

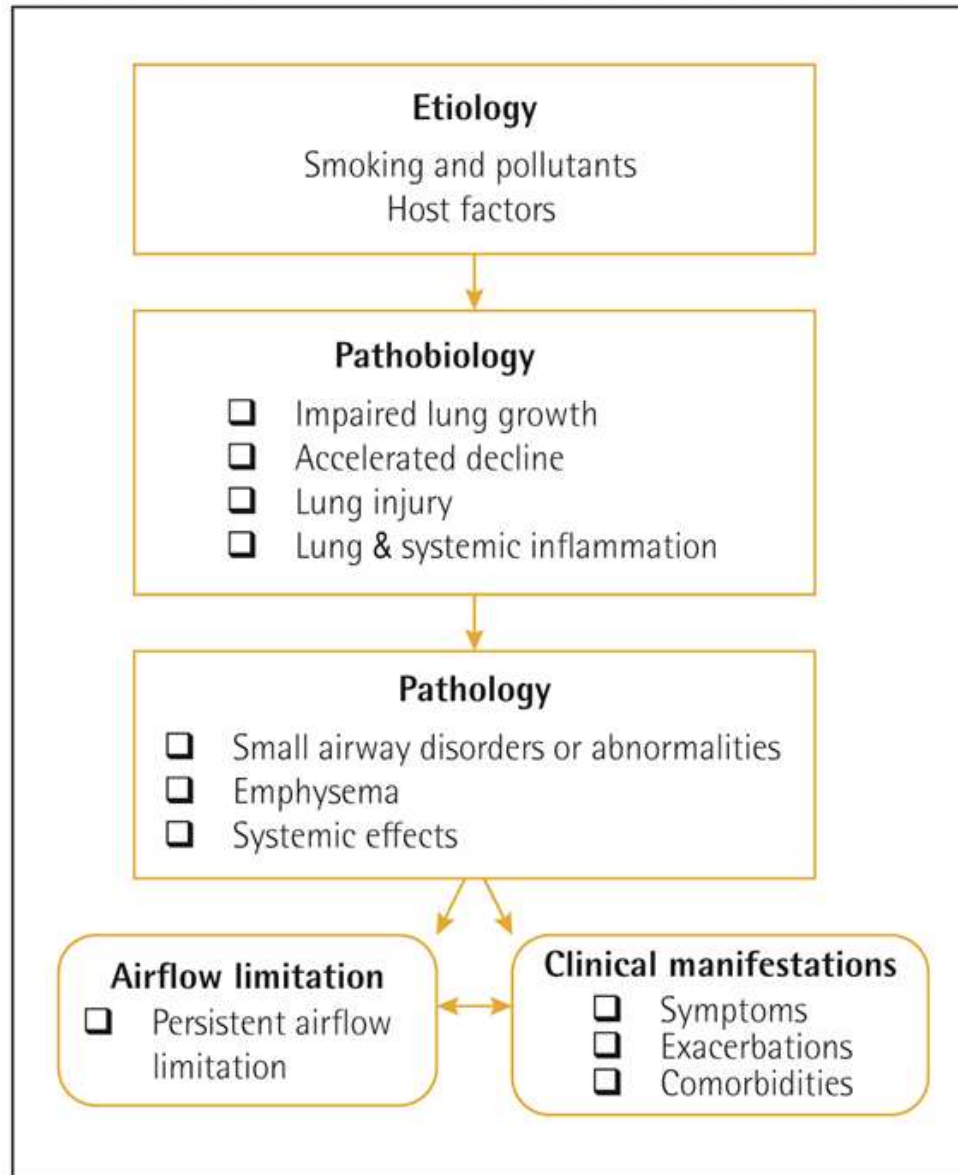
COPD

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Definition

Chronic Obstructive Pulmonary Disease (COPD) is a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.

Figure 1.1. Etiology, pathobiology and pathology of COPD leading to airflow limitation and clinical manifestations



Chronic Obstructive Pulmonary Disease (COPD)

Characterized by respiratory symptoms and airflow limitation that is due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases.

The main risk factor for COPD is tobacco smoking but other environmental exposures such as biomass fuel exposure and air pollution may contribute

Prevalence

Prevalence of COPD was higher in smokers and ex-smokers compared to non-smokers

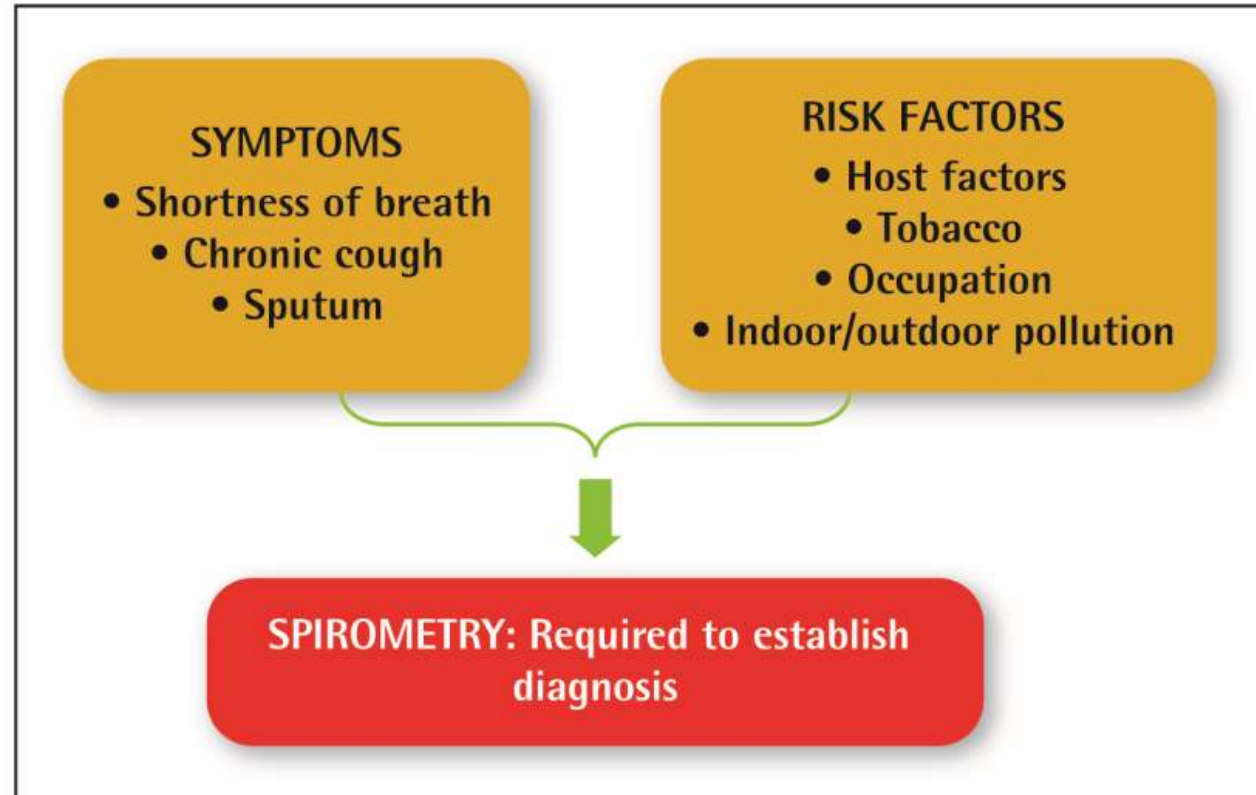
Higher ≥ 40 year group compared to those < 40

Higher in men than women

Diagnosis and Initial Assessment

Diagnosis

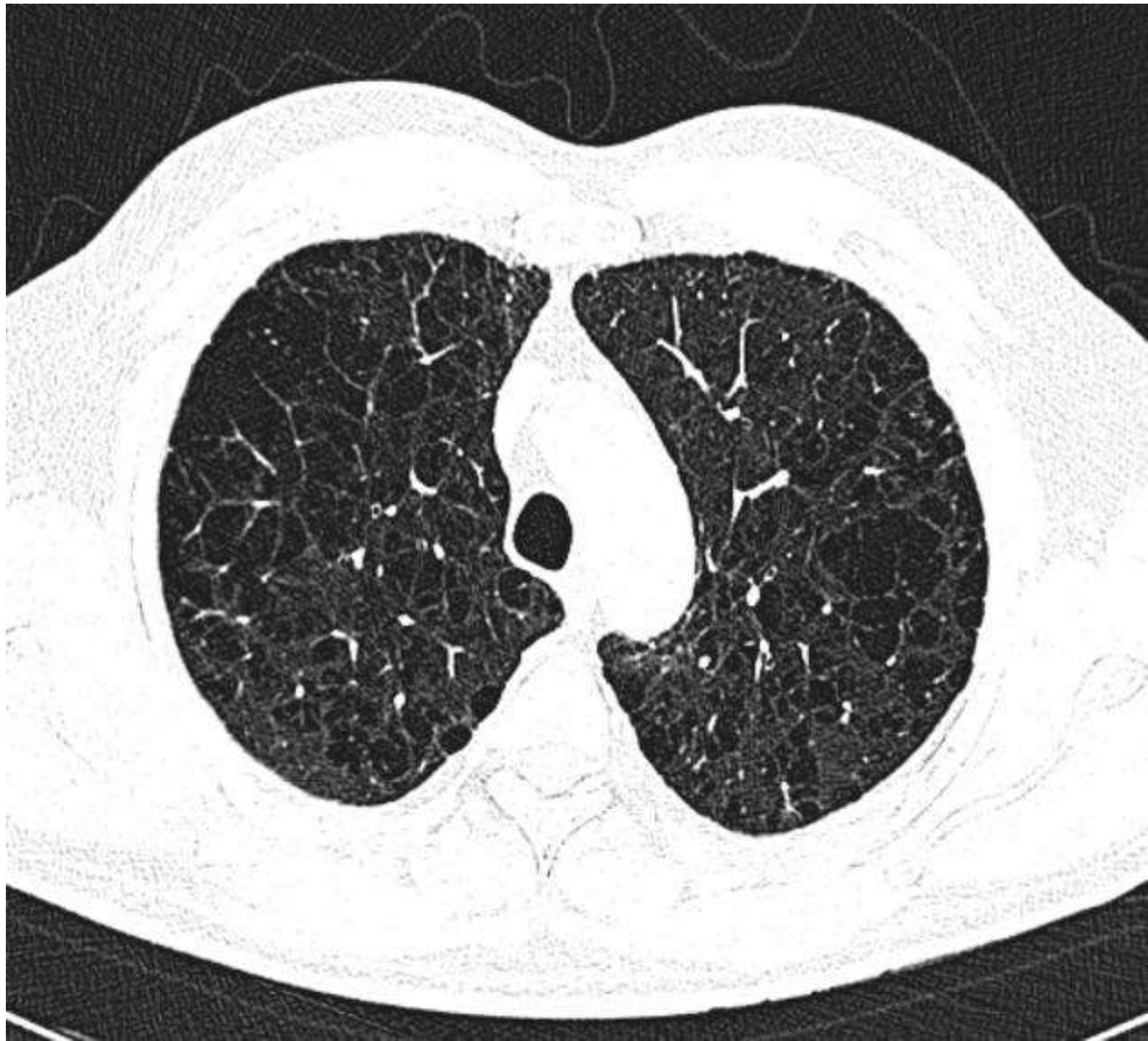
Figure 2.1. Pathways to the diagnosis of COPD



Symptoms

- Chronic and progressive dyspnea
- Cough
- Sputum production
- Wheezing and chest tightness
- Others – including fatigue, weight loss, anorexia, syncope, rib fractures, ankle swelling, depression, anxiety.





