

Chronic Obstructive Pulmonary Disease (COPD) Fact Sheet

(Chronic Bronchitis and Emphysema)

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Chronic obstructive pulmonary disease (COPD) is a term referring to two lung diseases, chronic bronchitis and emphysema, that are characterized by obstruction to airflow that interferes with normal breathing. Both of these conditions frequently co-exist, hence physicians prefer the term COPD. It does not include other obstructive diseases such as asthma.

- COPD is the fourth leading cause of death in America, claiming the lives of 118,171 Americans in 2004 and the number of women dying from the disease has surpassed the number seen in men.¹
- 2005 is the fifth consecutive year in which women have exceeded men in the number of deaths attributable to COPD. In 2004, almost 61,000 females died compared to 57,260 males.²
- Smoking is the primary risk factor for COPD. Approximately 80 to 90 percent of COPD deaths are caused by smoking. Female smokers are nearly 13 times as likely to die from COPD as women who have never smoked. Male smokers are nearly 12 times as likely to die from COPD as men who have never smoked.³
- Other risk factors of COPD include air pollution, second-hand smoke, history of childhood respiratory infections and heredity. Occupational exposure to certain industrial pollutants also increases the odds for COPD. A recent study found that the fraction of COPD attributed to work was estimated as 19.2% overall and 31.1% among never smokers.⁴
- In 2005, 11.6 million U.S. adults (aged 18 and over) were estimated to have COPD. However, close to 24 million U.S. adults have evidence of impaired lung function, indicating an under diagnosis of COPD.⁵
- An estimated 721,000 hospital discharges were reported in 2005; a discharge rate of 24.4 per 100,000 population. COPD is an important cause of hospitalization in our aged population. Approximately 65% of discharges were in the 65 years and older population in 2005.⁶
- In 2007, the cost to the nation for COPD was approximately \$42.6 billion, including \$26.7 billion in direct health care expenditures, \$8.0 billion in indirect morbidity costs and \$7.9 billion in indirect mortality costs.⁷
- **Chronic bronchitis** is the inflammation and eventual scarring of the lining of the bronchial tubes. When the bronchi are inflamed and/or infected, less air is able to flow to and from the lungs and a heavy mucus or phlegm is coughed up. The condition is defined by the presence of a mucus-producing cough most days of the month, three months of a year for two successive years without other underlying disease to explain the cough.
- This inflammation eventually leads to scarring of the lining of the bronchial tubes. Once the bronchial tubes have been irritated over a long period of time, excessive mucus is produced constantly, the lining of the bronchial tubes becomes thickened, an irritating cough develops, and air flow may be hampered, the lungs become scarred. The bronchial tubes then make an ideal breeding place for bacterial infections within the airways, which eventually impedes airflow.⁸
- In 2005, an estimated 8.9 million Americans reported a physician diagnosis of chronic bronchitis. Chronic bronchitis affects people of all ages, although

