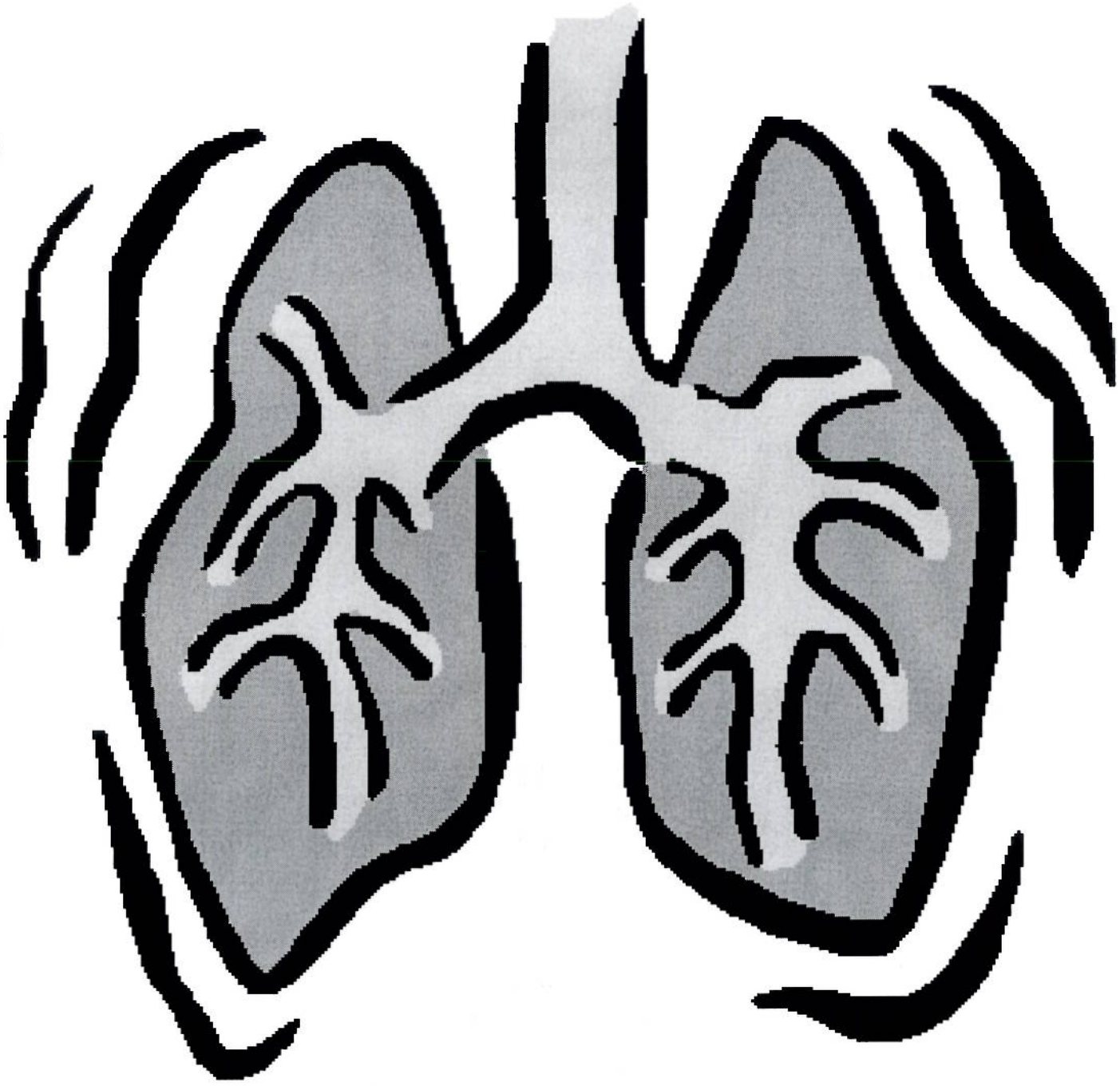
RESPIRATORY MEDICINE
SHOAIB

Elective Report



Qasim Shoaib

COPD and its' management in the community

I undertook my elective in respiratory medicine. I chose respiratory medicine as I find it interesting. It is a wide and diverse specialty that deals with over 30 conditions- some that are very common, others more rare. Being based on the ward and outpatient setting, I was able to see first hand a variety of respiratory conditions. These included acute severe conditions such as pneumothoraces/ exacerbation of asthma, and chronic conditions such as COPD/pulmonary fibrosis. COPD was frequently seen, both acutely and out in the community. I was part of the respiratory multi-disciplinary team, working alongside specialist respiratory nurses, physiotherapists, speech and language therapists, dieticians, community respiratory teams as well as other medical staff.

Definition

Chronic Obstructive Pulmonary Disease (COPD) is a chronic lung condition characterised by airflow obstruction (defined as a reduced FEV1/FVC ratio) that is not completely reversible. In the long term airflow obstruction does not markedly change over several months but is usually progressive.

A combination of airway and parenchymal damage is responsible for the airflow limitation. This damage is usually a result of tobacco smoke which causes chronic inflammation; the inflammation seen in COPD differs to that seen in asthma. Symptoms of COPD develop insidiously, most people are not diagnosed until they are in their 50's.

Prevalence

According to the Quality outcome framework (QOF) 1.5% of the population has been diagnosed with COPD- approximately 900,000. A further 2 Million people are thought to be COPD sufferers but remain undiagnosed. Therefore, It is estimated that up to 3 Million people are affected by COPD in the UK.

When a group of primary care patients, aged 45 and over, were screened opportunistically to assess lung function. The prevalence of an abnormal FEV1 with respiratory symptoms was found to be 9%. This prevalence increases with age and there are significant variations in the prevalence of COPD geographically. The prevalence of COPD has not reduced in recent years unlike other common chronic conditions, prevalence rates have reached a plateau in men but still increasing in women steadily.

