

Asthma – an overview



Definition of asthma

“A **Chronic Inflammatory Disorder** of the airways ... in susceptible individuals, inflammatory symptoms are usually associated with widespread but variable airflow obstruction and an increase in airway response to a variety of stimuli.

Obstruction is often **Reversible**, either spontaneously or with treatment.”

Adam and Eve
and
Christopher Robin

Eve is a 5-year old girl with:

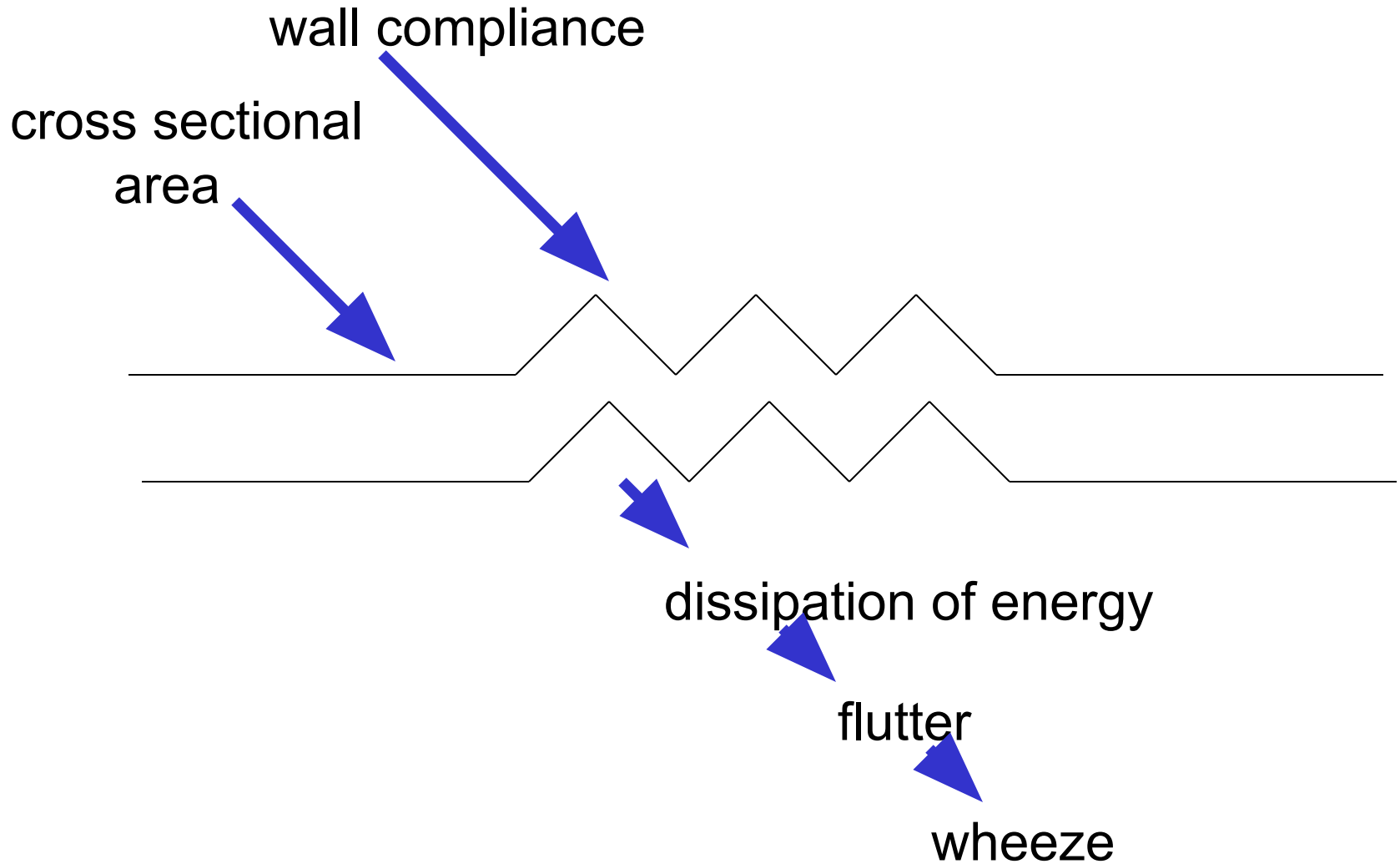
- Personal and family history of allergy
- Wheeze on laughing and exercise
- Severe attacks with colds
- Bronchodilator-responsive and dependent on inhaled corticosteroid
- Persistent symptoms and PEF variability on a depressed baseline
- Evidence of allergy
- Eosinophilic airway inflammation
- Evidence of allergy
- Eosinophil airway inflammation

Adam is a 14-month old boy with:

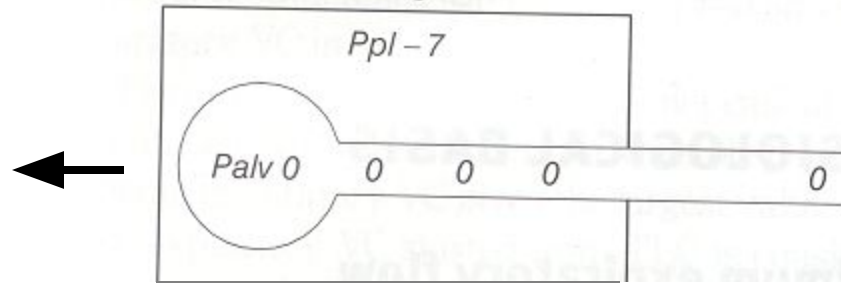
- A single, smoking non-allergic mother
- Multiple admissions to hospital with viral, episodic wheeze
- Poor response to nebulised β agonist
- No symptoms between episodes
- No evidence of allergy
- No inflammation between episodes

**What is
“Wheeze”?**

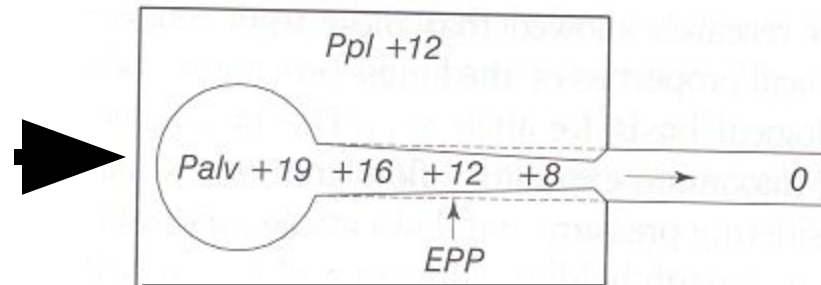
Flow limitation and wheeze



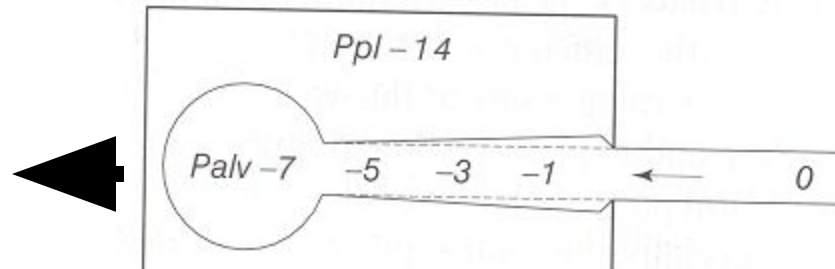
(a) Breath-holding



(b) Expiration

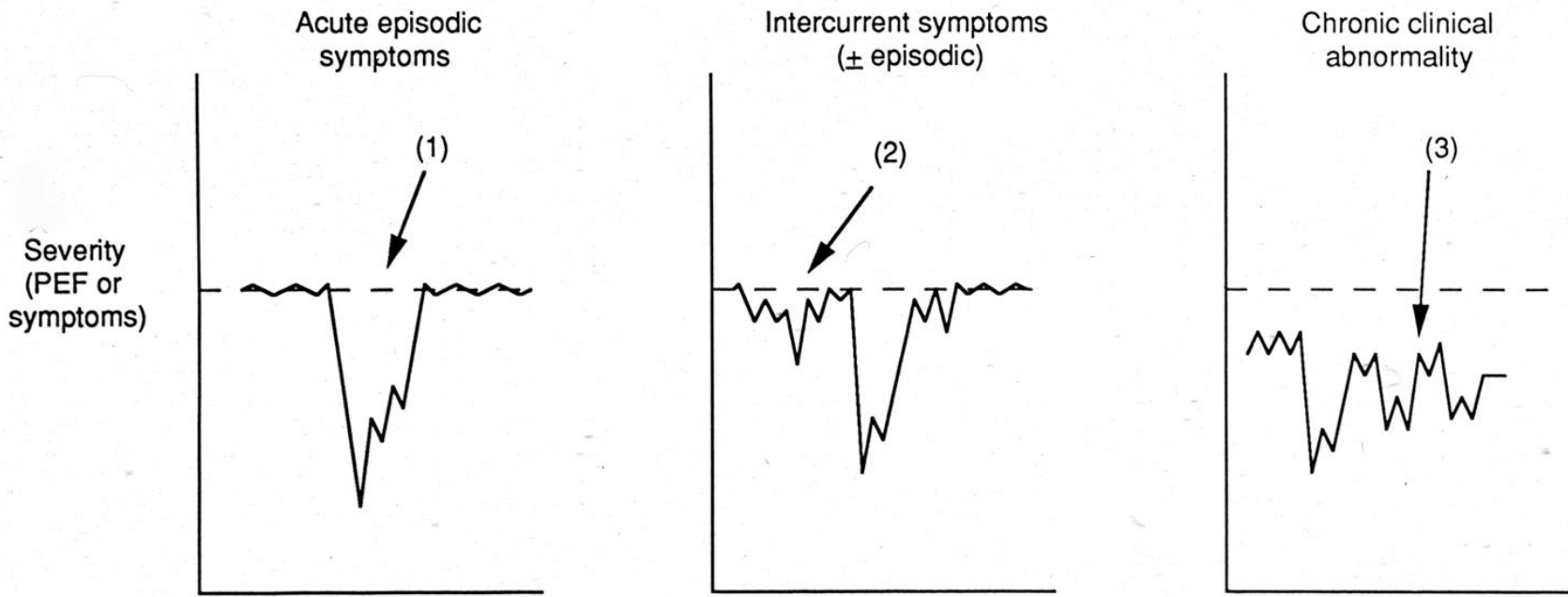


(c) Inspiration



**How can airway narrowing
be measured?**





Acute episodic symptoms

Intercurrent symptoms (± episodic)

