



ROYAL COLLEGE OF PHYSICIANS OF IRELAND

Public Meeting Series

Promoting a Healthy Nation



Controlling your Asthma - Facts to Take your Breath Away

Prof Stephen Lane, Consultant in Respiratory Medicine, AMNCH, Tallaght, Dublin

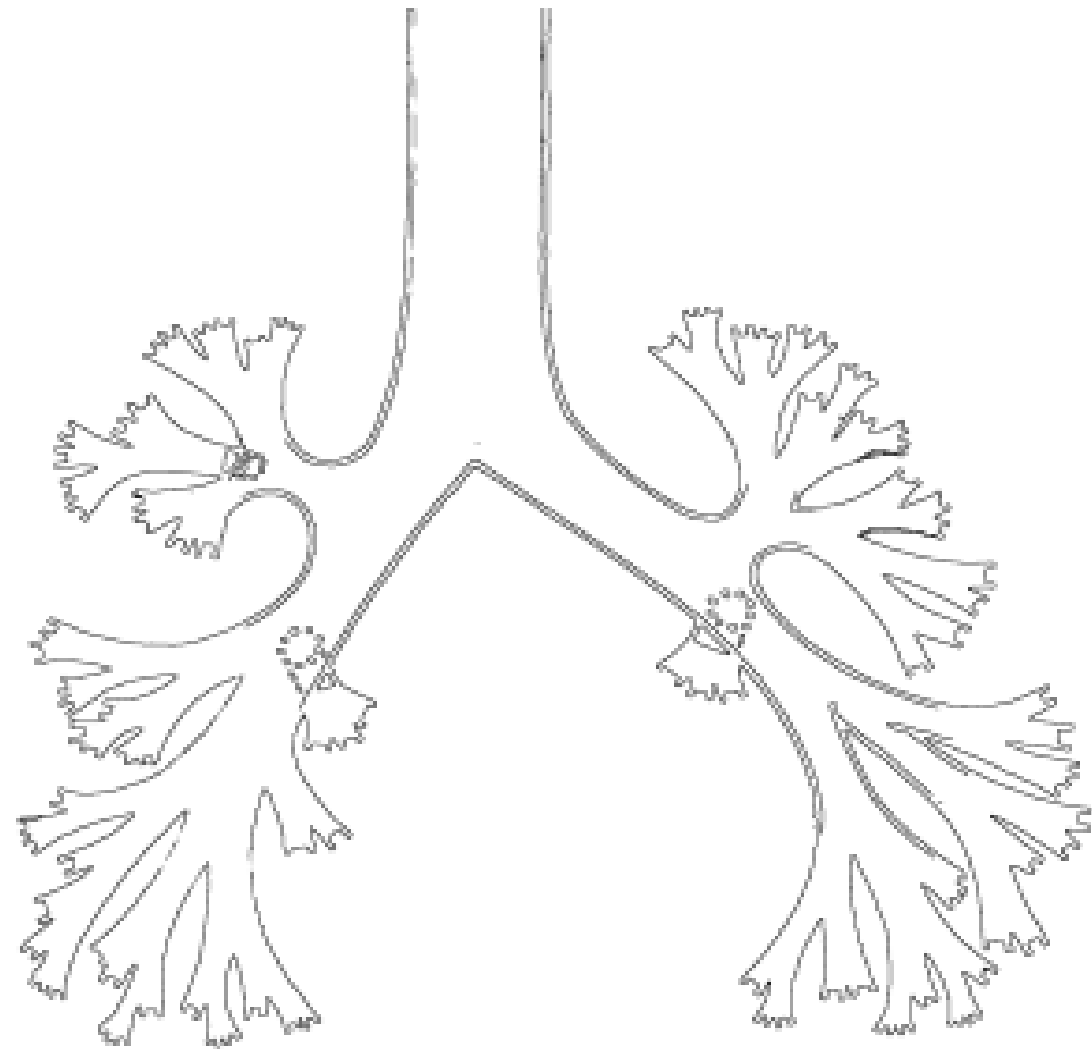


Asthma – a medical mystery

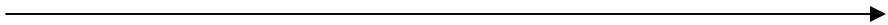


Professor Stephen Lane PhD, FRCPI, FRCP, FCCP
Nov 11th 2008 RCPI Public Meeting Series

