

## A Review on Chronic Obstructive Pulmonary Disease

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### ABSTRACT

In the ancient age COPD has a variable natural history and not all individuals follow the same course about 15-20% of smokers develop clinically significant COPD. It is characterized by the airflow obstruction that is not fully reversible. It is predominantly caused by smoking, particularly occupational exposures, may also contribute to the development of COPD. Chronic obstructive pulmonary disease is diagnosed using a medical device called a spirometer, which measures air volume and flow, the main components of common clinical breathing tests (pulmonary function tests). Long-term exposure to lung irritants that damage the lungs and the airways usually is the cause of COPD. In this article we are focus about and detail review on the COPD.

Keywords:

### INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is an umbrella term for conditions, including chronic bronchitis and emphysema that impede the flow of air in the bronchi and trachea. COPD is the fourth-leading cause of death in the United States and is a major cause of sickness. It is currently the fifth-leading cause of death worldwide, but the World Health Organization projects it will become the third-leading cause by 2030<sup>[1]</sup> COPD is both preventable and treatable. International organizations have more specifically defined COPD as “a disease state characterized by airflow limitation that is not fully reversible. The airflow limitation is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases.” Chronic obstructive pulmonary disease is diagnosed using a medical device called a spirometer, which measures air volume and flow, the main

components of common clinical breathing tests (pulmonary function tests)<sup>[2]</sup>. The measurement of the forced expired volume of air in one second (FEV1) as a percentage of the total amount of air that can be forcefully exhaled (forced vital capacity or FVC) is the main functional way of defining COPD. An FEV1/FVC ratio less than 0.70 after a patient is given a bronchodilator usually indicate that he or she has suffering from COPD is a progressive disease, COPD is widely recognized as having four stages of severity. Over 50 percent of people with evidence of COPD, though, have never been diagnosed with disease. This proportion is even higher among people with mild disease, which is most amenable to intervention<sup>[3]</sup>. COPD is responsible for about 700,000 hospitalizations annually in the United States. In recent years, the hospitalization rate among women has increased and is now similar to the rate among men. In 2005, more than

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126,000 adults in the United States died from COPD<sup>[4]</sup>. COPD has an enormous financial burden, with estimated direct medical costs in 1993 of billion. The estimated indirect cost related to morbidity (loss of work time and productivity) and premature mortality is an additional billion, for a total of the forced expired volume of air in one second (FEV1) as a percentage of the total amount of air that can be forcefully exhaled (forced vital capacity or FVC) is the main functional way of defining COPD. An FEV1/FVC ratio less than 0.70 after a patient is given a bronchodilator usually indicates that he or she has COPD. Chronic obstructive pulmonary disease (COPD) can cause shortness of breath, tiredness, production of mucus, and cough. Many people with COPD develop most, if not all, of these signs and symptoms<sup>[5]</sup>. Shortness of breath (or *breathlessness*) is a common symptom of COPD because the obstruction in the breathing tubes makes it difficult to move air in and out of your lungs. Chronic Obstructive Pulmonary Disease (COPD) is a chronic disease usually, but not exclusively, associated with cigarette smoking. Worldwide it is the fourth leading cause of death and has a significant burden on healthcare systems throughout the world. Because this disease is due largely to exposure to environmental pollutants, it is a prime target for prevention programs and community education<sup>[6]</sup>. This includes increasing costs due to more frequent hospitalizations and increasing hospitalizations. Cigarette Smoke: As mentioned before, smoking cessation is the most effective primary prevention intervention available to prevent patients from developing COPD<sup>[7]</sup>. During routine office visits, physicians have an opportunity to counsel patients on the dangers of cigarette smoking, encourage quitting, and reinforce positive behavior in those patients that have either never smoked or have quit. Outside of the office, measures to inform the population of the dangers of smoking through public service

announcements, health fairs and public education campaigns may reduce the prevalence of smoking<sup>[8]</sup>. For those that already smoke, there are guidelines on counseling patients, and there is a dose dependent relationship between the intensity and frequency of counseling with the success of patients to quit<sup>[9]</sup>.