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The prevalence of COPD closely correlates with deprivation levels- a higher level of deprivation is associated with high rates of COPD.

Mortality/morbidity

COPD is the 5th leading cause of death in the UK (4th worldwide) accounting for approximately 30,000 deaths in the UK each year; most deaths (>90%) occur in the over 65 age group. COPD accounts for 23% of all respiratory deaths, it is 3rd largest cause of respiratory death. Due to an ageing population, the prevalence of COPD, and hence mortality from COPD, is expected to increase further. By the year 2020, COPD is expected to become the 3rd leading cause of death worldwide after heart disease and stroke.

Following diagnosis, the 5-year survival in those with clinically mild disease is 78% in men and 72% in women, this falls to 30% in men and 24% in women in those with severe disease.

Mortality from COPD demonstrates a strong urban rural gradient with the highest mortality rates in the large conurbations in the north of England. Social inequalities affects mortality; men aged 20-64, employed in manual unskilled sectors, are 14 times more likely to die from COPD than those in higher social classes with professional occupations.

Despite the fact that a small proportion of COPD patients are admitted to hospital, 1 in 8 emergency hospital admissions are COPD related- the 2nd largest cause of emergency admissions to hospital in the UK.

The chief medical officer estimates the direct cost of COPD to the NHS is £810-930 Million/year. The indirect costs of COPD are considerable, accounting for an estimated 24 million lost working days/ year, grossly impacting annual productivity.

Diagnosing COPD

There is no single diagnostic test. The diagnosis should be suspected on the basis of signs and symptoms with supporting evidence from spirometry. COPD is considered in patients over 35 with a risk factor (usually smoking) who present with one or more of the following symptoms:

- exertional breathlessness

- chronic cough
- regular sputum production
- frequent winter 'bronchitis'
- wheeze

One of the main symptoms of COPD is breathlessness, the degree of breathlessness should be graded according to the medical research council (MRC) dyspnoea scale.