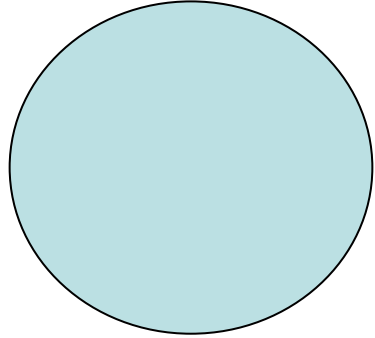
What we know about asthma



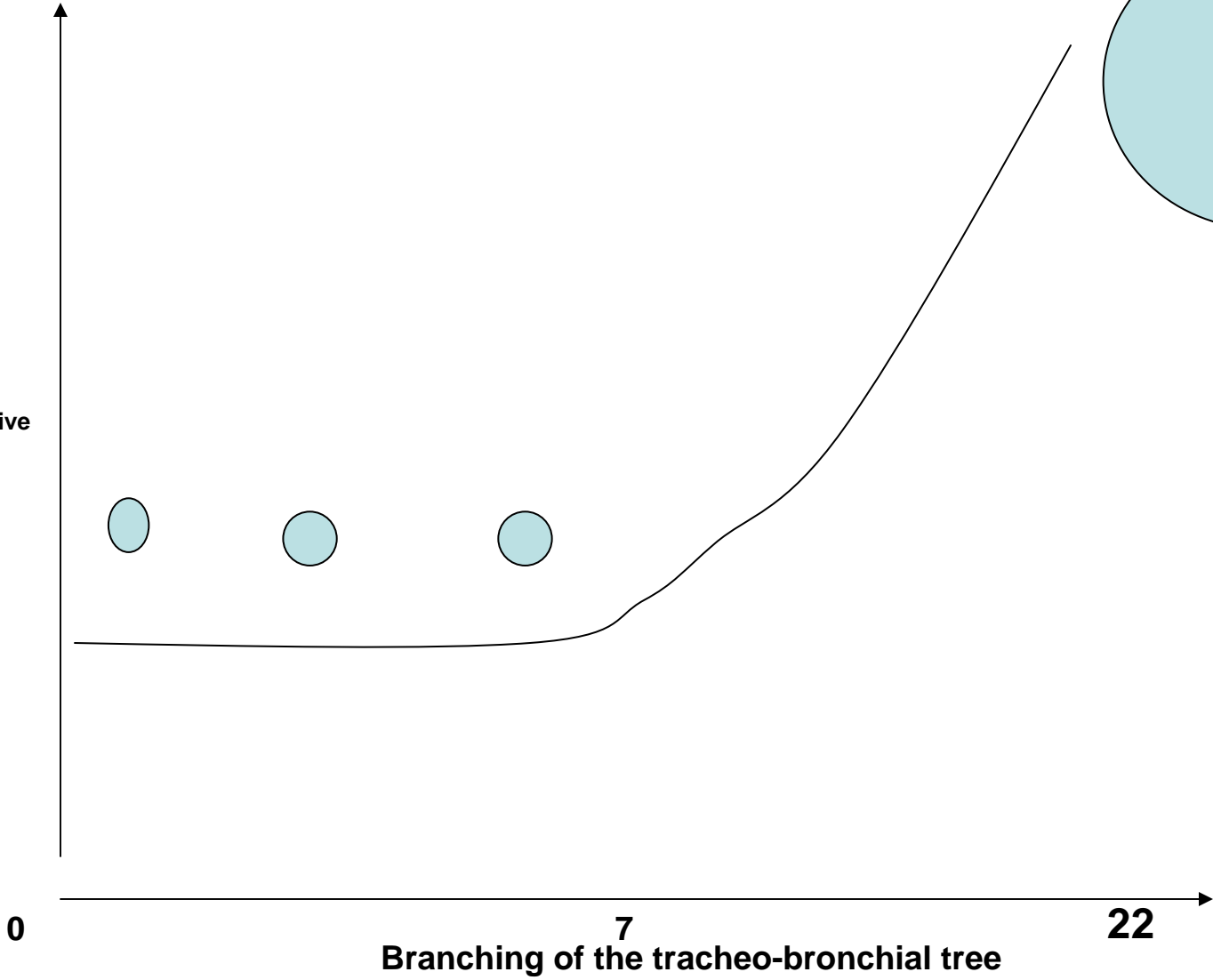
