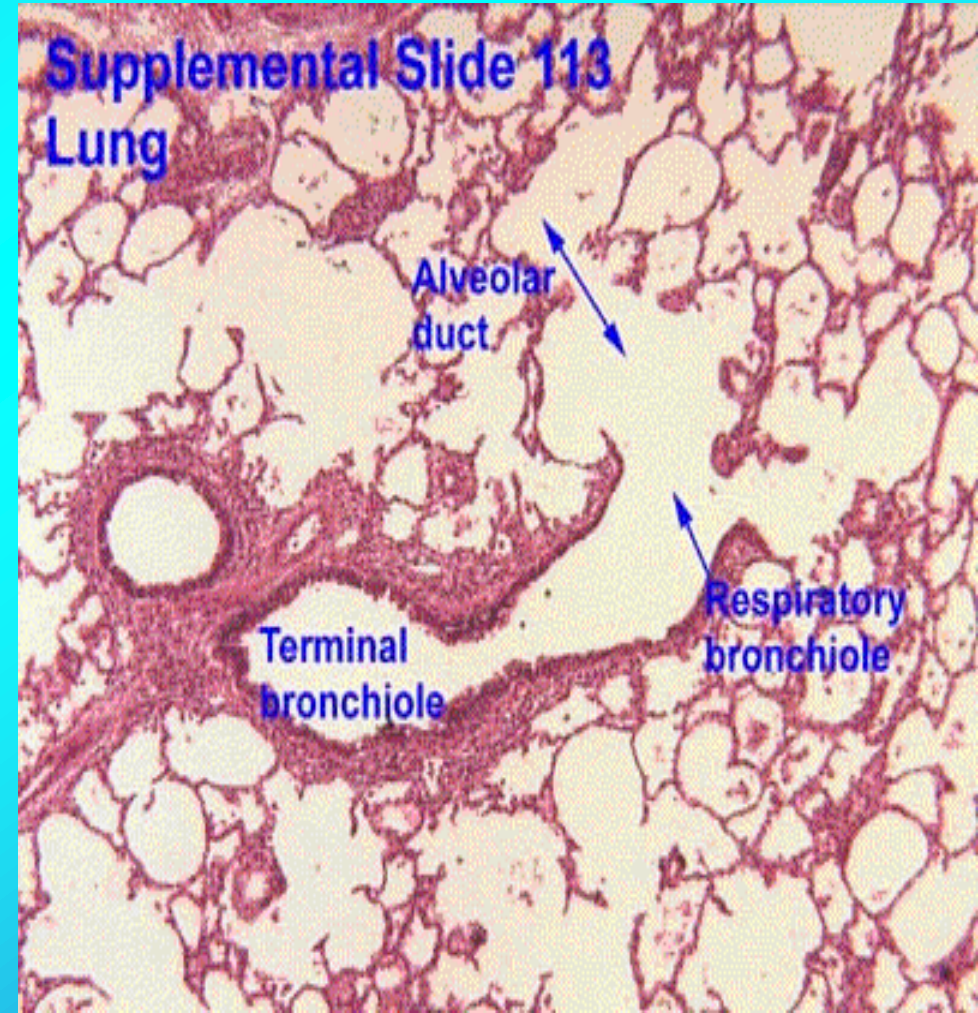


Fatal asthma



©1995 Cornell University Medical College

normal





# Asthma

## Triggering factors

Exercise

Allergens

Hyperventilatio

Infection

Cold air/air con.

pollution

Psychological factors

-smoking

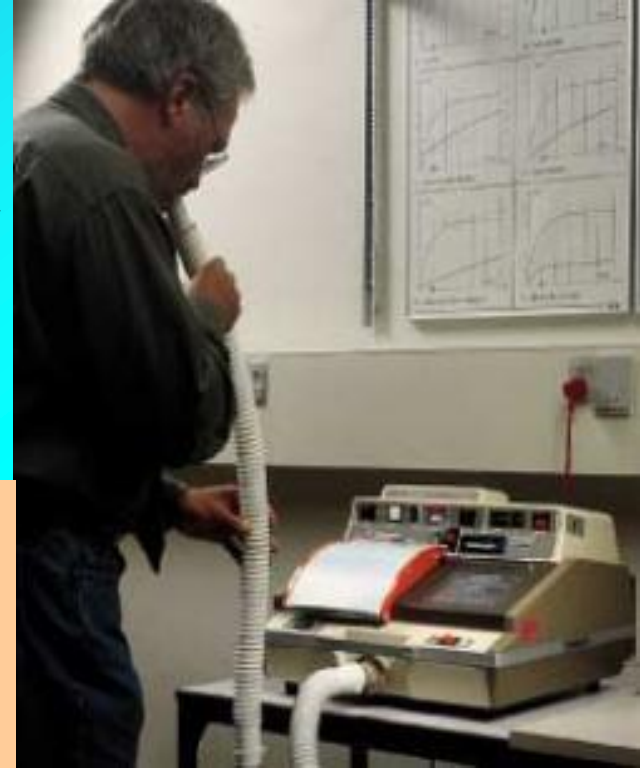
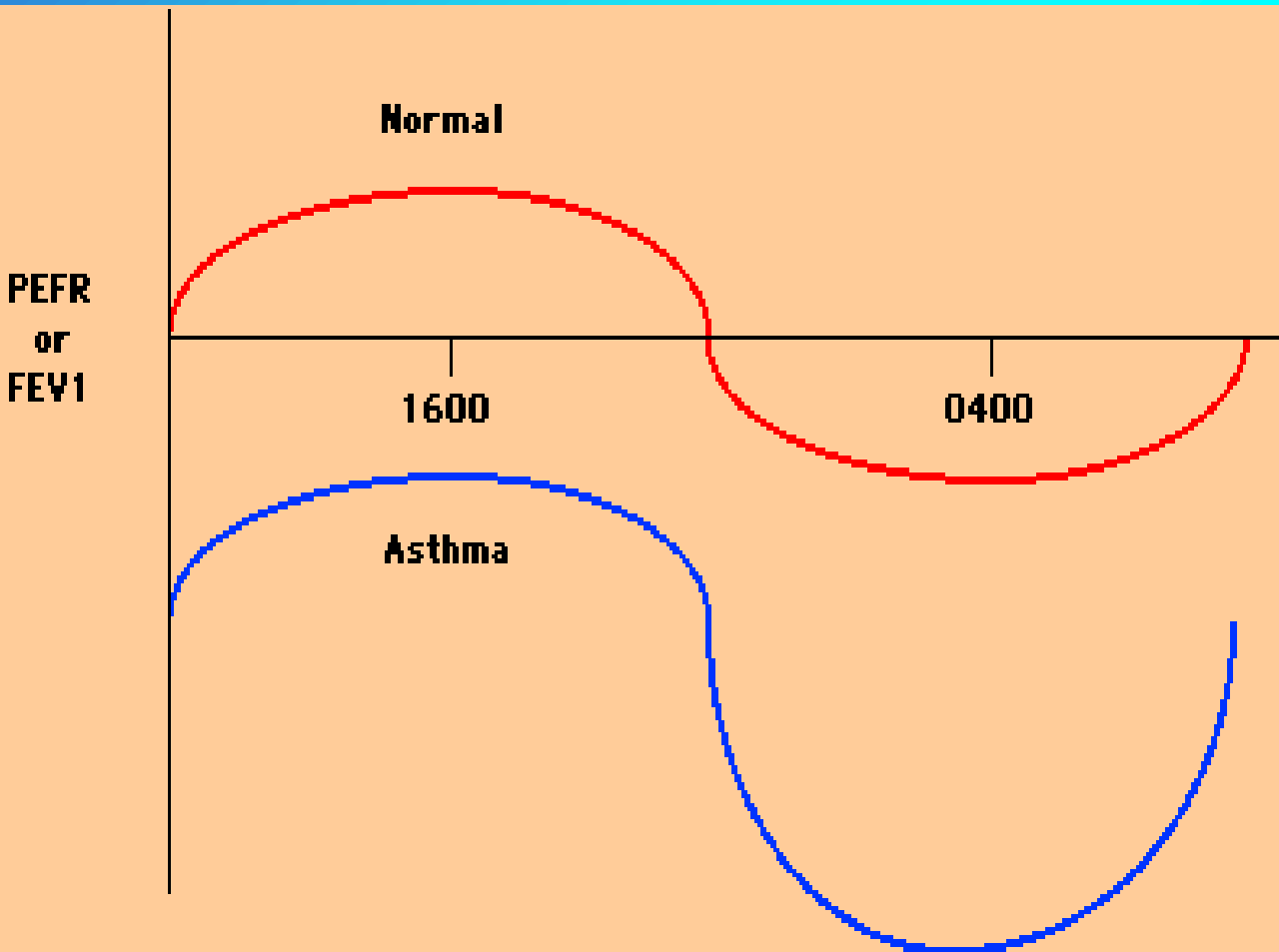
'fragrant-smell'