Other Causes of Chronic Cough

Table 2.2

INTRATHORACIC

- Asthma
- Lung Cancer
- Tuberculosis
- Bronchiectasis
- Left Heart Failure
- Interstitial Lung Disease
- Cystic Fibrosis
- Idiopathic Cough

EXTRATHORACIC

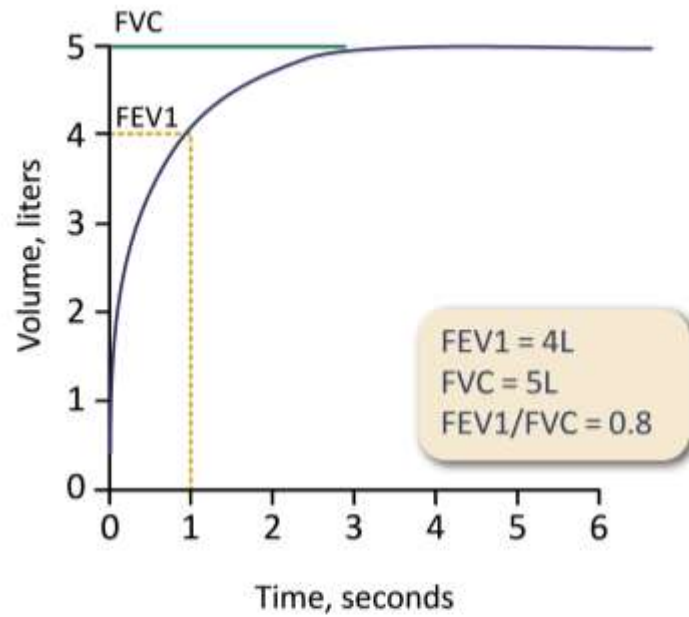
- Chronic Allergic Rhinitis
- Post Nasal Drip Syndrome (PNDS)
- Upper Airway Cough Syndrome (UACS)
- Gastroesophageal Reflux
- Medication (e.g., ACE Inhibitors)

A. Spirometry - Normal Trace

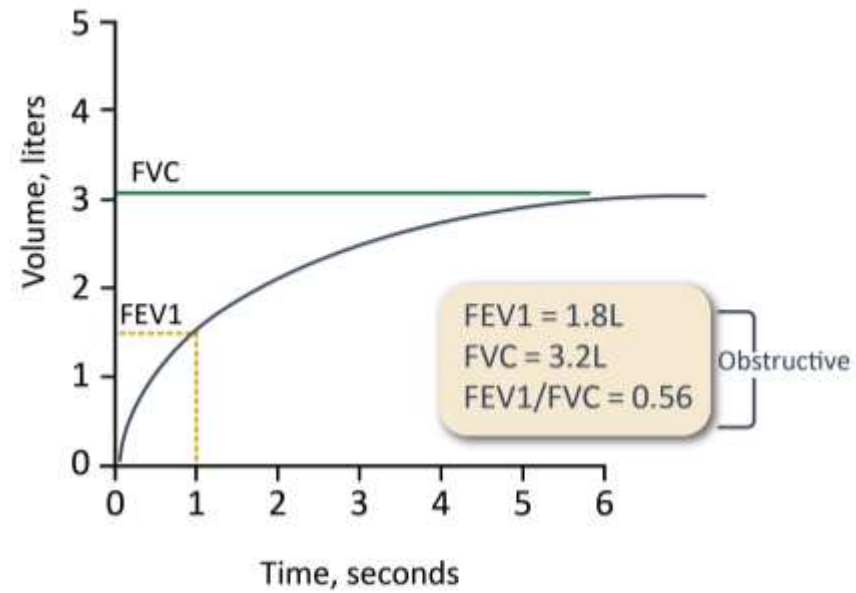
B. Spirometry - Airflow Obstruction

Figure 2.1

A



B



FVC = 
FEV1 = 

GOLD Grades and Severity of Airflow Obstruction in COPD (based on post-bronchodilator FEV1)

Table 2.6

In COPD patients (FEV1/FVC < 0.7):

GOLD 1:	Mild	FEV1 ≥ 80% predicted
GOLD 2:	Moderate	50% ≤ FEV1 < 80% predicted
GOLD 3:	Severe	30% ≤ FEV1 < 50% predicted
GOLD 4:	Very Severe	FEV1 < 30% predicted

Threshold

- COPD Assessment Test (CAT™)
- Modified Medical Research Council (mMRC) questionnaire

Modified MRC Dyspnea Scale

Table 2.7

PLEASE TICK IN THE BOX THAT APPLIES TO YOU | ONE BOX ONLY | Grades 0 - 4

mMRC Grade 0	mMRC Grade 1	mMRC Grade 2	mMRC Grade 3	mMRC Grade 4
I only get breathless with strenuous exercise	I get short of breath when hurrying on the level or walking up a slight hill	I walk slower than people of the same age on the level because of breathlessness, or I have to stop for breath when walking on my own pace on the level	I stop for breath after walking about 100 meters or after a few minutes on the level	I am too breathless to leave the house or I am breathless when dressing or undressing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Reference: ATS (1982) Am Rev Respir Dis. Nov;126(5):952-6.

CAT™ Assessment

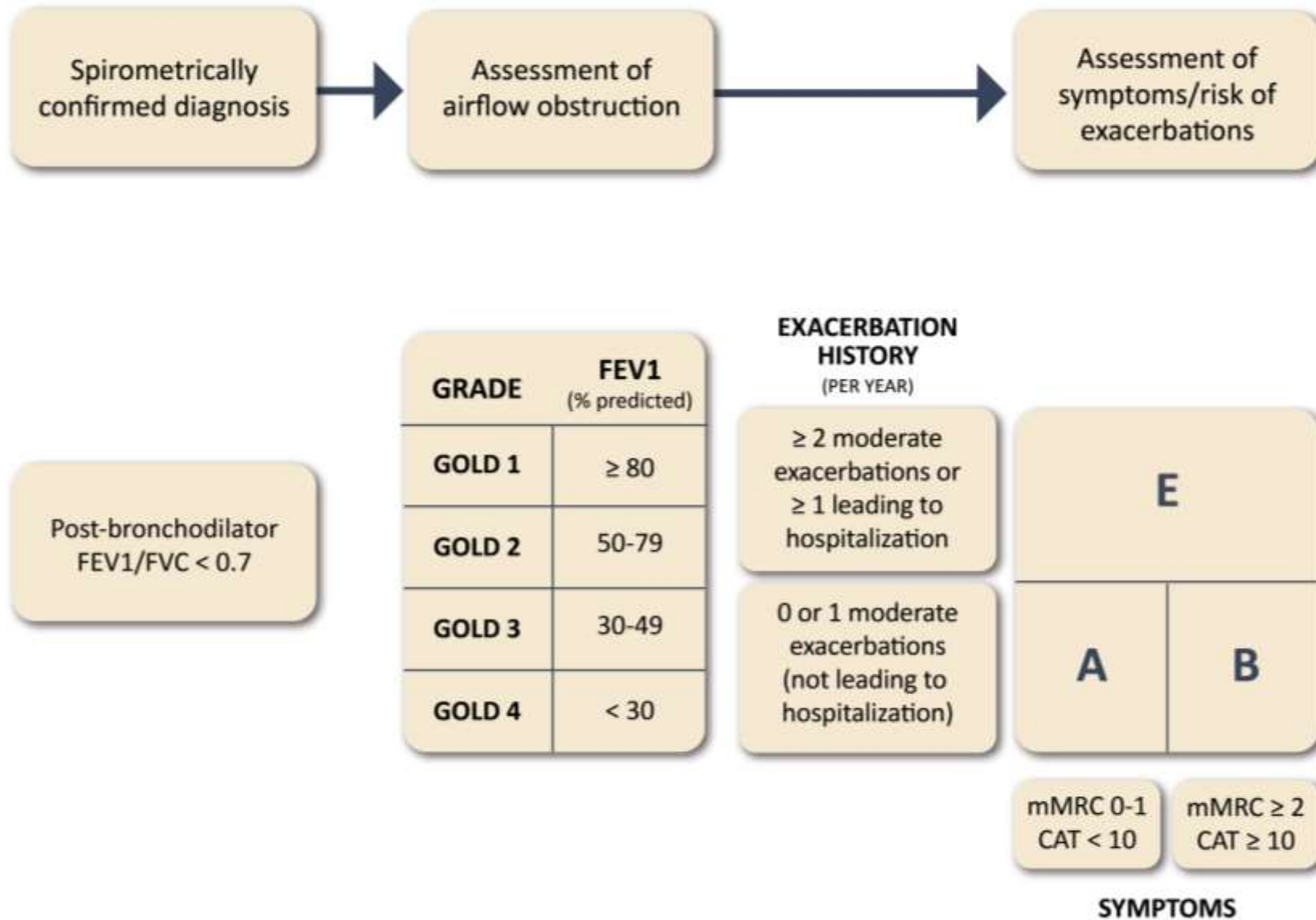
Figure 2.2

For each item below, place a mark (x) in the box that best describes you currently. Be sure to only select one response for each question.

EXAMPLE: I am very happy	0 X 2 3 4 5	I am very sad	Score
I never cough	0 1 2 3 4 5	I cough all the time	
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	
When I walk up a hill or one flight of stairs I am not breathless	0 1 2 3 4 5	When I walk up a hill or one flight of stairs I am very breathless	
I am not limited doing any activities at home	0 1 2 3 4 5	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	0 1 2 3 4 5	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	0 1 2 3 4 5	I don't sleep soundly because of my lung condition	
I have lots of energy	0 1 2 3 4 5	I have no energy at all	

Reference: Jones et al. ERI 2009; 34 (3); 648-54.

TOTAL SCORE:



Differential Diagnosis

Differential Diagnosis of COPD

Table 2.3

Diagnosis	Suggestive Features
COPD	Symptoms slowly progressive History of tobacco smoking or other risk factors
Asthma	Variable airflow obstruction Symptoms vary widely from day to day Symptoms worse at night/early morning Allergy, rhinitis, and/or eczema also present Often occurs in children Family history of asthma
Congestive heart failure	Chest X-ray shows dilated heart, pulmonary edema Pulmonary function tests indicate volume restriction, not airflow obstruction
Bronchiectasis	Large volumes of purulent sputum Commonly associated with bacterial infection Chest X-ray/HRCT shows bronchial dilation
Tuberculosis	Onset all ages Chest X-ray shows lung infiltrate Microbiological confirmation High local prevalence of tuberculosis
Obliterative bronchiolitis	Can occur in children Seen after lung or bone marrow transplantation HRCT on expiration shows hypodense areas
Diffuse panbronchiolitis	Predominantly seen in patients of Asian descent Most patients are male and nonsmokers Almost all have chronic sinusitis Chest X-ray & HRCT show diffuse small centrilobular nodular opacities & hyperinflation

These features tend to be characteristic of the respective diseases, but are not mandatory. For example, a person who has never smoked may develop COPD (especially in LMICs where other risk factors may be more important than cigarette smoking).