Chronic clinical abnormality

Severity (PEF or symptoms)

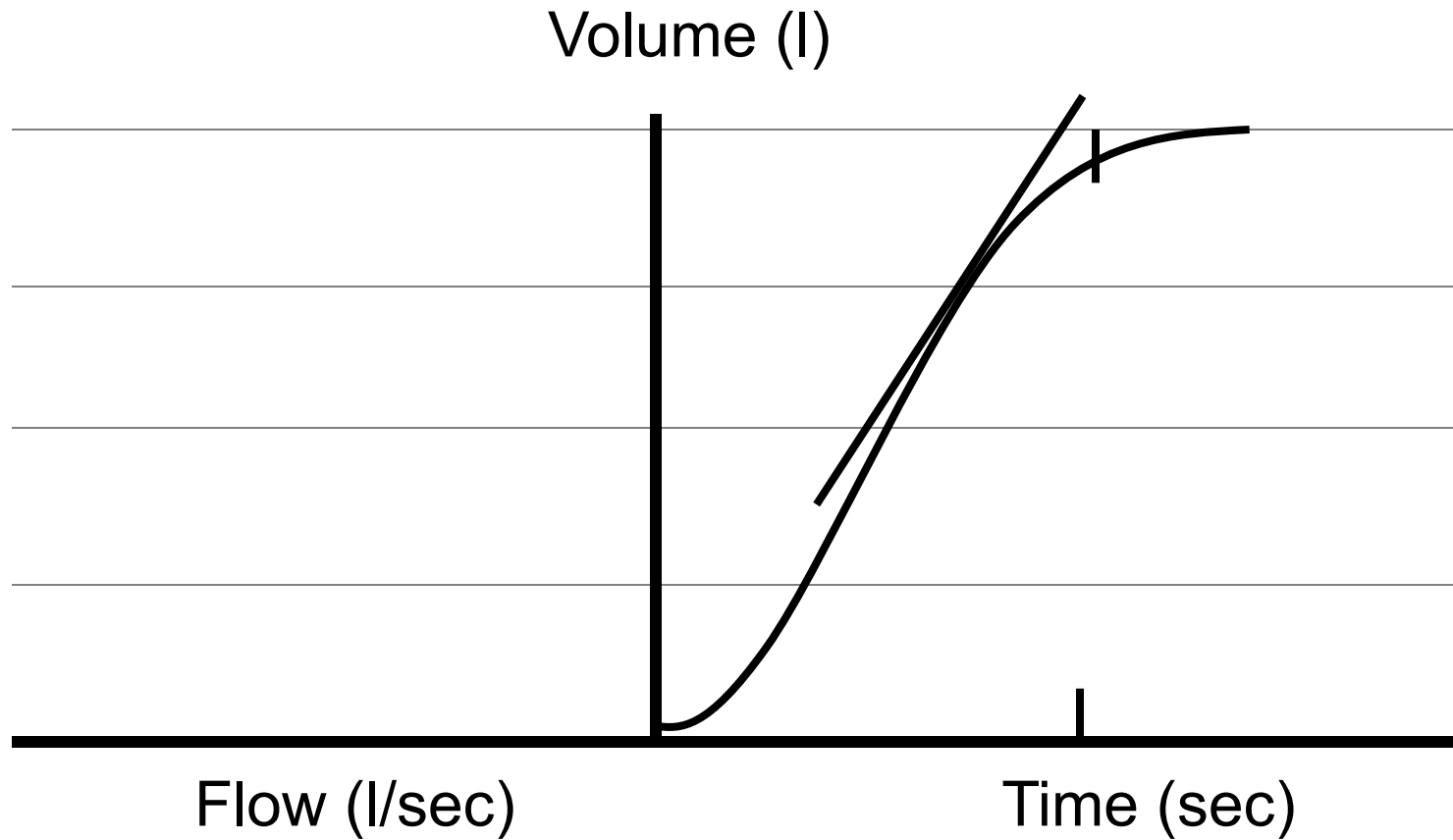
(1)

(2)

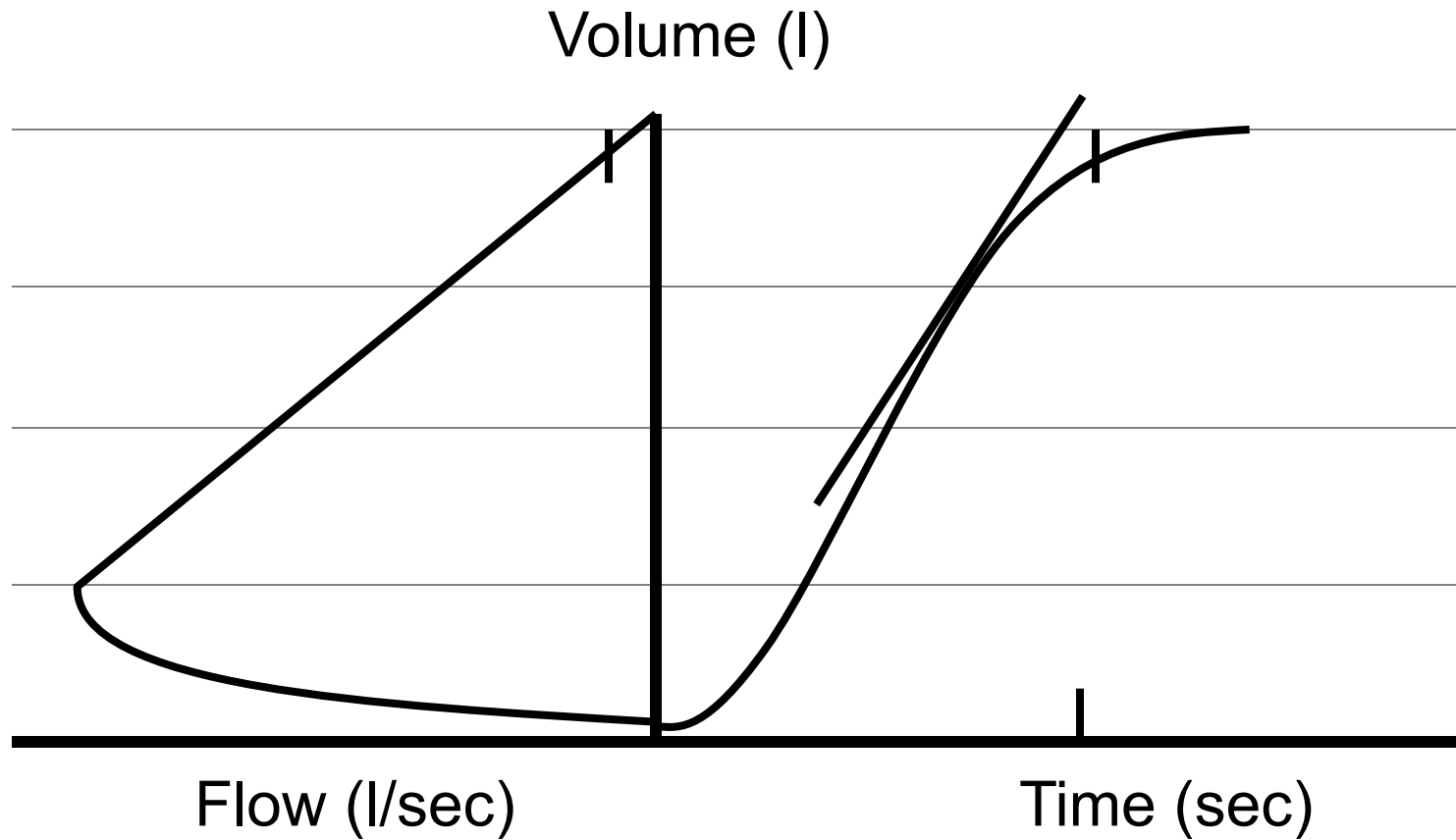
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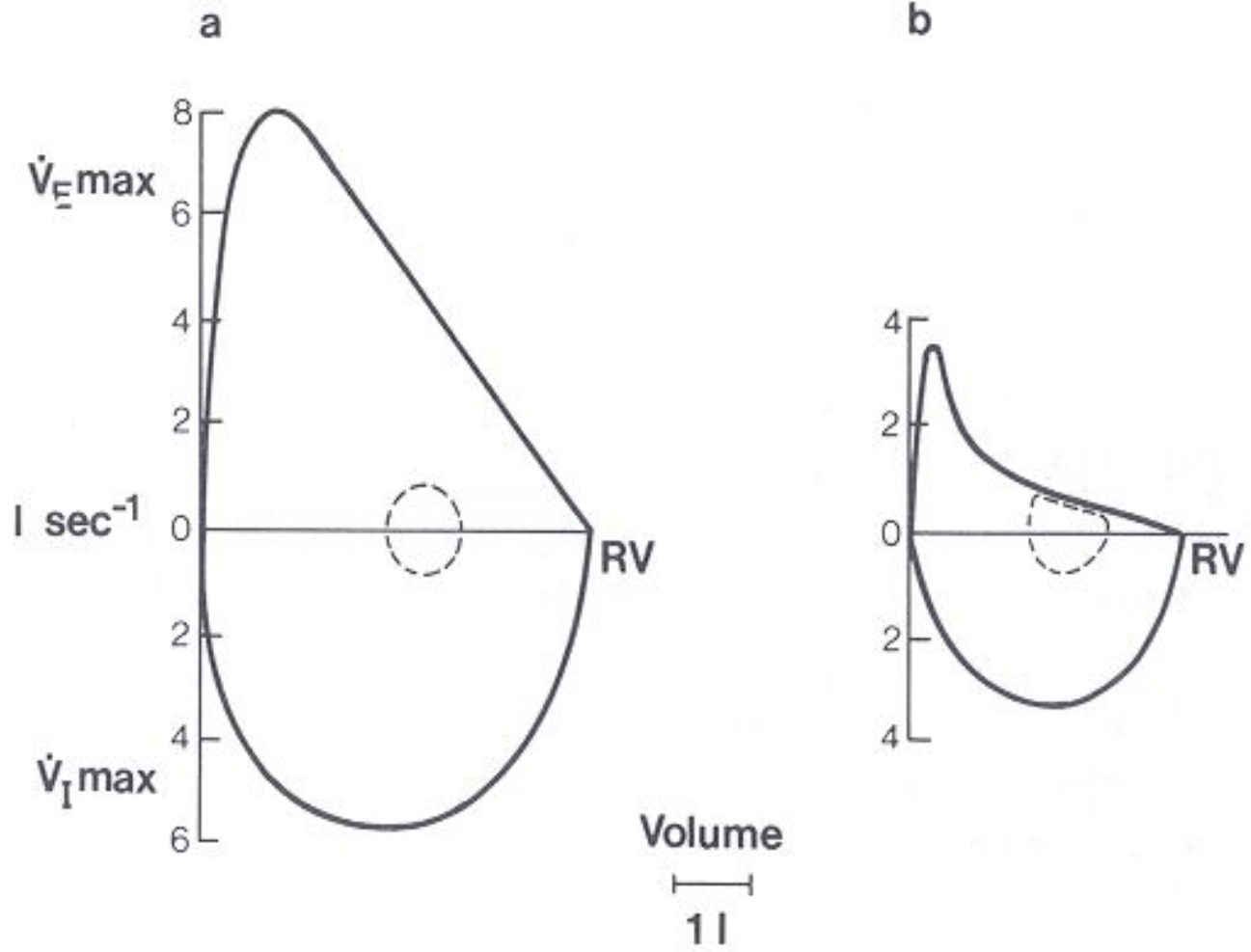
Volume, time and flow