Table 1 MRC dyspnoea scale

Grade	Degree of breathlessness related to activities
1	Not troubled by breathlessness except on strenuous exercise
2	Short of breath when hurrying or walking up a slight hill
3	Walks slower than contemporaries on level ground because of breathlessness, or has to stop for breath when walking at own pace
4	Stops for breath after walking about 100 metres or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when dressing or undressing

<u>Spirometry</u>

Should be performed at the time of diagnosis. This should be done post bronchodilator to confirm the diagnosis of COPD. An alternative diagnosis should be considered in older people where the FEV1/FVC ratio is less than 0.7 and without typical COPD symptoms and in younger people with symptoms of COPD where the FEV1/FVC ratio is greater than 0.7.

Other conditions that may present with similar symptoms include:

- Asthma
- Bronchiectasis
- Congestive heart failure
- Broncial carcinoma
- Bronchopulmonary dysplasia

	COPD	Asthma
Smoker or ex-smoker	Nearly all	Possibly
Symptoms under age 35	Rare	Often
Chronic productive cough	Common	Uncommon
Breathlessness	Persistent and progressive	Variable
Night time waking with breathlessness and/or wheeze	Uncommon	Common
Significant diurnal or day-to-day variability of symptoms	Uncommon	Common

In addition to spirometry, at the time of initial evaluation patients should also receive a chest radiograph to exclude other pathologies, FBC (anaemia/polycythaemia) and their BMI calculated. Other investigations that may be performed include:

Table 2 Additional investigations

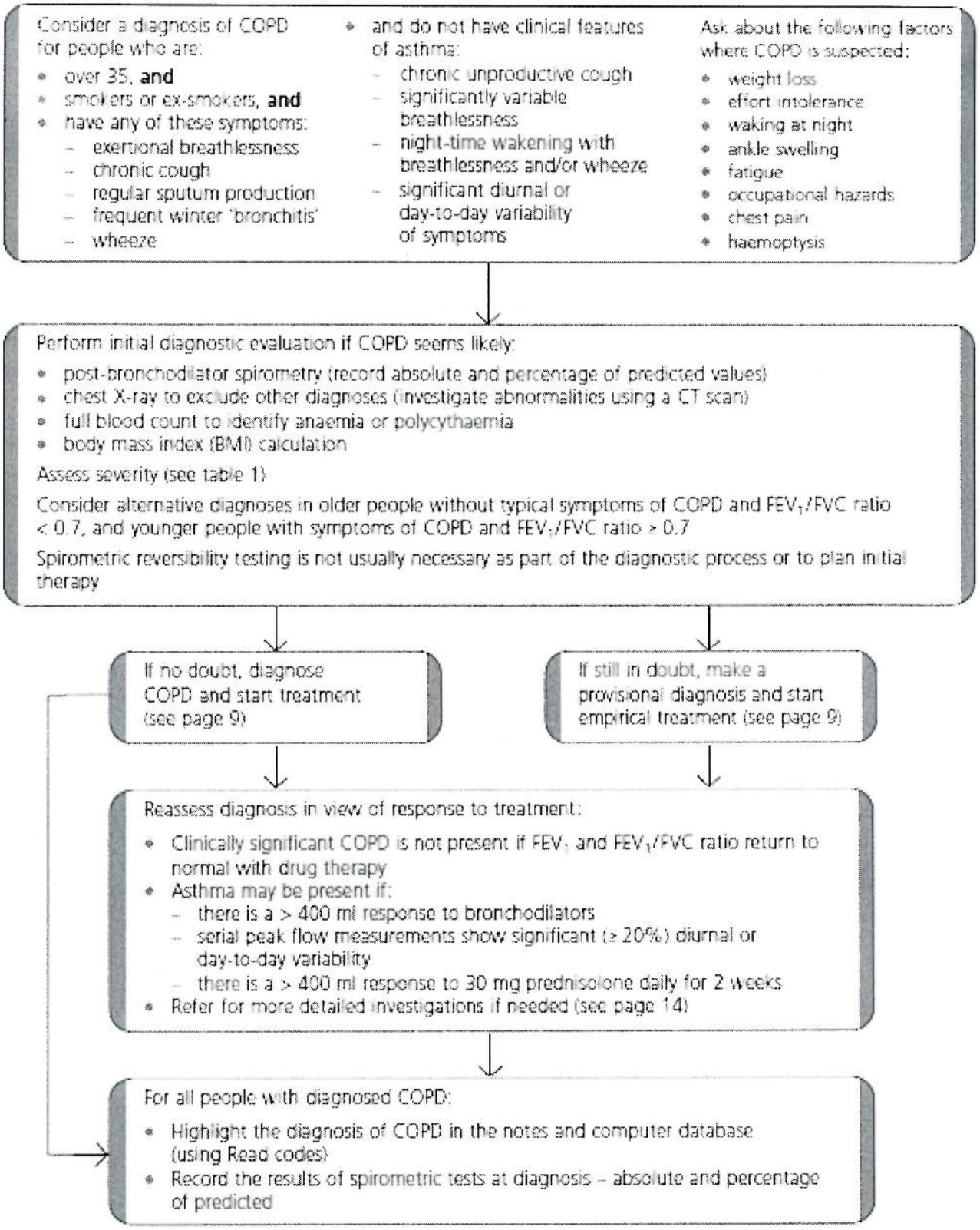
Investigation	Role
Serial domiciliary peak flow measurements	To exclude asthma if diagnostic doubt remains
Alpha-1 antitrypsin	If early onset, minimal smoking history or family history
Transfer factor for carbon monoxide (T_LCO)	To investigate symptoms that seem disproportionate to the spirometric impairment
CT scan of the thorax	To investigate symptoms that seem disproportionate to the spirometric impairment To investigate abnormalities seen on a chest radiograph To assess suitability for surgery
ECG	To assess cardiac status if features of cor pulmonale
Echocardiogram	To assess cardiac status if features of cor pulmonale
Pulse oximetry	To assess need for oxygen therapy If cyanosis or cor pulmonale present, or if FEV_1 < 50% predicted
Sputum culture	To identify organisms if sputum is persistently present and purulent