Management

Approach

Management of Stable COPD

Goals for Treatment of Stable COPD

Table 4.1

- Relieve Symptoms
- Improve Exercise Tolerance
- Improve Health Status



REDUCE SYMPTOMS

AND

- Prevent Disease Progression
- Prevent and Treat Exacerbations
- Reduce Mortality



REDUCE RISK

Non-Pharmacologic Treatment

- Education and self-management
- Physical activity
- Pulmonary rehabilitation programs
- Exercise training
- Self-management education
- End of life and palliative care
- Nutritional support
- Vaccination
- Oxygen therapy

Education, Self-Management and Pulmonary Rehabilitation	<ul style="list-style-type: none"> • Education is needed to change patient's knowledge but there is no evidence that used alone it will change patient behavior • Education self-management with the support of a case manager with or without the use of a written action plan is recommended for the prevention of exacerbation complications such as hospital admissions (Evidence B) • Rehabilitation is indicated in all patients with relevant symptoms and/or a high risk for exacerbation (Evidence A) • Physical activity is a strong predictor of mortality (Evidence A). People with COPD should be encouraged to increase the level of physical activity although we still don't know how to best insure the likelihood of success
Vaccination	<ul style="list-style-type: none"> • Influenza vaccination is recommended in people with COPD (Evidence B) • The WHO and CDC recommends SARS-CoV-2 (COVID-19) vaccination for people with COPD (Evidence B) • The CDC recommends one dose of 20-valent pneumococcal conjugate vaccine (PCV20); or one dose of 15-valent pneumococcal conjugate vaccine (PCV15) followed by 23-valent pneumococcal polysaccharide vaccine (PPSV23) in people with COPD (Evidence B) • Pneumococcal vaccine has been shown to reduce the incidence of community-acquired pneumonia and exacerbations in people with COPD (Evidence B) • The CDC recommends Tdap (dTaP/dTPa) vaccination to protect against pertussis (whooping cough) for people with COPD that were not vaccinated in adolescence (Evidence B), and Zoster vaccines to protect against shingles for people with COPD over 50 years (Evidence B)
Nutrition	<ul style="list-style-type: none"> • Nutritional supplementation should be considered in malnourished patients with COPD (Evidence B)
End of Life and Palliative Care	<ul style="list-style-type: none"> • All clinicians managing patients with COPD should be aware of the effectiveness of palliative approaches to symptom control and use these in their practice (Evidence D) • End of life care should include discussions with patients and their families about their views on resuscitation, advance directives and place of death preferences (Evidence D)
Treatment of Hypoxemia	<ul style="list-style-type: none"> • In patients with severe resting hypoxemia long-term oxygen therapy is indicated (Evidence A) • In patients with stable COPD and resting or exercise-induced moderate desaturation, long term oxygen treatment should not be routinely prescribed. However, individual patient factors may be considered when evaluating the patient's needs for supplemental oxygen (Evidence A) • Resting oxygenation at sea level does not exclude the development of severe hypoxemia when travelling by air (Evidence C)
Treatment of Hypercapnia	<ul style="list-style-type: none"> • In patients with severe chronic hypercapnia and a history of hospitalization for acute respiratory failure, long term noninvasive ventilation may be considered (Evidence B)
Intervention Bronchoscopy and Surgery	<ul style="list-style-type: none"> • Lung volume reduction surgery should be considered in selected patients with upper-lobe emphysema (Evidence A) • In selected patients with a large bulla surgical bullectomy may be considered (Evidence C) • In select patients with advanced emphysema, bronchoscopic interventions reduce end-expiratory lung volume and improve exercise tolerance, quality of life and lung function at 6-12 months following treatment. Endobronchial valves (Evidence A); Lung coils (Evidence B); Vapor ablation (Evidence B) • In patients with very severe COPD (progressive disease, BODE score of 7 to 10, and not candidate for lung volume reduction) lung transplantation may be considered for referral with at least one of the following: (1) history of hospitalization for exacerbation associated with acute hypercapnia ($P_{CO_2} > 50$ mmHg); (2) pulmonary hypertension and/or cor pulmonale, despite oxygen therapy; or (3) FEV1 < 20% and either DLco < 20% or homogenous distribution of emphysema (Evidence C)



Smoking

- Smoking cessation has the greatest capacity to influence the natural history of COPD.
- If effective resources and time are dedicated to smoking cessation, long-term quit success rates of up to 25% can be achieved.

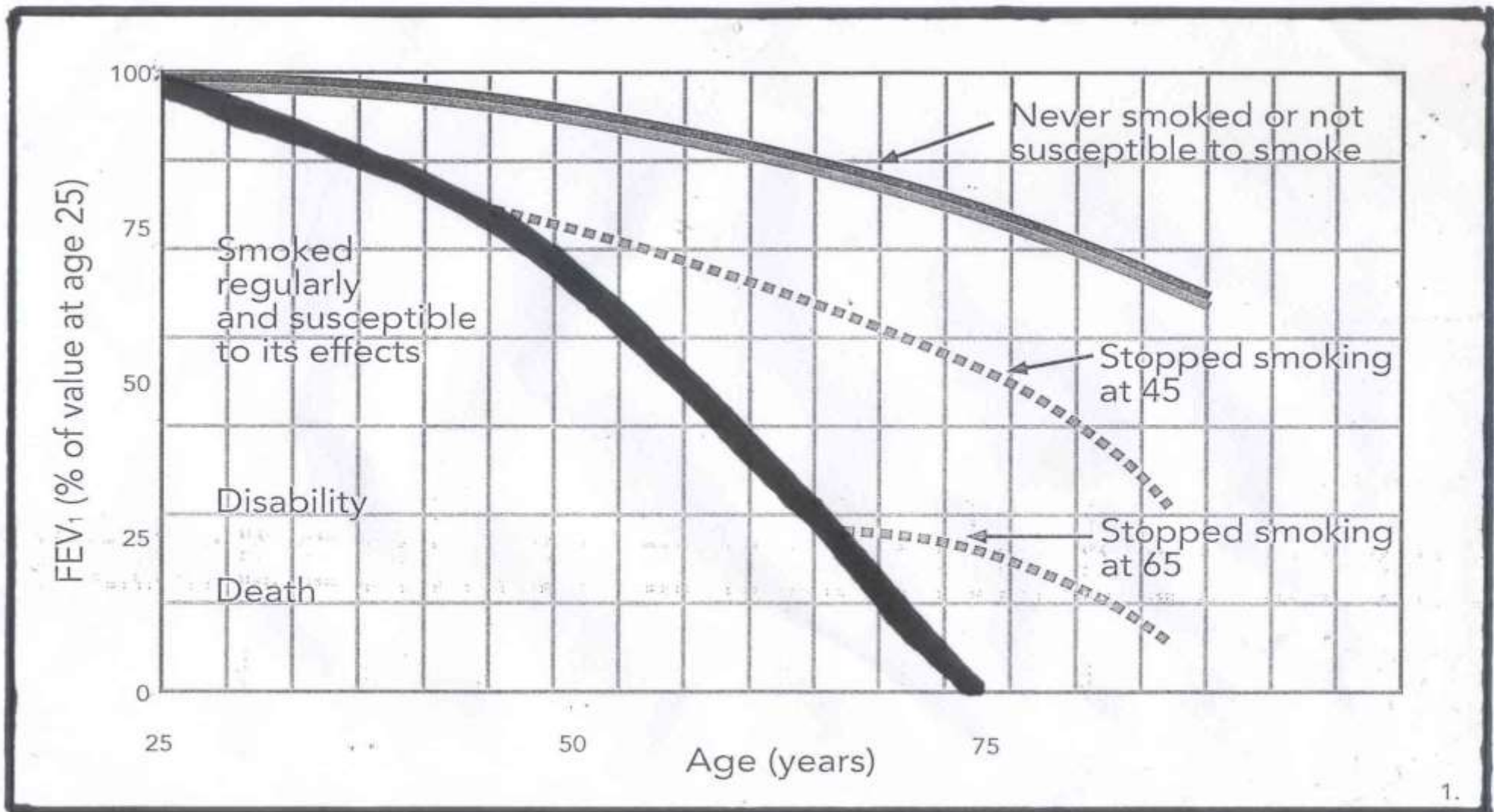


FIGURE 2 - Risks for various men if they smoke: differences between these lines illustrate effects that smoking, and stopping smoking can have on FEV₁ of man who is liable to develop Chronic obstructive lung disease if he smokes. (BMJ, 1977)

Non-Pharmacologic Management of COPD*

Table 4.9

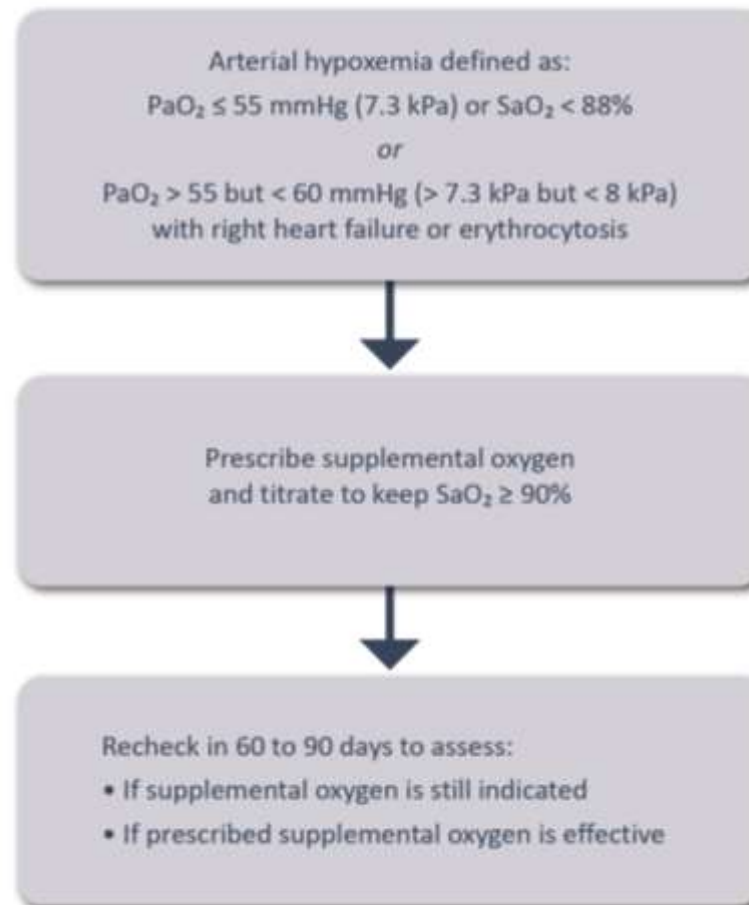
Patient Group	Essential	Recommended	Depending on Local Guidelines
A	Smoking Cessation (can include pharmacological treatment)	Physical Activity	Flu Vaccination Pneumococcal Vaccination Pertussis Vaccination COVID-19 Vaccinations Shingles Vaccination
B and E	Smoking Cessation (can include pharmacological treatment) Pulmonary Rehabilitation	Physical Activity	Flu Vaccination Pneumococcal Vaccination Pertussis Vaccination COVID-19 Vaccinations Shingles Vaccination

*Can include pharmacologic treatment

Oxygen therapy

Prescription of Supplemental Oxygen to COPD Patients

Figure 4.5



Pharmacologic Therapy

Generic Drug Name	Inhaler Type	DELIVERY OPTIONS			Duration of Action
		Nebulizer	Oral	Injection	
BETA₂-Agonists					
Short-acting (SABA)					
Fenoterol	MDI	✓	pill, syrup		4-6 hours
Levalbuterol	MDI	✓			6-8 hours
Salbutamol (albuterol)	MDI & DPI	✓	pill, syrup, extended release tablet	✓	4-6 hours 12 hours (ext. release)
Terbutaline	DPI		pill	✓	4-6 hours
Long-acting (LABA)					
Arformoterol		✓			12 hours
Formoterol	DPI	✓			12 hours
Indacaterol	DPI				24 hours
Olodaterol	SMI				24 hours
Salmeterol	MDI & DPI				12 hours
Anticholinergics					
Short-acting (SAMA)					
Ipratropium bromide	MDI	✓			6-8 hours
Oxipropium bromide	MDI				7-9 hours
Long-acting (LAMA)					
Acidinium bromide	DPI,				MDI 12 hours
Glycopyrronium bromide	DPI		solution	✓	12-24 hours
Tiotropium	DPI, SMI, MDI				24 hours
Umeclidinium	DPI				24 hours
Glycopyrrolate		✓			12 hours
Revefenacin		✓			24 hours
Combination Short-Acting Beta₂-Agonist Plus Anticholinergic in One Device (SABA+SAMA)					
Fenoterol/ipratropium	SMI	✓			6-8 hours
Salbutamol/ipratropium	SMI, MDI	✓			6-8 hours
Combination Long-Acting Beta₂-Agonist Plus Anticholinergic in One Device (LABA+LAMA)					
Formoterol/acidinium	DPI				12 hours
Formoterol/glycopyrronium	MDI				12 hours
Indacaterol/glycopyrronium	DPI				12-24 hours
Vilanterol/umeclidinium	DPI				24 hours
Olodaterol/tiotropium	SMI				24 hours

Pulmonary Rehabilitation, Self-Management and Integrative Care in COPD

Table 3.8

Pulmonary Rehabilitation

- Pulmonary rehabilitation improves dyspnea, health status and exercise tolerance in stable patients **(Evidence A)**
- Pulmonary rehabilitation reduces hospitalization among patients who have had a recent exacerbation (≤ 4 weeks from prior hospitalization) **(Evidence B)**
- Pulmonary rehabilitation leads to a reduction in symptoms of anxiety and depression **(Evidence A)**

Education and Self-Management

- Education alone has not been shown to be effective **(Evidence C)**
- Self-management intervention with communication with a health care professional improves health status and decreases hospitalizations and emergency department visits **(Evidence B)**