## HISTORY

The word "emphysema" is derived from the Greek ἐμφυσᾶν emphysan meaning "inflate" -itself composed of ἐν en, meaning "in", and φυσᾶν physan, meaning "breath, blast"<sup>[21]</sup>. The term chronic bronchitis came into use in 1808 while the term COPD is believed to have first been used in 1965.<sup>[22]</sup> Previously it has been known by a number of different names including: chronic obstructive broncho pulmonary disease, chronic obstructive respiratory disease, chronic airflow obstruction, chronic airflow limitation, chronic obstructive lung disease, nonspecific chronic pulmonary disease, and diffuse obstructive pulmonary syndrome. The terms chronic bronchitis and emphysema were formally defined in 1959 at the CIBA guest symposium and in 1962 at the American Thoracic Society Committee meeting on Diagnostic Standards<sup>[23]</sup>. Early treatments included garlic, cinnamon and ipecac, among others. Modern treatments were developed during the second half of the 20th century. Evidence supporting the use of steroids in COPD were published in the late 1950s. Bronchodilators came into use in the 1960s following a promising trial of isoprenaline. Further bronchodilators, such as salbutamol, were developed in the 1970s, and the use of LABAs began in the mid-1990s.<sup>[24]</sup>

## REASON OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Long-term exposure to lung irritants that damage the lungs and the airways usually is the cause of COPD. In the United States, the most

common irritant that causes COPD is cigarette smoke. Pipe, cigar, and other types of tobacco smoke also can cause COPD, especially if the smoke is inhaled. Breathing in secondhand smoke, air pollution, or chemical fumes or dust from the environment or workplace also can contribute to COPD. Asthma is a chronic (long-term) lung disease that inflames and narrows the airways. Treatment usually can reverse the inflammation and narrowing. However, if not, COPD can develop.

### SIGN AND SYMPTOMS

COPD symptoms range from mild to very severe, depending upon how advanced the

disease. COPD stands for chronic obstructive pulmonary disease. It is a lung disease that is characterized by airflow limitation into and out of the lungs that is not fully reversible. The disease is caused primarily by long-term, cumulative exposure to airway irritants, such as smoking secondhand smoke, air pollution or exposure. One of the most important aspects of managing the disease is early recognition of symptoms. This often leads to earlier diagnosis and earlier COPD treatment, which may improve your prognosis. That said, if any of the following COPD symptoms sound familiar, contact your health care provider for further evaluation.

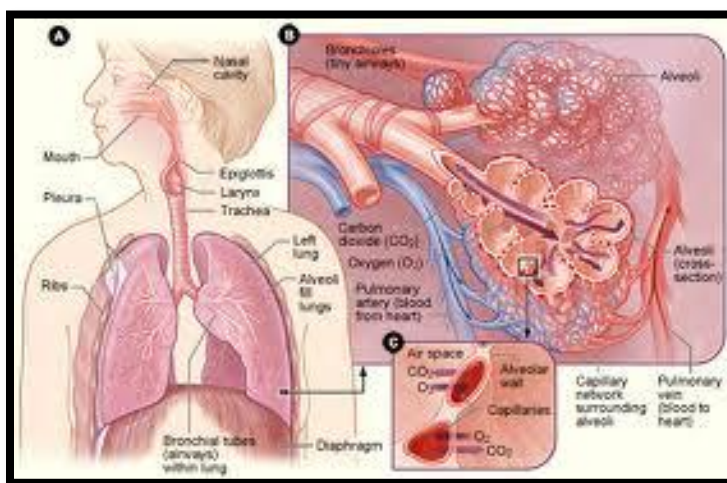


Figure no 1. COPD symptoms

### DYSPNEA

Dispend, the hallmark symptom of COPD, is the medical term for shortness of breath. Many patients describe it as a sensation that requires an increased effort to breathe, gasping or difficult, labored breathing. Initially, a patient may experience dispend only when they exert themselves. As the disease progresses, it may occur even while resting. As a symptom, it is the most anxiety-producing, disabling feature of the disease.

\*Understanding Dispend

\*Breathing Exercises to Help Manage Dispend

\*MMRC Dispend Scale

\*10 Tips to Manage Shortness of Breath,  
Dietary Tips for Better Breathing.

