

Universität
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22nd Course: Allergy and Immunology Update (AIU)
Weekend January 31st to February 2nd, 2020

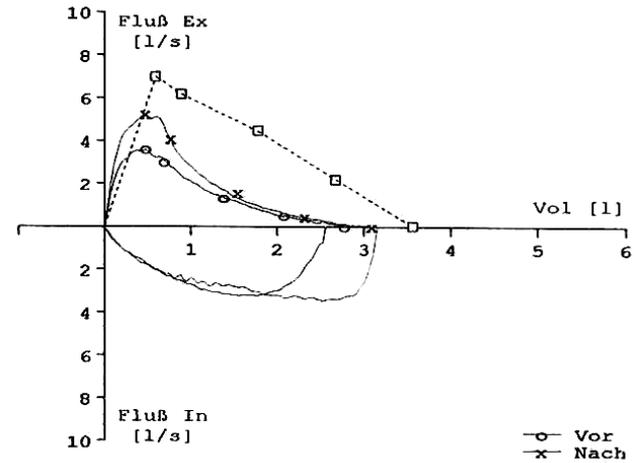
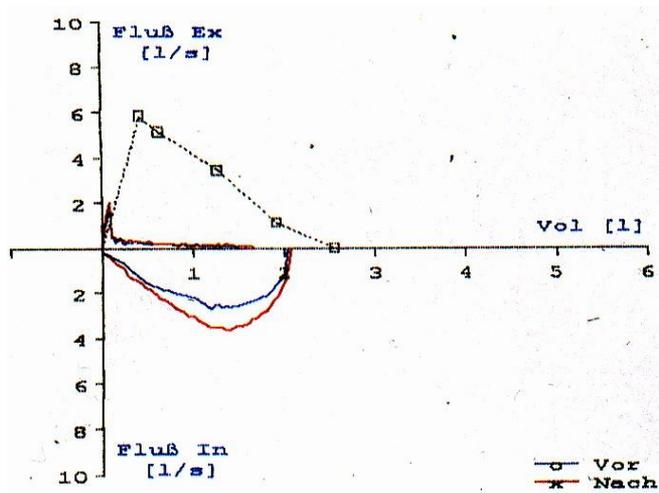
Obstructive lung diseases others than asthma

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Head, University Clinic of Medicine, Cantonal Hospital Baselland

Non reversible - reversible



Ralf Ernst, 45 year old man with atopy

Computer programmer. Hobbies: chess, no sport. Given asthma diagnosis age 29.

Uses a regularly inhaled corticosteroid and a SABA as required.

Two treatments with systemic steroids due to exacerbation in the past year, but only experienced a slow recovery each time.

Currently: two-day history of shortness of breath with occasional inspiratory stridor.

Progress

03.02 enucleation of bronchogenic cyst

15.03.02 recurrent mass DD seroma causing stenosis of left main bronchus

21.03.02 insertion of a polyflex-Stent into the left main bronchus

27.03.02 occlusive mucus plugging of stent

April 02 removal of stent due to proximal migration

24.01.03 isolated left main bronchus resection, reconstruction with End-zu-End-Anastomose

Normal spirometry thereafter!

Organ cysts

- 15% of all mediastinal tumors Middle mediastinum
- 3rd-5th decade, coughing and stridor
- Originate from bronchus, pericardium oder ectopic gastrointestinal mucosa.