Integrated Care Programs

- Integrative care and telehealth have no demonstrated benefit at this time **(Evidence B)**

Pharmacological therapy

Methylxanthines					
Aminophylline			solution	✓	Variable, up to 24 hours
Theophylline (SR)			pill	✓	Variable, up to 24 hours
Combination of Long-Acting Beta₂-Agonist Plus Corticosteroid in One Device (LABA+ICS)					
Formoterol/beclometasone	MDI, DPI				12 hours
Formoterol/budesonide	MDI, DPI				12 hours
Formoterol/mometasone	MDI				12 hours
Salmeterol/fluticasone propionate	MDI, DPI				12 hours
Vilanterol/fluticasone furoate	DPI				24 hours
Triple Combination in One Device (LABA+LAMA+ICS)					
Fluticasone/umeclidinium/vilanterol	DPI				24 hours
Beclometasone/formoterol/glycopyrronium	MDI, DPI				12 hours
Budesonide/formoterol/glycopyrrolate	MDI				12 hours
Phosphodiesterase-4 Inhibitors					
Roflumilast			pill		24 hours
Mucolytic Agents					
Erdosteine			pill		12 hours
Carbocysteine [†]			pill		
N-acetylcysteine [†]			pill		

Commonly Used Maintenance Medications in COPD*

Table 3.3

Generic Drug Name	Inhaler Type	DELIVERY OPTIONS			Duration of Action
		Nebulizer	Oral	Injection	
BETA₂-Agonists					
Short-acting (SABA)					
Fenoterol	MDI	✓	pill, syrup		4-6 hours
Levalbuterol	MDI	✓			6-8 hours
Salbutamol (albuterol)	MDI & DPI	✓	pill, syrup, extended release tablet	✓	4-6 hours 12 hours (ext. release)
Terbutaline	DPI		pill	✓	4-6 hours
Long-acting (LABA)					
Arformoterol		✓			12 hours
Formoterol	DPI	✓			12 hours
Indacaterol	DPI				24 hours
Olodaterol	SMI				24 hours
Salmeterol	MDI & DPI				12 hours
Anticholinergics					
Short-acting (SAMA)					
Ipratropium bromide	MDI	✓			6-8 hours
Oxipropium bromide	MDI				7-9 hours
Long-acting (LAMA)					
Acclidinium bromide	DPI,				MDI 12 hours
Glycopyrronium bromide	DPI		solution	✓	12-24 hours
Tiotropium	DPI, SMI, MDI				24 hours
Umeclidinium	DPI				24 hours
Glycopyrrolate		✓			12 hours
Revefenacin		✓			24 hours
Combination Short-Acting Beta₂-Agonist Plus Anticholinergic in One Device (SABA+SAMA)					
Fenoterol/ipratropium	SMI	✓			6-8 hours
Salbutamol/ipratropium	SMI, MDI	✓			6-8 hours
Combination Long-Acting Beta₂-Agonist Plus Anticholinergic in One Device (LABA+LAMA)					
Formoterol/acclidinium	DPI				12 hours
Formoterol/glycopyrronium	MDI				12 hours
Indacaterol/glycopyrronium	DPI				12-24 hours
Vilanterol/umeclidinium	DPI				24 hours
Olodaterol/tiotropium	SMI				24 hours
Methylxanthines					
Aminophylline			solution	✓	Variable, up to 24 hours
Theophylline (SR)			pill	✓	Variable, up to 24 hours
Combination of Long-Acting Beta₂-Agonist Plus Corticosteroid in One Device (LABA+ICS)					
Formoterol/beclomethasone	MDI, DPI				12 hours
Formoterol/budesonide	MDI, DPI				12 hours
Formoterol/mometasone	MDI				12 hours
Salmeterol/fluticasone propionate	MDI, DPI				12 hours
Vilanterol/fluticasone furoate	DPI				24 hours
Triple Combination in One Device (LABA+LAMA+ICS)					
Fluticasone/umeclidinium/vilanterol	DPI				24 hours
Beclomethasone/formoterol/glycopyrronium	MDI, DPI				12 hours
Budesonide/formoterol/glycopyrrolate	MDI				12 hours
Phosphodiesterase-4 Inhibitors					
Roflumilast			pill		24 hours
Mucolytic Agents					
Erdosteine			pill		12 hours
Carbocysteine†			pill		
N-acetylcysteine†			pill		

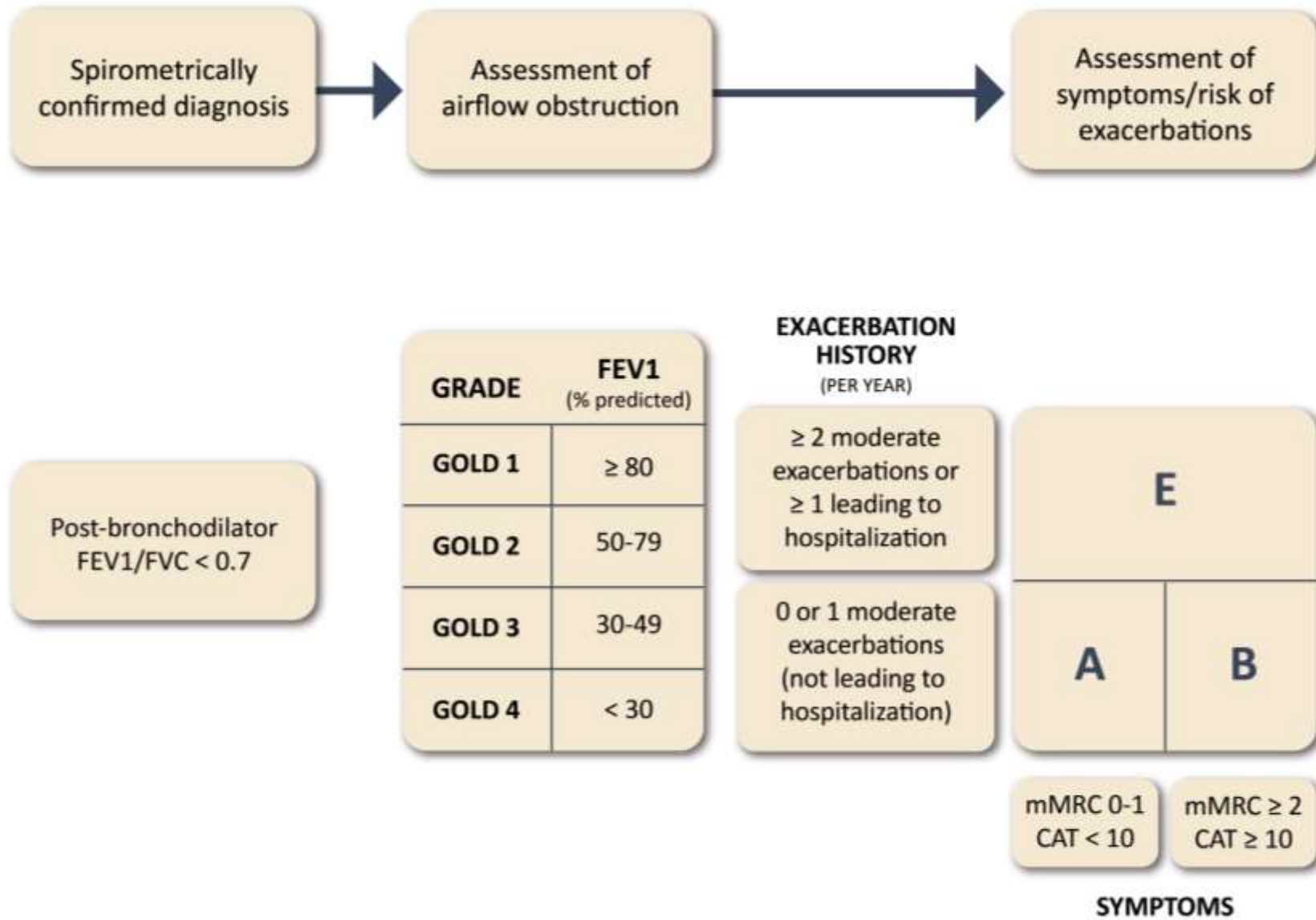
*Not all formulations are available in all countries. In some countries other formulations and dosages may be available. †Dosing regimens are under discussion. MDI = metered dose inhaler; DPI = dry powder inhaler; SMI = soft mist inhaler. Note that glycopyrrolate & glycopyrronium are the same compound.

Anti-inflammatory Therapy in Stable COPD

Inhaled Corticosteroids	<ul style="list-style-type: none">• An ICS combined with a LABA is more effective than the individual components in improving lung function and health status and reducing exacerbations in patients with exacerbations and moderate to very severe COPD (Evidence A)• Regular treatment with ICS increases the risk of pneumonia especially in those with severe disease (Evidence A)• Lower blood and sputum eosinophils are associated with greater presence of proteobacteria, notably <i>Haemophilus</i>, increased bacterial infections & pneumonia• Independent of ICS use, there is evidence that a blood eosinophil count < 2% increases the risk of pneumonia (Evidence C)• Triple inhaled therapy of LABA+LAMA+ICS improves lung function, symptoms and health status, and reduces exacerbations, compared to LABA+ICS, LABA+LAMA or LAMA monotherapy (Evidence A). Recent data suggest a beneficial effect of triple inhaled therapy versus fixed-dose LABA+LAMA combinations on mortality in symptomatic COPD patients with a history of frequent and/or severe exacerbations• Single inhaler therapy may be more convenient and effective than multiple inhalers
Oral Glucocorticoids	<ul style="list-style-type: none">• Long-term use of oral glucocorticoids has numerous side effects (Evidence A) with no evidence of benefits (Evidence C)
PDE4 Inhibitors	<ul style="list-style-type: none">• In patients with chronic bronchitis, severe to very severe COPD and a history of exacerbations:<ul style="list-style-type: none">• A PDE4 inhibitor improves lung function and reduces moderate and severe exacerbations (Evidence A)• A PDE4 inhibitor improves lung function and decreases exacerbations in patients who are on fixed-dose LABA+ICS combinations (Evidence A)
Antibiotics	<ul style="list-style-type: none">• Long-term azithromycin and erythromycin therapy reduces exacerbations over one year (Evidence A)• Treatment with azithromycin is associated with an increased incidence of bacterial resistance (Evidence A) and hearing test impairments (Evidence B)
Mucoregulators and Antioxidant Agents	<ul style="list-style-type: none">• Regular treatment with mucolytics such as erdosteine, carbocysteine and NAC reduces the risk of exacerbations in select populations (Evidence B)
Other Anti-Inflammatory Agents	<ul style="list-style-type: none">• Simvastatin does not prevent exacerbations in COPD patients at increased risk of exacerbations and without indications for statin therapy (Evidence A). However, observational studies suggest that statins may have positive effects on some outcomes in patients with COPD who receive them for cardiovascular and metabolic indications (Evidence C)• Leukotriene modifiers have not been tested adequately in COPD patients