Trachea

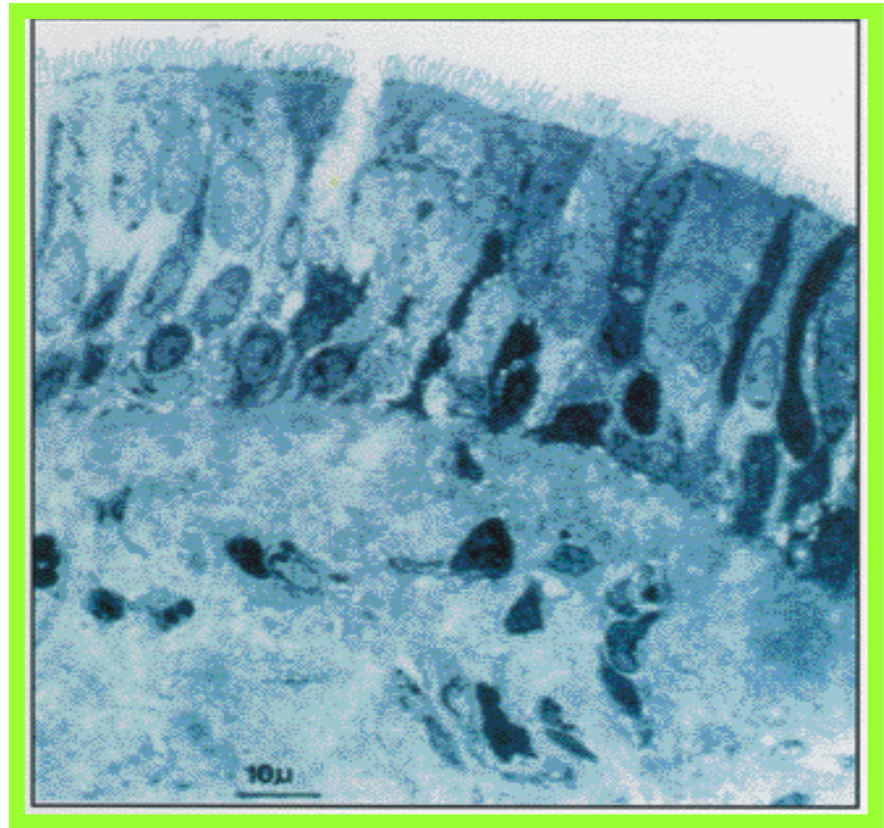
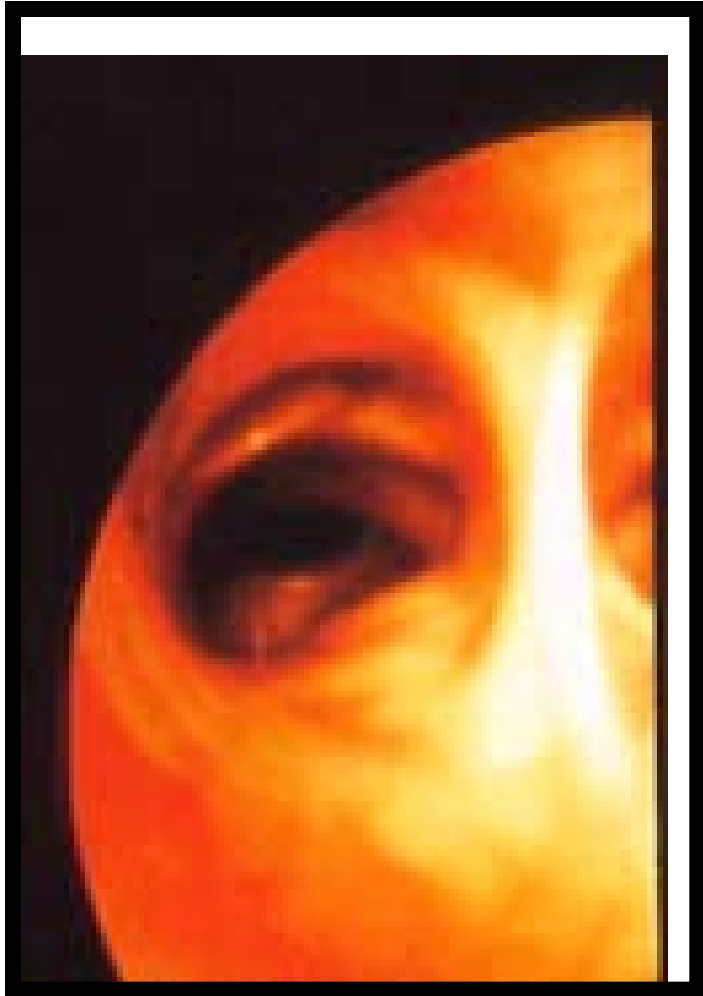