-Particles/dust

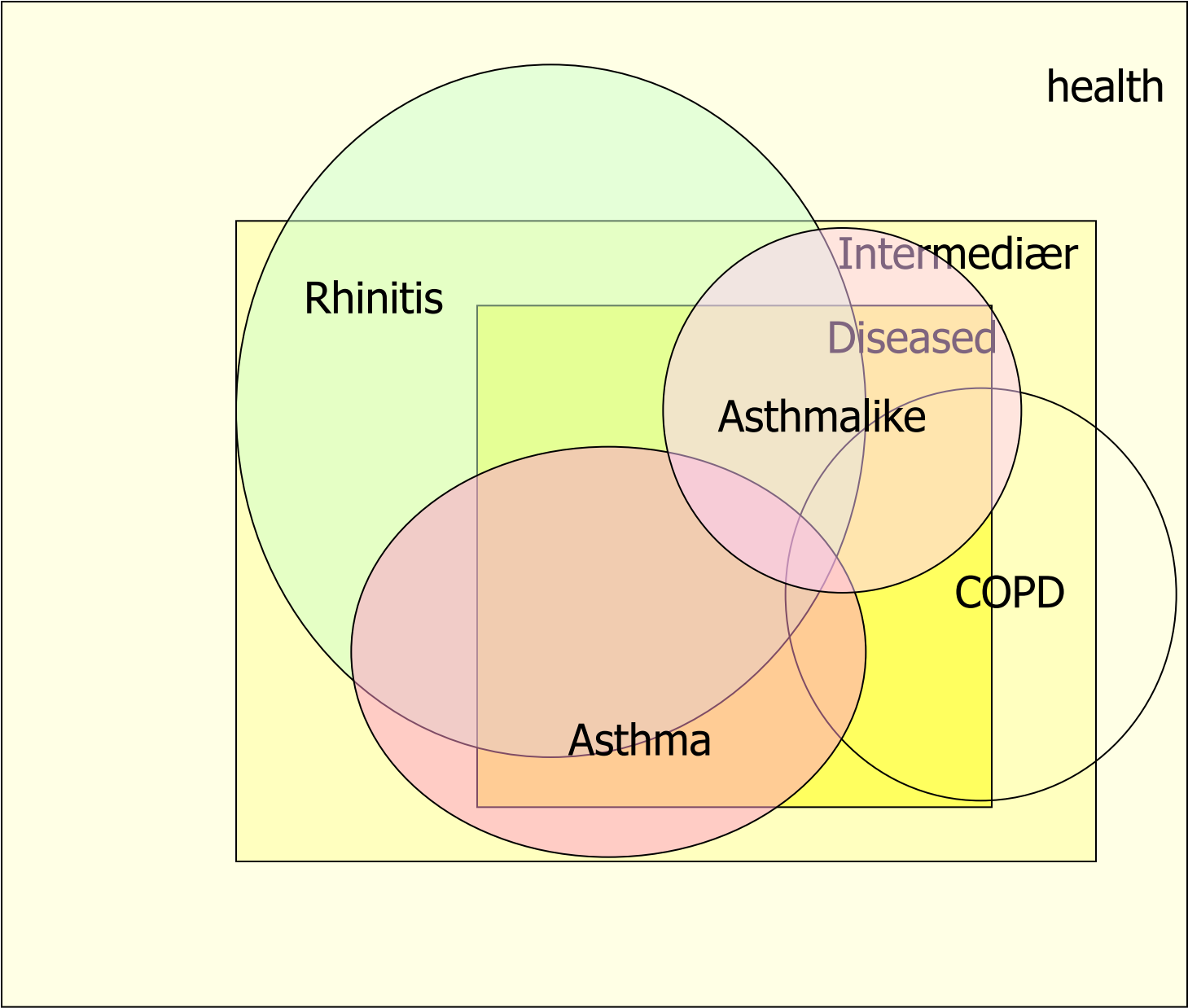


# Asthma :

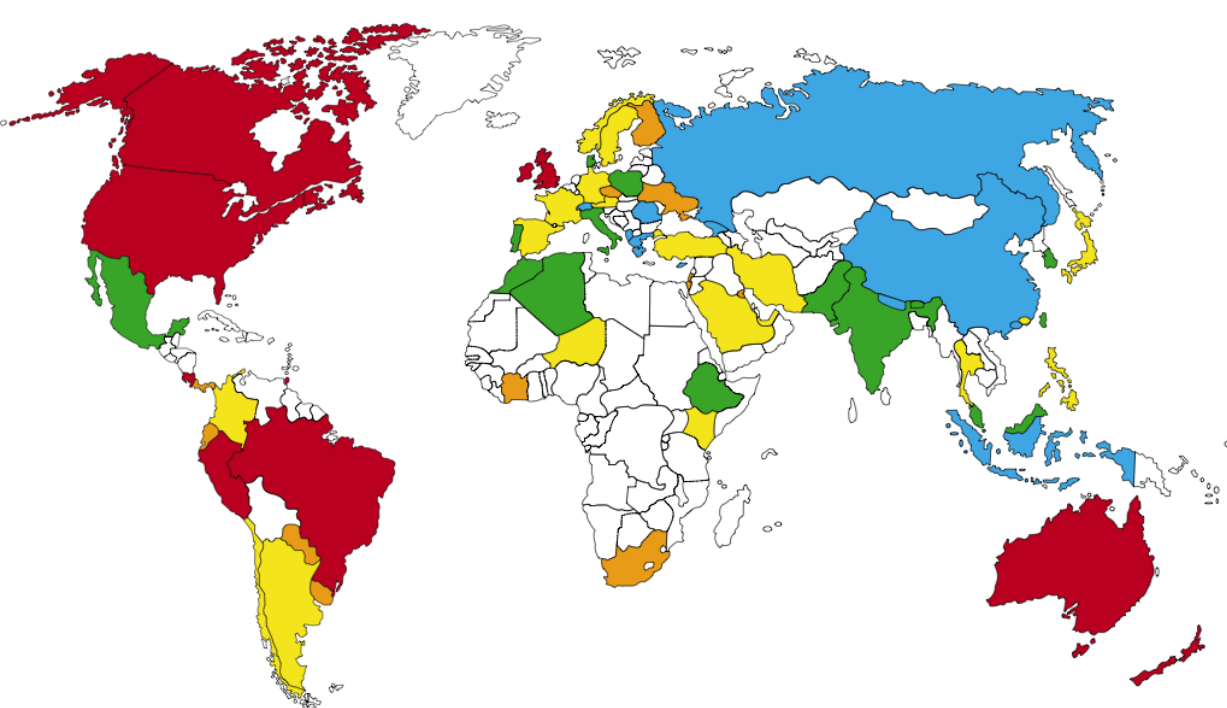
Lung function varies and may at times be normal