The Inhaled Route

Right inhaler for the Right patient



ABE of COPD

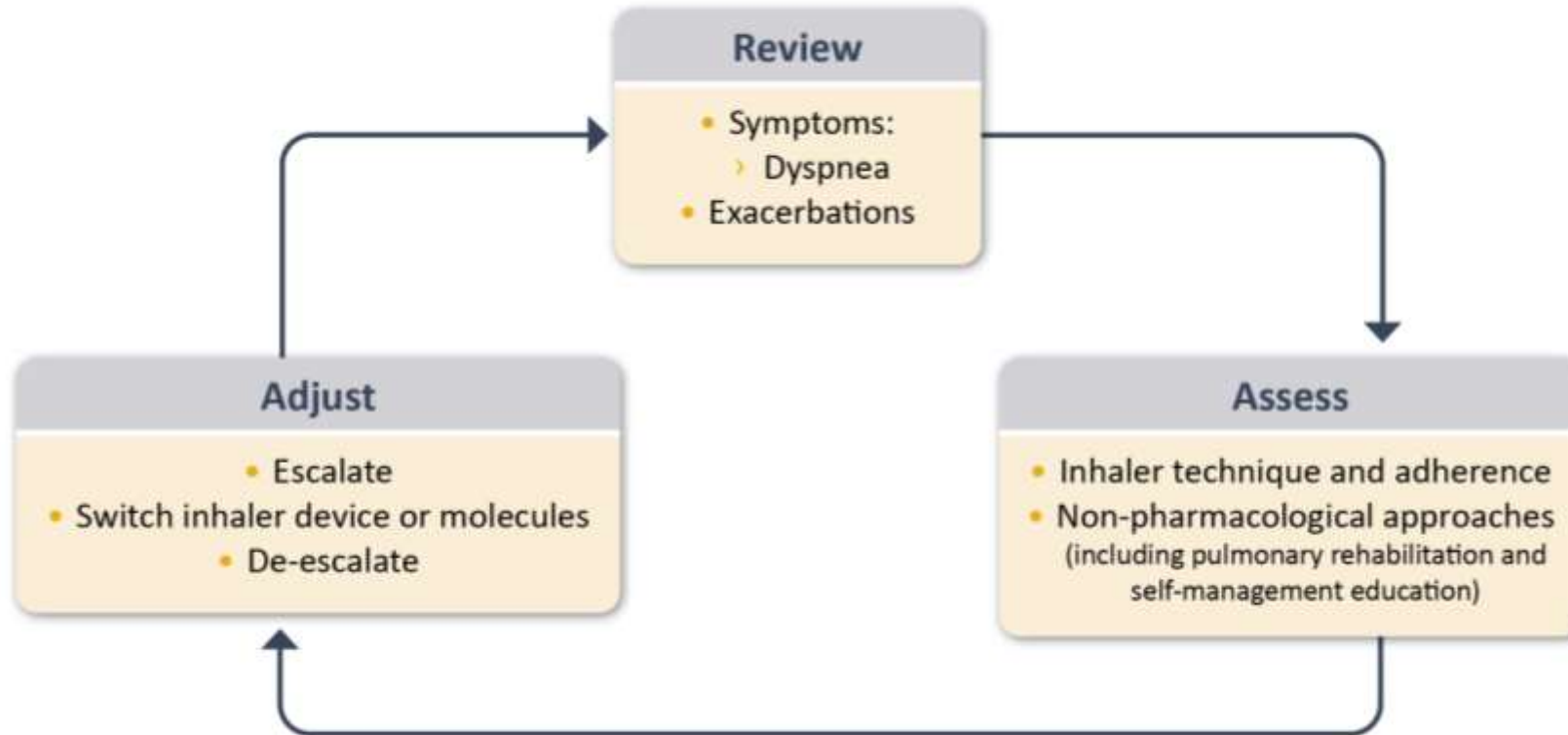
Initial Pharmacological Treatment

Figure 4.2



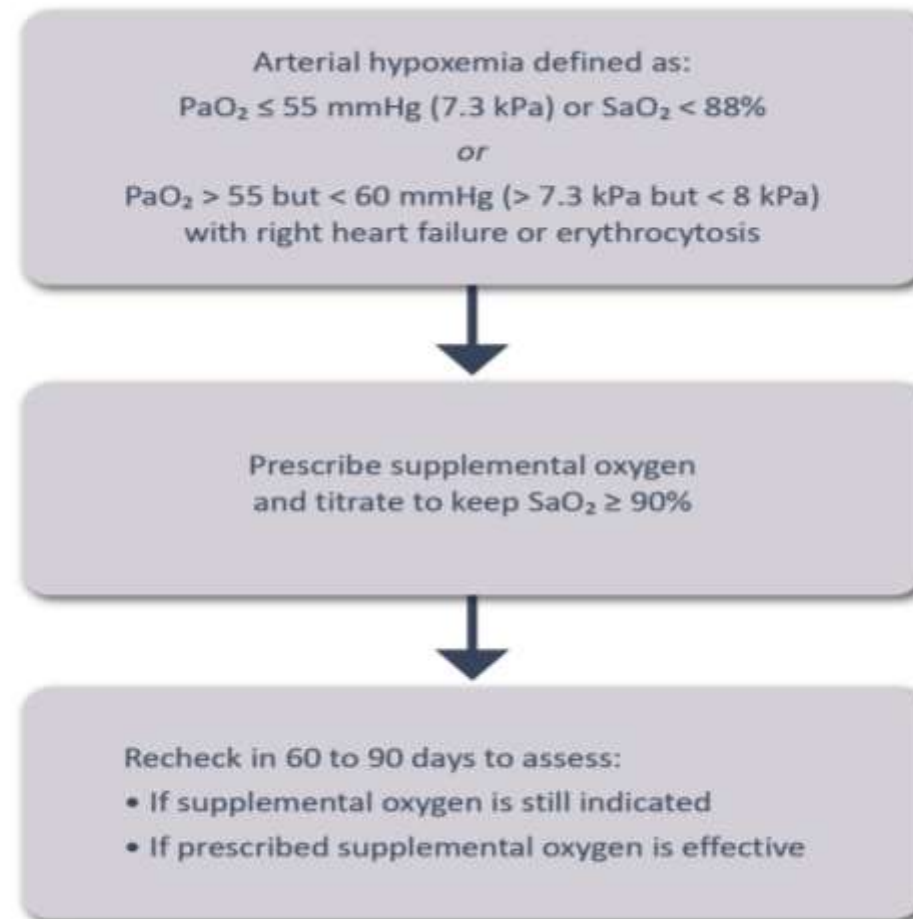
*single inhaler therapy may be more convenient and effective than multiple inhalers
Exacerbations refers to the number of exacerbations per year

Management Cycle



Oxygen therapy

Long-term oxygen therapy is indicated for stable patients who have:



Interventional bronchoscopy and surgery

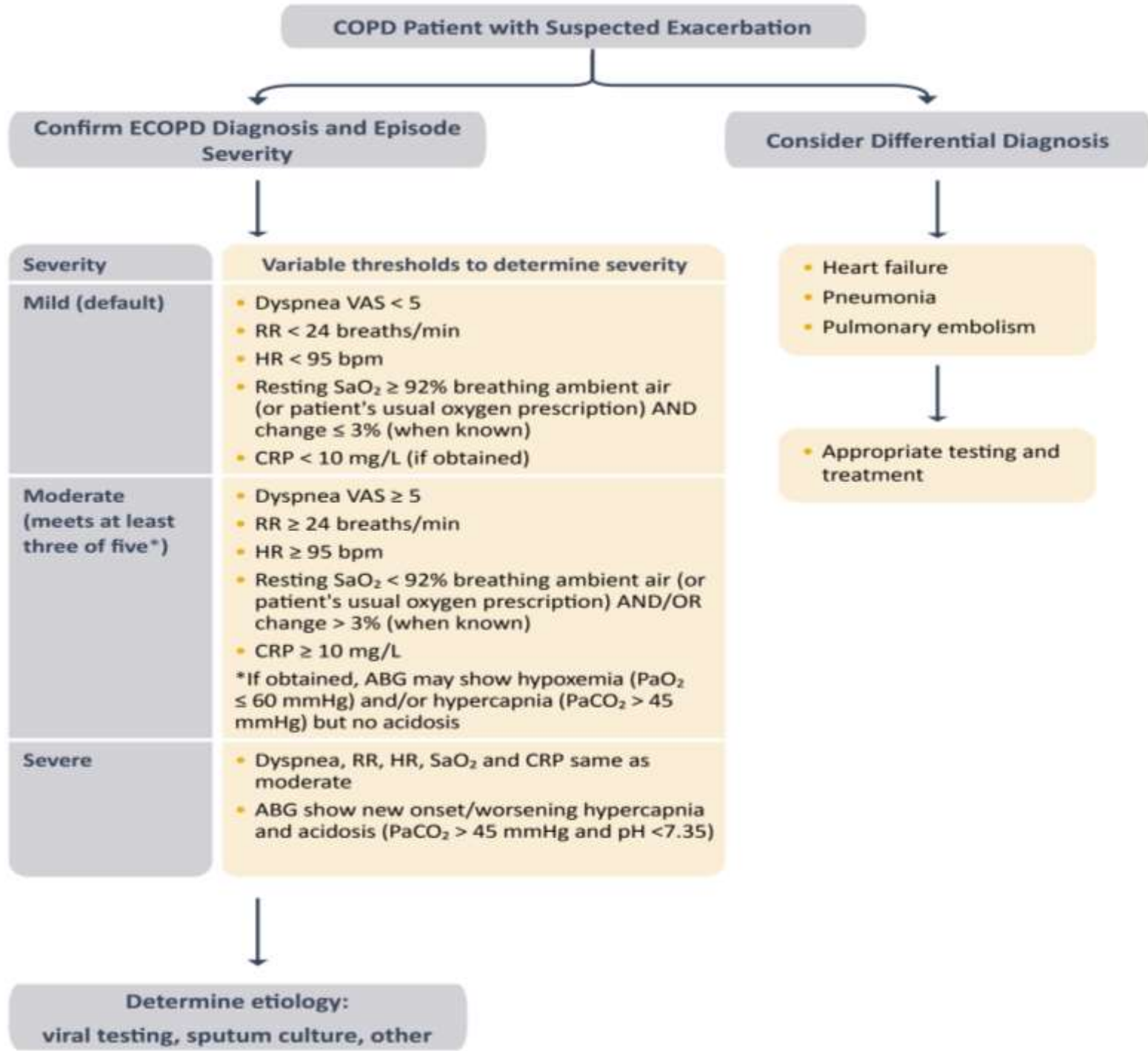
Surgical or endoscopic LVRS

Bullectomy

Transplant

Management of Exacerbations

COPD exacerbations are defined as an acute worsening of respiratory symptoms that result in additional therapy.



Management of Exacerbations

- Bronchodilators
- Corticosteroids
- Antibiotics
- Controlled oxygen therapy
- Ventilatory support; non invasive/invasive

Indication for Non Invasive Ventilation

At least one of the following:

- Respiratory acidosis ($\text{PaCO}_2 \geq 6.0$ kPa or 45 mmHg and arterial pH ≤ 7.35)
- Severe dyspnea with clinical signs suggestive of respiratory muscle fatigue, increased work of breathing, or both, such as use of respiratory accessory muscles, paradoxical motion of the abdomen, or retraction of the intercostal spaces
- Persistent hypoxemia despite supplemental oxygen therapy