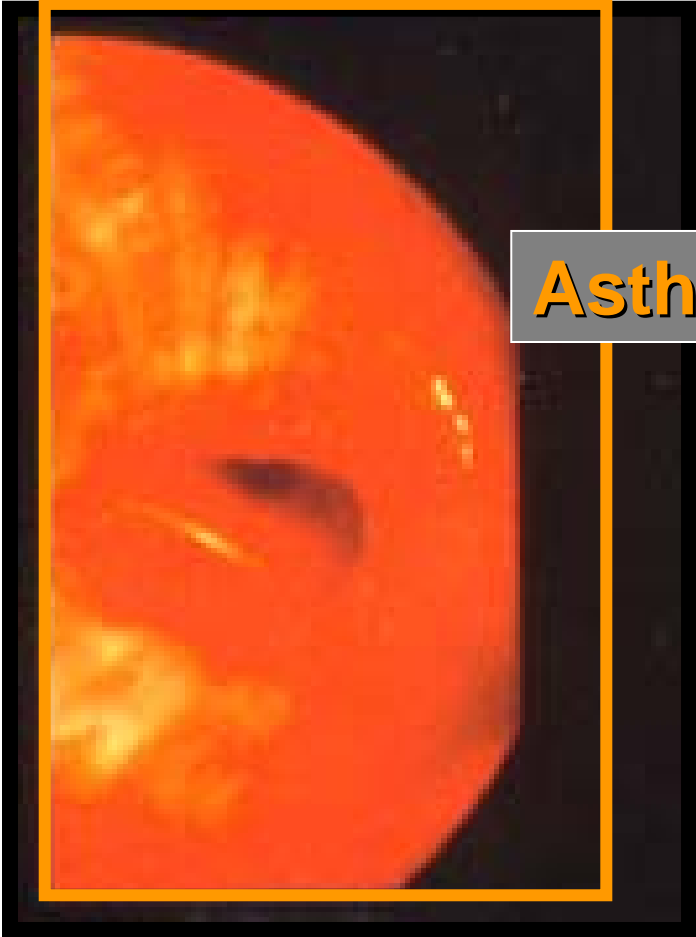
Alveolus



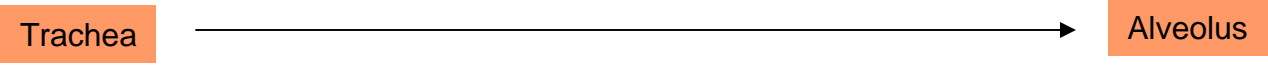
CSA
cumulative



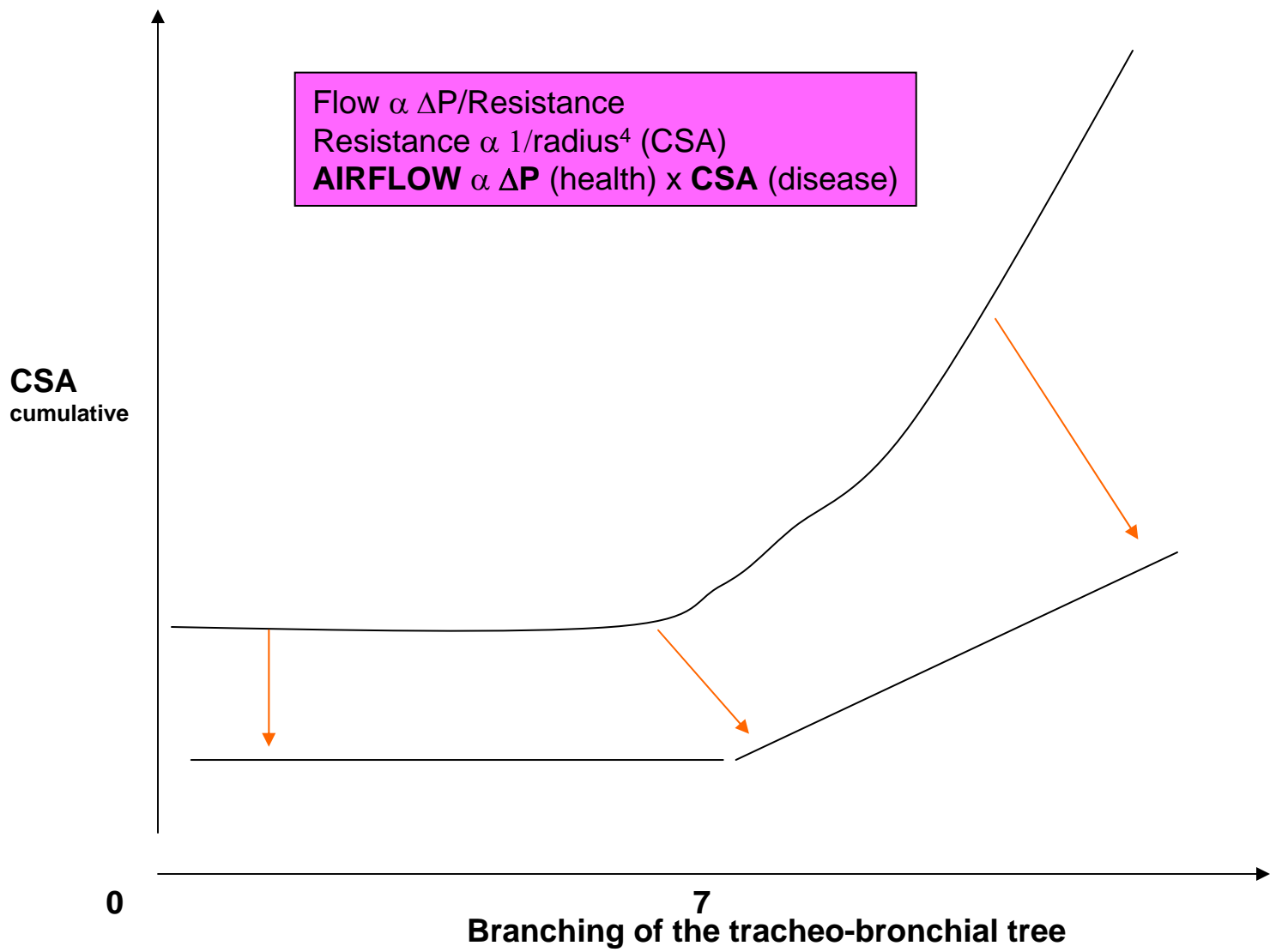




Asthma



Flow $\propto \Delta P / \text{Resistance}$
Resistance $\propto 1 / \text{radius}^4$ (CSA)
AIRFLOW $\propto \Delta P$ (health) \times **CSA** (disease)