Differential diagnoses of obstructive lung diseases

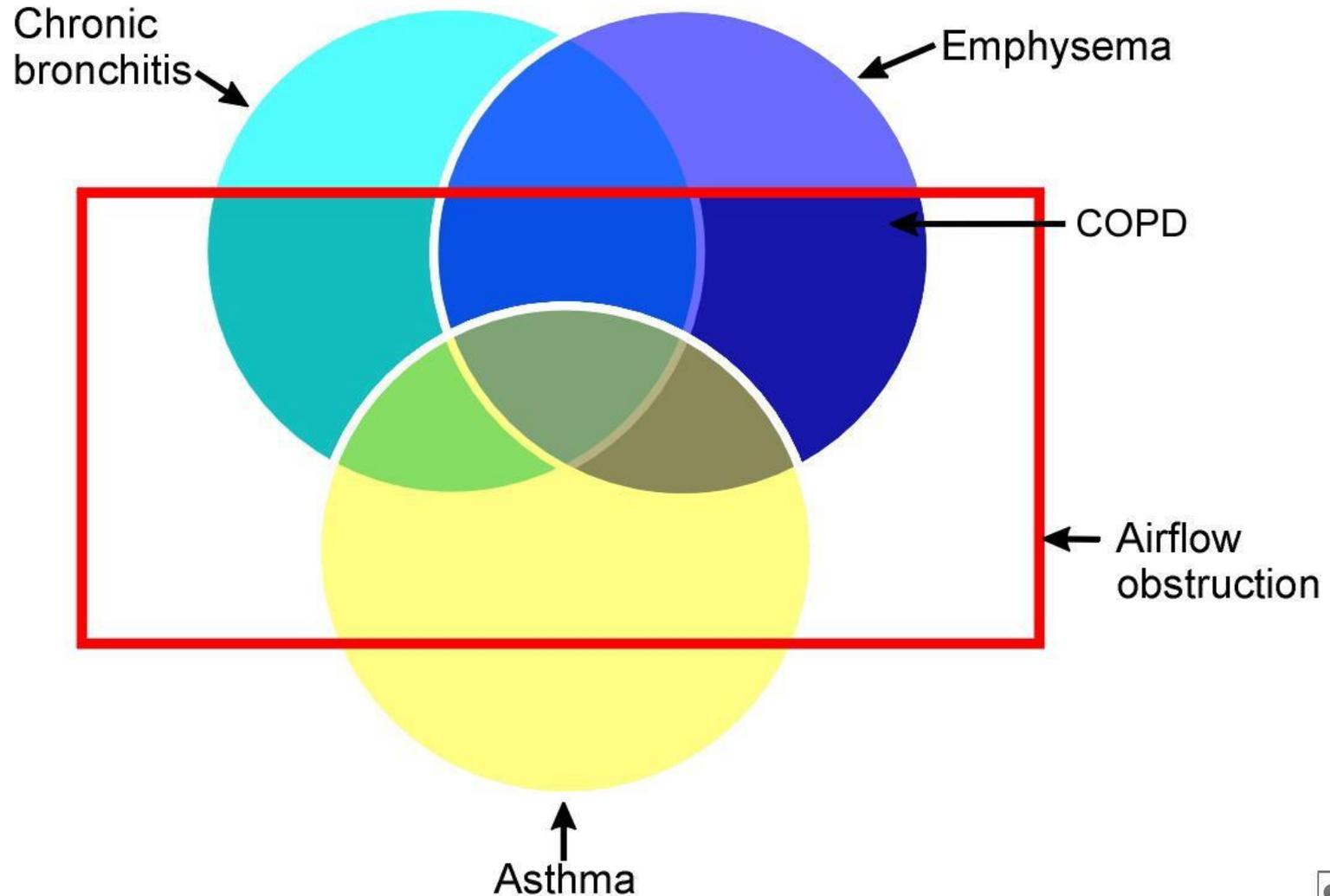
Pulmonary

- Asthma
- Bronchogenic carcinoma
- Bronchogenic cysts
- Bronchiectasis
- COPD
- Tuberculosis
- Cystic fibrosis
- Bronchiolitis obliterans
- Emphysema