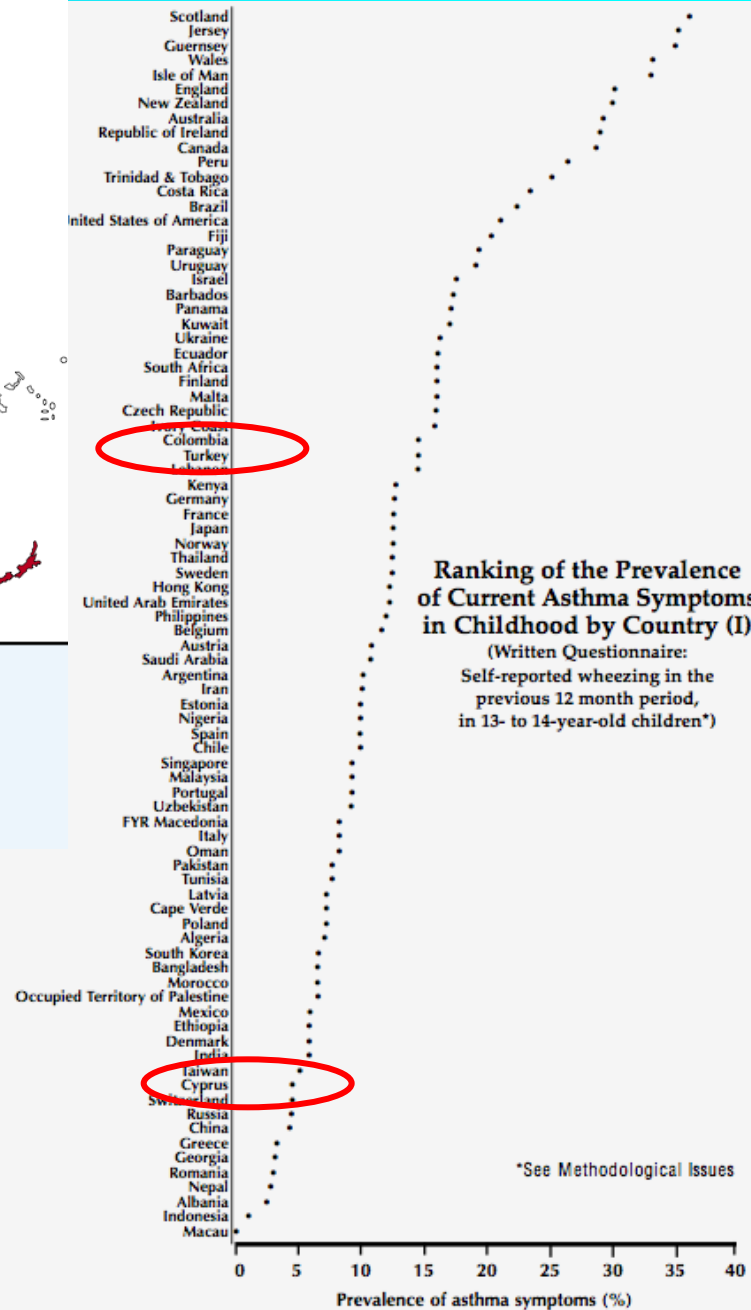
The reason that symptoms often appears first at nights !!!







### Proportion of population (%)\*



# Asthma-risk factors

Genetics

Sex

Rhinitis/Atopy/Eksema

Bronchial Hyperreactivity

Infections

-timing?

Pollution

Smoking

-Active

-Passive

Mother milk

Not consistent information (at least 4-6 mdr)

”Western lifestyle”



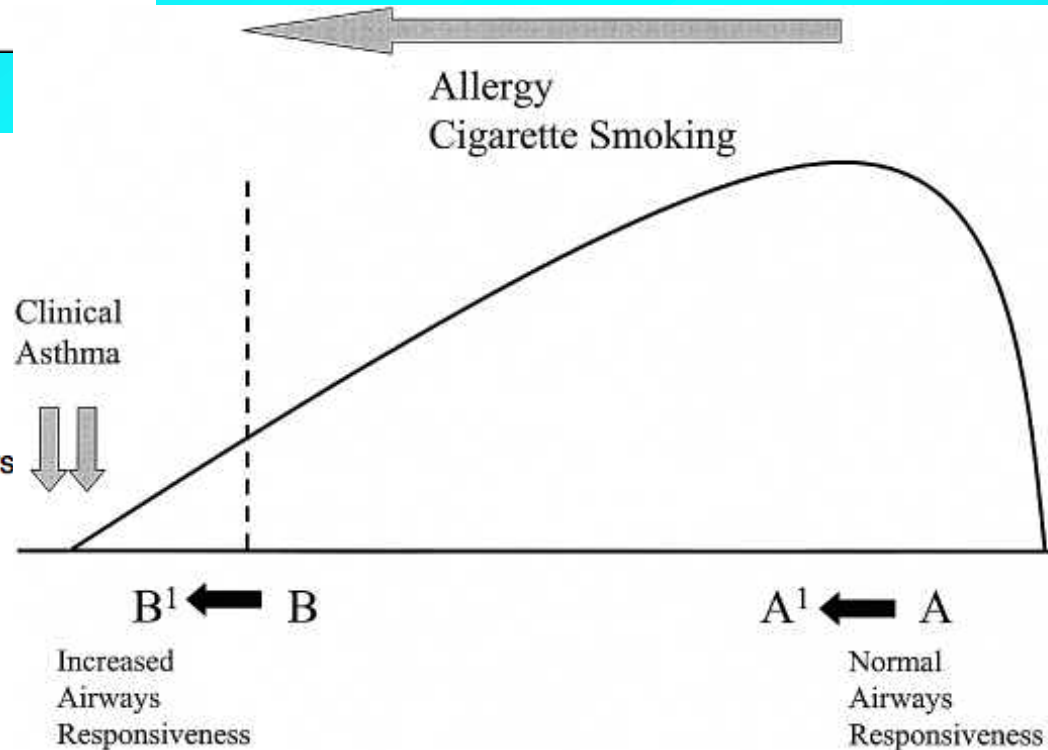
# Risk factors for asthma can be separated into

## Host factors

- Genetic predisposition
- Atopy
- Airway hyperresponsiveness
- Gender
- Race/ethnicity

## Milieu factors

- Indoor allergens
  - Domestic mites
  - Animal allergens
  - Cockroach allergen
  - Fungi, molds, yeasts
- Outdoor allergens
  - Pollens
  - Fungi, molds, yeasts
- Occupational sensitizers
- Tobacco smoke
  - Passive smoking
  - Active smoking
- Air pollution
  - Outdoor pollutants
  - Indoor pollutants
- Respiratory infections
  - Hygiene hypothesis
- Parasitic infections
- Socioeconomic status
- Family size
- Diet and drugs
- Obesity

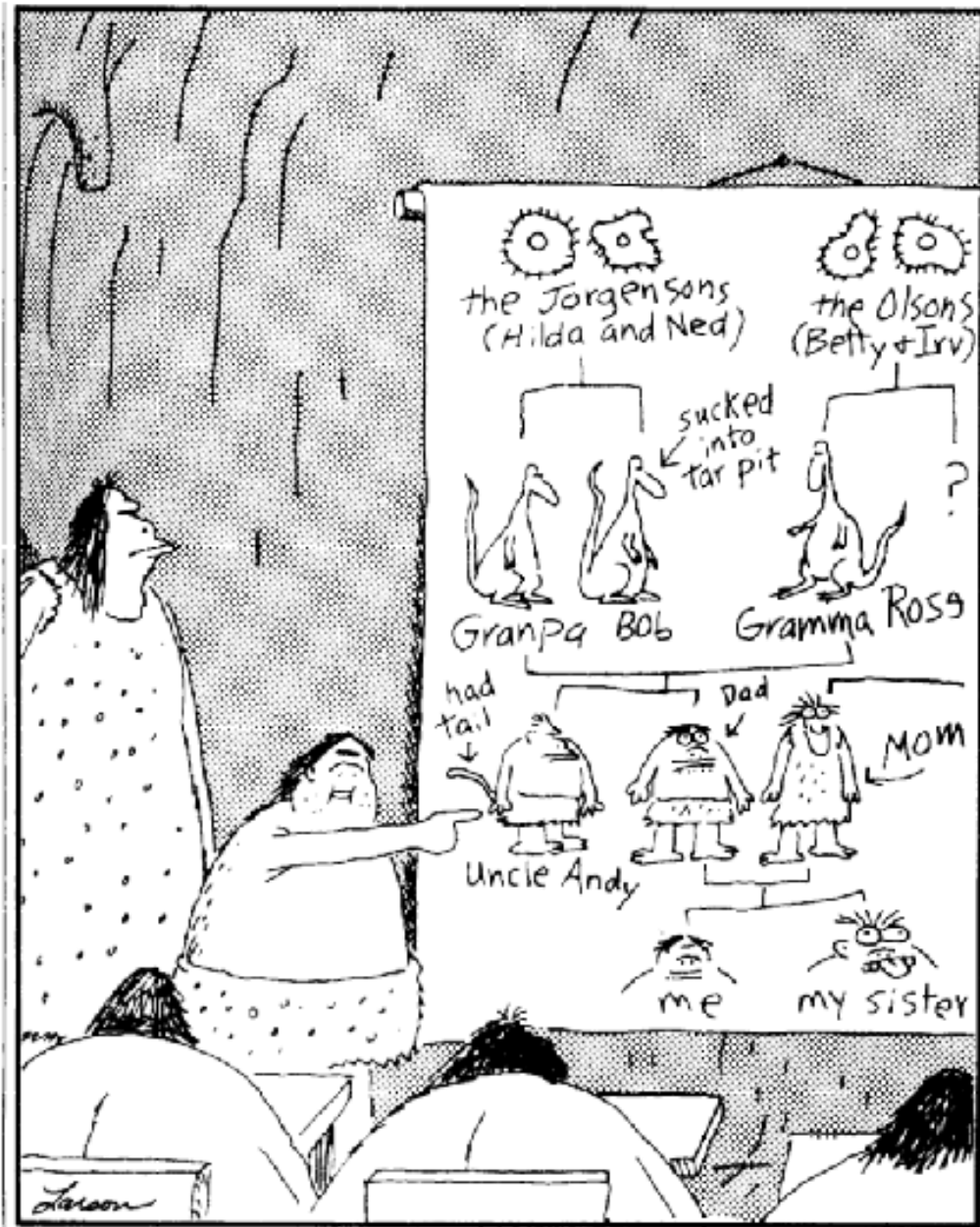
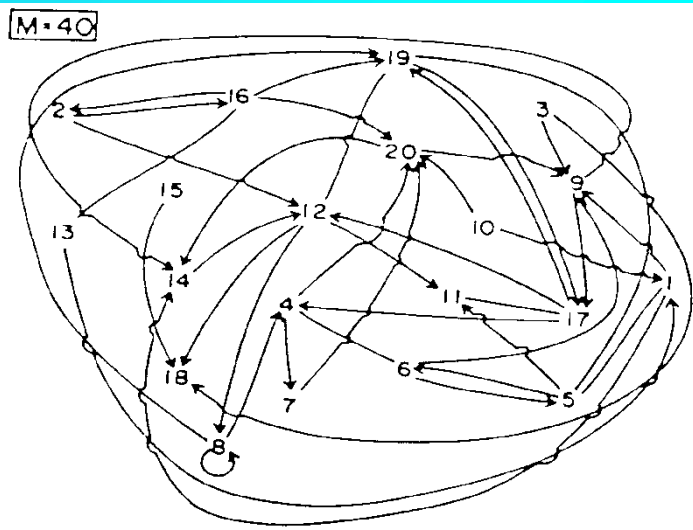