Disease Severity

Disease severity is important to identify due to implications of treatment and prognosis. COPD is heterogenous, therefore there is no single measure that adequately assesses true disease severity. The BODE index (BMI, airflow-obstruction, dyspnoea, exercise capacity) is calculated which is used to assess prognosis.

The reduction in FEV1 is used to assess airflow obstruction as shown below:

		NICE clinical guideline 12 (2004)	ATS/ERS[4] 2004	GOLD 2008[5]	NICE clinical guideline 101 (2010)
Post-bronchodilator FEV_1/FVC	FEV_1 % predicted	Severity of airflow obstruction			
			Post-bronchodilator	Post-bronchodilator	Post-bronchodilator
< 0.7	≥ 80%		Mild	Stage 1 – Mild	Stage 1 – Mild*
< 0.7	50–79%	Mild	Moderate	Stage 2 – Moderate	Stage 2 – Moderate
< 0.7	30–49%	Moderate	Severe	Stage 3 – Severe	Stage 3 – Severe
< 0.7	< 30%	Severe	Very severe	Stage 4 – Very severe**	Stage 4 – Very severe**



The above flow diagram summarises the process of diagnosing COPD.

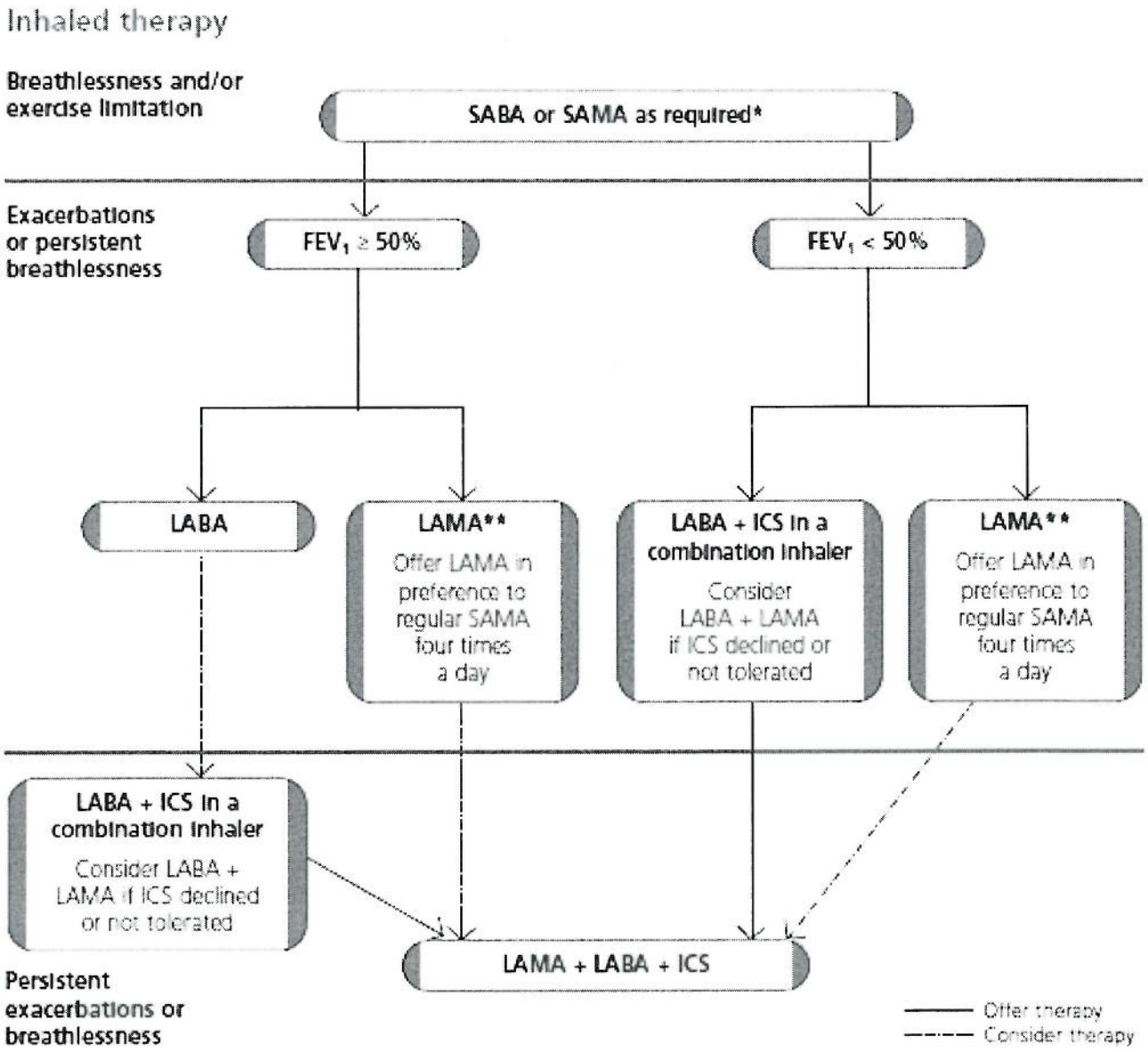
Managing stable COPD

Smoking Cessation

A thorough smoking history should be documented for all diagnosed with COPD. All should be encouraged to stop regardless of age and disease severity. A number of options may be considered including offering nicotine replacement therapy, varenicline, bupropion with an additional support programme to enhance rate of quitting.

Inhaled Therapy

The below diagram summarises use of inhaled therapy in COPD:



Short acting B agonists/Short acting anti-muscarincs

This is the initial empirical treatment used to relieve breathlessness and exercise limitation.

Corticosteroids

Maintenance use of oral corticosteroids is not normally recommended. However, these may be required in advanced COPD following an exacerbation. The dose needs to be kept as low as possible and the patient requires regular monitoring for side effects/complications of steroids.

Theophylline

Offer after trailing short and long acting bronchodilators or to those who cannot use inhaled therapy. They can be given with B2 agonists/muscarinc antagonists

Mucolytic Therapy

These can be considered for people with a chronic productive cough.