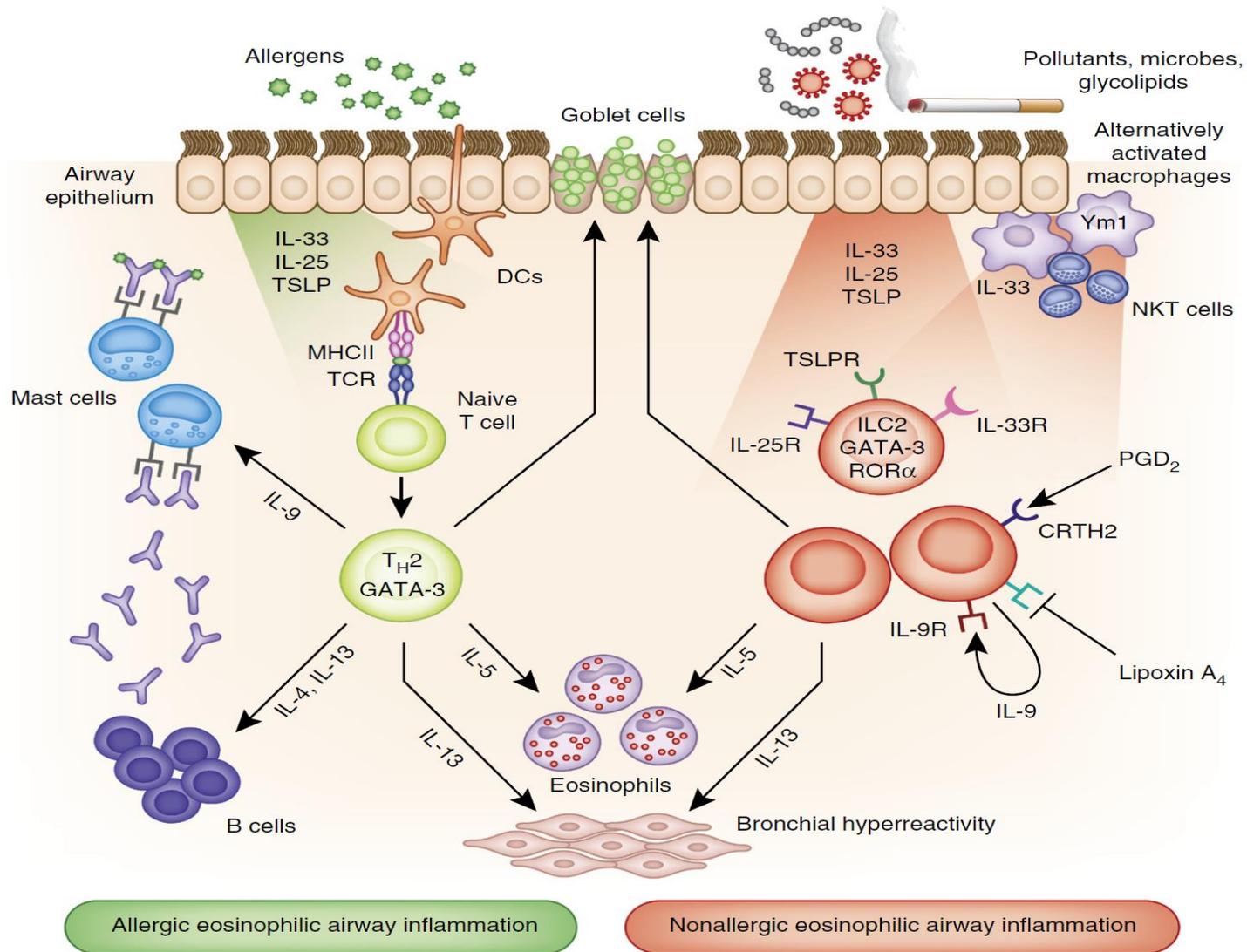
Non-pulmonary

- Congestive heart failure
- Vocal cord dysfunction

Obstructive lung diseases

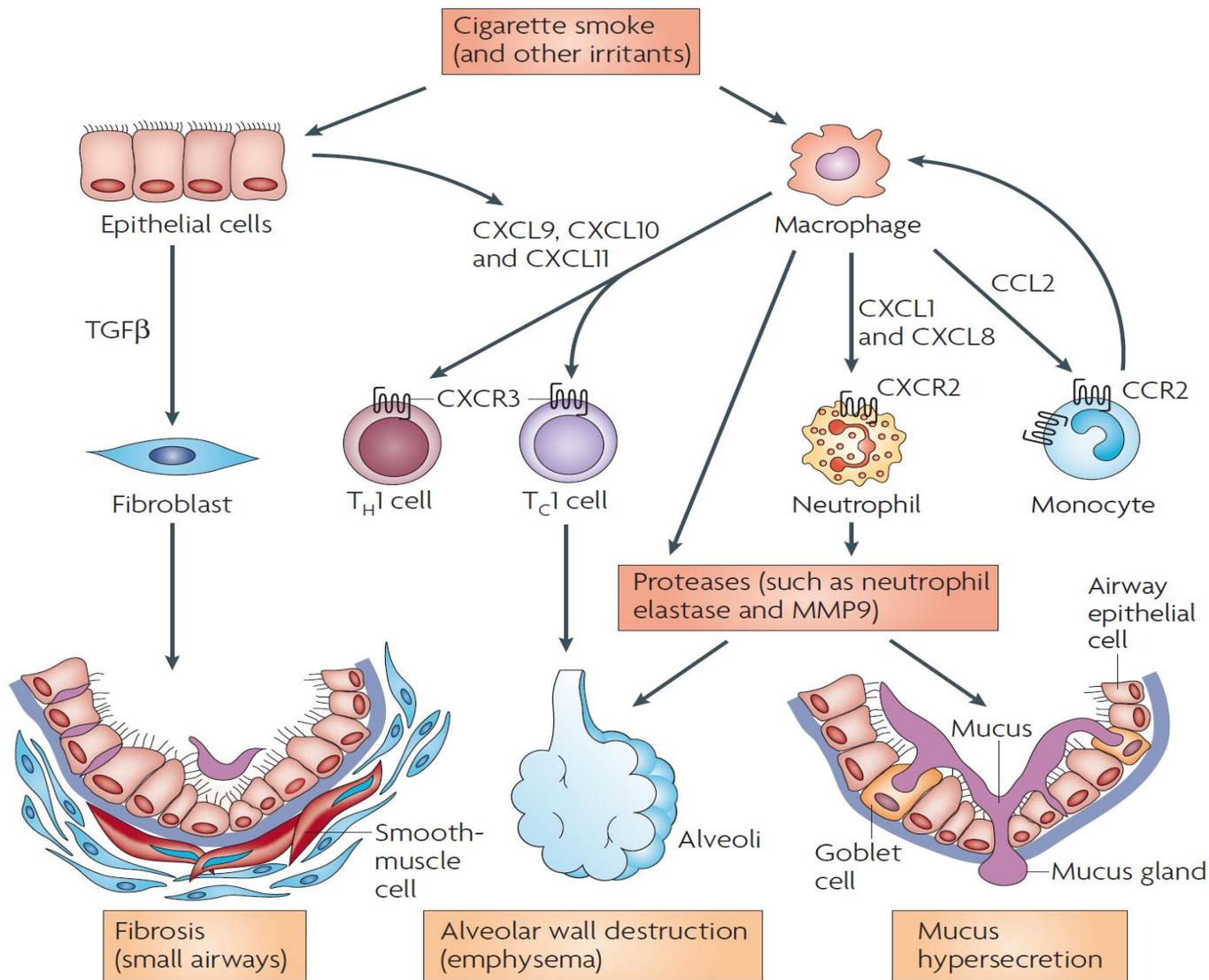


Asthma



Brusselle G et al. Nat Med 2013;19(8):977-79

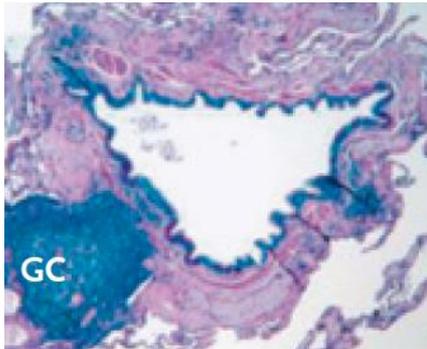
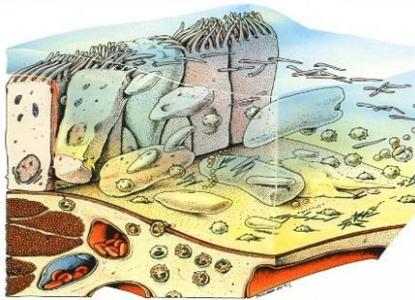
COPD



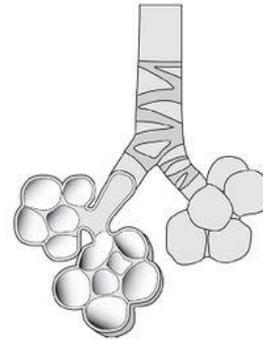
Barnes P., Nature Reviews, Immunology 2008

Pathology

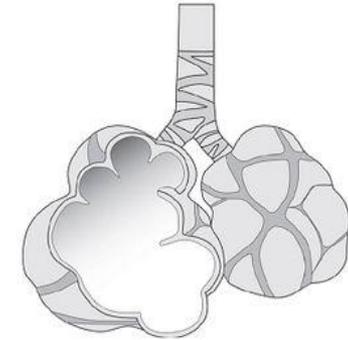
Bronchitis/Bronchiolitis



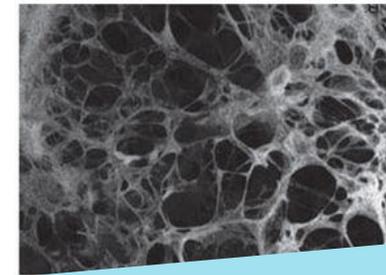
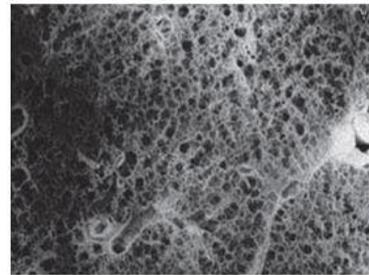
Emphysema