Host and milieu  
Affects each other



# Inheritance

- “complicated” inheritance
- Milieu can modify
  - Smoking/
  - Allergen exposure
- Genetic disposed have aprox 2 times risk for developing asthma

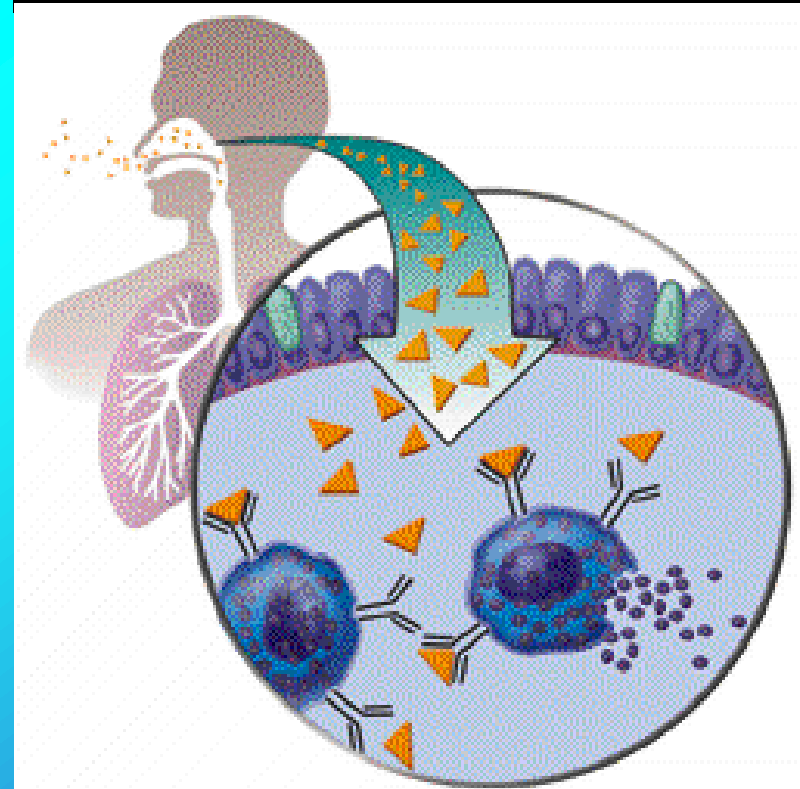
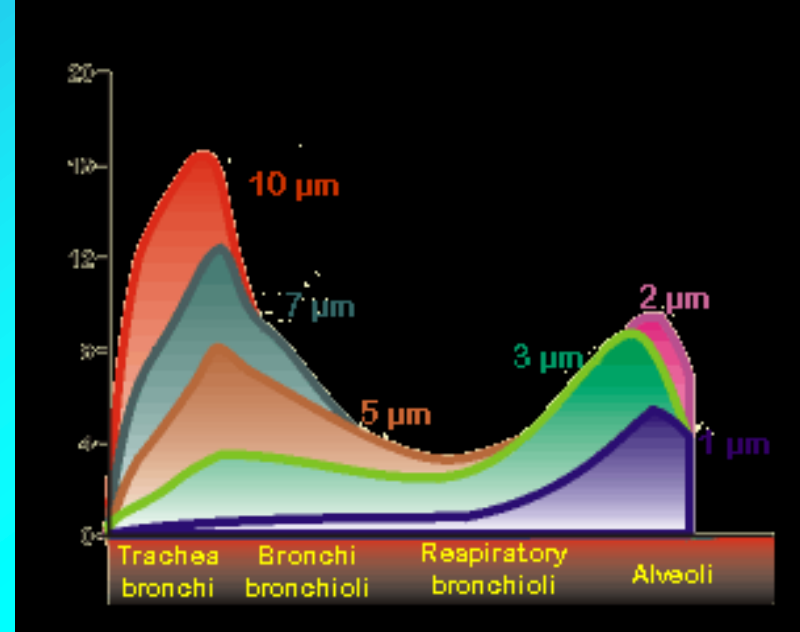
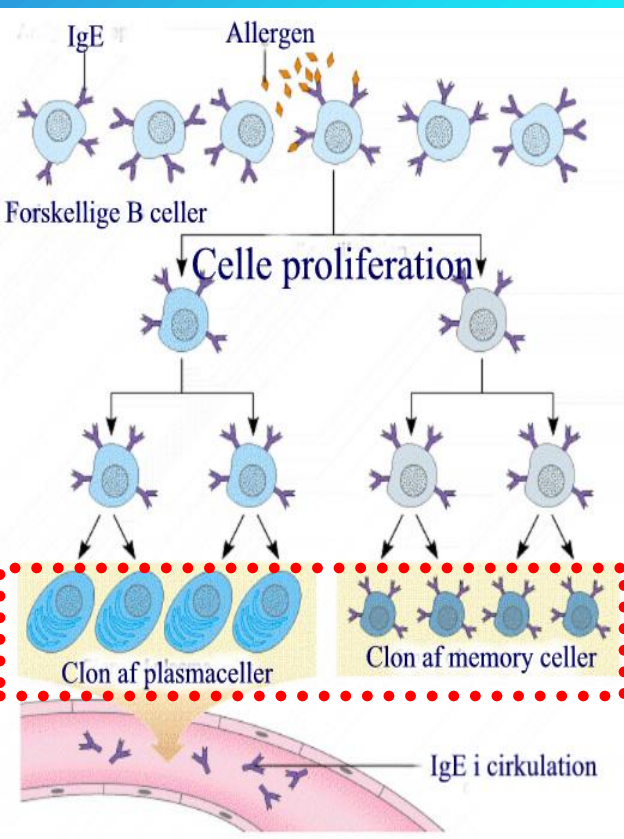


Dirk brings his family tree to class.