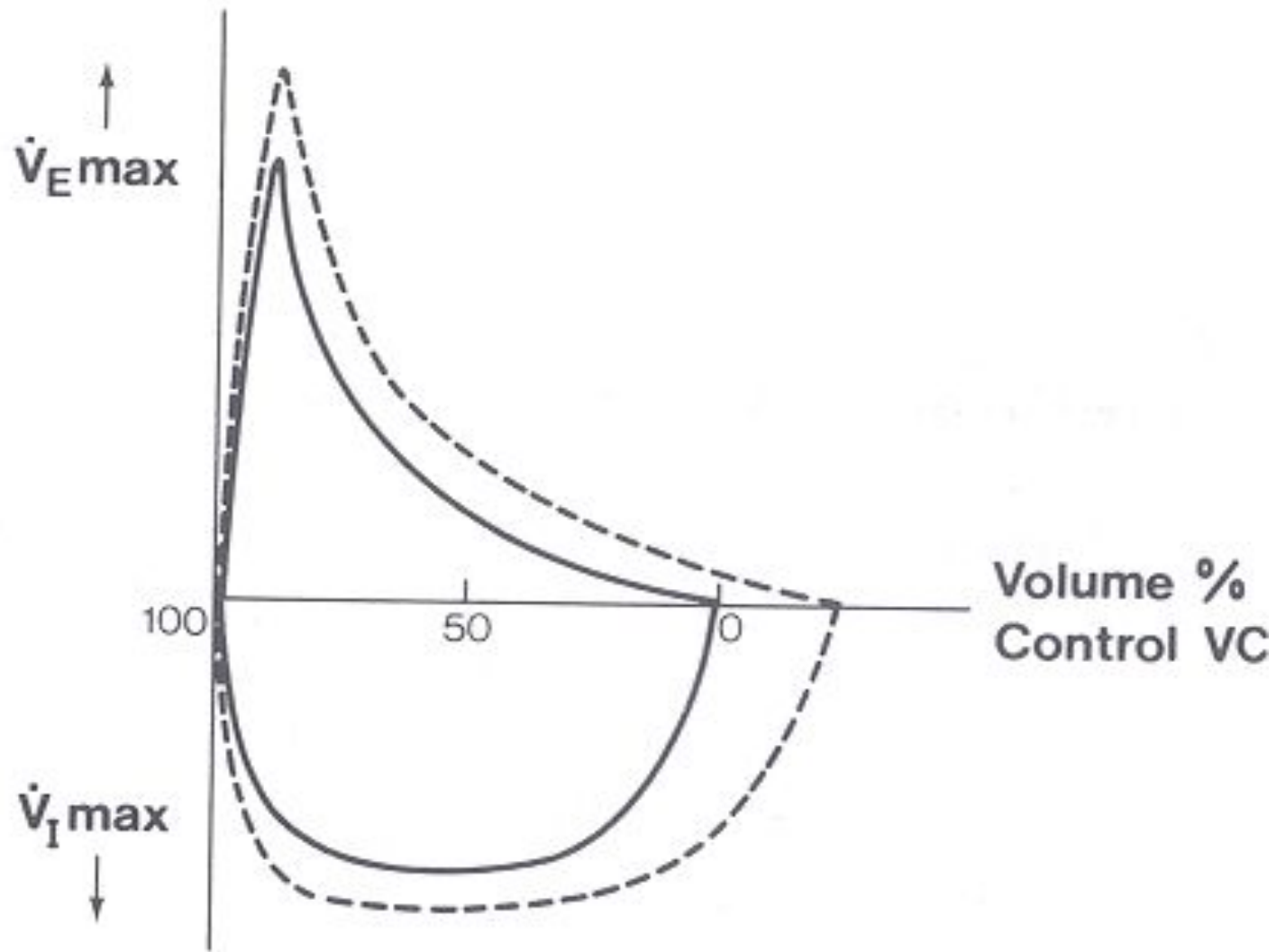
Volume, time and flow



Flow-volume curves

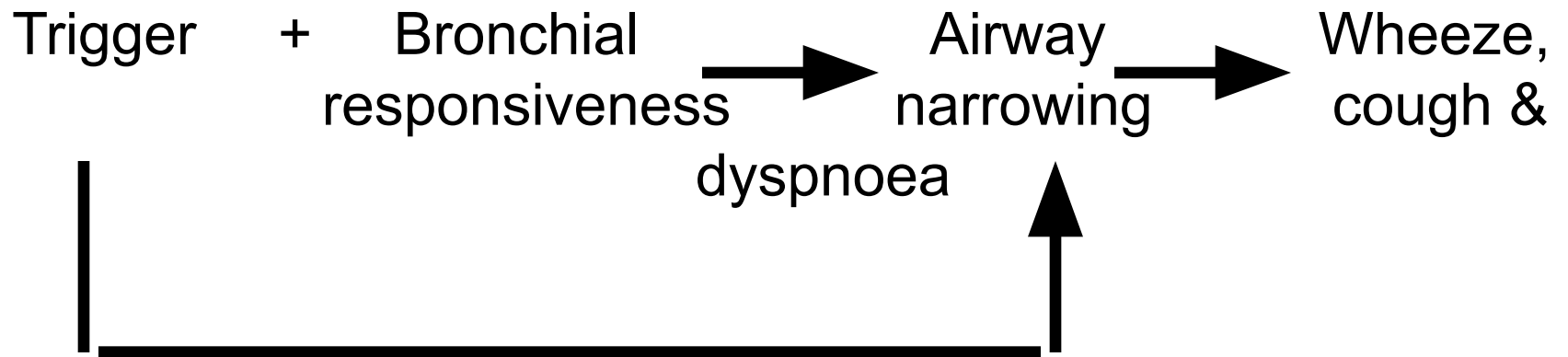


Bronchodilator response

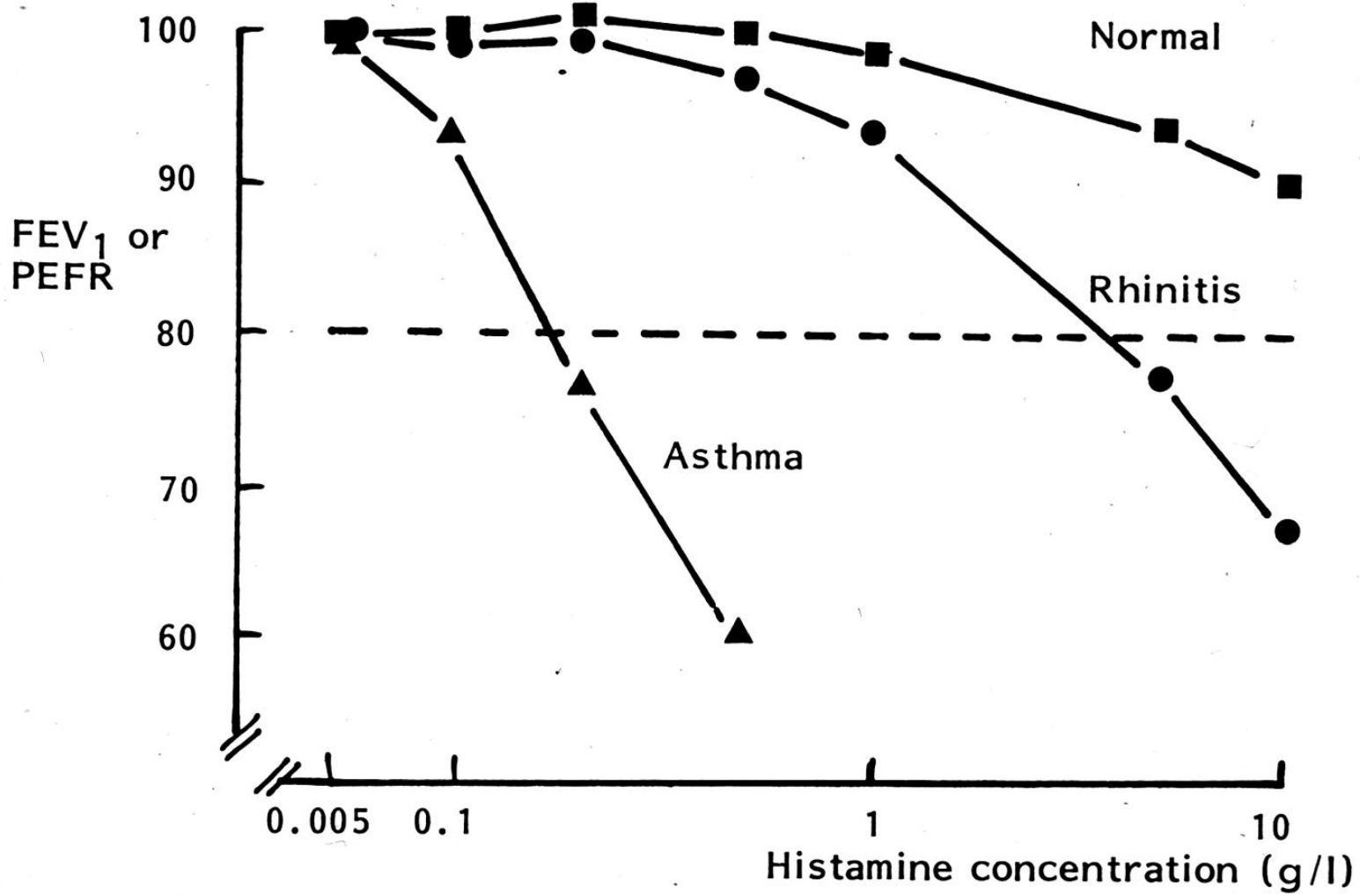


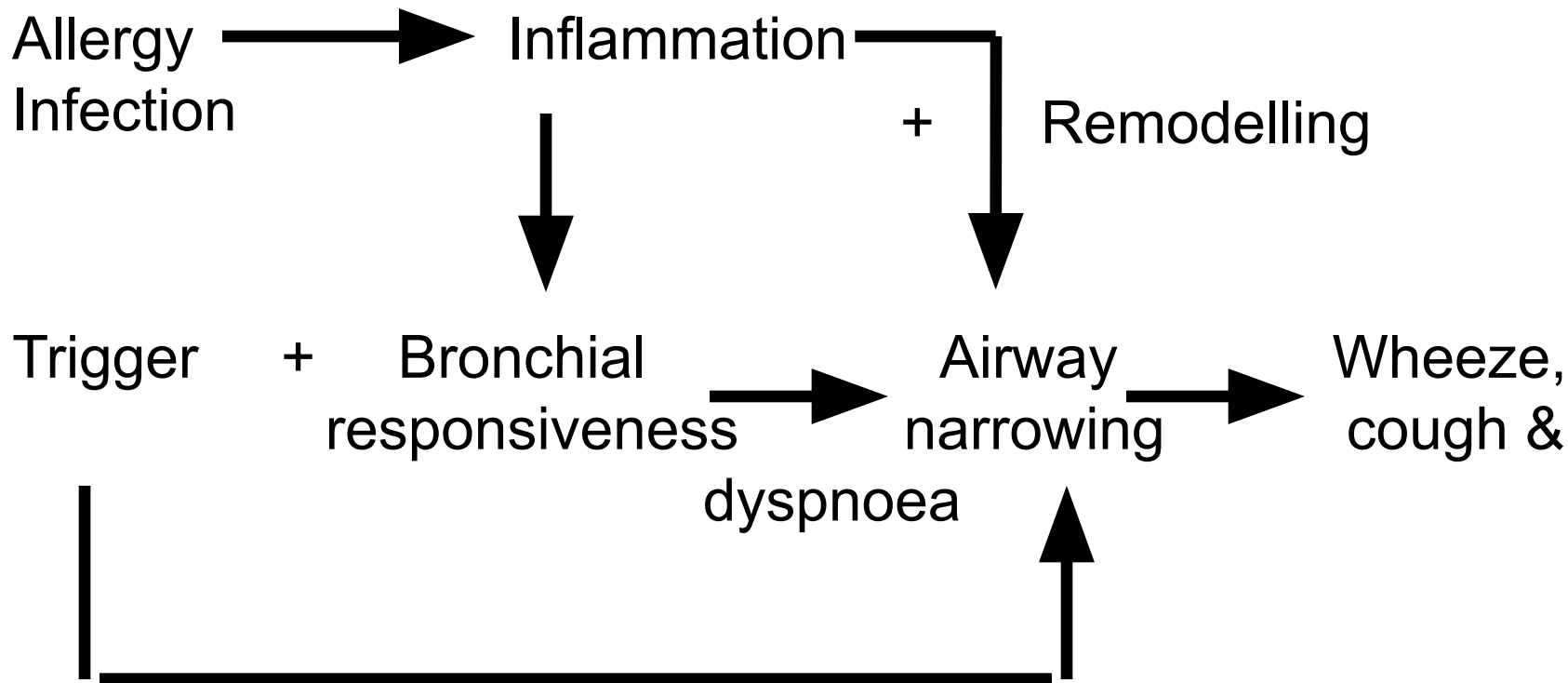
**What's bronchial
responsiveness?**

(or hyper responsiveness: BHR)