Gesunde Lungenbläschen



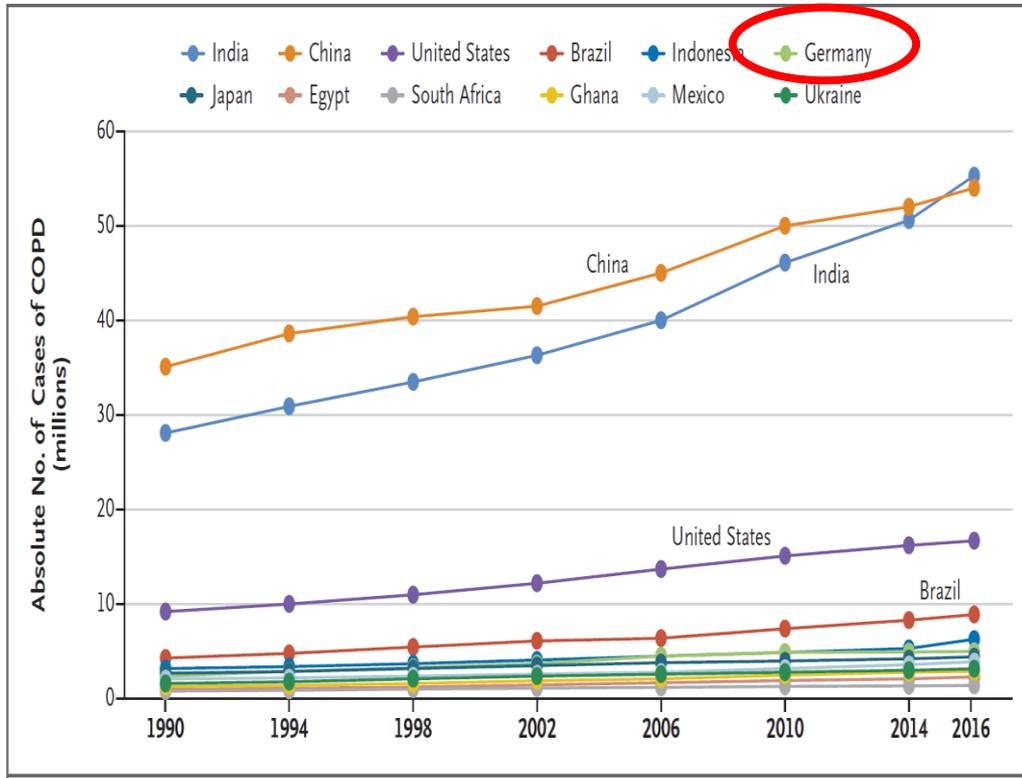
Zerstörte Lungenbläschen



Airway obstruction, Dyspnoea

Cough, Sputum

Prevalence



Switzerland:

In adults 2,5% (30-39y.) - 8,0% (≥70y) (SAPALDIA, Swiss Study on Air Pollution and Lung Diseases in Adults, SAPALDIA, Brideveaux P, Eur Respir J 2010).

In smokers ≥40 years: 27% obstructive lung function test
mild 6%
moderate 15%
severe 5%
very severe 1%

(440 GPs, 24,995 spirometries) (Leuppi J, Respiration 2010).

- 5-10% of the population in rich and poor countries
- 2020 worldwide third most common cause of death

Celli R, Update on Clinical Aspects of Chronic Obstructive Pulmonary Disease, NEJM September 2019

Multidimensional Assessment

Staging on the basis of FEV₁ alone is inadequate. Other additional factors determine the course and prognosis of COPD:

1. Spirometry
2. Symptoms
3. Exacerbations
4. Comorbidities

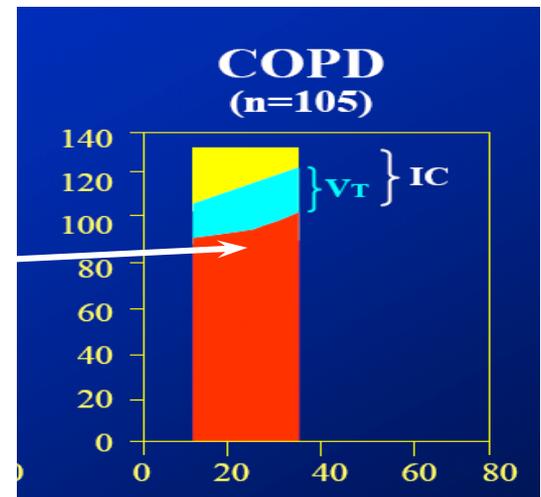
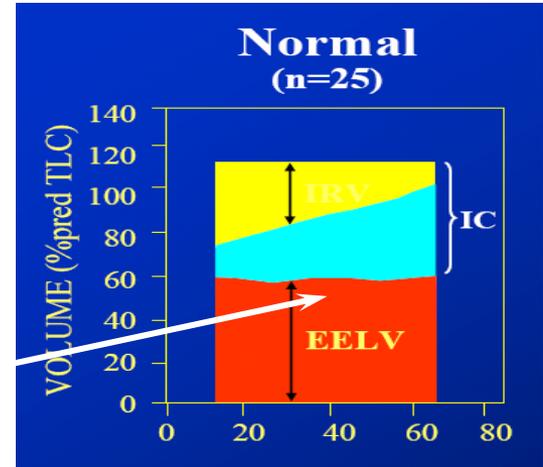
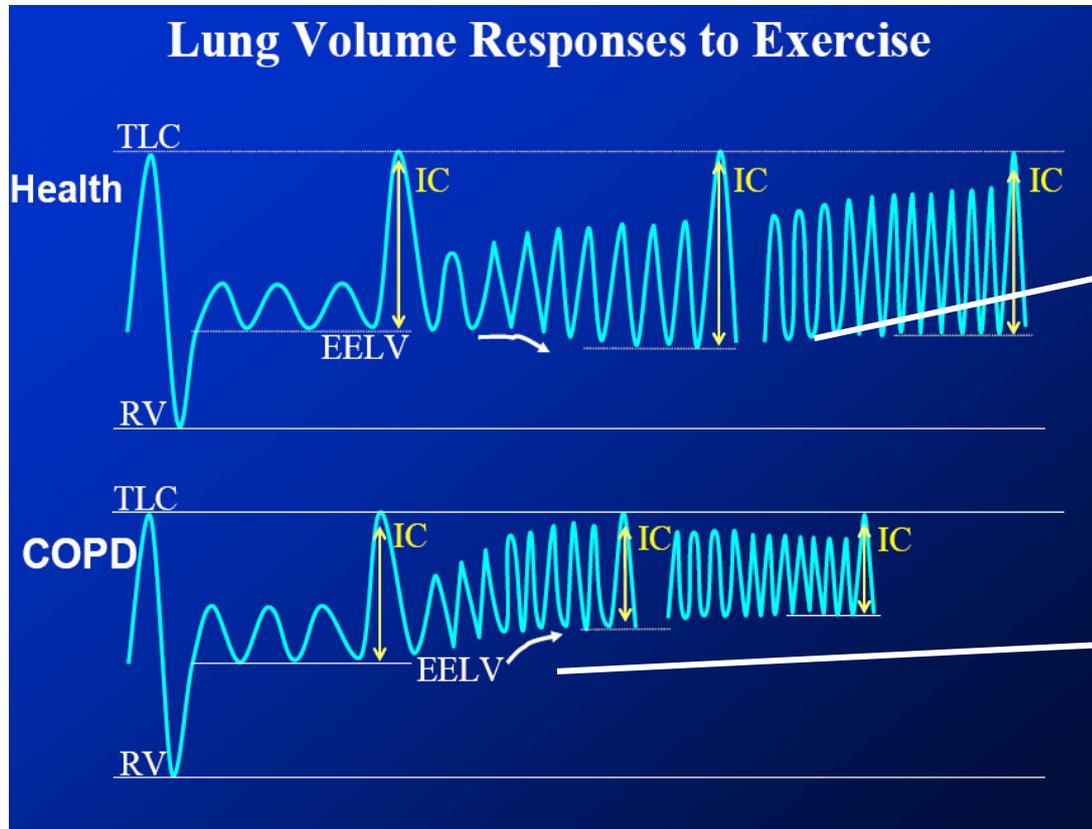
1. Spirometry