# Hay fever/atopy

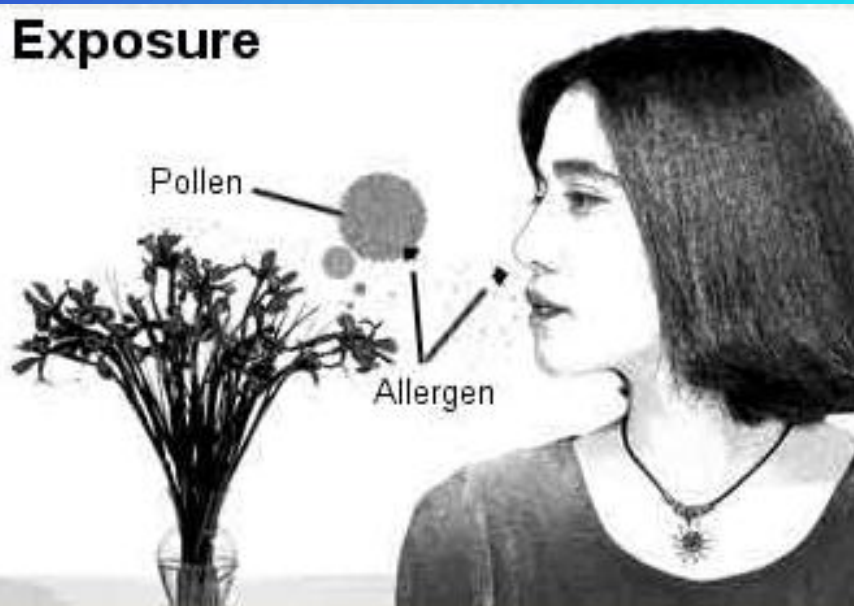
## Sensibilisation – what is necessary

1. Antigen must have a certain size
2. Penetration of the mucosa
3. Activation of the immunosystem



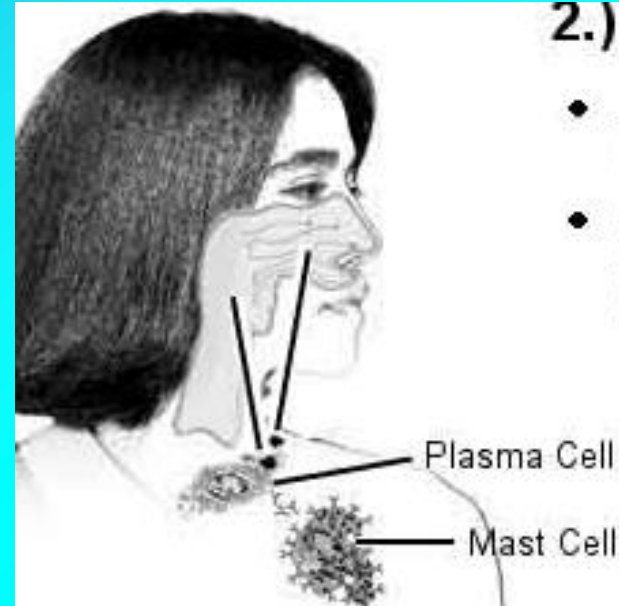
# Allergy development

## 1.) Exposure



## 2.) Sensitization

- Allergen activates sensitized mast cell
- Mast Cell degranulates (breaks down)



## 3.) Re-Exposure/Histamine Release

Chemical mediators (Histamine) are released causing inflammation

leading to allergy symptoms.



## 4.) Allergic Response

- Itchy, Watery Eyes and Nose
- Sneezing
- Nasal Congestion
- Profuse Nasal Discharge
- Postnasal Drip





# Test for allergy

## Skin Prik test/bloodtest

Standard panelet will diagnose >aprox 95% of all luftallergy

Normal 4 groups

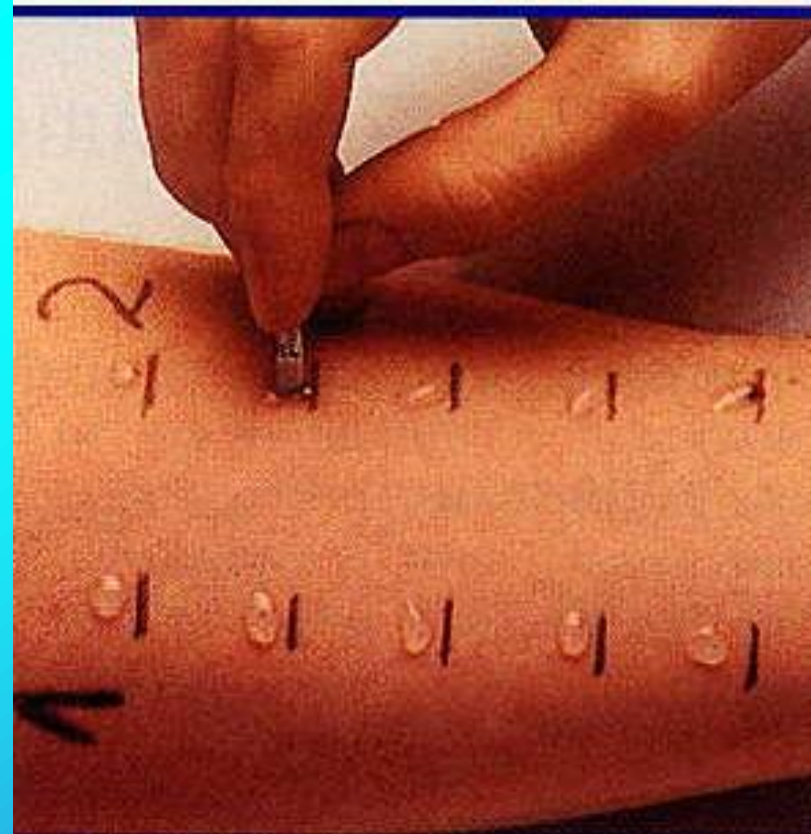
Pollen

Fur

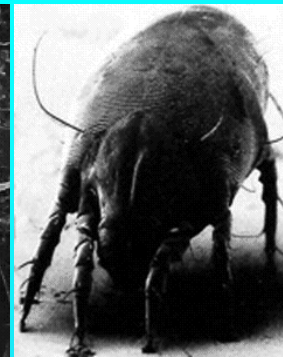
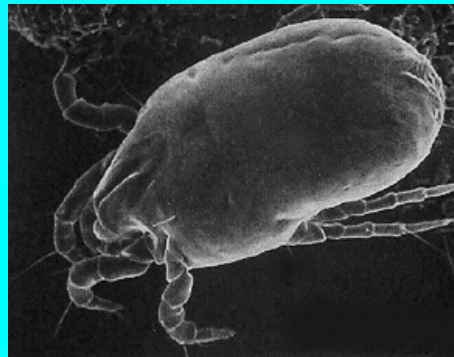
Hus dust mites