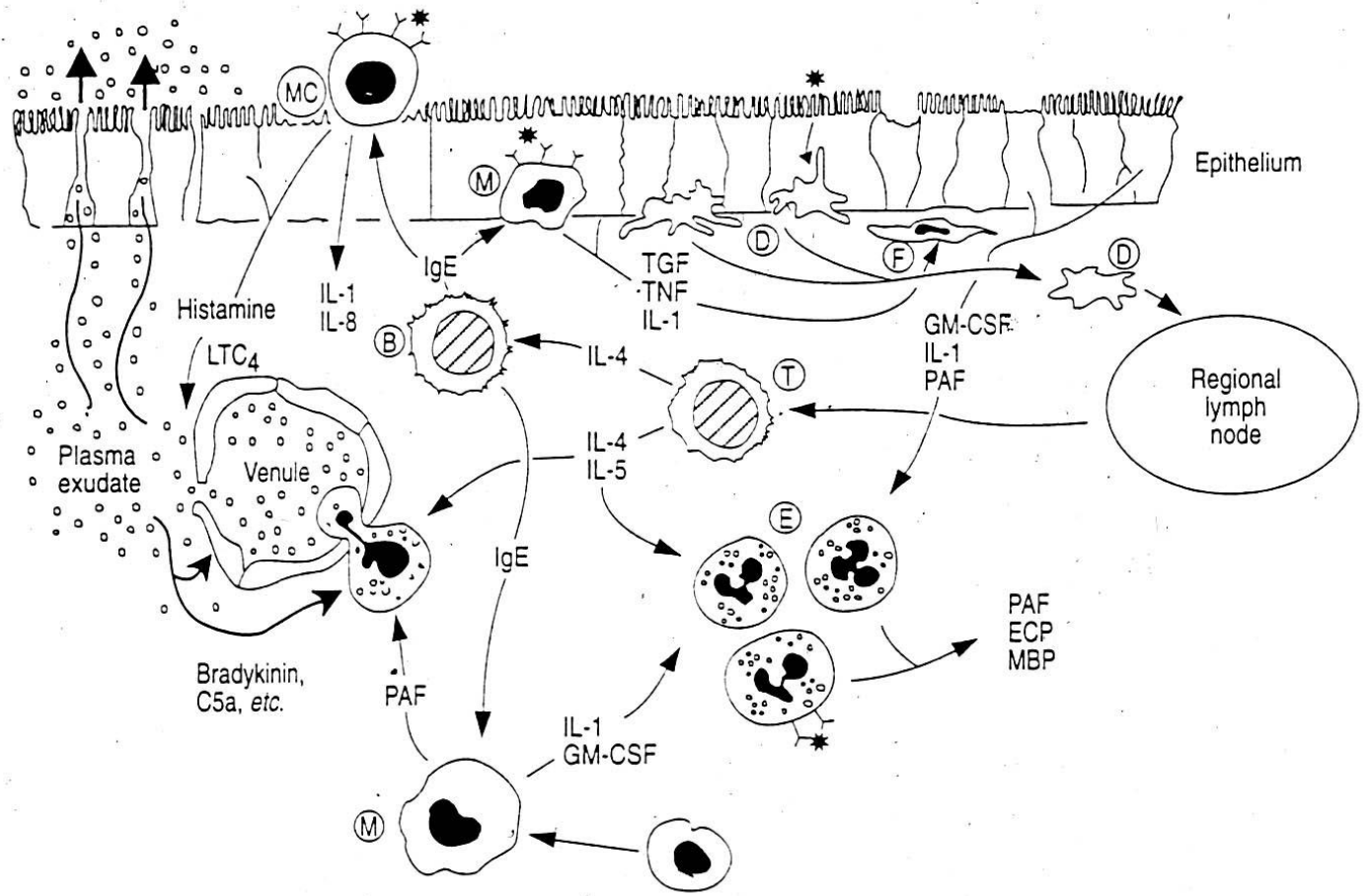




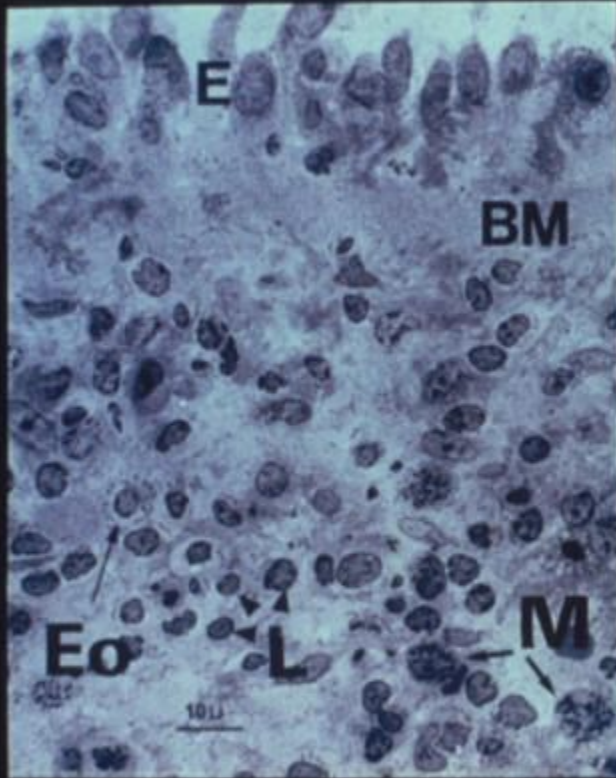




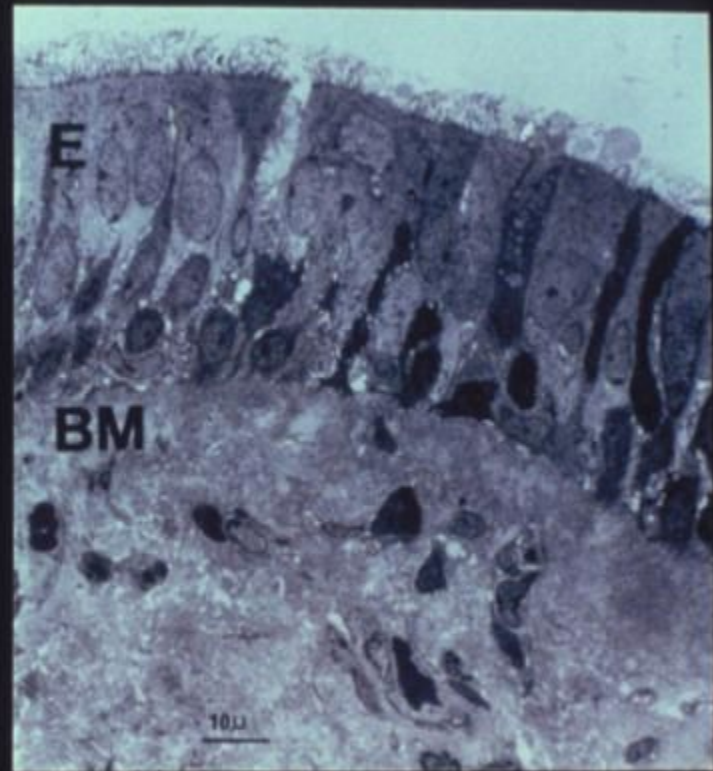
Airway inflammation



From Persson, *Eur Respir Rev* 1994



Asthmatic



Steroid – treated Asthmatic

Inflammatory Effects in Asthma

ACUTE

Airway Constriction

Microvascular leakage / oedema

Vasodilatation

Mucus hypersecretion