Asthma Concept- 1

**REDUCTION IN CUMULATIVE
CSA (airflow obstruction)**

Measuring the narrowing of the bronchial tubes

1. Narrowing of the branches reduces the flow of air in and out of the lungs
2. Airflow measured by the adaptable peak flow meter i.e. PFM measures narrowing
3. There are more complex measurements called 'challenge' tests

Flow $\propto \Delta P / \text{Resistance}$

Resistance $\propto 1 / \text{radius}^4$ (CSA)

AIRFLOW $\propto \Delta P$ (health) \times **CSA** (disease)

Br Med Journal 1959

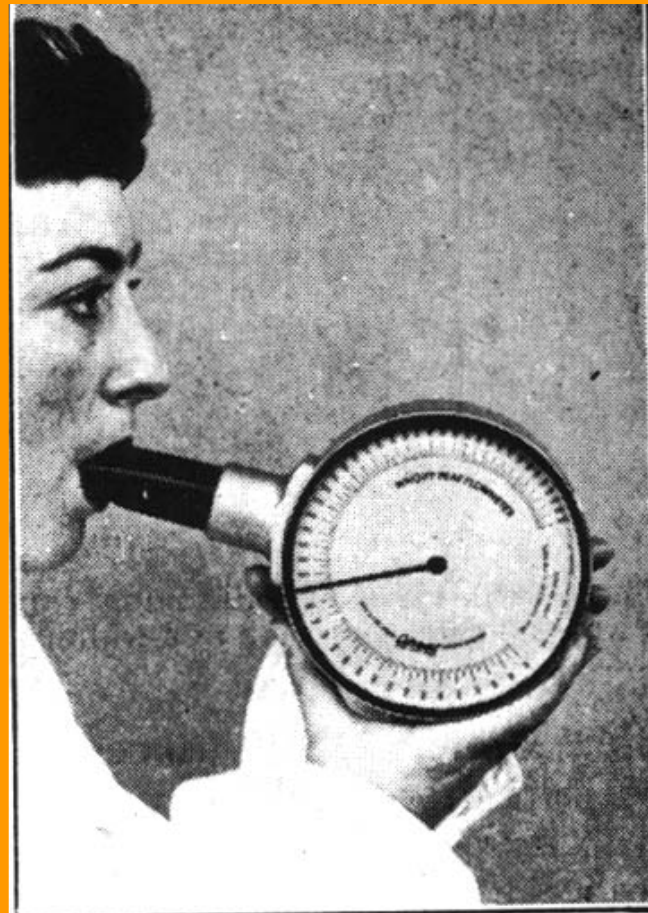
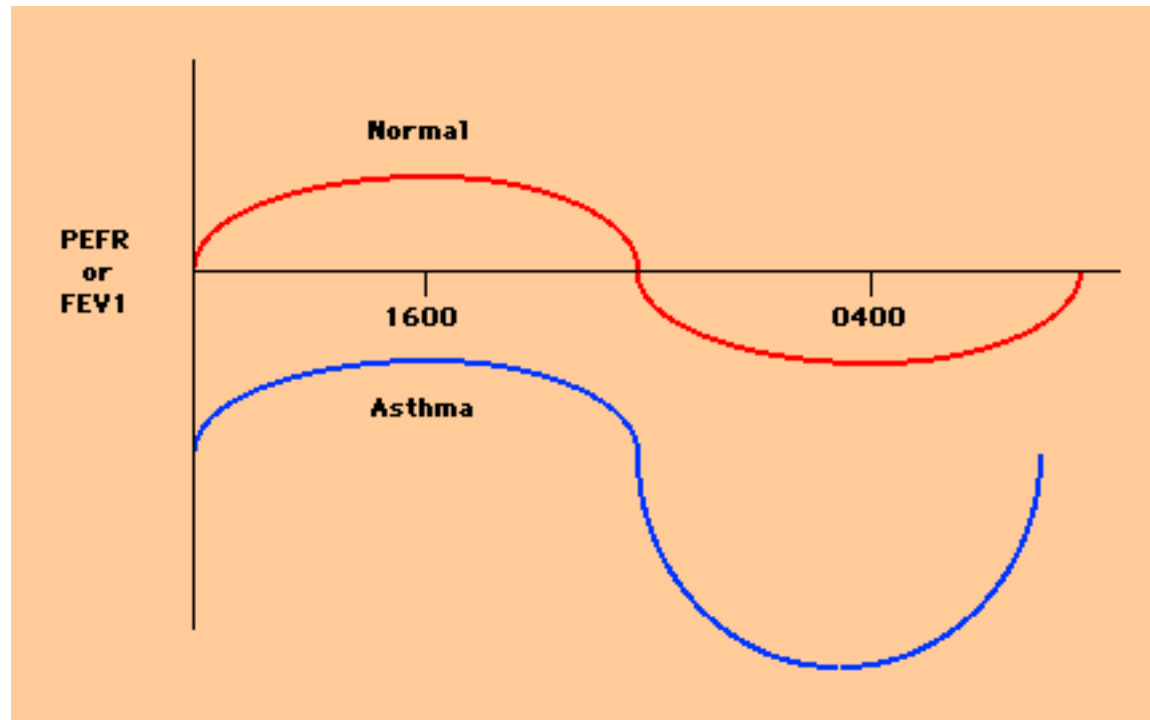


FIG. 2.—Peak flow meter, showing method of use.