people aged 65 years or more have the highest rate at 53.2 per 1,000 persons.⁹

- Females are almost twice as likely to be diagnosed with chronic bronchitis as males. In 2005, 2.9 million males had a diagnosis of chronic bronchitis compared to 6.0 million females.¹⁰
- Symptoms of chronic bronchitis include chronic cough, increased mucus, frequent clearing of the throat and shortness of breath.¹¹
- **Chronic bronchitis** doesn't strike suddenly and is often neglected by individuals until it is in an advanced state, because people mistakenly believe that the disease is not life-threatening. By the time a patient goes to his or her doctor the lungs have frequently been seriously injured. Then the patient may be in danger of developing serious respiratory problems or heart failure.¹²
- **Emphysema** begins with the destruction of air sacs (alveoli) in the lungs where oxygen from the air is exchanged for carbon dioxide in the blood. The walls of the air sacs are thin and fragile. Damage to the air sacs is irreversible and results in permanent "holes" in the tissues of the lower lungs. As air sacs are destroyed, the lungs are able to transfer less and less oxygen to the bloodstream, causing shortness of breath. The lungs also lose their elasticity, which is important to keep airways open. The patient experiences great difficulty exhaling.¹³
- Emphysema does not develop suddenly. It comes on very gradually. Years of exposure to the irritation of cigarette smoke usually precede the development of emphysema. Of the estimated 3.8 million Americans ever diagnosed with emphysema, 91 percent are 45 or older.¹⁴
- In 2005 emphysema sufferers were 54.4 percent male and 45.6 percent female. However, from 1997 to 2005 the prevalence rate for women has increased by 17% but the rate for men decreased by 3%.¹⁵
- Symptoms of emphysema include cough, shortness of breath and a limited exercise tolerance. Diagnosis is made by pulmonary function tests, along with the patient's history, examination and other tests.¹⁶
- **Alpha1 antitrypsin deficiency-related (AAT) emphysema** is caused by the inherited deficiency of a protein called alpha1-antitrypsin (AAT) or alpha1-protease inhibitor. AAT, produced by the liver, is a "lung protector." In the absence of AAT, emphysema is almost inevitable. It is responsible for 5% or less of the emphysema in the United States.¹⁷
- An estimated 100,000 Americans, primarily of northern European descent, have AAT deficiency emphysema. Another 20 million Americans carry a single deficient gene that causes Alpha-1 and may pass the gene onto their children.¹⁸
- Symptoms of AAT deficiency emphysema usually begin between 32 and 41 years of age and include shortness of breath and decreased exercise capacity. Smoking significantly increases the severity of emphysema in AAT-deficient individuals.¹⁹
- Blood screening is primarily used to diagnose whether a person is a carrier or AAT-deficient. If children are diagnosed as AAT-deficient through blood screening, they may undergo a liver transplant.²⁰ In addition, a DNA-based cheek swab test has been recently developed for the diagnosis of AAT-deficiency.²¹
- A recent study suggested that there are at least 116 million carriers among all racial groups, worldwide.²²

COPD Treatment

- Emphysema and chronic bronchitis often co-exist in COPD. The quality of life for a person suffering from COPD diminishes as the disease progresses. At the onset, there is minimal shortness of breath. People with COPD may eventually require supplemental oxygen and may have to rely on mechanical respiratory assistance.²³
- An ALA survey revealed that half of all COPD patients (51%) say their condition limits their ability to work. It also limits them in normal physical exertion (70%), household chores (56%), social activities (53%), sleeping (50%) and family activities (46%).²⁴
- None of the existing medications for COPD has been shown to modify the long-term decline in lung function that is the hallmark of this disease. Therefore, the goal of pharmacotherapy for COPD is to provide relief of symptoms and prevent complications and/or progression of the disease with a minimum of side effects.²⁵
- Bronchodilator medications (prescription drugs that relax and open air passages in the lungs) are central to the symptomatic management of COPD. They can be inhaled as aerosol sprays or taken orally.²⁶
- Additional treatment includes antibiotics, oxygen therapy, and systemic glucocorticosteroids. The efficacy of inhaled glucocorticosteroids in modifying long-term decline in lung function continues to be under study, however short-term benefit has been demonstrated. Corticosteroids have been shown to decrease cardiovascular and lung cancer deaths and the frequency of exacerbations. Chronic treatment with systemic steroids involves the risk of serious side effects; therefore these are used mostly for acute exacerbations.^{27,28}
- Pneumonia and influenza vaccines should be given to COPD patients. Those with COPD should also live a healthy lifestyle by exercising, avoiding cigarette smoke and other air pollutants, and eating well.²⁹
- Pulmonary rehabilitation is a preventive health-care program provided by a team of health professionals to help people cope physically, psychologically, and socially with COPD.³⁰
- Lung transplantation is being performed in increasing numbers and may be an option for people who suffer from severe emphysema. Additionally, lung volume reduction surgery (LVRS) has shown promise and is being performed with increasing frequency. However, a recent study found that emphysema patients who have severe lung obstruction with either limited ability to exchange gas when breathing or damage that is evenly distributed throughout their lungs are at high risk of death from the procedure.³¹
- In August 2003, the Centers for Medicare and Medicaid Services (CMS) announced that they intend to cover LVRS for people with non-high risk severe emphysema, who meet the criteria stated in the National Emphysema Treatment Trial (NETT). In addition, CMS has decided that LVRS is "reasonable and necessary" only for qualified patients that undergo therapy before and after the surgery. CMS is currently composing accreditation standards for LVRS facilities and will use these standards to determine where the surgery will be covered.³²
- Treatments for AAT deficiency emphysema including AAT replacement therapy (a life-long process) and gene therapy are currently being evaluated. It is hoped that a clinical trial on gene therapy will take place within the decade.³³