### CHRONIC COUGH

A chronic cough in COPD is one that is long-term and doesn't seem to go away. It is often the initial symptom of the disease yet, the one that gets overlooked the most because patients attribute it to smoking or other environmental irritants. Patients can have a chronic cough that is productive, meaning it produces mucus, or it can be non-productive, where no mucus is

produced. Initially, the cough may be intermittent, but as the disease progresses, it may be present every day, throughout the day.

### **SPUTUM PRODUCTION**

Sputum, also called mucus or phlegm, is a protective substance produced by the lungs to aid in the trapping and removal of foreign particles.<sup>[10]</sup> It is expelled by coughing or clearing of the throat. Patients with COPD usually produce small amounts of tenacious sputum when they cough. A copious amount of thick sputum is often associated with a bacterial lung infection, which can exacerbate COPD symptoms. The color and consistency of sputum may change when a bacterial infection is present.

### **WHEEZING AND CHEST TIGHTNESS**

Wheezing is often described as a whistling sound heard during inhalation or exhalation. It is caused by a narrowing or blockage of the airways. Wheezing may, or may not be, accompanied by abnormal sounds heard with a stethoscope.<sup>[11]</sup> Tightness in the chest is often described as a feeling of pressure within the chest walls that makes automatic breathing difficult. Chest tightness may be present when there is an infection in the lungs and it may make deep breathing painful causing respirations to be short and shallow. It is important to note that an absence of these symptoms does not exclude, or confirm, a diagnosis of COPD.

### **FATIGUE**

Different than ordinary tiredness, fatigue is a symptom that is often poorly understood and many times underreported in COPD as the focus tends to fall on more recognizable symptoms like dispend and chronic cough. But, because fatigue is nearly 3 times greater in those who have lung disease than in healthy people, it is an important symptom to recognize.

### **ANXIETY AND DEPRESSION**

The emotional aspects of COPD, especially anxiety and depression, are often overlooked. These symptoms are clinically relevant however, because they increase the risk of COPD exacerbation and a poorer health status overall. Medications and other non-pharmacological treatments are available that can alleviate the anxiety and depression in COPD, sometimes completely. If you suffer from either symptom, or both, talk to your health care provider about your treatment options.

### **ANOREXIA AND WEIGHT LOSS**

Anorexia and weight loss are common problems in COPD, often occurring in severe and very severe cases of disease. When not addressed, these symptoms can lead to malnutrition, a serious condition that can also be life-threatening. Anorexia and weight loss are symptoms that warrant further investigation, as they may also indicate that other diseases are present, such as lung cancer or pulmonary tuberculosis.

## **TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)<sup>[12]</sup>**

The goals of COPD treatment follow the following points.

- Relieving your symptoms
- Slowing the progress of the disease
- Improving your exercise tolerance (your ability to stay active)
- Preventing and treating complications
- Improving your overall health

COPD has no cure yet. However, lifestyle changes and treatments can help you feel better, stay more active, and slow the progress of the disease. To assist with your treatment, your family doctor may advise you to see a pulmonologist. This is a doctor who specializes in treating lung disorders.

### **Quit Smoking and Avoid Lung Irritants**

Quitting smoking is the most important step you can take to treat COPD. Consult with your doctor about programs and products that can help you quit. If you have trouble quitting smoking on your own, consider joining a support group<sup>[13]</sup>. Many hospitals, workplaces, and community groups offer classes to help people quit smoking. Also, try to avoid secondhand smoke and places with dust, fumes, or other toxic substances that you may inhale.

### **Other Lifestyle Changes**

If you have COPD, you may have trouble eating enough because of your symptoms, such as shortness of breath and fatigue. As a result, you may not get all of the calories and nutrients you need, which can worsen your symptoms and raise your risk for infections. Talk with your doctor about following an eating plan that will meet your nutritional needs. Your doctor may suggest eating smaller, more frequent meals; resting before eating; and taking vitamins or nutritional supplements.