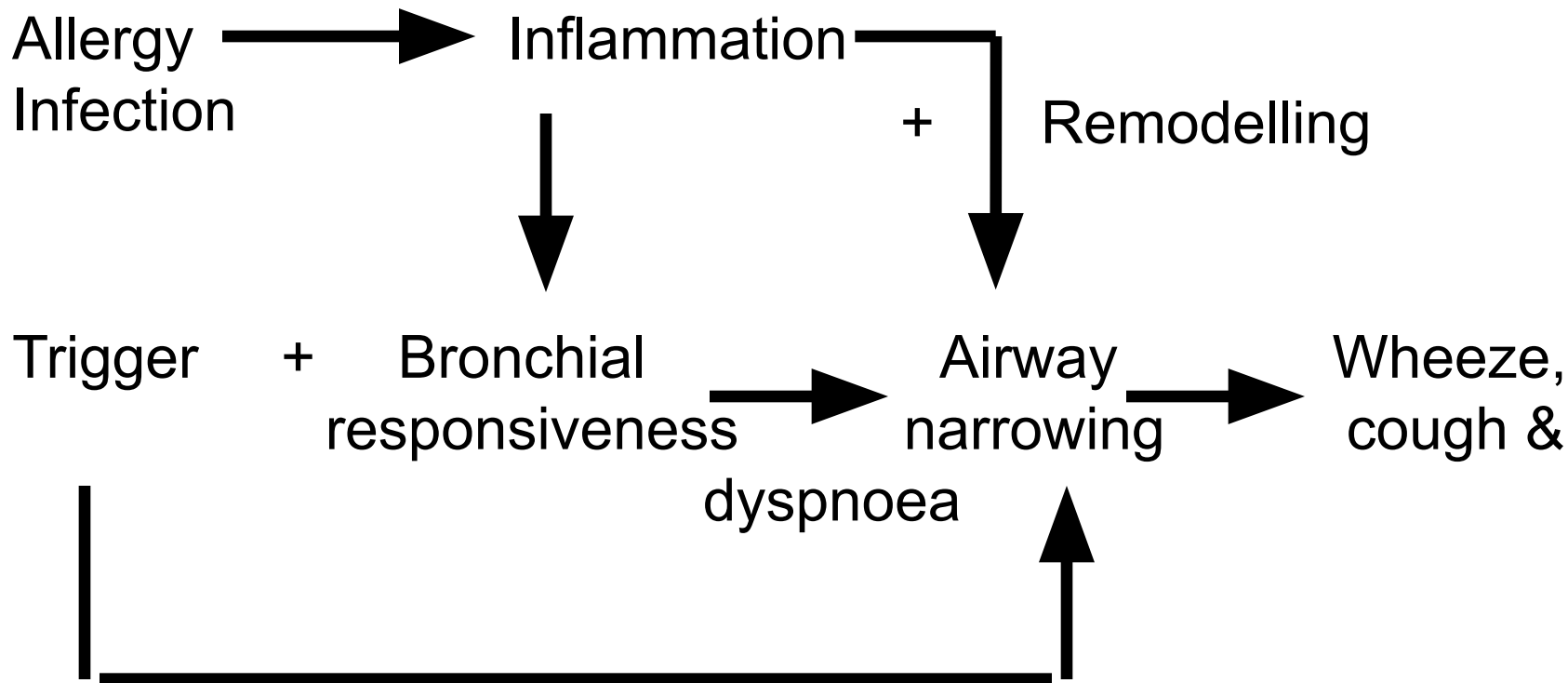
CHRONIC (REMODELLING)

Subepithelial fibrosis

Smooth muscle hyperplasia / hypertrophy

Goblet cell hyperplasia

New vessel formation



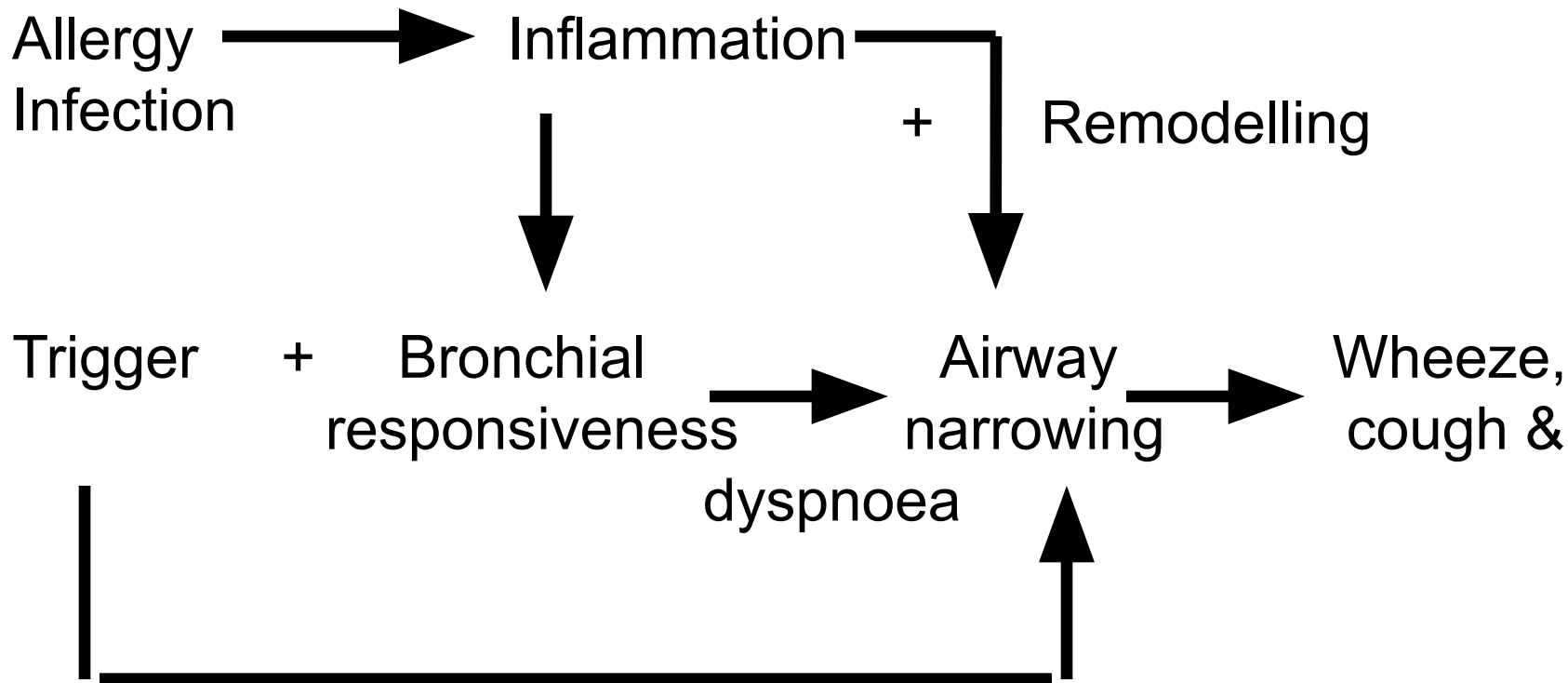






WEAL

FLARE



Triggers

- Allergen (pollen, cat...)
- Air pollution (smoke...)
- Infection (URTI)
- Exercise, etc.