Fungis

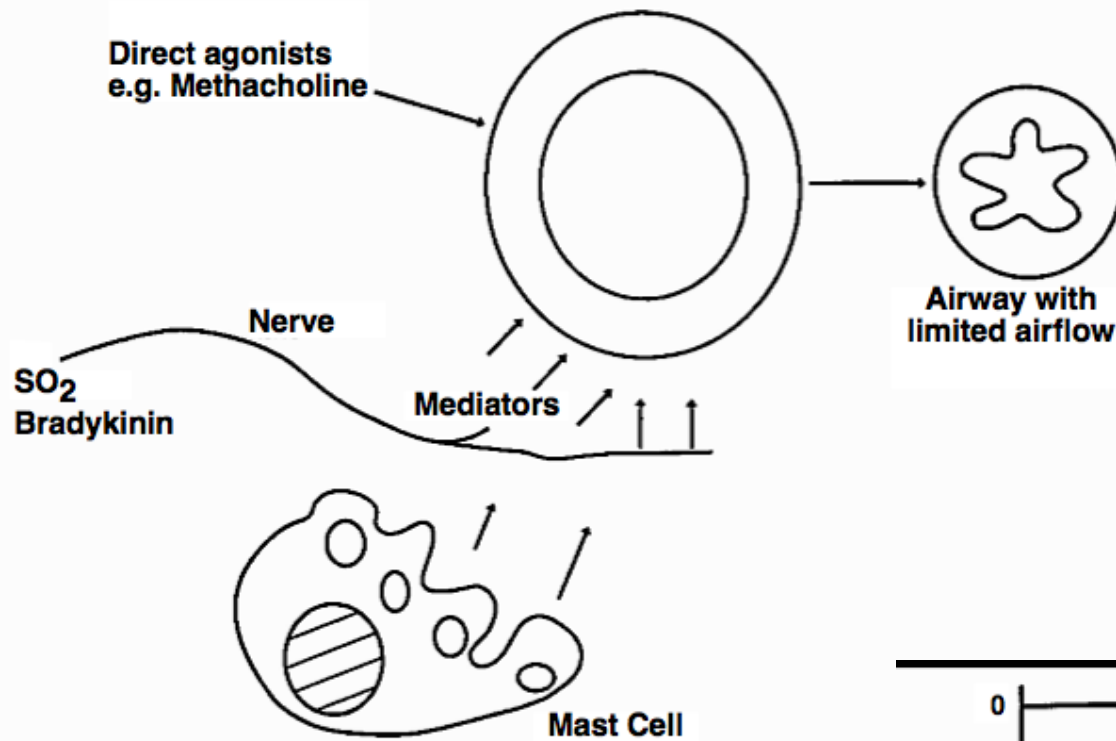
+ foods



Skin Prick Test: Performance



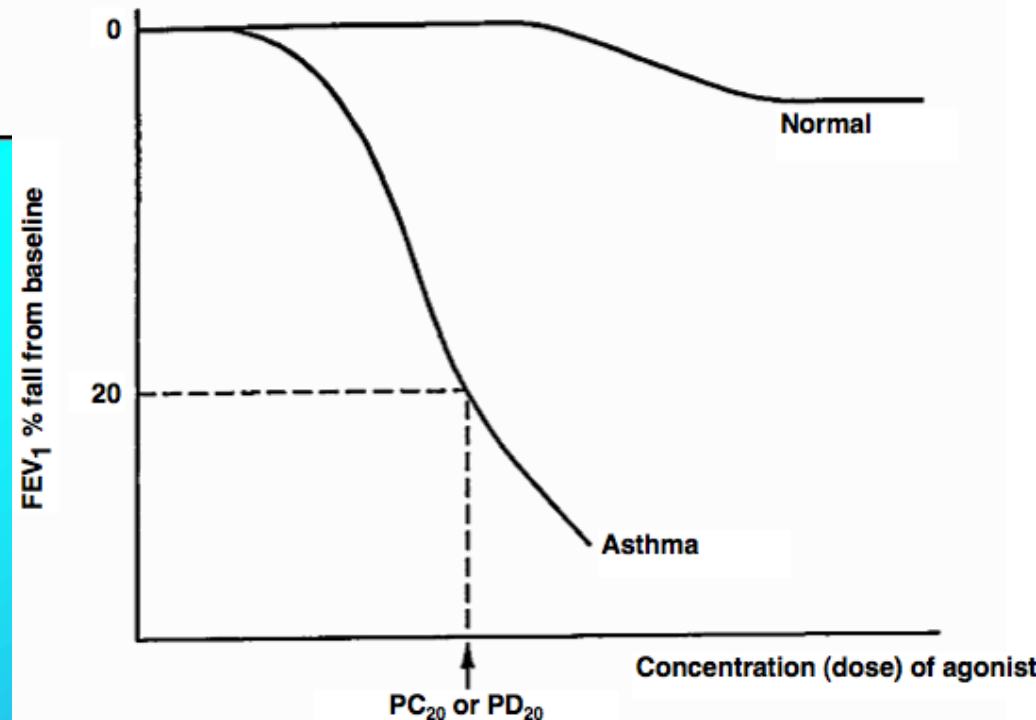
Genetic  
Gained hyperreactivity  
A landmark of asthma!!?

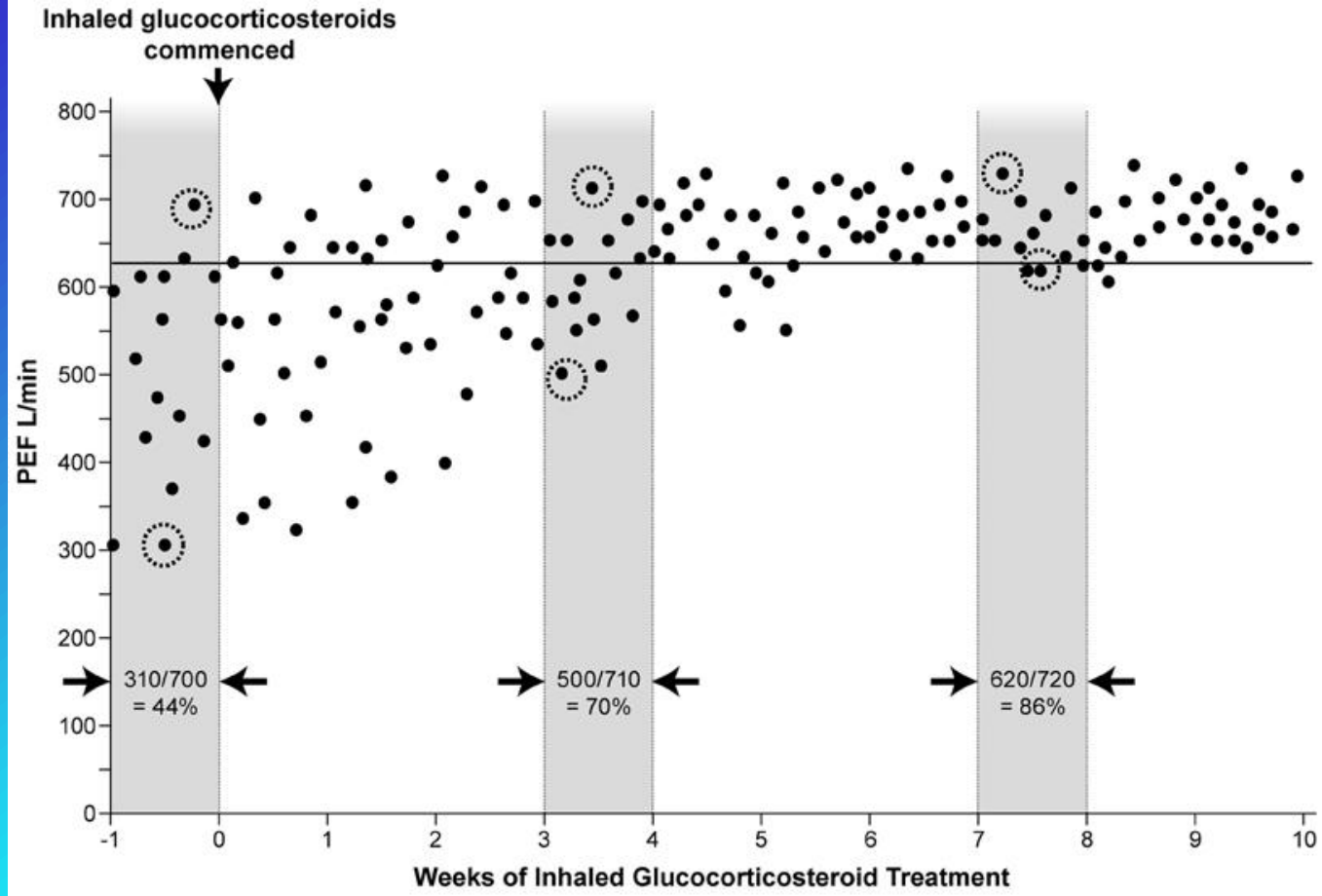


Printed with permission from Dr. Stephen T. Holgate.

Increased sensitivity to:

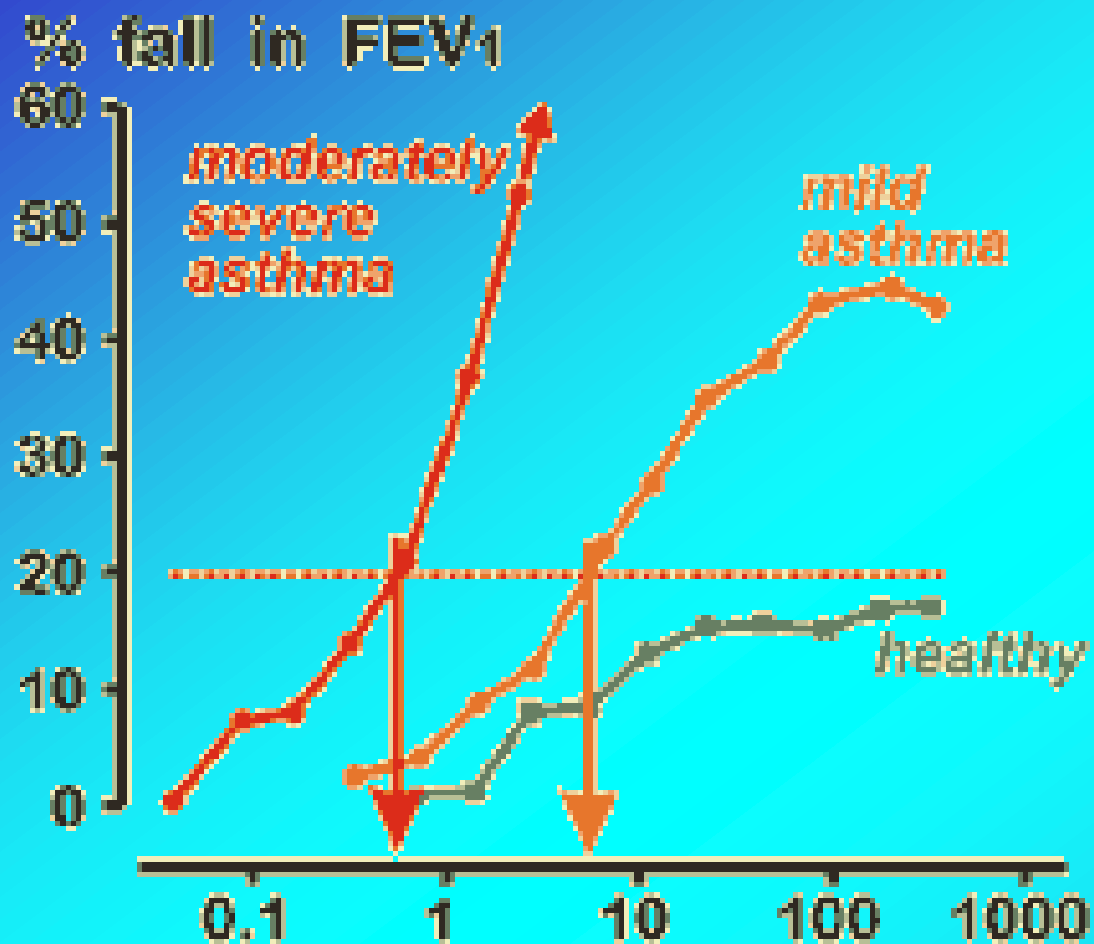
- Smoke
- exercise
- allergens
- Particles etc.