Classification of airflow limitation

GOLD		FEV₁/ FVC	FEV₁ (% predicted)
1	Mild	< 70	≥ 80
2	Moderate		≥ 50 < 80
3	Severe		≥ 30 < 50
4	Very severe		< 30

FEV₁ defines the COPD grades 1-4

Pathophysiology: air trapping



2. Symptoms:

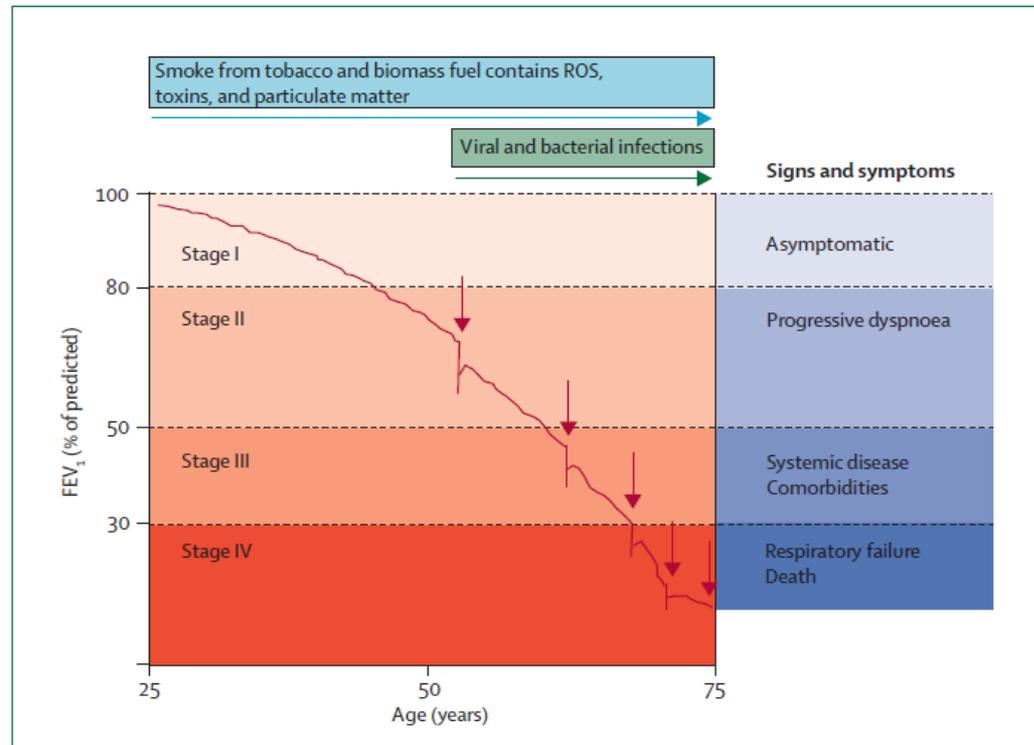
Modified Medical Research Council Dyspnea-Scale (mMRC)

Grade	
0	I only get breathless with strenuous exercise
1	I get short of breath when hurrying on level ground or walking up a slight hill
2	On level ground, I walk slower than people of the same age because of breathlessness, or have to stop for breath when walking at my own pace
3	stop for breath after walking about 100 yards or after a few minutes on level ground
4	I am too breathless to leave the house or I am breathless when dressing

Bestall JC et al: Thorax 1999; 54: 581-586

3. Exacerbations

- ✓ Exacerbations: quality of life ↓, survival ↓
hospitalisations ↑, costs ↑
- ✓ Exacerbations accelerate the fall in FEV₁
- ✓ Recovery takes weeks and does not return to the previous level