## **MEDICINES**

### **Bronchodilators**

Bronchodilators relax the muscles around your airways. This helps open your airways and makes breathing easier. Depending on the severity of your COPD, your doctor may prescribe short-acting or long-acting bronchodilators. Short-acting bronchodilators last about 4–6 hours and should be used only when needed. Long-acting bronchodilators last about 12 hours or more and are used every day. Most bronchodilators are taken using a device called an inhaler. This device allows the medicine to go straight to your lungs. Not all inhalers are used the same way. Ask your health care team to show you the correct way to use your inhaler. If your COPD is mild, your doctor may only prescribe a short-acting inhaled

bronchodilator. In this case, you may use the medicine only when symptoms occur.

### **Inhaled Glucocorticosteroids (Steroids)**

Doctors use inhaled steroids to treat people whose COPD symptoms flare up or worsen. These medicines help reduce airway inflammation. Your doctor may ask you to try inhaled steroids for a trial period of 6 weeks to 3 months to see whether the medicine helps relieve your breathing problems.

## **VACCINES<sup>[14]</sup>**

### **Flu Shots**

The flu (influenza) can cause serious problems for people who have COPD. Flu shots can reduce your risk of getting the flu. Talk with your doctor about getting a yearly flu shot.

### **Pneumococcal Vaccine**

This vaccine lowers your risk for pneumococcal pneumonia (NU-mo-KOK-al nu-MO-ne-ah) and its complications. People who have COPD are at higher risk for pneumonia than people who don't have COPD. Talk with your doctor about whether you should get this vaccine.

### **Pulmonary Rehabilitation**

Pulmonary rehabilitation (rehab) is a broad program that helps improve the well-being of people who have chronic (ongoing) breathing problems. Rehab may include an exercise program, disease management training, and nutritional and psychological counseling. The program's goal is to help you stay active and carry out your daily activities. Your rehab team may include doctors, nurses, physical therapists, respiratory therapists, exercise specialists, and dietitians. These health professionals will create a program that meets your needs.

### **Oxygen Therapy**

If you have severe COPD and low levels of oxygen in your blood, therapy can help you

breathe better. For this treatment, you're given oxygen through nasal prongs or a mask. You may need extra oxygen all the time or only at certain times. For some people who have severe COPD, using extra oxygen for most of the day can help them

- Do tasks or activities, while having fewer symptoms.
- Protect their hearts and other organs from damage.
- Sleep more during the night and improve alertness during the day, Live longer.

### Surgery

Surgery may benefit some people who have COPD. Surgery usually is a last resort for people who have severe symptoms that have not improved from taking medicines. Surgeries for people who have COPD that's mainly related to emphysema include bullectomy (bull-EK-toe-me) and lung volume reduction surgery (LVRS). A lung transplant might be an option for people who have very severe COPD.

### Bullectomy <sup>[15]</sup>

When the walls of the air sacs are destroyed, larger air spaces called bullae (BUL-e) form. These air spaces can become so large that they interfere with breathing. In a bullectomy, doctors remove one or more very large bullae from the lungs.

### Lung Volume Reduction Surgery

In LVRS, surgeons remove damaged tissue from the lungs. This helps the lungs work better. In carefully selected patients, LVRS can improve breathing and quality of life.

### Lung Transplant

During a lung transplant, your damaged lung is removed and replaced with a healthy lung from a deceased donor. A lung transplant can improve your lung function and quality of life. However, lung transplants have many risks, such as infections. The surgery can cause death