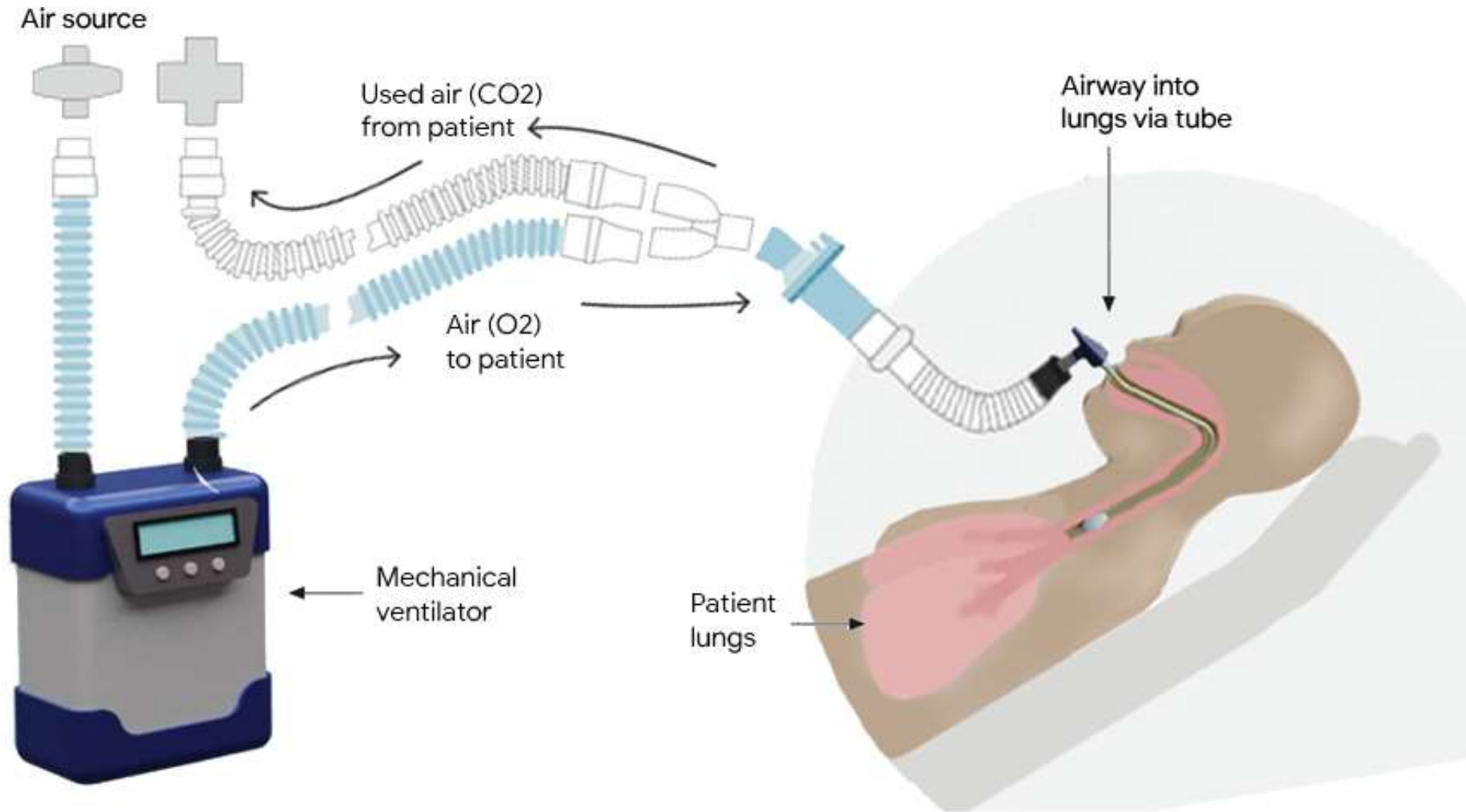
Non invasive Ventilation NIV



Invasive Mechanical ventilation

- Unable to tolerate NIV or NIV failure
- Status post-respiratory or cardiac arrest
- Diminished consciousness, psychomotor agitation inadequately controlled by sedation
- Massive aspiration or persistent vomiting
- Persistent inability to remove respiratory secretions
- Severe hemodynamic instability without response to fluids and vasoactive drugs
- Severe ventricular or supraventricular arrhythmias
- Life-threatening hypoxemia in patients unable to tolerate NIV

Invasive mechanical ventilation





Bronchiectasis

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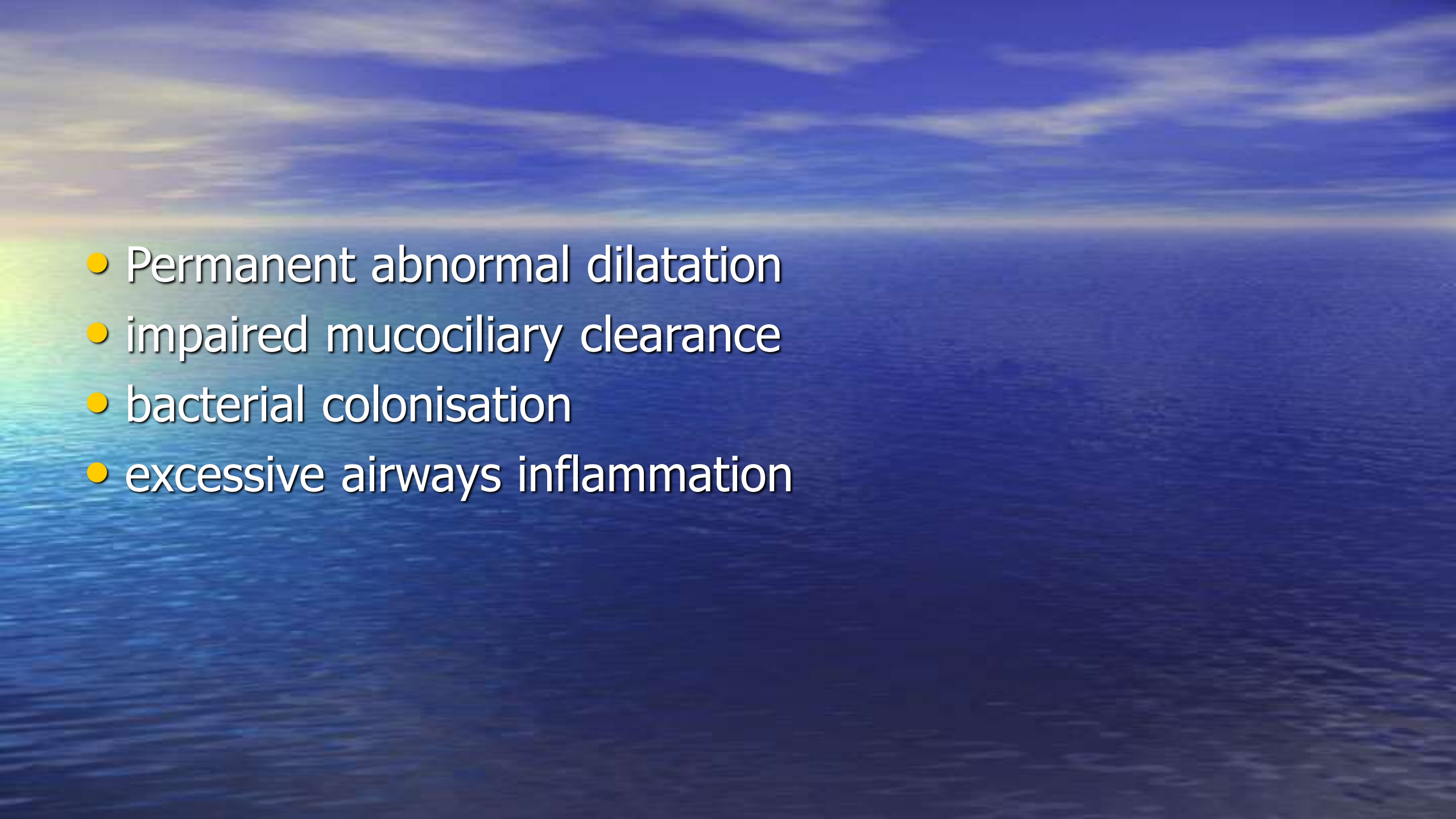
Bronchiectasis

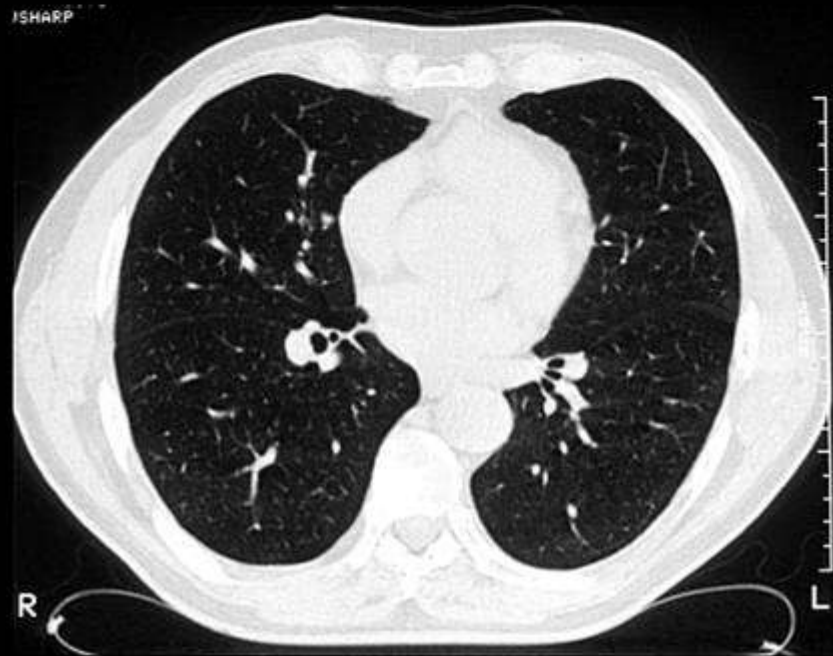
Originally described by Laennec in 1819

- Chronic
- Debilitating

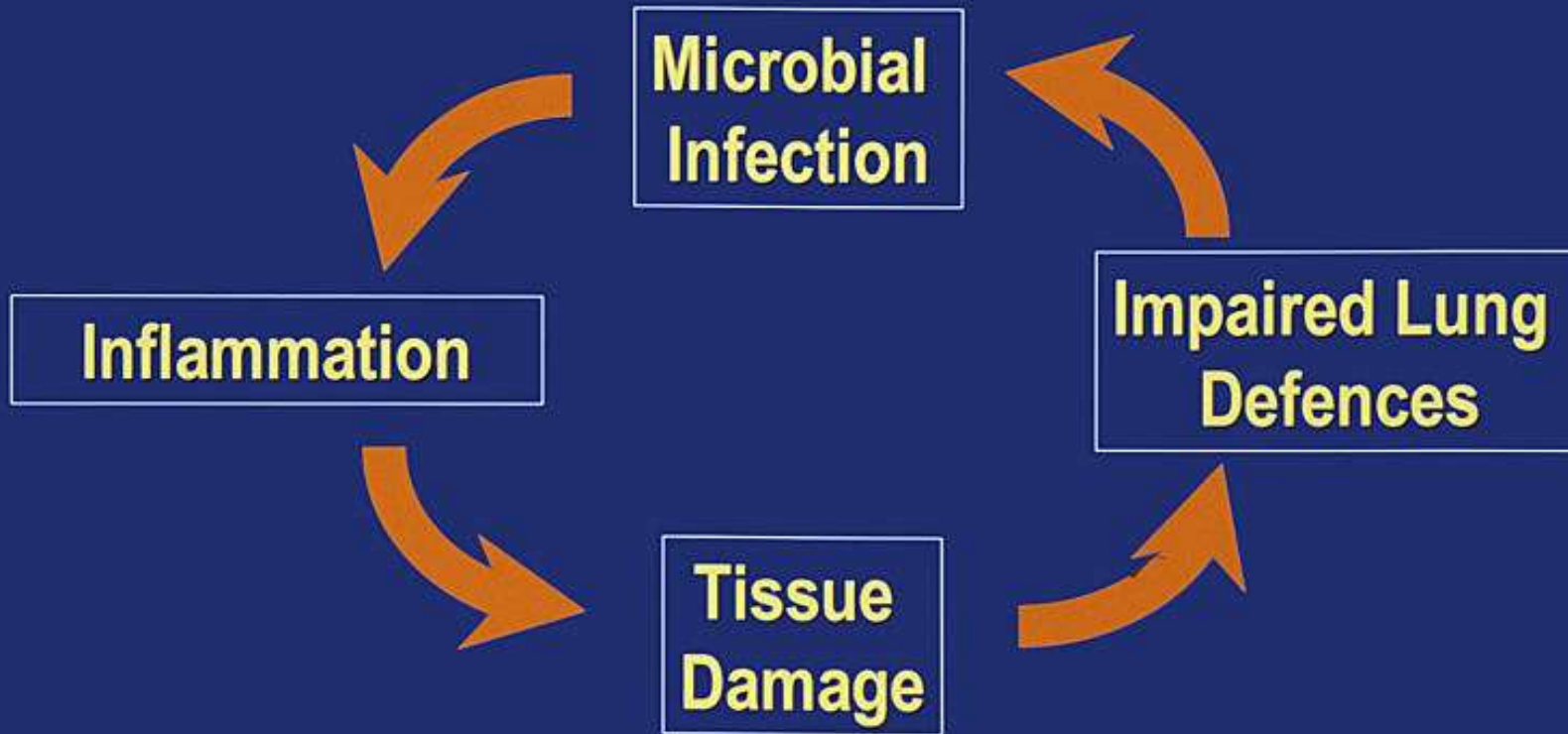
Characterised

- persistent cough
- excessive sputum production
- recurrent chest infection

- 
- Permanent abnormal dilatation
 - impaired mucociliary clearance
 - bacterial colonisation
 - excessive airways inflammation



