

## Chronic Obstructive Pulmonary Disease (COPD)

Includes the disease conditions of Chronic Bronchitis and Emphysema

It is a common condition affecting millions of people worldwide. Generally, it is a disease that occurs in the 4<sup>th</sup> – 5<sup>th</sup> decade of life.

Globally around 9 % of adults over 40 years suffer from COPD. Data from Sri Lanka indicates a prevalence of 11 % in the over 40 year olds.

COPD is often undiagnosed, 50 % of those with COPD are unaware that they have COPD.

Doctors too under diagnose COPD.

COPD is a progressive disease that results in increasing breathlessness and limitation of physical activity. It takes a heavy toll on a patient's life and activities of daily living.

The development of COPD is strongly associated with tobacco smoking. It is also associated with exposure to bio-mass fuels, indoor and outdoor air pollutants, certain occupational exposures, malnutrition and repeated childhood infections.

Genetic and hereditary factors also contribute to the development of COPD.

## What happens in COPD

Our lungs consist of a system of branching tubular structures that end up in a bunch of tiny rounded sacs filled with air called alveoli. These air sacs are surrounded by tiny blood vessels called capillaries.

Oxygen that is required for the generation of our body's energy, moves into the capillaries across the thin-walled air sacs and carbon dioxide the waste product of energy generation moves out into the air sacs to be eliminated from the lungs through the process of exhalation.

The lungs are elastic structures, these supported by chest wall muscles and diaphragm (the muscle separating the chest cavity from the abdominal cavity) help us breath.

The elasticity of the lungs helps it to expand and fill when we breath in and helps to empty when we breath out.

### **In COPD, due to damage caused by inhaled toxins / pollutants the lungs**

- Loose its elasticity, making it less complaint, the lungs find it difficult to empty itself as air is trapped within. This means those with COPD must work harder to breath in as the lung is only half empty.
- Tiny air sacs and capillaries get destroyed, less numbers are available to help in the process of gas exchange.
- Breathing tubes too are affected by COPD. Their walls are inflamed or swollen, walls become thick and narrowed.
- Mucus is produced in excess by mucus glands, blocking and clogging breathing tubes.

Breathing is something that happens naturally. In COPD patients, the changes that happen in their lungs make it harder for them to breath. They must work hard to breath expending energy in the process. Over a period of time COPD patient's bodies organ systems and tissues are starved of oxygen.

The muscles are important tissues that get affected and starved of oxygen resulting in weight loss and further weakening of the respiratory system.

COPD can also lead to problems with your heart and circulation.

### **Who is at risk of developing COPD**

- Tobacco smokers.
- Bio-mass fuel exposure
- Occupational exposures to harmful fumes.

- Indoor and outdoor air pollutants
- Malnutrition
- Repeated childhood respiratory infections
- Hereditary conditions such as alfa one antitrypsin deficiency

### What are the symptoms of COPD

- **Breathlessness** which is persistent and progressive . limitation of physical activity due to breathlessness , patients are more breathless during the day and during activity than at night.
- **Wheeze or noisy breathing.**
- **Chest tightness / discomfort**
- **Cough productive of sputum**
- **Weight loss / loss of muscle mass**
- **Fatigue**
- **Early morning headaches , drowsiness , poor memory may occur in advanced disease.**

### How is COPD diagnosed

Doctors can suspect COPD by obtaining information of symptoms, exposure to known risk factors and examination.

However a definitive diagnosis can only be made after performance of tests of lung function.

Chest X rays , High Resolution CT scans can help in the diagnosis

Your doctor may also do tests to assess functional state of the heart such as ECG and transthoracic Echo cardiograms.

Routine blood tests , screening for diabetes and other conditions may also be done by your doctor.

### What are lung function tests?

Lung functions tests such as spirometry measures our lungs capacity to move air in and out of our lungs. Technicians instruct you to perform certain maneuvers like normal breathing, forcefully breathing out and breathing in.

These are graphically recorded and lung volumes are calculated.