▶ THE REFINED ABCD ASSESSMENT TOOL

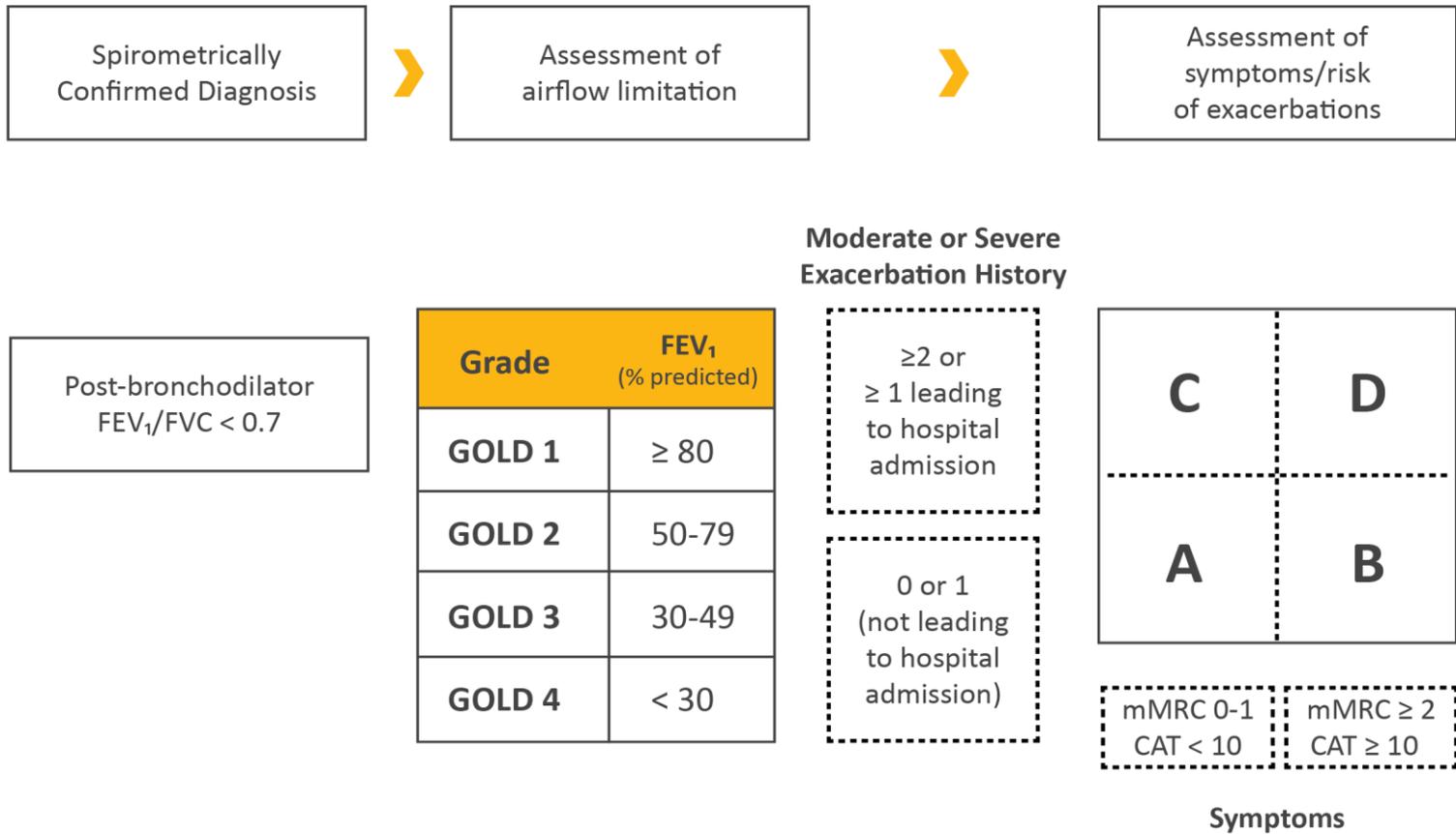
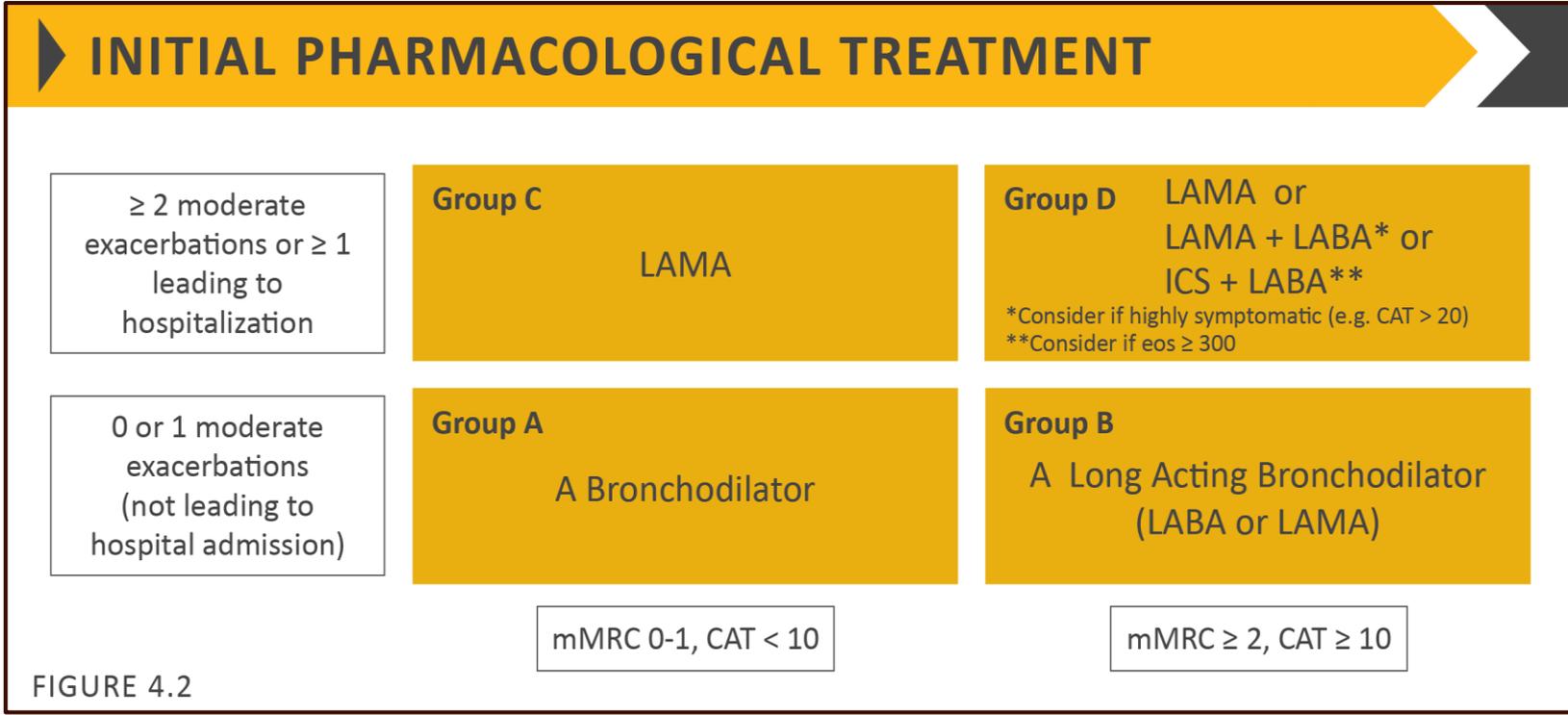