Asthma history questionnaire

- age of onset of symptoms
- pattern of symptoms
- amount of disturbance to everyday life, schooling etc.
- definite association with precipitating factors
 - allergic, infective, emotional, exercise, environmental
- family background and other illnesses
- previous treatment
 - appropriateness and technique
 - response

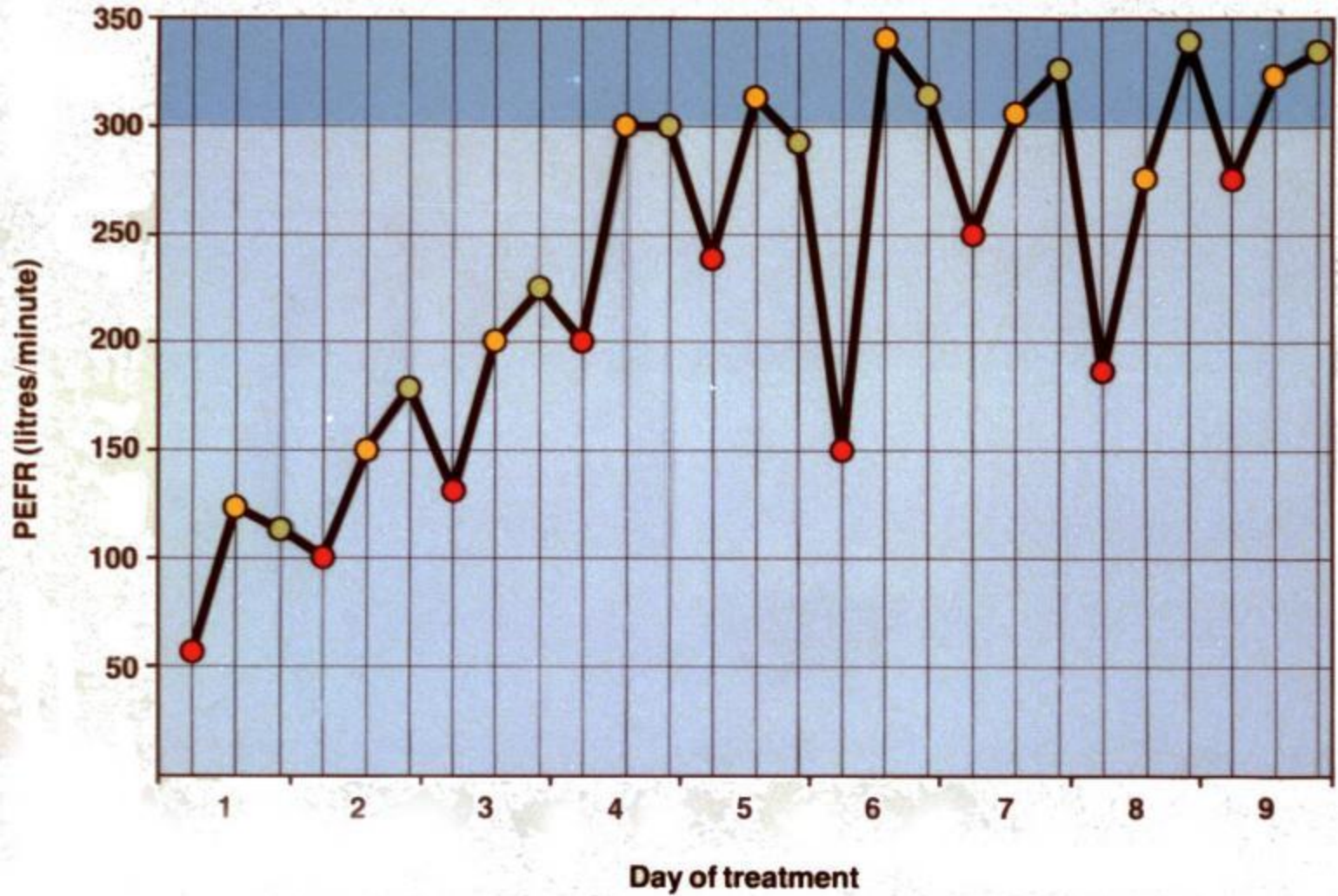
Date at start		12	13	14	15
			AUG		
NIGHT	COUGH	None ... 唔咳... .. 0			
		Coughing in sleep .. 睡唔咳... .. 1	1	1	
		Sleep disturbed by cough .. 咳到不能睡... .. 2			
NIGHT	WHEEZE	None ... 唔喘... .. 0			
		Slept but wheezy .. 睡唔... .. 1			
		Disturbed once by wheeze ... 一... .. 2	2		
		Very disturbed by wheeze .. 喘到不能入睡... .. 3			
DAY	WHEEZE/COUGH ON EXERCISE	None ... 唔咳... .. 0			
		Slight ... 咳... .. 1		1	
		Limits exercise .. 不能运动... .. 2	2		
DAY	COUGH	None ... 完全唔咳... .. 0			
		Occasional .. 有时咳... .. 1			
		Frequent .. 经常咳... .. 2	2	2	2
DAY	WHEEZE	None ... 完全唔喘... .. 0			
		Mild (relieved by medicine) .. 吃完药后唔喘... .. 1			
		Moderately bad .. 中等程度... .. 2			
		Severe .. 严重... .. 3			3
DAY	PEAK FLOW READINGS	Before morning medicines .. 早 M	M	M	M
		Before night time medicines .. 晚 N	N	N	N
DAY	DRUGS	Name of Drug	Dose Ordered		
		SALBITAMOL	4		
		Number of doses actually taken during the past 24 hours			
COMMENTS		(Only if there is anything unusual to report)			

Peak Flow Chart

● 6 a.m.

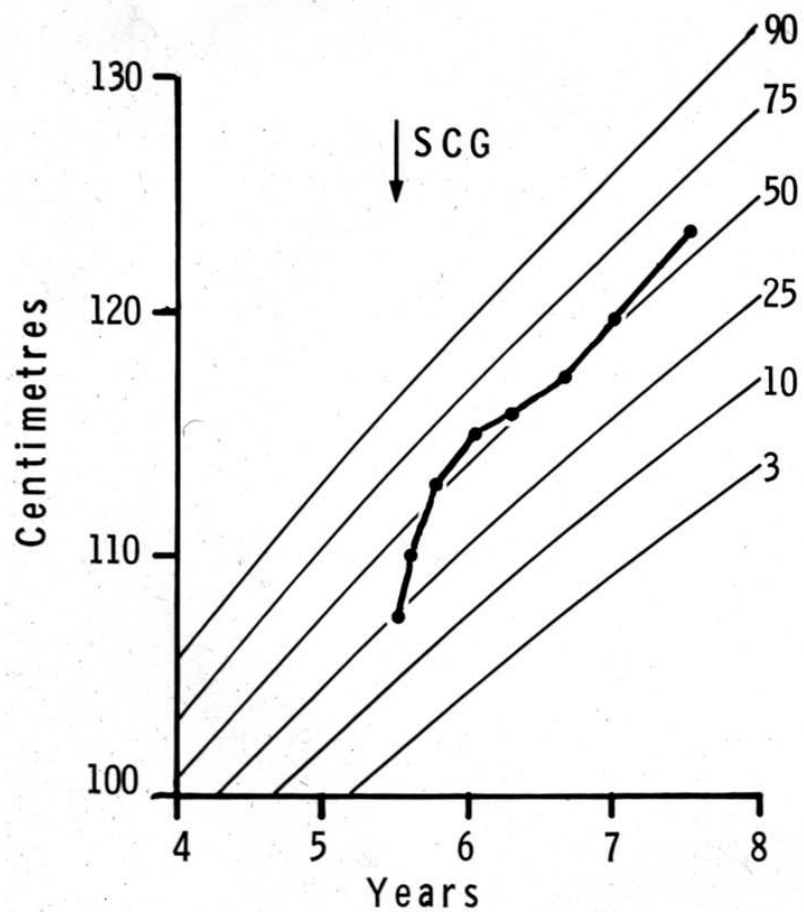
● 2 p.m.

● 10 p.m.

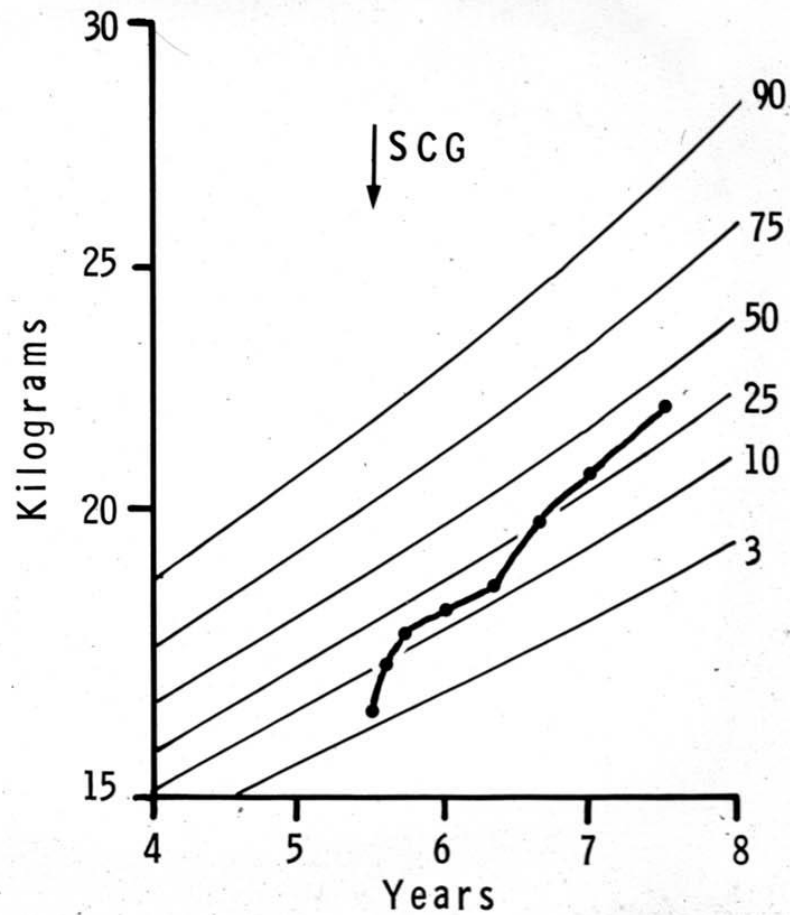




HEIGHT



WEIGHT



Chronic Wheeze: Non-Asthmatic

Cystic fibrosis (host-defence)

Bronchiectasis

Foreign body aspiration

Congenital airway disease

Recurrent aspiration syndrome

other!!