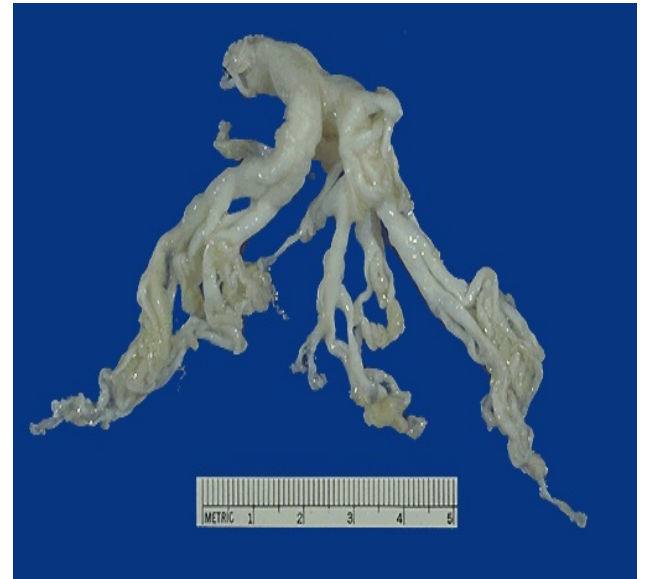
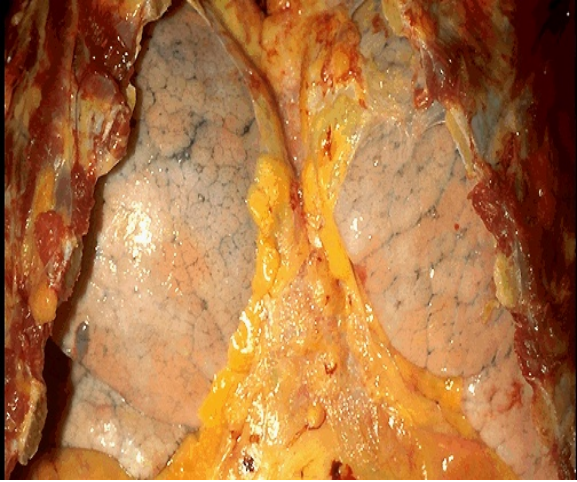
Diurnal Variation



Circadian lung function in asthma Circadian alterations in lung function (as assessed by peak expiratory flow rate or FEV1) in normal subjects and asthmatics. The nadir occurs at approximately 4 AM in both groups, but the amplitude of the peak-to-trough swings is much larger in asthma. (Adapted from Hetzel, MR, Clark, TJ, Thorax 1980; 35:732.)

Asthma Concept - 2

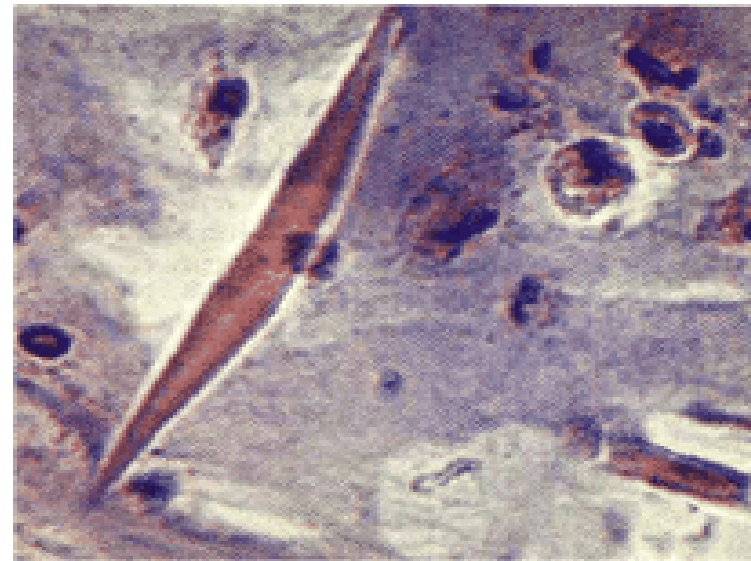
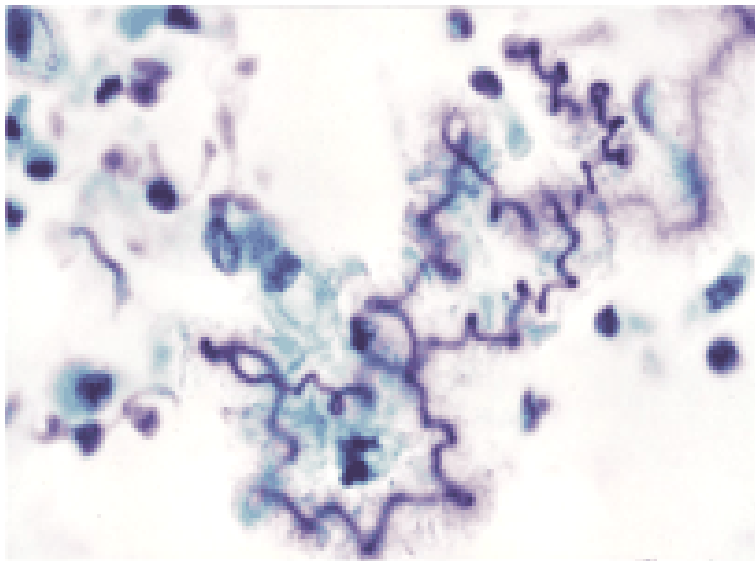
- Variable reduction in CSA (airflow obstruction)
- Concept of 'palpitations' of the airways (branches)



