

Chronic Obstructive Pulmonary Disease

Also called Chronic Obstructive Lung Disease (COLD), Chronic Airflow Obstruction (CAO)

Description of the Disability

Chronic Obstructive Pulmonary Disease (COPD) is a group of lung diseases that make it very difficult for someone to breathe. It is progressive and potentially life threatening, but not contagious. The term "Obstructive" means the person is not able to exhale well, which leaves "old" air in the lungs and reduces the amount of "new" (oxygenated) air the person can bring in with the next breath. There is growing evidence that the COPD diseases are the result of long-term (often decades) inflammation from breathing in irritating smoke, dust particles or fumes. Smoking cigarettes is the most common cause of COPD, but there are probably genetic factors that make some people who smoke more likely to experience COPD than others. Prolonged exposure to other lung irritants such chemicals or industrial dust can also cause COPD.

In some ways, COPD is similar to Asthma (see entry) since both involve narrowing of the airways because of inflammation. However, the blockage of Asthma attacks is usually short-term (although potentially frequent), in response to recent exposure to the trigger, and involves a reversible decrease in breathing ability. COPD is continuous, in response to long-term exposure, and involves a permanent decrease in breathing ability.

The two most common lung diseases included in COPD are Chronic Bronchitis and Emphysema.

- **Chronic Bronchitis** - When you breathe in, you bring in some dust and other things along with the air. The airways of your lungs (called bronchial tubes) have a special mucus lining to capture this dust and filter it out. Your bronchial tubes also special hairs, or cilia, which sweep this mucus up and out, gradually removing the dust. When a person's bronchial tubes are chronically irritated and inflamed for many years, they permanently swell and stiffen up, making it hard to exhale. The irritation also damages the special cilia, which allows the mucus to build up and thicken. In response, the cells that make the mucus begin to produce even more. The main symptoms of Chronic Bronchitis are a persistent cough to bring up the mucus and difficulty breathing. The person may also experience frequent bacterial and viral infections.
- **Emphysema** - When you breathe in, the air goes down into your lungs and ends up in grape-like clusters of small sacs called Alveoli. This cluster arrangement helps make the largest possible surface area across which oxygen can move from the fresh air into the blood. When a person experiences Emphysema, the lungs loose elasticity and the thin walls of these tiny air sacks begin to tear instead of flexing and expanding with each breath. The damage is permanent. As the air sacks break down, the person's lungs loose oxygen exchange efficiency because of the lost surface area. The person's lungs also continue to become less flexible overall, which makes them empty less efficiently. The word Emphysema comes from a Greek word meaning "to swell", because the person's lungs tend to stay partly inflated, making them seem bigger. Chronic inflammation from dust or other irritants seems to cause the emphysema.

- **Bronchiectasis** is sometimes included in the diseases called COPD. It involves difficulty getting rid of mucus in the breathing passages, which causes the passages to stretch and enlarge, become inflamed, and weakened. Cystic Fibrosis (see entry) is one of the most common causes of Bronchiectasis, but other severe lung damage or respiratory diseases (such as influenza and tuberculosis) can also cause it.

(A rare birth defect, Antitrypsin Deficiency, also causes COPD. There are a few other obstructive respiratory diseases, such as asthma, that physicians do not include in the COPD label.)

The most common symptoms of COPD are frequent coughing (a "productive" cough that brings up thick sputum/mucus from the lungs), tightness in the chest and difficulty breathing after mild physical activities, and frequent lung infections such as pneumonia. Weight loss and depression are also common.

During early stages of COPD, the person may have just occasional shortness of breath and chronic throat clearing. As it progresses they may begin to have more frequent shortness of breath, have a chronic cough, have difficulty sleeping because of the cough, and experience occasional exacerbations (see above). In advanced stages, any physical activity may leave them breathless, the skin of their fingers and toes may turn bluish (see Cor Pulmonale below), they may become confused, and they may experience frequent exacerbations and take longer to recover from the exacerbations. They often feel as if they are perpetually drowning.