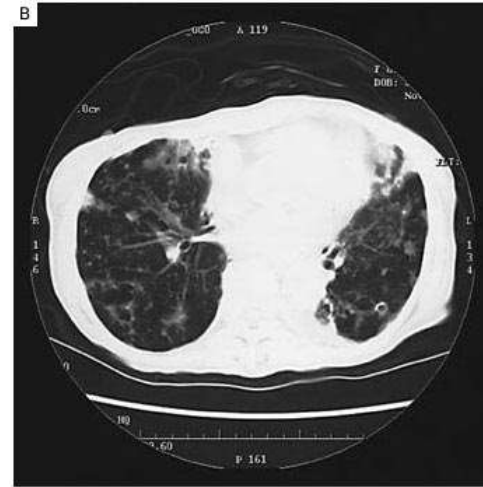
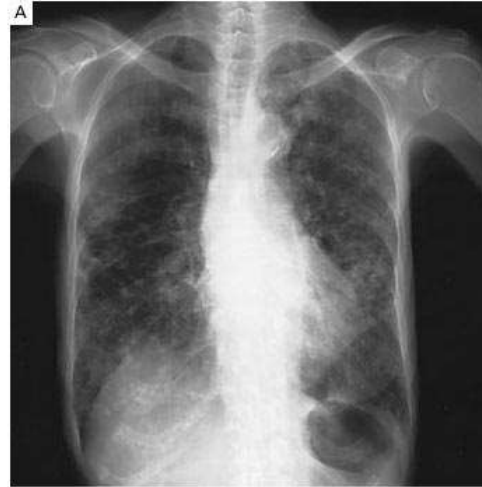
A VICIOUS CYCLE OF INFECTION AND INFLAMMATION



Etiology

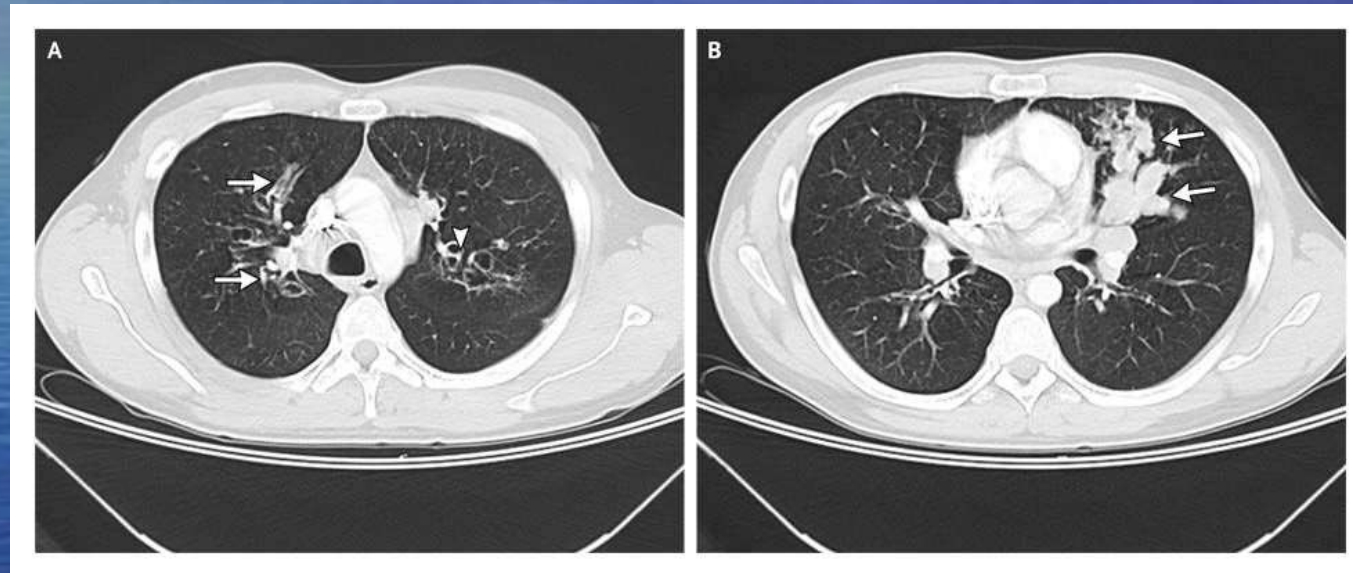
- Acquired bronchiectasis
 - Recurrent pulmonary infection
 - Bronchial obstruction
 - Childhood infection e.g measles, pertussis
 - Aspiration
- Congenital bronchiectasis
 - Kartagener's syndrome
 - Hypogammaglobulinemia
 - Cystic fibrosis
 - Abnormal cartilage formation

An 81-year-old woman was admitted with weight loss (18 kg in 27 months), hemoptysis, and tubular and diffuse granular shadows on her chest radiograph (Panel A)



**Final diagnosis:
MAC infection
of bronchiectasis**

A 26-year-old man who smoked and had a long history of poorly controlled asthma and severe environmental allergies was admitted for an exacerbation of asthma. Total IGE 5000, Aspergillus IGE raised, Aspergillus antibody raised.



Final diagnosis: ABPA

34-year-old man

recurrent respiratory infections

Chest problems since childhood
told that he had asthma but
inhalers not effective

Symptoms and signs of
malabsorption

Diabetic on Insulin

He struggled at school due to
frequent absence due to "chest
infections"

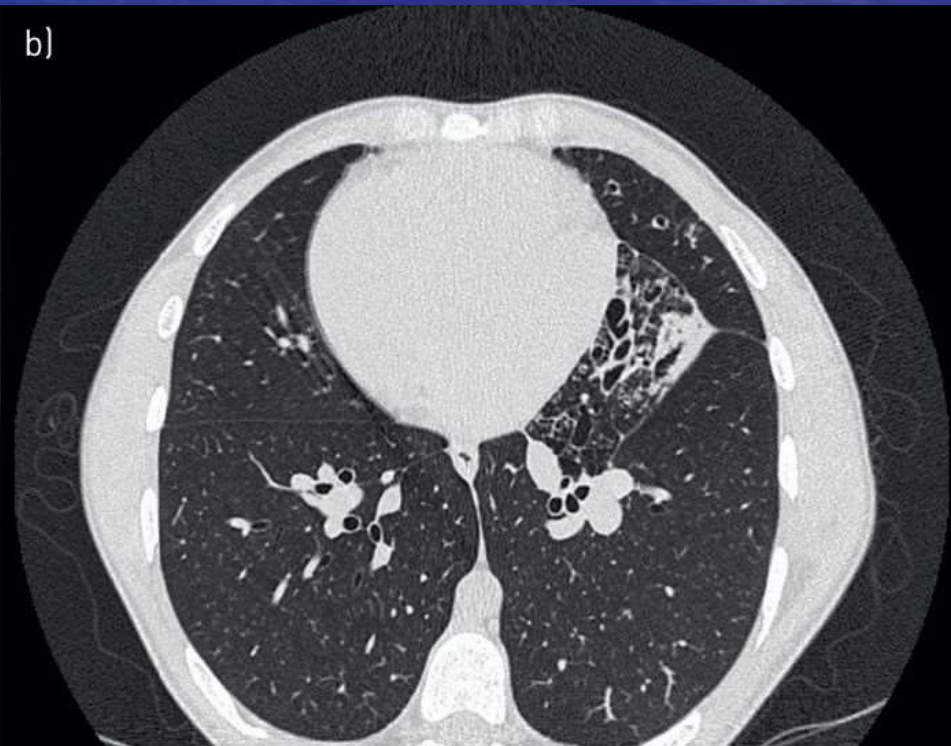
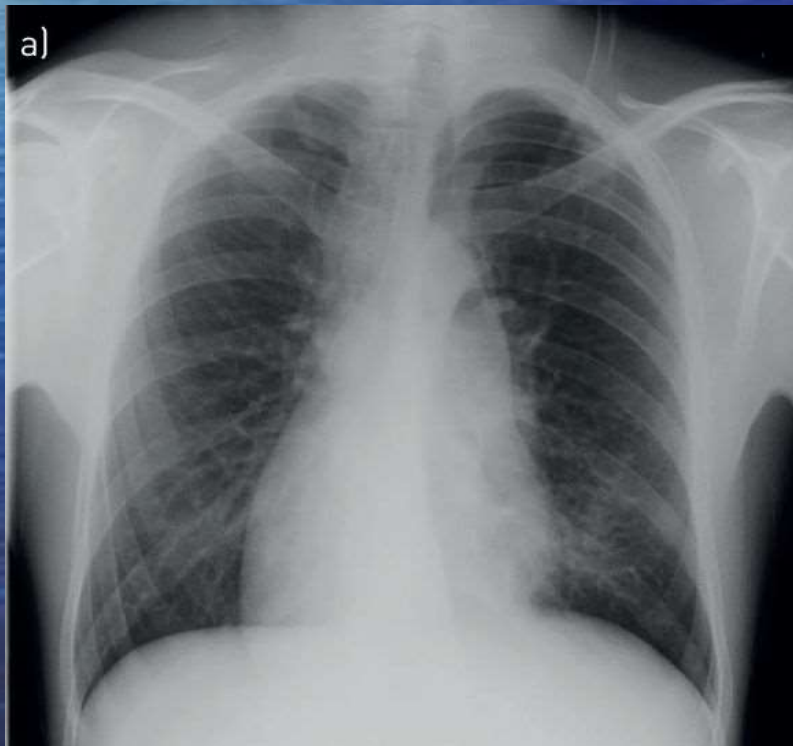
Married no children

Sister and Cousin have similar
chest problems



CF

- 17 Year old
- Respiratory problems from childhood
- Grand parents describe him as a small child with chronic cough from birth
- Recurrent ear and sinus infections which have led to partial deafness
- His brother and one of his cousins are similarly affected



PCD



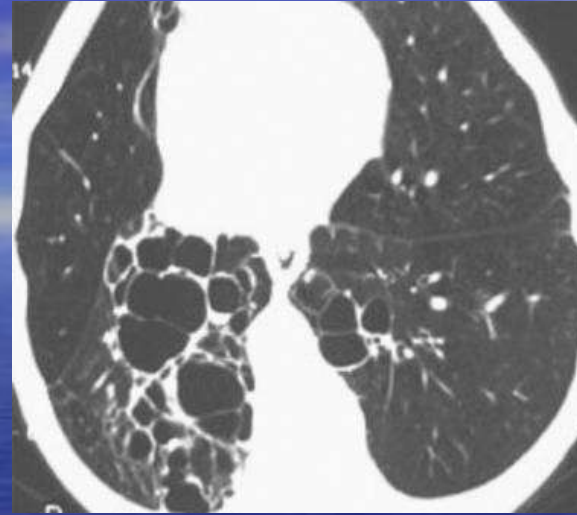
1) 75 year old lady

Had TB 55 years ago

Chronic cough and SOB

Recurrent LRTI

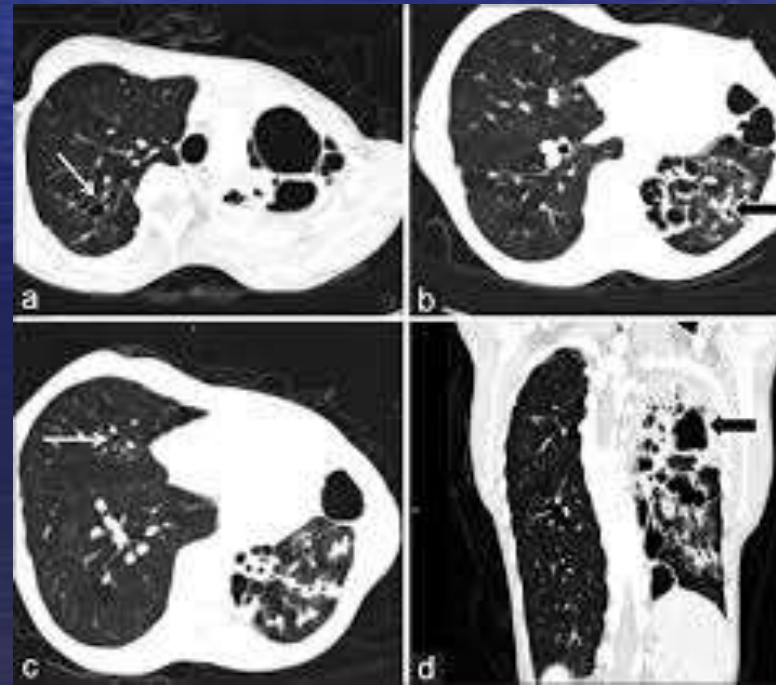
Sputum production



2) 79 YEAR old man

Cough, sputum production and recurrent LRTI

POST TB





Bronchiectasis

Adults

Who to suspect

Persistent productive cough

- young age at presentation
- symptoms over many years
- absence of smoking history
- daily expectoration of large volumes of sputum
- haemoptysis