You will also be given inhaled medication and tests will be repeated to assess your response to these medications.

Spirometry with response to inhaled bronchodilator medication is fundamental to the diagnosis of COPD.

### How is COPD treated

COPD is considered a preventable diseases as elimination of known risk factors such as tobacco smoking, exposure to bio-mass fuels , indoor and outdoor air pollutants may prevent the occurrence and progression of the diseases.

Key elements in COPD care

- Smoking Cessation
- Inhaled medication
- Nutritional support
- Pulmonary Rehabilitation
- Vaccination
  
- Monitoring for complications

### Smoking cessation

This involves individual or group based programs by trained professionals in helping in quitting smoking.

## **Nutritional advices**

Loss of weight and decreases in muscle mass is a major problem in COPD patients . Such patients will need advice on a healthy diet

## **Pulmonary Rehabilitation**

This is a graded system of exercises and strength training specially designed for COPD patients. It will help you to remain more physically active and cope with breathlessness.

## **Vaccination**

COPD patients are at risk of infections with common respiratory microbes . Vaccination aims at providing protection against them.

## **Inhaled medication**

After a detailed medical history , physical examination , diagnostic tests , your doctor will be able to asses the severity of your COPD.

What inhaled medication suits you best will be decided by your doctor after this .

## **Home oxygen**

Some patients with advanced COPD may need supplementary oxygen to be taken at home. This is called Long Term Oxygen Therapy (LTOT)

Small group of COPD patients may benefit from surgical procedures such as lung volume reduction, endo-bronchial valves.

Some may benefit from Non-Invasive ventilatory Support.

In advanced disease where all medical options are exhausted

## What are the complications of COPD

COPD puts you at increased risk of diseases of the heart and circulation, you will be carefully assessed for these and closely monitored for these to detect them early.

COPD can result in respiratory failure , you will be carefully monitored for this by your medical team.

COPD can from time to time worsen acutely (disease flare ups ), theses are called exacerbations. Exacerbations are key events in patients with COPD and management will aim at reducing exacerbations.

Changing character of cough, unexplained weight loss , coughing up blood may indicate a serious underlying diseases state and must be urgently brought to the attention of your doctor

## What are exacerbations of COPD?

Exacerbations are flare ups of COPD. These are key events in patients with COPD, as with each exacerbation COPD patients tend to lose more of their lung capacity . This will result in more rapid diseases progression and give rise to complications of COPD.

Management of COPD aims at reducing the number and frequency of flare ups.

## How do you recognize exacerbations?

- You will feel more breathless than usual, this may be sustained over a period of days.
- You will cough out more sputum, which might show a change in colour , it also may be thick and sticky.
- You will feel fatigued.

- Exacerbations are mostly triggered by infections, you may notice fever, body aches, poor appetite.
- Air pollution may also trigger exacerbations.
- If you have frequent exacerbations this must be brought to your doctor's notice.
- If you have frequent exacerbations, your doctor may prescribe you and additional steroid inhaler.

### What Can You do to prevent exacerbations / flare ups ?

- Be educated about COPD.
- Have a proper diagnostic work up performed.
- Have a definite management plan.
- Be enrolled in a Pulmonary Rehabilitation Program.
- Obtain your vaccinations
- Ensure appropriate nutrition.
- Recognize symptoms of exacerbations early
- Get medical advice early.

### What's the difference between COPD and asthma ?

Asthma is a disease of air breathing tubes and allergy plays an important role. COPD affects breathing tubes, air sacs, surrounding capillaries and lung elasticity is affected. Asthma is mainly a disease of childhood and young though it can occur late in life.

COPD occurs mainly in the 4<sup>th</sup> or 5<sup>th</sup> decade of life.

Asthma comes in episodes with more symptoms early in the morning and at night, patients can identify certain agents that bring on symptoms of asthma. COPD symptoms are persistent and progressive usually an offending agent such as tobacco smoke, bio-mass fuels, occupational agents can be identified. Though asthma and COPD have some symptoms in common treatment approaches to the two are different.