# Chronic obstructive pulmonary disease (COPD)

## *Executive summary*

## Introduction

COPD is a chronic lung condition characterised by air-flow limitation that is not fully reversible. It usually progresses over time – either gradually or in a step-wise fashion. It is most commonly associated with smoking, but may also be associated with cooking over wood fires, exposure to dust or a history of TB.

COPD is not easy to diagnose. There is no single test and the diagnosis will depend on a good history and examination, supported by spirometry. Needless to say,tests are at best suggestive of COPD. It is not curable but can be treated. Adequate treatment can slow the rate of progression.

## Target users

* Doctors
* Nurses

## Target area of use

* Outpatients department
* Ward

## Key areas of focus / New additions / Changes

This guideline outlines the diagnosis and management of COPD in our setting.

## Limitations

There is limited access to spirometry and inhaled steroids.

## Diagnosis

### Presenting symptoms and signs

Patients complain of shortness of breath on exertion, chronic cough, often productive of sputum, wheeze and recurrent chest infections.

The exact degree of exertion required to bring on symptoms will vary from patient to patient. Some patients will not experience much shortness of breath but will have limited their activity levels to avoid exertion. This leads to most patients being overweight – however, patients with very severe disease can develop cachexia.

Most patients will give a history of smoking or other environmental exposure. A few patients may have a history of asthma which has evolved into COPD.

Symptoms commonly vary in severity over the day or from week to week. They are most often worse in the mornings.

### Examination findings

Patients may be using their accessory respiratory muscles. They may purse their lips on expiration. The lungs may be over-distended, with very reduced air entry and a long expiratory phase. There may be wheeze on auscultation.

Patients may have signs of right heart failure in established disease. Mild ankle oedema may be seen even in the absence of heart failure. Clubbing is not typical of COPD and suggests another diagnosis.

The saturations should be measured. Levels below 92% on air are abnormal.

### Investigation

* Hb – anaemia commonly coexists with COPD and treatment can reduce symptoms.
* Blood glucose, renal profile and electrolytes are all useful to exclude alternative causes of shortness of breath. If the renal function is normal, but the bicarbonate is raised, this is an indication of chronic under-ventilation. This is very important to note in hypoxic patients.
* Spirometry is not available here. PEFR can be measured instead, but it often underestimates the degree of airflow obstruction in COPD.
* Chest X-ray is important to exclude other diagnoses. About half of patients with COPD have a normal X-ray. Features supportive of a diagnosis of COPD are: increased radiolucency of the lung, flat diaphragm, long, narrow heart shadow, bullae and evidence of right heart failure.
* ECG may show right axis deviation, incomplete right bundle branch block, low voltage across all leads, persistent S waves in the precordial leads or prominent peaked P waves in leads II, III and aVF.

## Differential diagnoses

* Bronchial Asthma
* Central airway obstruction may be caused by a malignancy or by TB lymph nodes.
* Bronchiectasis is very difficult to differentiate from COPD – it is suggested by daily purulent sputum production.
* Heart failure usually presents with a large heart on CXR along with signs of pulmonary oedema.
* TB usually causes consolidation or other CXR signs. However, it can co-exist with COPD and about 30% of former TB patients will later develop some degree of airflow obstruction.
* Rarer lung diseases that can cause progressive shortness of breath include pulmonary fibrosis and bronchiolitis obliterans.

## Management

### Management in OPD

*This is only for stable COPD*

The management of COPD is difficult in our setting – we have access neither to the investigations we need to guide treatment nor to the best treatments.

The most important intervention is to encourage the patient to avoid any possible causes of COPD. Smokers should be encouraged to stop and women who cook over wood fires should try to avoid this.

Bronchodilators have been shown to improve symptoms and exercise capacity. Short-acting bronchodilators such as salbutamol are best administered via inhaler with a spacer. A spacer can be made from a plastic bottle. They work quickly and are particularly helpful to patients with mild intermittent symptoms. They are most effective and safest when used on an as-needed basis. Salbutamol can be prescribed orally but is more likely to cause serious side effects such as cardiac arrhythmias. As COPD is by definition not fully reversible, the benefits may not outweigh the risks.