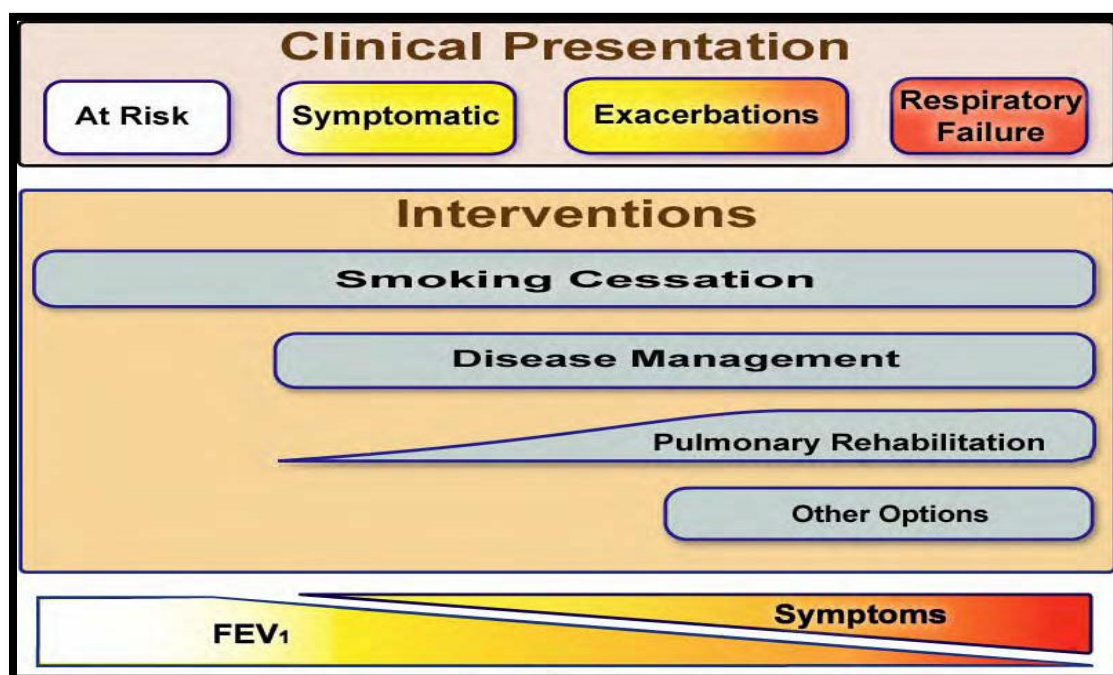
if the body rejects the transplanted lung. If you have very severe COPD, talk with your doctor about whether a lung transplant is an option

### PREFACE

There are over 40 different guidelines from different countries on diagnosis and management of chronic obstructive pulmonary disease (COPD). The guidelines formulated by the Global Initiative for chronic obstructive lung disease (GOLD) are perhaps the most popular and global in nature. <sup>[16]</sup> The need to formulate different set of guidelines for India was felt because of the differences in risk factors, disease prevalence and pattern, and above all, the different overall health-care infrastructure. Moreover a large burden of tuberculosis, which is an important cause of cough, adds to the difficulties of diagnosis and management. These guidelines have been developed at the initiative of WHO (India) under the WHO Government of India Biennium (2002-2003) programme. A consensus workshop was held in December 2002 with representative participation from several national professional bodies, medical colleges, general health sector, and other institutes. The recommendations were subsequently compiled and reviewed by the participants and other experts. The guidelines essentially incorporate general GOLD recommendations. The major alterations include a greater stress on clinical criteria, exclusion of diagnosis of tuberculosis, and a three-tier approach at different levels of healthcare, especially the primary and secondary care levels <sup>[17]</sup>. It is hoped that the recommendations will help the physicians of all hues to effectively manage COPD. Chronic obstructive pulmonary disease (COPD) is a common clinical problem. It is also known by various other names, such as chronic obstructive lung disease (COLD), chronic obstructive airway disease (COAD), chronic airflow obstruction (CAO), chronic airway (or airflow) limitation (CAL), or simply as chronic

bronchitis and emphysema. Chronic obstructive pulmonary disease, which includes chronic bronchitis and emphysema, is a progressive disease characterized by airflow limitation/obstruction that is either not reversible at all or only partially reversible. It is generally difficult to separate out the two conditions (chronic bronchitis and

emphysema), hence these are grouped together as COPD [14]. Chronic obstructive pulmonary disease does not include asthma in which the airflow obstruction is largely reversible. The airflow obstruction in COPD is associated with abnormal inflammatory response of the lungs to chronic inhalational exposure from smokes, dusts and other air pollutants.



**Figure no : 2** Clinical flow chart chronic obstructive pulmonary disease

#### EPIDEMIOLOGY, RISK FACTORS AND NATURAL HISTORY

- Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality worldwide, and results in an economic and social burden that is both substantial and increasing.
- Prevalence and morbidity data greatly underestimate the total burden of COPD because the disease is usually not diagnosed until it is clinically apparent and moderately advanced.
- In people aged 25–75 yrs in the USA, the estimated prevalence of mild COPD (defined as forced expiratory volume in one second

(FEV<sub>1</sub>)/forced vital capacity) was 6.9% and of moderate COPD) was 6.6%, according to the National Health and Nutrition Examination Survey (NHANES).