Effect of steroid treatment on peakflow



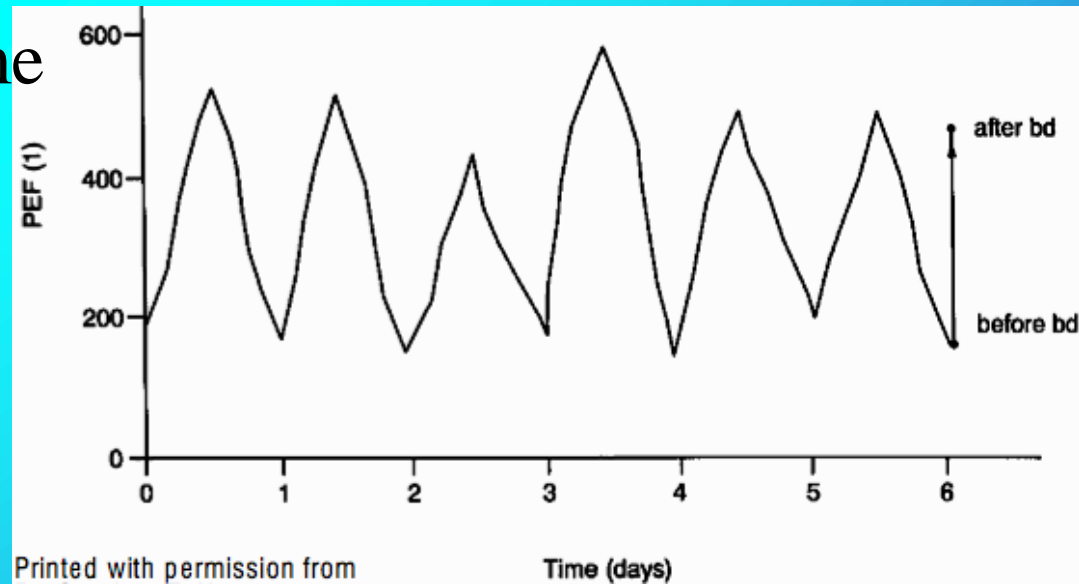


Variation in bronchial hyperreactivity

# Asthma-investigations

## -these few are often enough

- History
- Reversibility test ( $\beta_2$  agonist)
- Skinpricktest
- Eosinofilnumber
- Total IgE
- Perhaps: Peakflow home



# Medical History most important

- Rhinitis
  - Makes asthma worse (united airways)
  - Risk factors
  - Treatment (vaccination/avoidance)
- Inheritance
- Symptoms
  - Where and when
- Medicine
  - What
  - Aspirin ??
- Milieu
  - Jobs
  - Free time

# Asthma investigations

- Lung function
- Exercise test
- Methacholine test
- Steroid reversibility test
- Peakflow again (work; exercise)
- NO
- Bronchoscopy
- Sputum





**THAT TIRED FEELING**

That's just individuality trying to reassert itself.

**DON'T GIVE IN!**

**Special Services Agency**  
**COMMUNITY & PUBLIC HEALTH SERVICES**  
 1000 E. UNIVERSITY AVENUE, SUITE 100  
 DENVER, CO 80202

# Asthma treatment

- *Eliminate causes*
- *Treat inflammation*
- *Treat symptoms*

# Asthma plan

## Partnership

**The goal:** To provide the patient and his or her family with suitable information and training so that the patient can keep well and adjust treatment according to a medication plan developed with the health care professional.

### **Key components:**

- The development of a partnership
- Acceptance that this is a continuing process
- A sharing of information
- Full discussion of expectations
- Expression of fears and concerns

### **The patient then requires information about:**

- Diagnosis
- Difference between “relievers” and “controllers”
- Training in use of inhaler devices
- Advice regarding prevention
- Signs that suggest asthma is worsening and actions to take
- Training in monitoring asthma
- Advice about how and when to seek medical attention

### **The patient then requires:**

- A guided self-management plan
- Regular supervision, revision, reward, and reinforcement

## Asthma Action Plan<sup>†</sup>

Zone		Actions	
Green	Name: _____ Doctor's Name: _____ Doctor's Phone: _____ Baseline/Personal Best Peak Flow: _____ Medicines: _____	_____ _____ _____ _____ _____	
	Yellow	_____ _____ _____ _____ _____	
		Red	_____ _____ _____ _____ _____

Asthma

Action

Plan

<sup>†</sup>Adapted from Cecilia Vincuna-Keady, RN.  
 This plan is provided as an example to clinicians



Why no effect ?!

Wrong diagnosis ?!

## **Drug factors**

Difficulties with inhaler devices

Awkward regimes (e.g., four times daily or multiple drugs)

Side effects

Cost of medication

Dislike of medication

Distant pharmacies

## **Nondrug factors**

Misunderstanding or lack of instruction

Fears about side effects

Dissatisfaction with health care professionals

Unexpressed/undiscussed fears or concerns

Inappropriate expectations

Poor supervision, training, or follow-up

Anger about condition or its treatment

Underestimation of severity

Cultural issues

Stigmatization

Forgetfulness or complacency

Attitudes toward ill health

Religious issues

# Secondary non-farmakological

## Allergen avoidance

Hus dust (lowest exposition!!)

Take away from bedroom: carpets

Wash at least at 60 C bedlining 2 times a week

Low humidity

No smoking

No pets indoor



Keep the pet out of the main living areas and bedrooms<sup>78</sup>.  
Install HEPA air cleaners in the main living areas and bedrooms.  
Have the pet washed twice a week<sup>79</sup>, although some studies report this to be ineffective<sup>80</sup>.  
Thoroughly clean upholstered furniture/replace with leather furniture.  
Replace carpets with linoleum or wood flooring.  
Use a vacuum cleaner with integral HEPA filter and double-thickness bags<sup>81</sup>.

Encase mattress, pillow, and quilt in impermeable covers<sup>63,84</sup>.

Wash all bedding in the hot cycle (55-60°C) weekly<sup>73</sup>.

Replace carpets with linoleum or wood flooring.

Treat carpets with acaricides and/or tannic acid<sup>74</sup>.

Minimize upholstered furniture/replace with leather furniture.

Keep dust-accumulating objects in closed cupboards.

Use a vacuum cleaner with integral HEPA filter and double-thickness bags<sup>75</sup>.

Replace curtains with blinds or easily washable (hot cycle) curtains.

Hot wash/freeze soft toys<sup>76,77</sup>.