Asthma Concept - 3

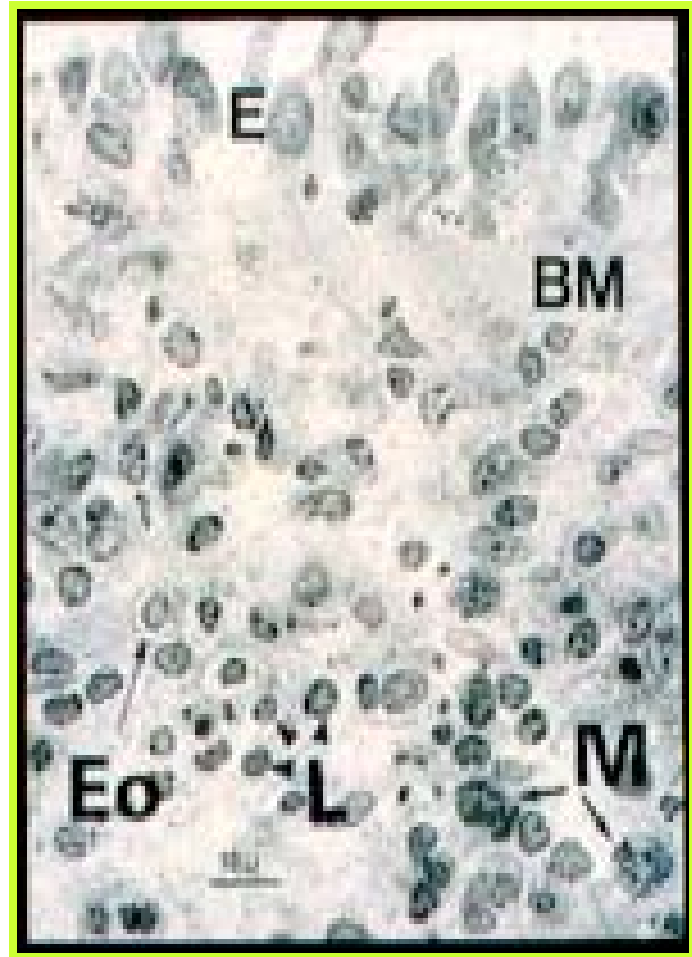
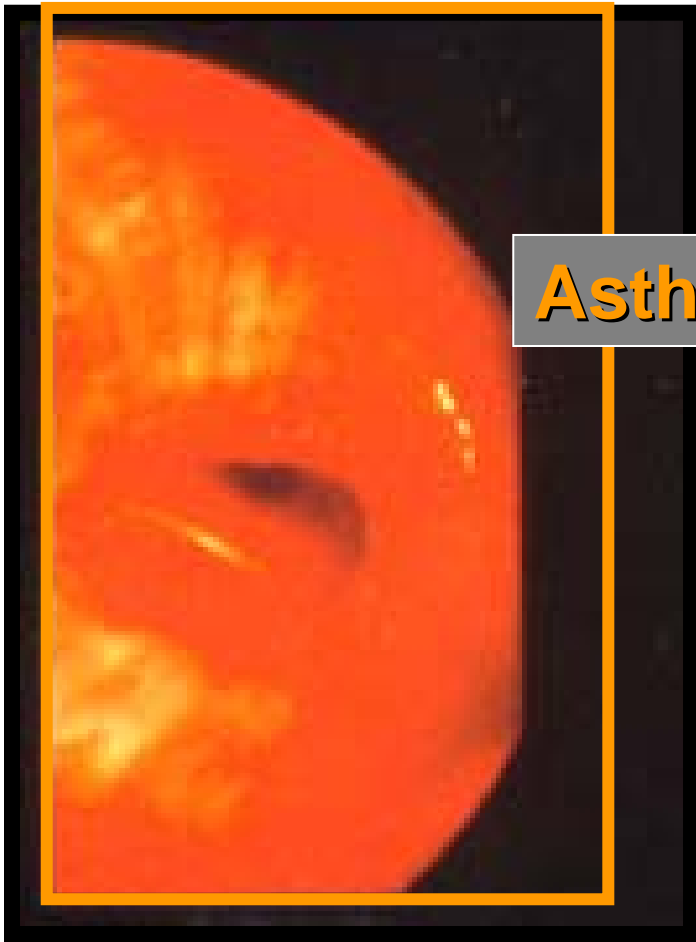
HYPERINFLATION