British Guideline on the Management of Asthma

A national clinical guideline

Thorax 2003; **58** (Suppl I): i1-i92

British Guidelines on Asthma Management

Key issues

Revision stresses:

- The importance of making the correct diagnosis
- The need to gain control of disease
- Certain therapeutic changes
- Attention being paid to inhaler characteristics
- The importance of self management





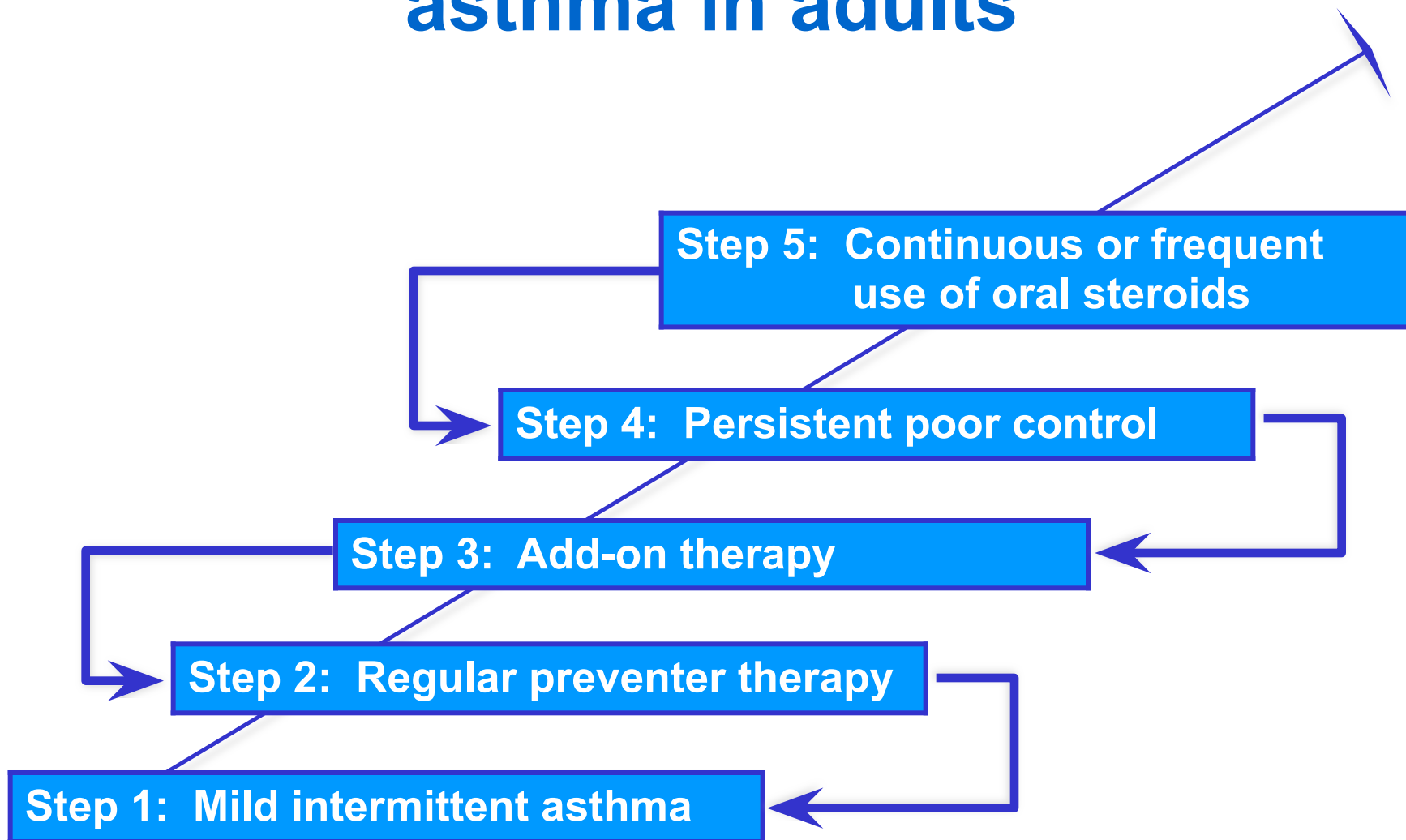
Asthma control

Asthma control means:

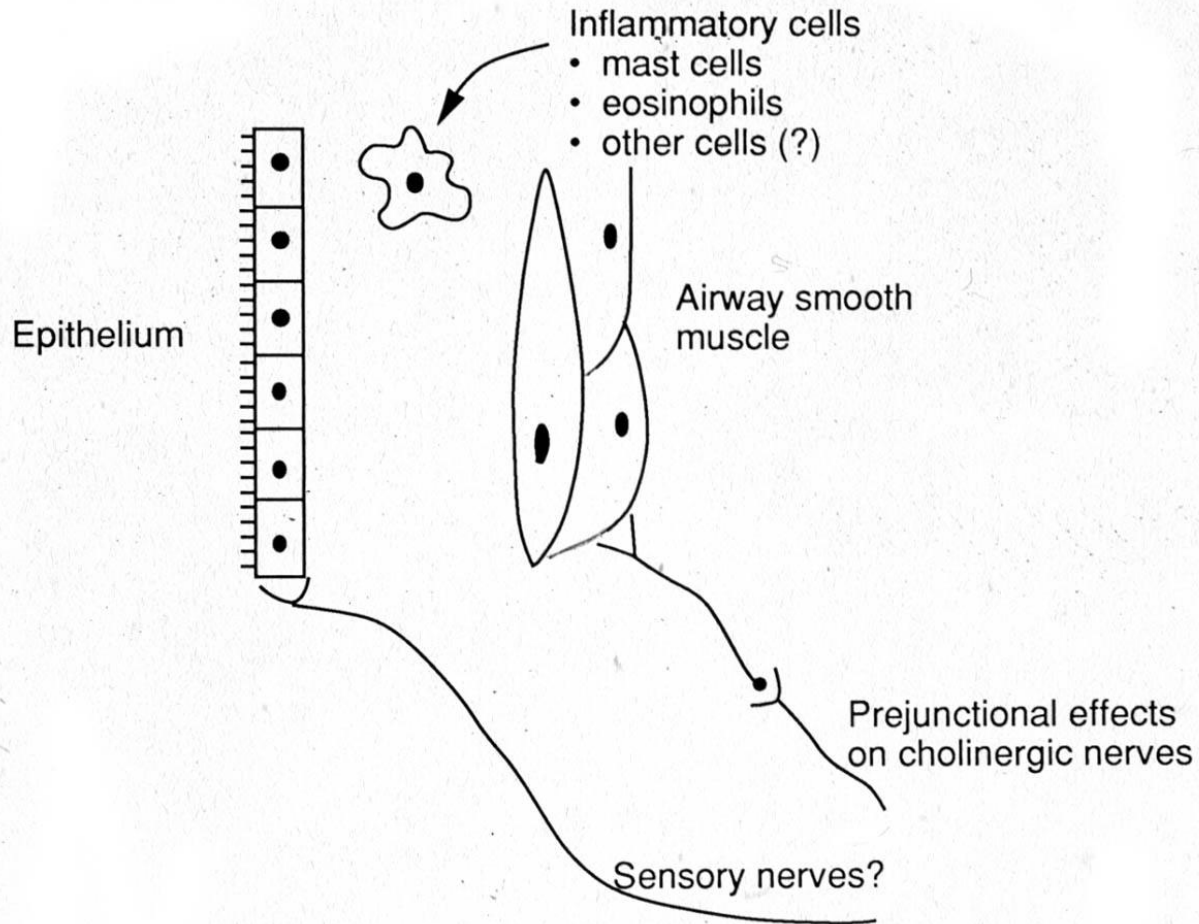
- minimal symptoms during day and night
- minimal need for reliever medication
- no exacerbations
- no limitation of physical activity
- normal lung function (FEV_1 and/or PEF >80% predicted or best)