Physicians monitor the progress of a person with COPD using, among other things, a Spirometer, into which the person blows to measure the volume and force of exhalation. This gives a Forced Expiratory Volume (FEV) rating based on normal exhalation. People with moderate COPD will have and FEV below 70%. In advanced stages FEV drops below 30%.

Cor Pulmonale (also called Pulmonary Hypertension) is a heart condition that occurs in some people with COPD. In most people the left side of the heart (the side the pumps fresh blood out to the body) has higher blood pressure than the right side of the heart (which pumps "used" blood to the lungs for oxygenation). In people with COPD or other diseases that damage the lungs, the blood pressure in the lungs may go up significantly, making the right side of the heart work harder and grow larger. This interferes with the overall functioning of the heart and can lead to several secondary symptoms, including fluid collection in the feet and legs, a swollen abdomen, bluish skin in the fingers and toes (Cyanosis), and an enlarged liver.

In some ways COPD is similar to Cystic Fibrosis (see entry), but with two differences. In people with Cystic Fibrosis the mucus/phlegm blocking the air passages of the lungs is much thicker and more difficult to remove. So there are some treatments for Cystic Fibrosis that are not used for people with COPD. In addition, COPD is generally caused by long-term behaviors and habits of the person (mostly smoking cigarettes), so personal responsibility for changing those behaviors is a large issue in slowing down the progression of the disease. In contrast, Cystic Fibrosis is a genetic condition.

Psychosocial Impact

For some individuals, there can be a great deal of fear associated with COPD exacerbations. Many people with COPD report that it feels like they are drowning and can't get enough air. A person with COPD may become very afraid of these attacks and work hard to avoid them. Because one of the triggers can be physical exertion, the person may become overly cautious about physical activity. This can start a vicious cycle of inactivity, making them out of shape, making the attack triggered by even lower levels of exertion, which makes the person even more cautious and inactive. Some research suggests that a person with a "moderate" level of denial about the seriousness of their COPD may be better off, since they are more likely to keep themselves active and inventive about finding ways around challenges. Individuals who accept all the cautionary advice of their physicians may become overly cautious and fall into the trap of inactivity, leading to social isolation and depression.

Incidence Statistics

- COPD is the fourth leading cause of death in America.
- Approximately 120,000 Americans die from COPD each year
- Between 80 and 90% of all people with COPD report significant cigarette usage.
- Cigarette smoking is the most common risk factor, but second hand smoke and the smoking of pipes or cigars are also risk factors.
- Only around 20% of smokers will develop COPD.
- Approximately 11% of Americans has COPD.
- COPD is probably under diagnosed. 24 million Americans show signs of reduced lung function that could indicate COPD.
- Most cases of COPD are diagnosed when the person is in their late 50s or early 60s.

Common Treatments, Medications, and Side Effects

Treatment of COPD focuses on symptom management and slowing the progression of the disease. Several drugs can help control coughing and minimize shortness of breath including:

- Bronchodilators relax or open narrow airways: Anticholinergics, Beta-agonists, Theophylline (See Drugs for side effects). They may be delivered with an inhaler (a pocket-sized cylinder of pressurized medicine released into the mouth as a mist as the person breaths in), a nebulizer (a small vaporizer that creates a mist of water and medicine which the person breaths in through a tube), syrup, or pills.
- Corticosteroids (Anti-inflammatory) control inflammation of airways (See Drugs for side effects)
- Mucolytics thin mucus making it easier to cough up (See Drugs for side effects)
- Expectorants make it easier to cough up mucus (See Drugs for side effects)

People experiencing advanced COPD may use supplemental oxygen. Usually they carry it in a portable pressurized gas canister with a tube delivering the oxygen to the person's nose (a "cannula"). They may have a larger set of canisters at home or even a home-based

People with COPD should avoid irritants that may trigger breathing problems, including chemicals, smoke, perfumes, indoor and outdoor pollution, smog, cold dry air, hot humid air, high altitudes. Individuals should also avoid respiratory illness such as the flu and pneumonia, which can make symptoms worse.