FIGURE 2.4

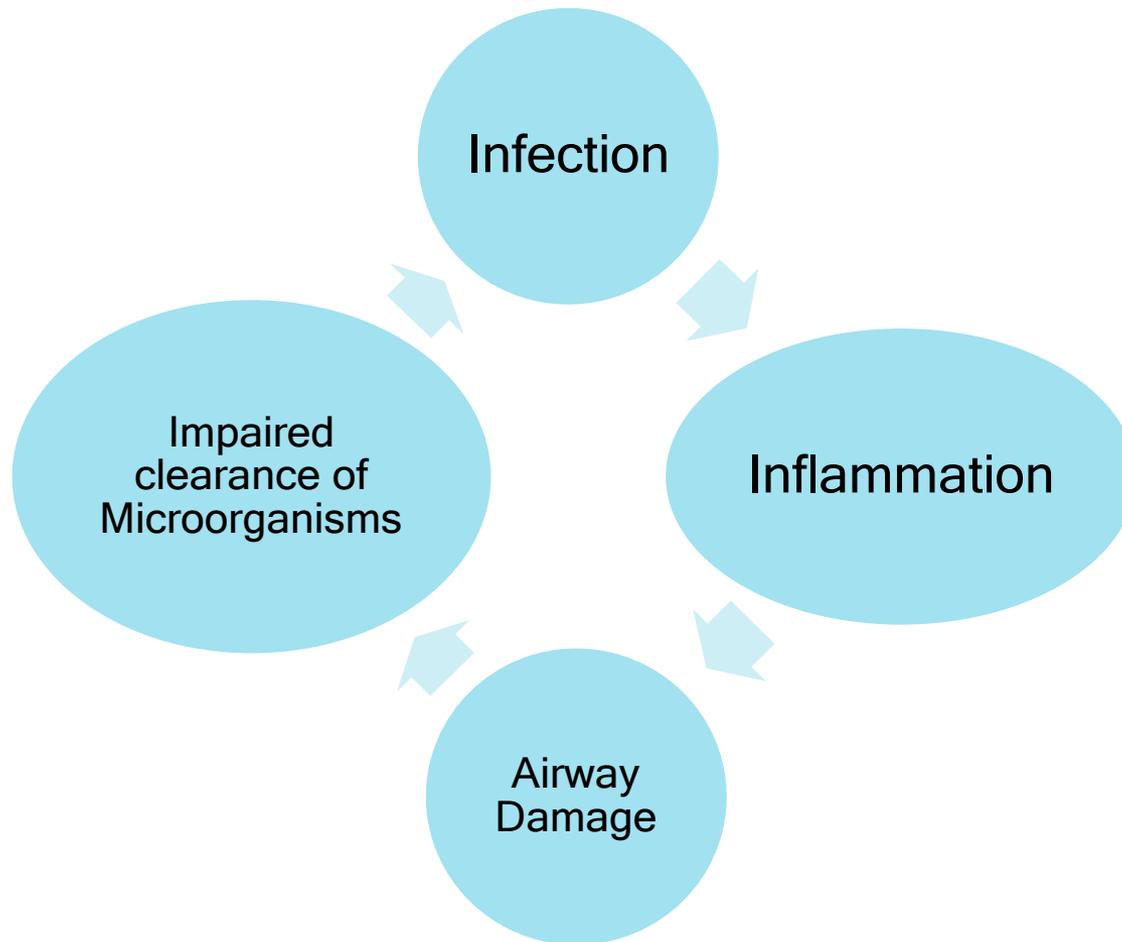


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Bronchiectasis: Definition

Abnormal and permanent dilatation of bronchi which maybe focal or diffuse

Etiology and Pathogenesis



Advanced pulmonary disease



Impaired
airways
clearance



Respiratory
infections

Vicious cycle



Inflammation and airways
deformation



Treatment

1. Treat underlying cause

- Tuberculosis - AKT
- ABPA - Glucocorticoids
- Hypogammaglobunemia - Immunoglobulin Replacement Therapy

2. Improve clearance of tracheobronchial secretions

- Chest Vibrations
- Chest Percussion
- Postural Drainage
- Mucolytics

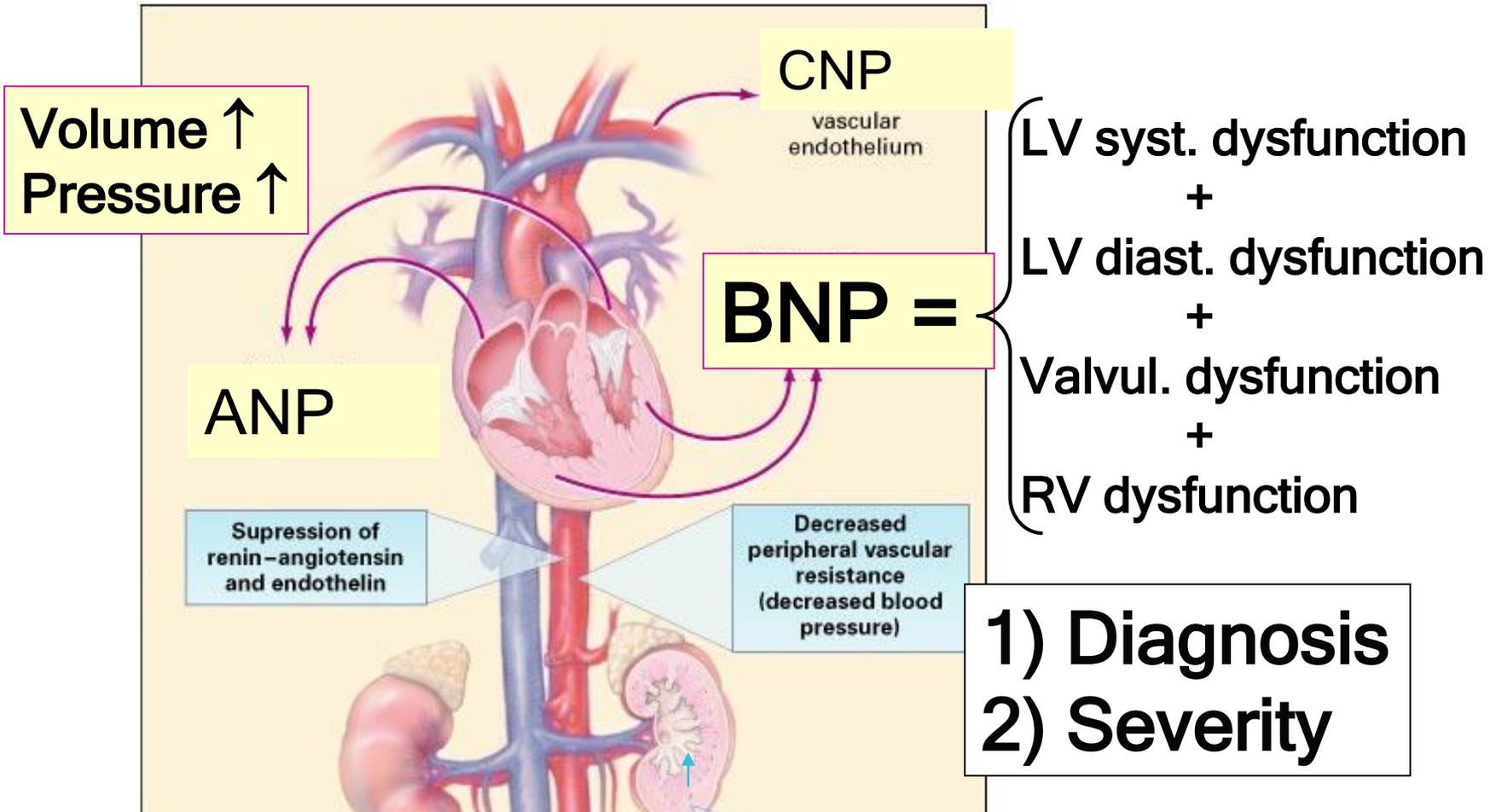
3. Control of Infections in Exacerbations