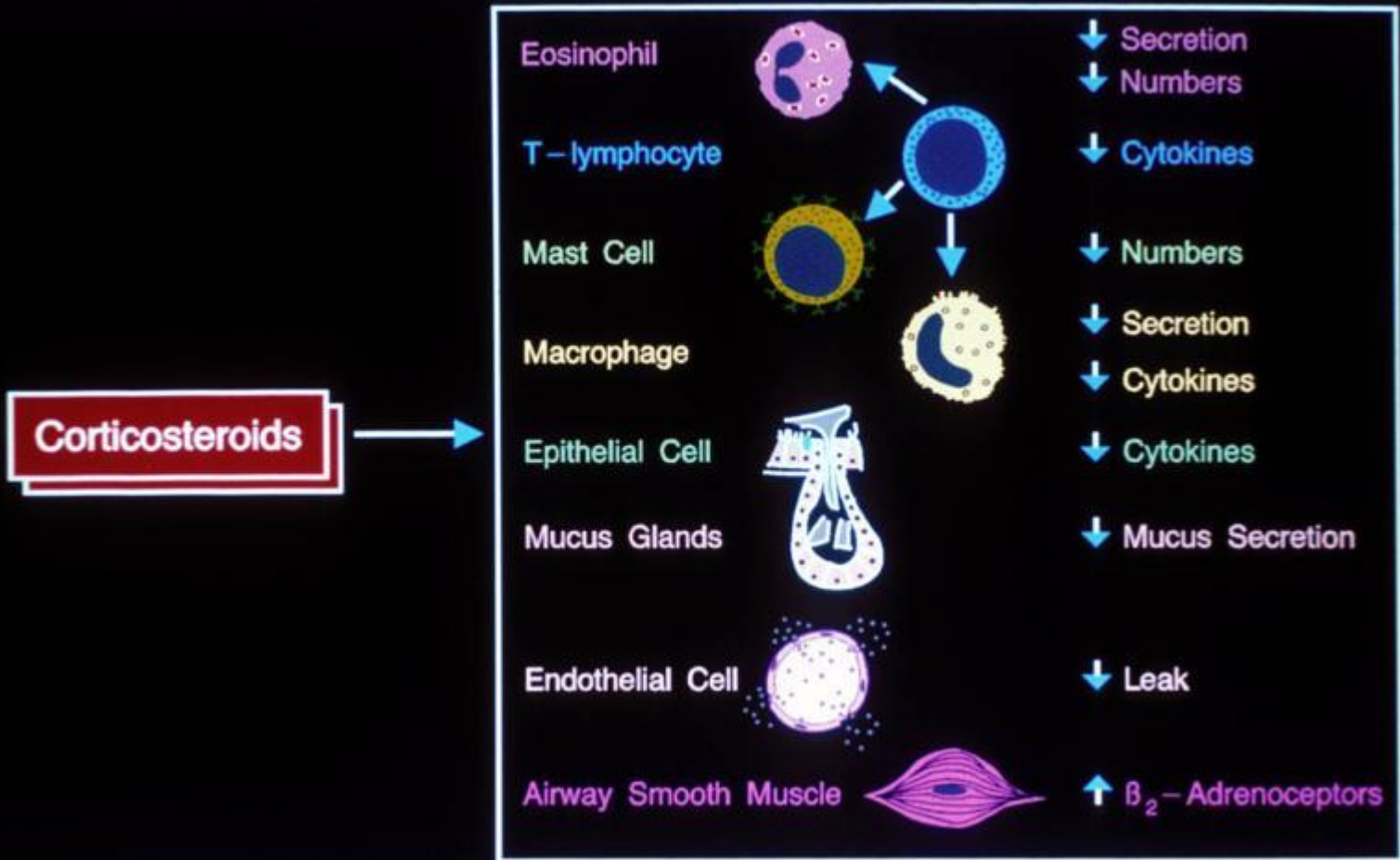
Stepwise management of asthma in adults



Potential sites of action of β_2 agonists in asthma



Actions of Steroids in Asthma







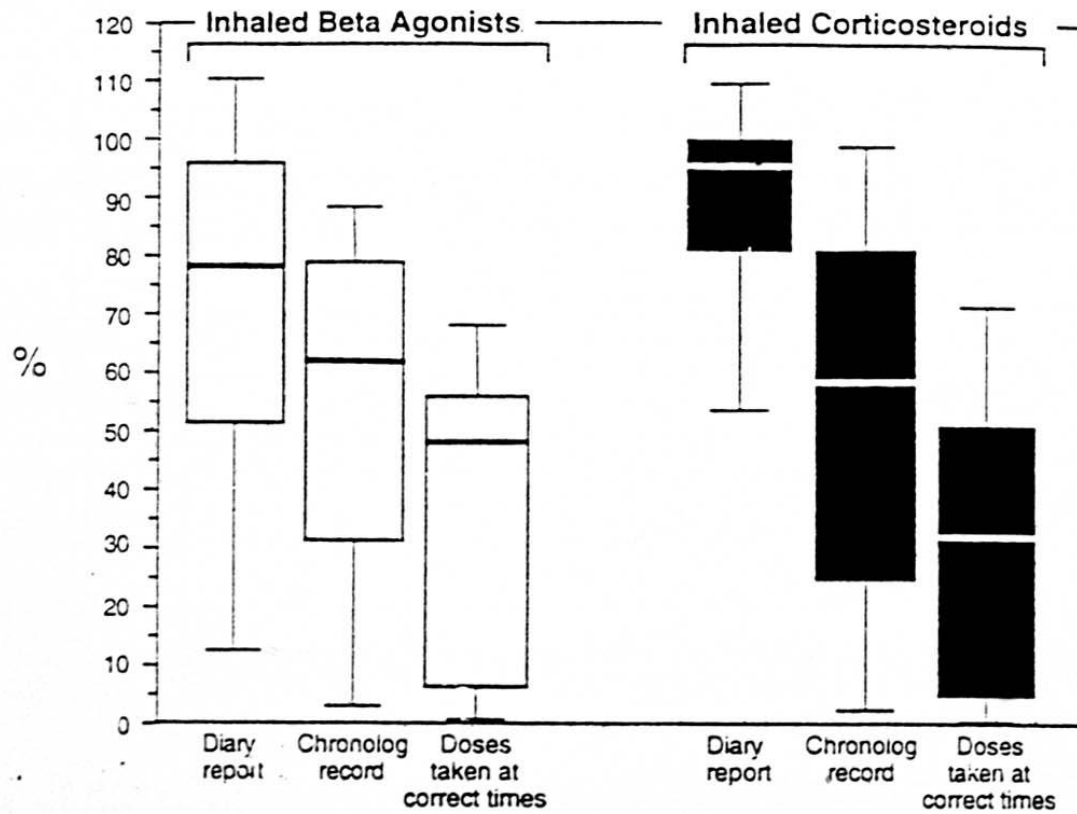
Summary

- outline of asthma
- fill in the details
 - British Guidelines
 - British Thoracic Society
- pharmacology of drugs

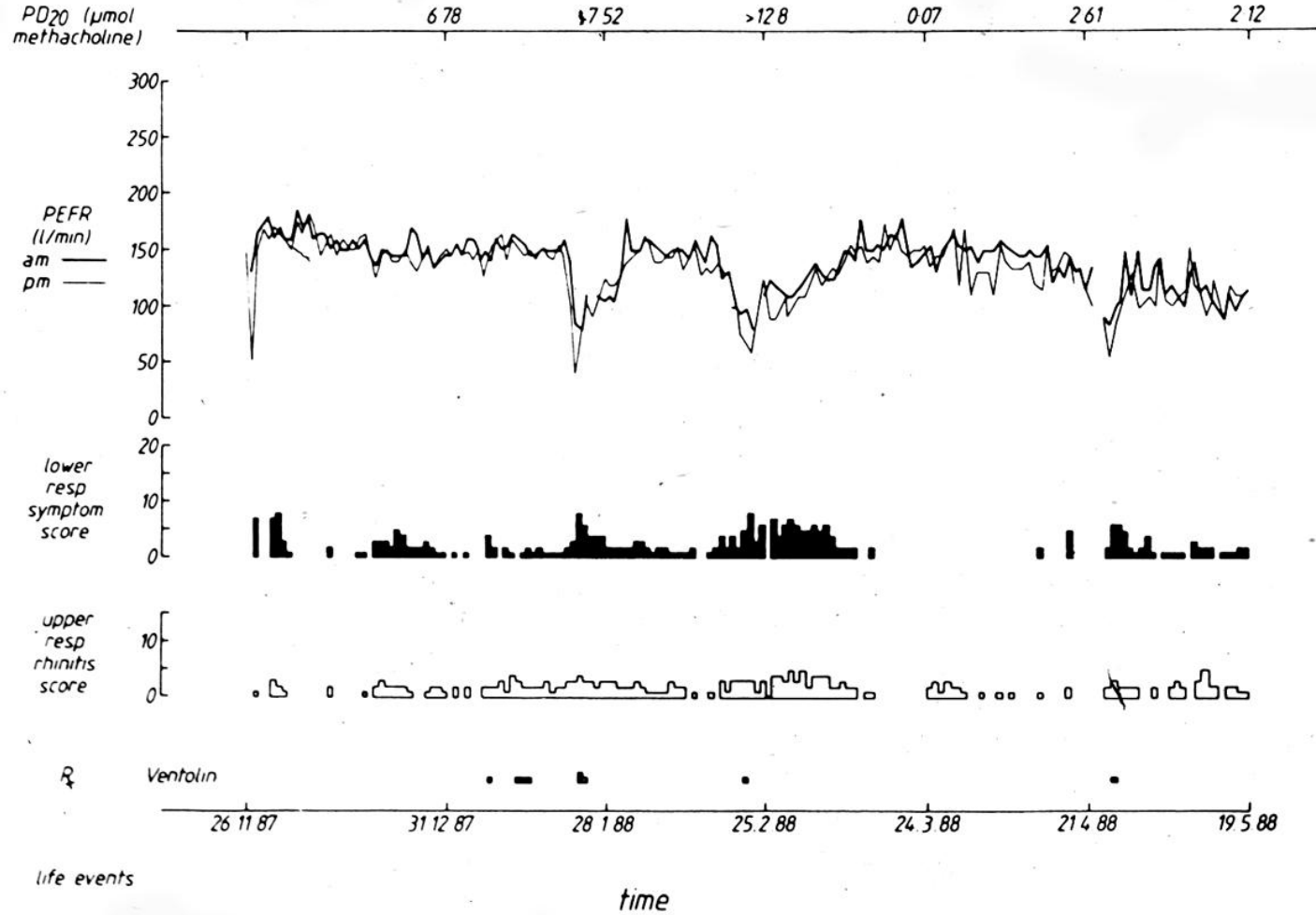
**Any
questions?**

Adherence with inhaled therapy in children

Milgrom et al, *J Allergy Clin Immunol* 1996;98:1051



Six months home monitoring in 7 year old atopic boy with wheeze



Clough et al, ARRD 1991