A small number of people receive **lung volume reduction surgery**. This surgery removes damaged parts of the lungs that no longer contract normally. With these parts gone, the remaining lung tissue has more room to function, allowing it to work more effectively. However, this is major surgery and it does not restore full breathing ability.

Possible Functional Issues

- Reduced stamina
- Difficulty breathing
- Difficulty climbing stairs
- Difficulty carrying objects
- Difficulty bending over
- Difficulty walking long distances
- Difficulty working in areas with much dust or strong fumes
- Sensitivity to cold and heat
- Sensitivity to days of high air pollution
- Vulnerability to lung infections
- Frequent coughing
- Depression
- Confusion (in advanced stages)
- Problem solving skills are usually not affected
- Social skills are usually not affected
- Fine motor skills are usually not affected

Initial Interview Considerations

Initial Questions

- How has COPD affected their ability to work?
- How has it affected their home life?

- How often, if ever, do they have exacerbations (see above)? Are there particular triggers that make it more likely?
- How long does it take them to recover from an exacerbation?
- How much trouble do they have with getting chilled? With getting over heated?
- What activities cause them the most trouble?
- What places or situations cause them the most trouble?
- What times of the day are best for them? What times are worst?
- How are they immediately after meals? (Some people report extra difficulty after eating)
- How often do they use supplemental oxygen, if at all? How do they carry it with them, if at all?
- How far can they walk without trouble?
- What sorts of things can they lift and carry without trouble?
- How many stairs can they climb without trouble?
- How often do they get respiratory infections (pneumonia, colds, etc.)?
- How comfortable are they with meeting the public?
- What kind of walking stick, scooter, or other mobility tool do they use?
- What side effects, if any, are they experiencing from their medication?
- How stable is their condition? How do they expect to be in five years? Ten years?
- How much trouble do they have bending over?

Initial Observations

- If the person got out of breath at any time during the meeting, how quickly did they recover?

Interview Accommodations (if any)

- Hold the interview somewhere that the person can reach without climbing stairs or having to walk a long distance.
- Have a side table available for the person on which they can place things without bending over.
- If you have a cold or cough the day of the interview, contact the person before the meeting to warn them and give them the opportunity to reschedule.

Possible Accommodations and Assistive Technology

- Flexible pacing of work
- Frequent breaks to rest, use oxygen, take medication, or take breathing treatments
- Desk located near frequently used areas (copier, bathroom, etc.)
- Flexible work schedule

- Minimized exposure to dust, smoke, perfumes, smog, cold dry air, hot humid air, fumes from cleaning supplies, etc.
- Minimized exposure to pest control chemicals (insecticides, pesticides, etc.)
- Schedule cleaning of facilities when person is not present
- Non-smoking workspace, non-smoking conference rooms
- Wheeled, shelved cart for carrying and moving objects
- Work supplies stored at comfortable level that requires no reaching

Career Planning Issues

- The person should avoid careers that involve work environments with dust or fumes, or with temperature extremes.
- Careers that involve being outside a lot could be problematic. Some people with COPD are very sensitive to outdoor air pollution levels, seasonal dust, etc.
- COPD is a progressive disease, so it is useful to discuss how the person's career choice might transition to part-time or home-based employment in the future if needed. If the person does not use supplemental oxygen, it might be useful to consider any accommodations if they do need it in the future.
- People with COPD are vulnerable to various lung infections, so careers that involve a lot of contact with the public could be challenging.

Emerging Issues

- New treatments, including Lung Reduction Surgery

Additional Information Resources

- National Emphysema Foundation - emphysemafoundation.org/copdcbro.htm (no "www")
- American Lung Association - www.lungusa.org
- The Australian Lung Foundation - www.lungnet.org.au
- National Heart, Lung, & Blood Institute - dci.nhlbi.nih.gov (no "www")
- Cleveland Clinic Health System, Health Information on COPD - www.cchs.net