If further treatment is required long-acting bronchodilators (either salmeterol or tiotropium) would be recommended next. Inhaled steroids, if prescribed, should be given with these agents.

In the absence of access to bronchodilators, aminophylline can be used. It is controversial, but there is some evidence of an improvement in lung function and improved exercise tolerance. It is toxic in overdose.

Oral steroids have no place in the management of stable COPD.

### Physical Exercises for Pulmonary Rehabilitation

This helps improve symptoms and quality of life of patients. The Physioterapy unit at EFSTH will help greatly in this regard.

*What types of exercise can you do with COPD?*

* Stretching. It improves flexibility, prevents injury, and gets your heart pumping. Hold a stretch for 10 to 30 seconds a few times a day. You can do stretches as an exercise or use them as a warm-up and cool-down.
* Aerobics. This doesn’t have to be a high-intensity workout. A 30-minute walk or swim a few times a week can boost the amount of oxygen in your system.
* Resistance. Strength exercises -- with exercise bands, weights, or even working against your own muscle resistance -- build muscles and ease breathing.
* Breathing exercises: There are two key breathing exercises:
  + Pursed-lips breathing: Breathe in through your nose for 2 seconds. Pucker your lips. Blow air through your mouth for about 5 seconds. This slows your breathing, keeps your airways open, and helps boost oxygen.
  + Abdominal (diaphragmatic) breathing: Relax your shoulders. Put one hand on your heart and the other on your stomach. Inhale through your nose, making sure your stomach expands. Slowly breathe out through pursed lips, pressing on your belly

### Management on the ward

*Patients with exacerbations of COPD are managed as inpatients on the ward.*

Exacerbations are characterised by increase in cough, increased sputum production and increased shortness of breath.

Note that 70% of exacerbations are thought to be caused by infections (bacterial or viral). Most of the remaining cases are caused by pulmonary emboli.

Patients with an exacerbation should be investigated with saturations, chest X-ray (to exclude pneumonia, pneumothorax, pulmonary oedema and pleural effusion), FBC, electrolytes, renal profile and glucose. Those with hypoxia (saturations < 92%) or who remain breathless after a nebuliser will need admission to hospital.

All patients will benefit from inhaled salbutamol during an acute exacerbation. Inhaled beclomethasone (which is now available) should be used daily alongside beta agonists as it leads to a more gradual decline in FEV1 .

Oral steroids may help a little in an acute exacerbation – give prednisolone 40 mg OD for 5 days in outpatients. Courses can be extended to 14 days for those ill enough to be admitted.

Patients who have 2 of these symptoms will benefit from antibiotics

* increased shortness of breath,
* increased sputum production,
* increased sputum purulence.

Those who are under age 65, without heart disease and who have less than 3 exacerbations per year can be given azithromycin, doxycycline or co-trimoxazole. Other patients should be treated with ciprofloxacin or co-amoxiclav. The antibiotics should be cycled to prevent resistance – especially in those receiving regular courses.

Oxygen should be used in all patients with saturations < 88%. It should be given via nasal prongs at an initial rate of 2 litres per minute and increased up to a rate of 6 litres per minute if necessary. Venturi masks can alternatively be used. The aim is to keep the saturationsbetween 88 and 92%. Higher levels than this are associated with hypercapnia and increased mortality.

## Key Issues for Nursing care

* Check the O2 saturation. Provide oxygen via nasal prongs if O2 saturation is less than 88% but do not allow to be more than 92%.
* Give salbutamol nebuliser if very short of breath.
* Sit patient upright – in the acute phase they will be most comfortable sitting with their arms resting on a pillow on a table. This position provides the most support to the intercostal muscles.
* Encourage mobilisation.
* Give patient advice to discontinue smoking and/or avoid cooking over an open wood fire.

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