- COPD is the fourth leading cause of death in the USA and Europe, and COPD mortality in females has more than doubled over the last 20 yrs.
- COPD is a more costly disease than asthma and, depending on country; 50–75% of the costs are for services associated with exacerbations.
- Tobacco smoke is by far the most important risk factor for COPD worldwide.

### EPIDEMIOLOGY PREVALENCE

Estimates of the prevalence of COPD depend on the definition and criteria used. Estimates based on the presence of airflow limitation are the most accurate, since symptoms and self report or clinician diagnosis lack sensitivity and specificity. A post bronchodilator FEV1/FVC <70%, in combination with an FEV1 <80% pred, in an individual with cough, sputum production or dyspnoea and exposure to risk factors confirms the diagnosis <sup>[18]</sup>. The best prevalence data available at present come from the third NHANES (NHANES III), a large national survey conducted in the USA between 1988 and 1994. In the USA, for those aged 25–75 yrs, the estimated prevalence of mild COPD was 6.9% and of moderate COPD was 6.6%.

### Morbidity

Morbidity data include physician visits, emergency department visits and hospitalizations. COPD databases for these outcome parameters are less readily available and usually less reliable than mortality databases. The limited data available indicate that morbidity due to COPD increases with age and is still greater in males than females <sup>[19]</sup>. The risk of hospital admission increases with decreasing lung function and when chronic respiratory symptoms are present. Admission rates are also increased in patients with lower socioeconomic status.

### Mortality

Mortality data for COPD are inaccurate because of inconsistent use of terminology. COPD death rates are very low under the age of 45 yrs and increase steeply with age. COPD is the fourth leading cause of death worldwide and is estimated to be the third leading cause of death by 2020. Recently, the most important change has been the huge increase in the COPD death rate in females that has occurred in the USA over the last 20 yrs: from 20.1 out of 100,000 in 1980 to 56.7 out of 100,000 in 2000; as

compared to the values in males, 73.0 out of 100,000 in 1980 to 82.6 out of 100,000 in 2000.

### Economic burden

COPD is a more costly disease than asthma. The direct costs of COPD are the value of healthcare resources devoted to diagnosis and medical management of the disease. Indirect costs reflect the monetary consequences of disability, missed work, premature mortality and caregiver or family costs resulting from the illness. When medical costs for COPD are compared across countries for which data are available, there is surprising similarity. When adjusted to 1993 US dollars, the costs per capita (in the entire population) are: \$65 for the UK, \$60 for Sweden and \$87 for the USA. Distribution of the costs in different countries, however, is different. In the USA, for example, ~75% of the costs for COPD are for services associated with exacerbations, such as hospitalization. Tobacco smoke is by far the most important risk factor for COPD worldwide. It is helpful, conceptually, to think of a person's exposures in terms of the total burden of inhaled particles. Each type of particle, depending on its size and composition, may contribute a different weight to the risk and the total risk will depend on the integral of the inhaled exposures. For example, tobacco smoke (active and passive tobacco smoke), outdoor and indoor air pollution, and occupational exposures probably act additively to increase a person's risk of developing COPD. Recent data from the US NHANES III survey indicate that occupation can be an important risk factor for COPD.

### Natural history

COPD has a variable natural history and not all individuals follow the same course. The often-quoted statistic that only 15–20% of smokers develop clinically significant COPD is misleading and greatly underestimates the toll of COPD. It is increasingly apparent that COPD often has its roots decades before the onset of symptoms.



Impaired growth of lung function during childhood and adolescence, caused by recurrent infections or tobacco smoking, may lead to lower maximally attained lung function in early adulthood.

### **DIAGNOSIS FOR COPD** <sup>[20]</sup>

The first step in diagnosing COPD is a good evaluation. Your doctor will conduct a complete physical exam and ask you questions about your lifestyle including your family, your job, your habits, your hobbies, your current medications, and your symptoms. Your doctor may have you do a number of tests to evaluate your breathing and other aspects of your health. These tests may be necessary because other diseases and/or disorders can be confused with COPD.