- Antibiotics
- Bronchodilators

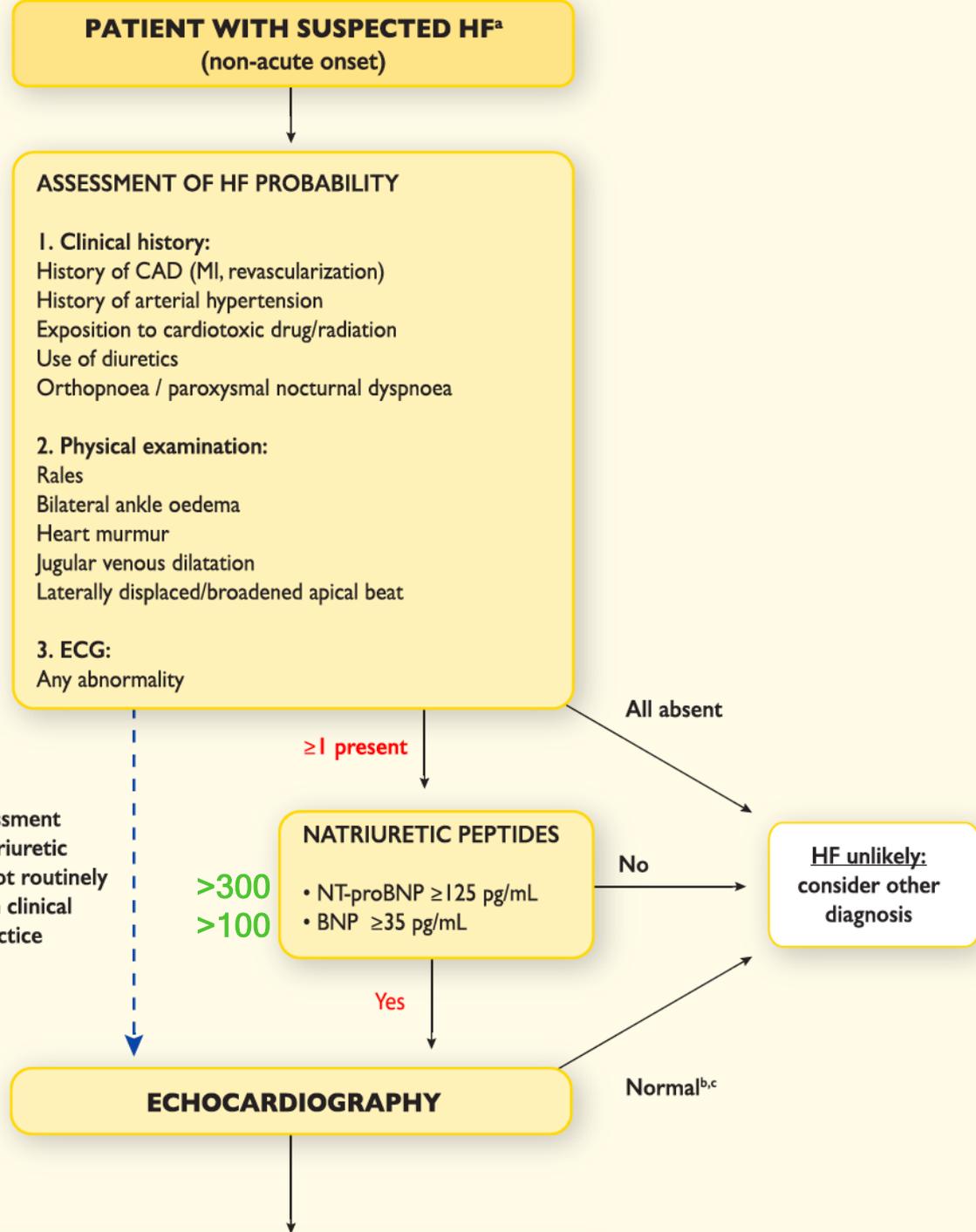
Heart failure

Symptoms	Signs
Typical	More specific
Breathlessness Orthopnoea Paroxysmal nocturnal dyspnoea Reduced exercise tolerance Fatigue, tiredness, increased time to recover after exercise Ankle swelling	Elevated jugular venous pressure Hepatojugular reflux Third heart sound (gallop rhythm) Laterally displaced apical impulse
Less typical	Less specific
Nocturnal cough Wheezing Bloating feeling Loss of appetite Confusion (especially in the elderly) Depression Palpitations Dizziness Syncope Bendopnea ⁵³	Weight gain (>2 kg/week) Weight loss (in advanced HF) Tissue wasting (cachexia) Cardiac murmur Peripheral oedema (ankle, sacral, scrotal) Pulmonary crepitations Reduced air entry and dullness to percussion at lung bases (pleural effusion) Tachycardia Irregular pulse Tachypnoea Cheyne Stokes respiration Hepatomegaly Ascites Cold extremities Oliguria Narrow pulse pressure

BNP: Quantitative marker of CHF

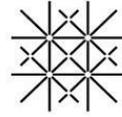


Recommendations	Class ^a	Level ^b
Upon presentation a measurement of plasma natriuretic peptide level (BNP, NT-proBNP or MR-proANP) is recommended in all patients with acute dyspnoea and suspected AHF to help in the differentiation of AHF from non-cardiac causes of acute dyspnoea.	I	A



Summary

- Several reasons can lead to non-reversible airway obstruction. COPD, bronchiectasis, emphysema, bronchiolitis obliterans and heart-failure are the most frequent differential diagnoses.
- Non-reversible airway obstruction is prevalent. For instance, the prevalence of COPD is around 4-7% in Switzerland
- COPD is classified in severity groups 1-4 and patient groups A-D. The treatment recommendation is based on the severity of symptoms and exacerbation frequencies.
- Cause of bronchiectasis is not always found. Infections and hypoimmunoglobulinaemia should be looked for.
- Heart failure is very frequent and can seldomly cause airway obstruction



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**Thank you for you
attention**

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