Curschmann Spirals & Charcot Leyden Crystals in Sputum from Asthmatics 1880s



Asthma not just a 'nervous disease'

Asthma



Asthma Concept- 4

SPECIFIC AIRWAY INFLAMMATION (Rash)

i.e. a rash on the inside of the 'branches of the tree'

Issues in Asthma Heterogeneity

- Aetiology
 - atopic, NSAIDs, infection
- Pattern of obstruction
 - exercise, nocturnal, brittle (Types 1 and 2)
- Response to treatment
 - steroid responsive, dependent, resistant
 - anti-leukotriene responsive, resistant
 - beta agonist responsive

Issues in Asthma Heterogeneity

- Age of onset
- Gender
- Secondary causes
 - GERD, sinusitis, vasculitis
- Severity
 - mild, moderate, severe
- Acute severe asthma

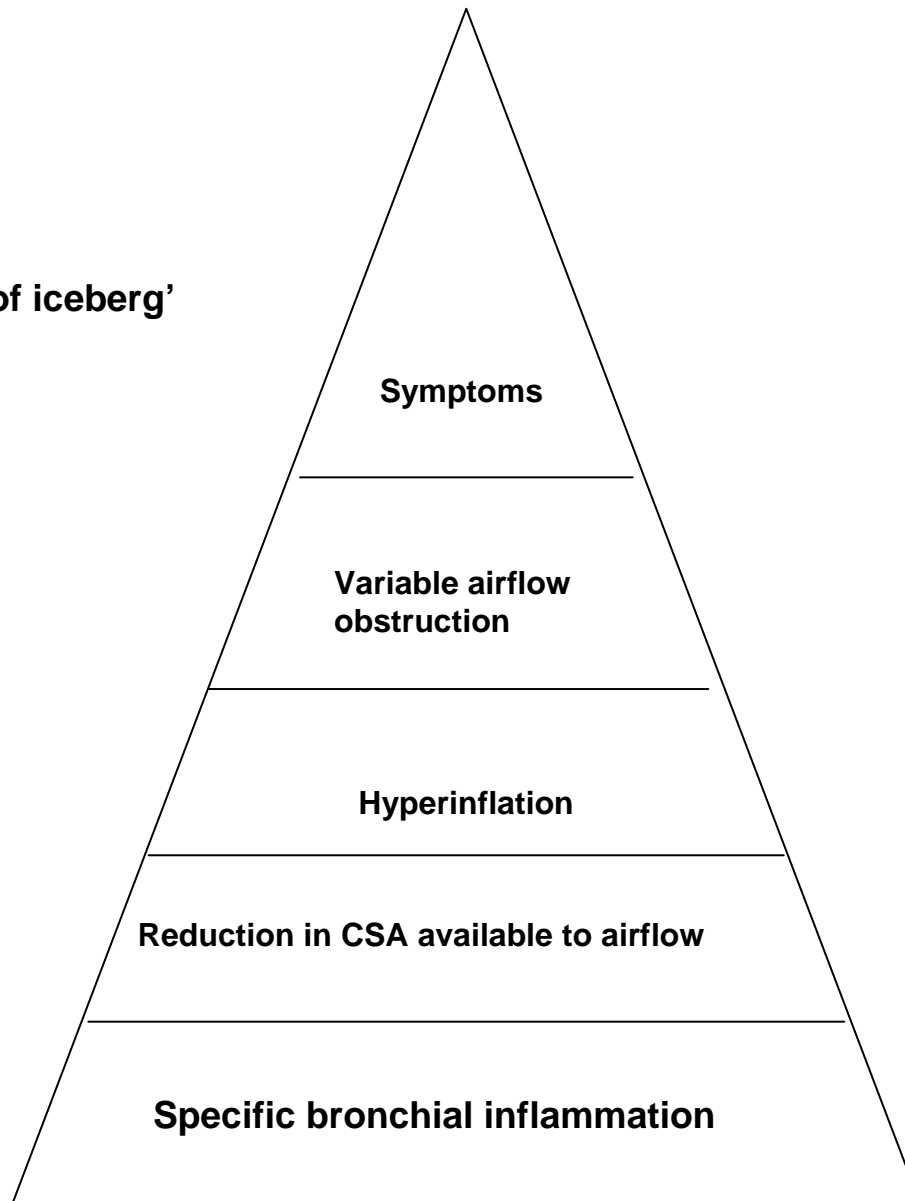
Asthma - 5

There are many causes of asthma

Summary of asthma definition

- Narrowing of the bronchial tubes (branches)
- Narrowing varies:
 - Over time
 - Triggers
 - Laboratory challenges
 - Drugs
- Swollen lungs because of trapped air
- Underpinned special 'eosinophilic inflammation' or rash
- Heterogeneous condition

Symptoms are 'tip of iceberg'



Conclusions

1. Asthma is a 'syndrome' rather than a 'disease' of unknown cause
 1. Difficult to prevent
 2. Difficult to cure
2. Reasons for asthma epidemic remain unclear
3. Despite excellent treatment options, asthma remains chronically undertreated