### **BREATHING, EXERCISE, AND OXYGEN TESTS**

Pulmonary function testing measures how well you are breathing. There are different types of breathing tests that can be done during pulmonary function testing. The results of pulmonary function testing can help your doctor find the best treatment plan for you. Spirometry: A spirometry test measures airflow into and out of the lungs. This indicates whether or not there is airway obstruction. Spirometry test results are useful in making the diagnosis of a specific lung disorder. Even more important, yearly spirometry measurements help to detect lung disease at an early stage when lifestyle changes and treatment may help forestall future problems.

**Arterial Blood Gas Testing:** Arterial blood gas is a blood sample test ordered by your physician to evaluate measurements of oxygen level, carbon dioxide (effectiveness of respiration), and several other parameters <sup>[25]</sup>. Generally, it is indicated when your physician needs to evaluate the effectiveness of your breathing.

**Bronchial Provocation Test:** The bronchial provocation test evaluates how sensitive the airways in your lungs are. A spirometry

breathing test is done before and after you inhales a spray such as methacholine. The spirometry results are compared before and after you inhale the spray to see what changes there are in your breathing.

**Exercise Tolerance Testing:** The exercise tolerance test evaluates the ability of your heart and lungs to provide oxygen and remove carbon dioxide from the bloodstream before, during and after you exercise.

**Exercise for Desideration Testing:** The exercise for de-saturation test evaluates your oxygen needs at rest and during exercise.

### **X-Rays and CT (CAT) Scans**

#### **X-rays:**

X-rays can show irregularities or damage in the lungs caused by COPD and other chronic lung diseases. CT scan of the Chest: A CT or CAT scan is a shortened name for computerized tomography. During a CT scan of the chest pictures are taken of cross sections or slices of the thoracic structures in your body. Thoracic structures include your lungs, heart and the bones around these areas.

#### **CT scan of the Sinuses:**

During a CT scan of the sinuses pictures are taken of cross sections or slices of the sinuses. The sinuses are air-filled cavities in your head<sup>26</sup>. CT scans can identify problems with your sinuses. Your doctor will use this information to determine the best treatment for you.

### **Other Tests**

#### **Bronchoscope:**

A bronchoscope allows the doctor to look inside the airways in the lungs. The bronchoscope can be videotaped to look at later. Your doctor may also do a lavage, which involves putting a small amount of fluid into the airways, and the fluid is then pulled out with cells from the airways of your lungs. A biopsy of the airway may also be done, where a small amount of the tissue is taken from the lining of the lung. The cells and

tissue can be studied closely to help determine your diagnosis and the best treatment for you.

#### **Mucus Culture:**

Some kinds of bacteria like to live in the mucus produced in the sinuses and airways of the lungs. A culture of this mucus can help identify an infection <sup>[27]</sup>. Lung and/or sinus infections can complicate and/or mimic some symptoms of COPD.

#### **Bone Scan:**

A bone scan is a test that can identify bone that is diseased or injured. Normally, bone absorbs nutrients that are the building blocks of bone formation. If bone is diseased or injured nutrients are absorbed differently. The bone scan takes pictures of this process. A bone scan can pick up on bone disease or injury that may not be seen with a traditional x-ray.

#### **pH Probe Study:**

A pH probe study measures the amount of gastro esophageal reflux you child has. Gastro esophageal reflux is the backward flow or reflux of food and acid from the stomach into the esophagus. The esophagus is the tube that takes food from your mouth into your stomach. A pH probe will help identify if you have increased amounts of reflux and if it is causing you to have trouble breathing or other symptoms.

#### **Pathology, pathogenesis and path physiology**

##### **Pathology**

Chronic obstructive pulmonary disease (COPD) comprises pathological changes in four different compartments of the lungs (central airways, peripheral airways, lung parenchyma, pulmonary vasculature), which are variably present in individuals with the disease.

##### **Pathogenesis**

Tobacco smoking is the main risk factor for COPD, although other inhaled noxious particles

and gases may contribute <sup>[28]</sup>. This causes an inflammatory response in the lungs, which is exaggerated in some smokers, and leads to the characteristic pathological lesions of COPD. In addition to inflammation, an imbalance of pretenses and antiproteinases in the lungs, and oxidative stress are also important in the pathogenesis of COPD.