Unexplained

- haemoptysis
- non-productive cough

After excluding other causes

HISTORY WHICH SHOULD LEAD TO SUSPICION OF BRONCHIECTASIS

- **Recurrent LRTI**
- **Chronic productive cough**
- **Breathlessness, wheeze**
- **Haemoptysis**
- **Chest pain**
- **Tiredness**
- **(ENT, infertility, GI, ILD)**

Investigations

- Cxray
- HRCT

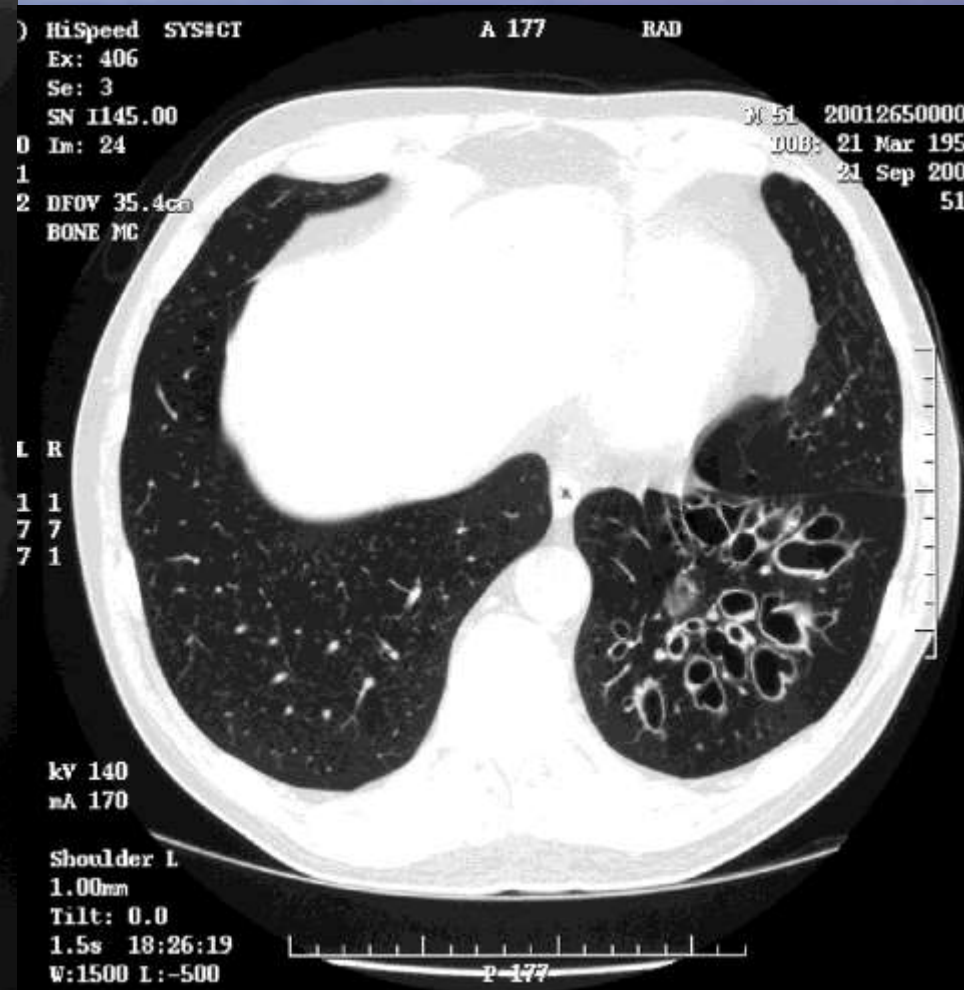
- Sputum MCS
 1. When stable
 2. Onset exacerbating

- Spirometry

Thought to have COPD

- COPD with Bronchiectasis
- no history of smoking
- there is slow recovery from lower respiratory tract infections
- recurrent exacerbations
- Sputum growth/colonised with *Pseudomonas aeruginosa*

Radiology



Exacerbations

- Is it an exacerbation
- ?Antibiotics required
 1. Deterioration over days
 2. Increasing Cough
 3. Increased sputum volume or change of viscosity
 4. increased sputum purulence + increasing wheeze & breathlessness
 5. haemoptysis
 6. systemic upset
 7. Non specific
- Antibiotic Choice, Dose and Duration

Admit

- Development of cyanosis or confusion
- Breathlessness with a respiratory rate >25/minute
- Circulatory failure, respiratory failure, cyanosis or confusion
- Temperature >38°C
- Patient unable to take oral therapy
- Patient unable to cope at home
- Haemoptysis >25mls/day
- Intravenous therapy required in patients with clinical failure after oral antibiotics

Empiric therapy

- Amoxicillin 500mg tds 14days
- Clarithromycin 500 bd
- Severe Bronchiectasis/colonised with H influenzae
Amoxicillin 1g tds/ 3g bd
- Pseudomonas colonised patients
Ciprofloxacin 500/750 bd.

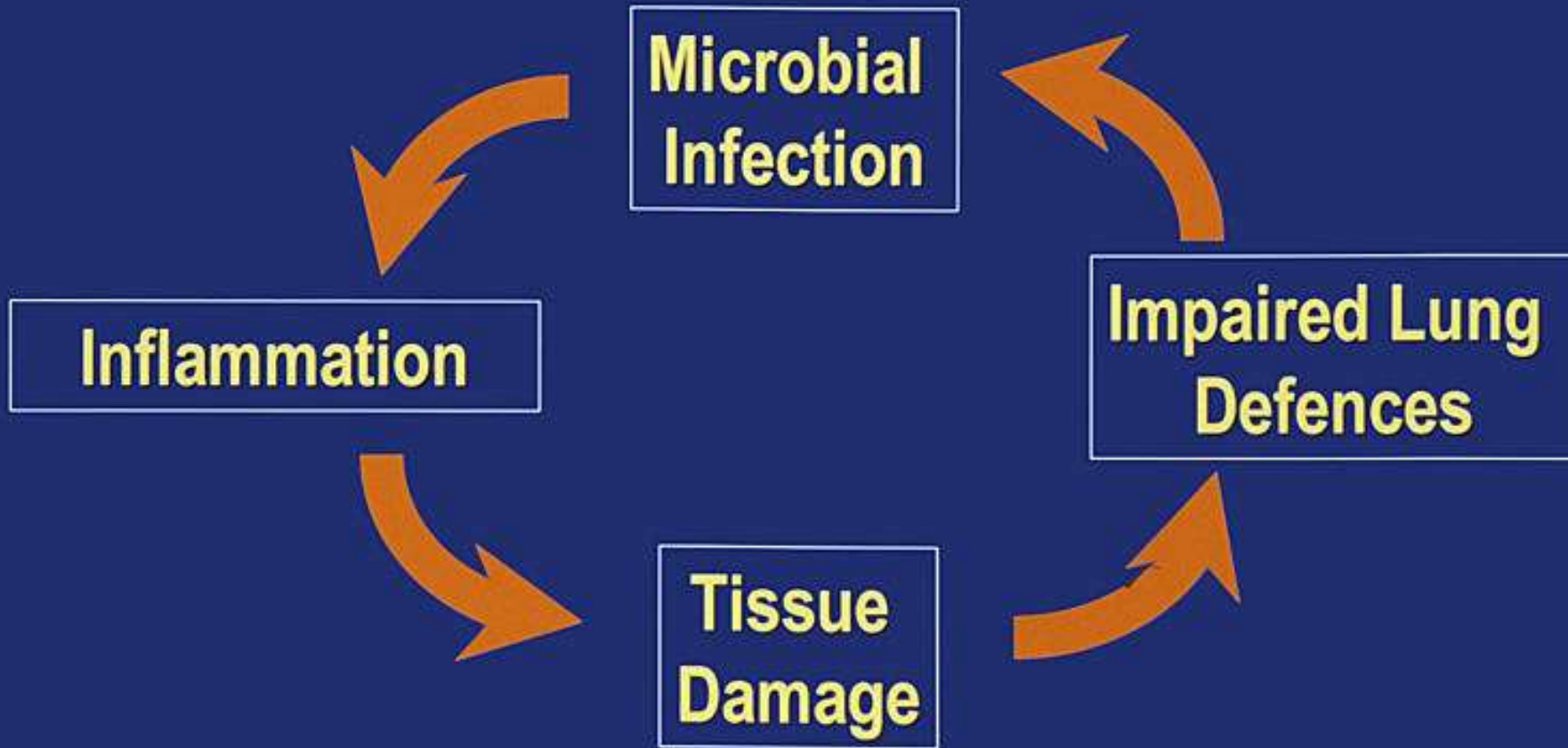
Long Term antibiotics

- =>3 Exacerbations/yr
- Fewer Exacerbation but significant morbidity
- Nebulised antibiotics Gent/tobramycin/colistin
- Long term Macrolides

Management

- Physiotherapy
- Immunisation
- Bronchodilators
- Mucolytics
- Nebulised saline

A VICIOUS CYCLE OF INFECTION AND INFLAMMATION



Monitoring

- Symptom
- Sputum Volume 24hrs/Purulence
- Frequency of Exacerbations/yr
- Frequency of Antibiotic use
- FEV1 FVC PEF annually
- Cxray only if indicated

Self Management Plan

BTS Bronchiectasis Self Management Plan

My Usual Symptoms day to day when stable- (not during a chest infection) please tick or answer

Cough

- normally cough most days of the week
- normally cough one or two days of the week
- normally cough a few days per month
- normally cough only with chest infections

Sputum

- normally cough up sputum most days of the week
- normally cough up sputum one or two days of the week
- normally cough up sputum a few days per month
- normally cough up sputum only with chest infections

What colour is it?

clear white light yellow or green dark yellow or green

How much do you cough day to day?

1 teaspoon 1 tablespoon 1/2 a sputum pot 1 sputum pot

Is your sputum?

watery sticky

Breathlessness

- normally get breathless walking around the home
- normally get breathless walking outside on the level
- normally get breathless walking up a flight of stairs
- normally get breathless playing sports
- only get breathless with chest infections
- never get breathless

Other usual symptoms e.g. wheezing, tiredness, fatigue _____

Chest infections

Signs (you may have some or all of these)

- Feeling generally unwell
- Coughing up more sputum or sputum more sticky
- Worsening colour to your sputum (clear to light or dark yellow or green Or light to dark yellow or green)
- Worsening breathlessness

Action

- Clear your chest more often (at least twice daily).
- Take your medication and inhalers.
- Drink plenty of fluids.
- Collect sputum sample and hand to GP as soon as possible (if cannot get to surgery that day, keep the sample in fridge overnight).
- Some colds get better without needing antibiotics. If there is no change in the amount or colour of your sputum **do not start** your antibiotics.
- Seek help if needed.

Name _____

Date of Birth _____

Hospital/NHS Number _____

Date _____

When to seek help



Contact Numbers

GP
Community respiratory team
Hospital respiratory team

British Thoracic Society www.brit-thoracic.org.uk



Day to day

- Clear your chest as advised by your physiotherapist.
- Take your medication and inhalers, if on them, as prescribed.
- Never allow medicines to run out.
- Keep a rescue antibiotic course at home.
- Drink plenty of fluids, eat a healthy diet and take regular exercise.
- Don't smoke. Ask for help from your practice nurse if needed.
- Get your annual flu vaccination.
- Avoid visiting anyone who is unwell with a cold, flu or chest infection.
- Keep a supply of sputum pots in the house.
- Know how much sputum you have and its colour.

Recommended chest treatment day to day

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Recommendation treatment for chest infections

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

A VICIOUS CYCLE OF INFECTION AND INFLAMMATION