# Farmakologisk Asthma treatment

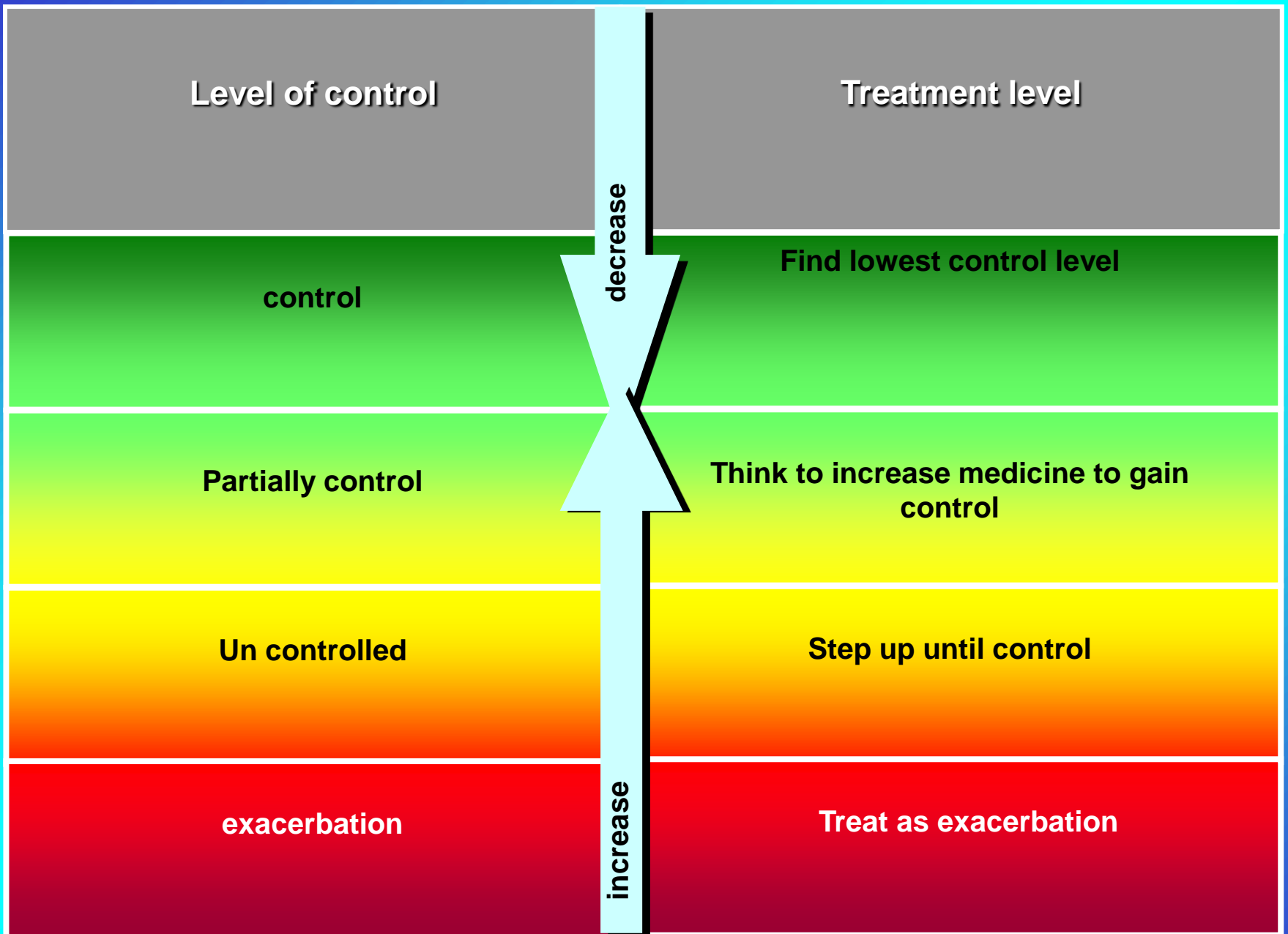
-start high then decrease

- Allergy avoidance
- Inhalationssteroids
- Bronchodilatators
- Leucotrienantagonists
- Anti IgE treatment
- Anti-TNF alfa treatment
- vaccination



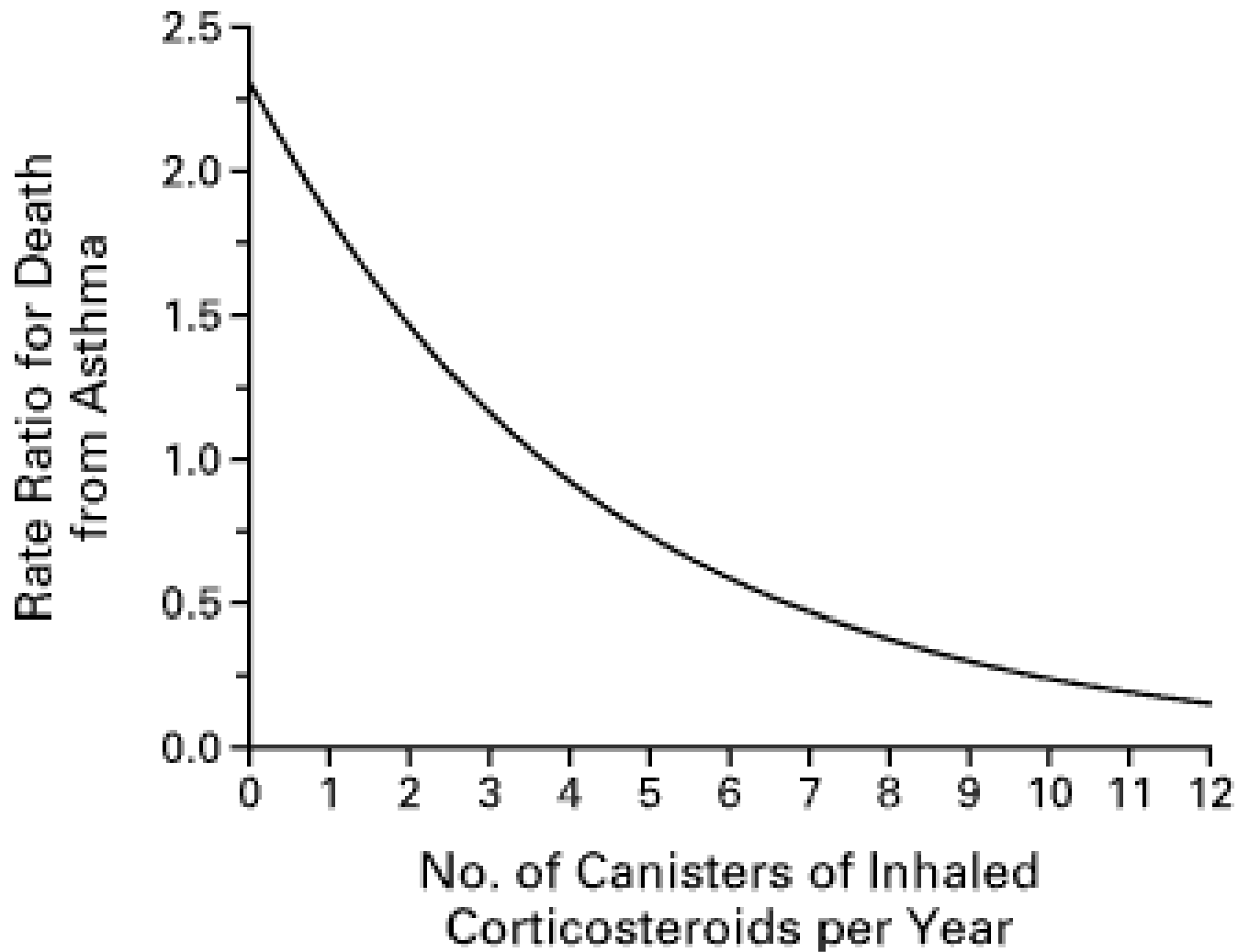
”All asthmatics can be symptomfree if treated well ”





TREATMENT STEPS				
STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
asthma education				
environmental control				
as needed rapid-acting $\beta_2$ -agonist	as needed rapid-acting $\beta_2$ -agonist			
CONTROLLER OPTIONS	SELECT ONE	SELECT ONE	ADD ONE OR MORE	ADD ONE OR BOTH
	low-dose ICS*	low-dose ICS <i>plus</i> long-acting $\beta_2$ -agonist	medium- <i>or</i> high-dose ICS <i>plus</i> long-acting $\beta_2$ -agonist	oral glucocorticosteroid (lowest dose)
	leukotriene modifier**	medium- <i>or</i> high-dose ICS	leukotriene modifier	anti-IgE treatment
		low-dose ICS <i>plus</i> leukotriene modifier	sustained-release theophylline	
		low-dose ICS <i>plus</i> sustained-release theophylline		
*inhaled glucocorticosteroids ** receptor antagonist or synthesis inhibitors				

## Asthma dead and steroid treatment !!





**"You're going to have to cut down on the pork if you want to keep huffing and puffing."**

# End