Treatments NOT recommended include:

- **Anti-oxidant therapy**
- **Anti-tussive therapy**
- **Prophylactic antibiotic therapy.**

Delivery Systems

Most people are able to acquire adequate inhaler technique once appropriate instructions/training is given. An exception is in those with cognitive impairment, in this case a pragmatic approach is required to choose the delivery device most suited to the patient. Devices include:

Delivery systems

Inhalers	• Hand-held devices are usually best, with a spacer if appropriate • If a person cannot use a particular device, try another • Teach technique before prescribing and check regularly
Spacers	• Ensure the spacer is compatible with the inhaler • Individuals should make single actuations of the inhaler into the spacer, and inhale as soon as possible, repeating as needed. Tidal breathing is as effective as single breaths • Do not clean spacers more than once a month. Clean with water and washing-up liquid and allow to air dry
Nebulisers	• Consider a nebuliser for people with distressing or disabling breathlessness despite maximum therapy with inhalers • Assess the individual and/or carer's ability to use the nebuliser before prescribing and arrange appropriate support and maintenance of equipment • Allow the patient to choose either a facemask or mouthpiece where possible • Continue nebuliser treatment only if there is an improvement in symptoms, daily living activities, exercise capacity or lung function

Oxygen Therapy

Oxygen is usually administered by the following methods:

Long term oxygen therapy(LTOT)

This is indicated in patients with COPD with PaO2 < 7.3kPa when stable or a PaO2 < 8kPa with either; secondary polycythemia, nocturnal hypoxaemia, pulmonary hypertension or peripheral oedema. Patients are required to use the oxygen for a minimum of 15 hrs/day, however maximum benefit is achieved with 20 hrs use or more.

Ambulatory Oxygen

This is prescribed to patients on LTOT who are prepared to continue using oxygen outside the home. It is also considered in patients who desaturate upon exercising.

Short Burst Therapy

This is considered only for patients who experience episodes of severe breathlessness that is not relieved by other treatments.

Follow-up/review of COPD patients

Patients should be reviewed at least once a year with mild/moderate COPD, with a twice yearly review recommended for those with very severe disease. The review should cover the following assessments and tests.

Mild, moderate or severe airflow obstruction (stages 1–3)	Very severe airflow obstruction (stage 4)
Assess: • Smoking status and desire to quit • Adequacy of symptom control: – breathlessness – exercise tolerance – estimated exacerbation frequency • Presence of complications • Effects of each drug treatment • Inhaler technique • Need for referral to specialist and therapy services • Need for pulmonary rehabilitation	Assess: • Smoking status and desire to quit • Adequacy of symptom control: – breathlessness – exercise tolerance – estimated exacerbation frequency • Presence of cor pulmonale • Need for LTOT • Nutritional state • Presence of depression • Effects of each drug treatment • Inhaler technique • Need for social services and occupational therapy input • Need for referral to specialist and therapy services • Need for pulmonary rehabilitation
Measure: • FEV_1 and FVC • BMI • MRC dyspnoea score	Measure: • FEV_1 and FVC • BMI • MRC dyspnoea score • Oxygen saturation of arterial blood (SaO_2)

COPD often experience an exacerbation of their condition. An exacerbation is a sustained worsening of the patient's symptoms and is usually acute in onset. Typical symptoms include worsening breathlessness and cough, greater production of sputum and a change in its colour. An exacerbation requires immediate treatment and it is important to assess the need for hospital admission- the following factors are assessed to make that decision.

Factor	Treat at home	Treat in hospital
Able to cope at home	Yes	No
Breathlessness	Mild	Severe
General condition	Good	Poor/deteriorating
Level of activity	Good	Poor/confined to bed
Cyanosis	No	Yes
Worsening peripheral oedema	No	Yes
Level of consciousness	Normal	Impaired
Already receiving LTOT	No	Yes
Social circumstances	Good	Living alone/not coping
Acute confusion	No	Yes
Rapid rate of onset	No	Yes
Significant comorbidity (particularly cardiac disease and insulin-dependent diabetes)	No	Yes
SaO_2 < 90%	No	Yes
Changes on chest radiograph	No	Present
Arterial pH level	≥ 7.35	< 7.35
Arterial PaO_2	≥ 7 kPa	< 7 kPa