##### **Pathophysiology**

The different pathogenic mechanisms produce the pathological changes which, in turn, give rise to the physiological abnormalities in COPD: mucous hyper secretion and colliery dysfunction, airflow limitation and hyperinflation, gas exchange abnormalities, pulmonary hypertension, and systemic effects.

##### **Pathology**

COPD comprises major pathological changes in the following four different compartments of the lung, which are variably present in individuals with the disease: central airways, peripheral Airways, lung parenchyma and pulmonary vasculature. Bronchial glands hypertrophy and goblet cell metaplasia occurs. This results in excessive mucous production or chronic bronchitis. Cell infiltrates also occur in bronchial glands.

#### **MANAGEMENT OF STABLE COPD: SMOKING CESSATION** <sup>[29-30]</sup>

- Smoking is an addiction and a chronic relapsing disorder.
- Smoking should be routinely evaluated whenever a patient presents to a healthcare facility
- All smokers should be offered the best chance to treat this disorder.
- Permanent remissions can be achieved in a substantial percentage of smokers with currently available treatments.
- Successful treatment of this disorder can have a substantial benefit in reducing many

secondary complications of which chronic obstructive pulmonary disease (COPD) is one.

- Smoking cessation activities and support for its implementation should be integrated into the healthcare system.

### Background

Cigarette smoking is an addiction and a chronic relapsing disorder regarded as a primary disorder by the Department of Health and Human Services Guidelines in the USA and by the World Health Organization. Therefore, treating tobacco use and dependence should be regarded as a primary and specific intervention. Preventing the development and progression of COPD can be regarded as one of the secondary effects prevented by treating the primary disorder, because although cigarette smoking is the single most important cause of COPD, it is also a major risk factor for many other diseases including atherosclerotic vascular disease, cancer, peptic ulcer and osteoporosis.

### OVERVIEW OF CURRENT TREATMENT FOR COPD

None of the existing treatments of COPD has been consistently shown to modify the course of the disease, as assessed by lung function decline and mortality. Thus, the remaining aims of current therapy are to decrease symptoms and exercise intolerance, improve activity and health status and reduce the risk for disease complications (e.g. acute exacerbations and chronic respiratory failure leading to cor pulmonale). In combination, these effects lead to improvements in quality of life. The purpose of using ICS in COPD is to decrease the severity of COPD symptoms and the frequency of exacerbations, and to improve health status. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommends that ICS treatment should be used in addition to bronchodilators in patients with severe or very severe COPD (forced expiratory volume in one second (FEV<sub>1</sub>) <50% predicted) who have

repeated exacerbations. However, practice surveys found that in COPD, ICS are frequently prescribed in situations that do not fit this indication. Finally, long-term treatment with oral glucocorticosteroids is not recommended for the treatment of patients with COPD: no obvious beneficial effect has been described with these agents, which can have many deleterious consequences, including impairments in bone density, nutritional status and peripheral muscle function, aggravation of co morbid diseases.

### CONCLUSIONS

At present, there are a large number of symptomatic treatments for COPD and these medications have been shown to significantly improve dyspnoea, exercise tolerance, activity, the rate of exacerbations and quality of life in patients with this disease. However, these agents may have limited efficacy in some patients, which is exacerbated by the fact that they are often used late in the course of disease, when the likelihood of reversible lesions may be reduced. Therapies that alter the course of COPD, as measured by survival and lung function decline, include smoking cessation, LTOT, and the combination of fluticasone propionate and salmeterol. However, the definition of a therapy that modifies the natural history of COPD may need to be revisited and more precisely defined in terms of markers and clinical outcomes indicative of progression, including the risks for co morbid extra respiratory diseases. It is reasonable to suggest that early diagnosis and treatment of patients with COPD might be the first and potentially most important disease-modifying intervention, since it would result in the application of existing treatments at the time when they are most likely to provide their greatest benefits. This remains to be formally demonstrated. Nevertheless, treatments with a more favorable long-term benefit/risk ratio are warranted. Their development will probably

require more specific targeting of the local and systemic inflammatory processes that give rise to the pulmonary and extra pulmonary

manifestations of chronic obstructive pulmonary disease.

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