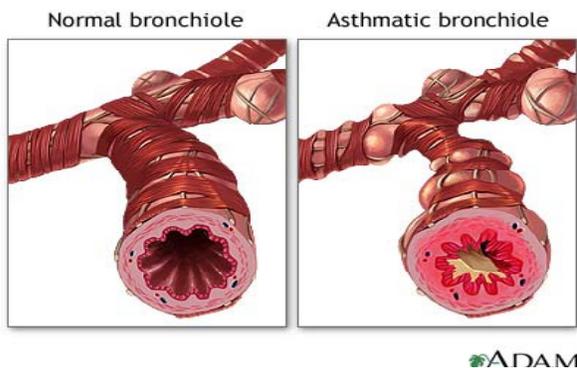


# Asthma Quick Facts

## What is asthma?

**Asthma** is a chronic condition that obstructs airflow, but the obstruction is reversible. It involves difficulty in breathing due to:

- Inflammation (swelling)
- Mucus in the airways
- Tightening of muscles around the airways



## How common is asthma?

- About 8% of Utah adults, aged 18 and older, currently have asthma (Source: Utah BRFSS, 2004)
  - » Males - 7.3%
  - » Females - 8.7%

## Asthma signs and symptoms

- Coughing
- Wheezing, a whistling sound when breathing
- Shortness of breath
- Chest tightness
- Sneezing and runny nose
- Itchy and inflamed eyes

Symptoms may be mild, moderate, or severe in intensity, or even life-threatening. Symptoms are more commonly experienced at night.

## Asthma triggers

A trigger is something that can cause an individual to have an asthma attack. Some examples include:

- Allergens (pollens, animals, dust, mold)
- Irritants (cold air, chemicals and sprays, tobacco smoke)
- Exercise
- Upper respiratory diseases

**A trigger is something that can cause an individual to have an asthma attack.**

## What increases an individual's chance for developing asthma?

Individual characteristics:

- Genetic makeup
- Age
- Sex
- Race

Medical conditions:

- Low birth weight
- Obesity
- Respiratory infections as a child
- Allergies

**Smoking and exposure to second-hand smoke increase the risk of developing asthma.**

# Asthma Quick Facts

## How is asthma treated?

Asthma cannot be cured, but it can be controlled by avoiding triggers and using medications to control symptoms.

Generally there are two types of medications:

- **Controller or long-term**
- **Rescue, quick-relief or short-term**

Both types of medications are important in helping control asthma. Each type is used for different purposes.

## Controller medications

These medications are taken daily. More common controller medications include:

- Salmeterol (e.g., Serevent)
- Fluticasone (e.g., Flovent)
- Cromolyn (e.g., Intal)
- Montelukast (e.g., Singulair)

Controller medications (long-term) treat the airway swelling or inflammation, the main problem of asthma. These medications reduce the swelling, prevent excess mucus from developing and help prevent the muscles from contracting around the airways. They also help make the airways less “twitchy” or irritated.

*Controller medications are taken at least once daily and prevent asthma attacks from happening long term. They should be taken until stopped by your doctor.*



Push down on the canister and breathe in slowly

ADAM

## Rescue medications

More common rescue medications include:

- Albuterol (e.g., Proventil)
- Pirbuterol (e.g., Maxair)
- Ipratropium bromide and albuterol (e.g., Cobivent)

Rescue medications work quickly and relax the muscles around the airways making it easier to breathe. These medications give temporary relief and their effects can last up to 4 hours. Rescue medications don't treat the swelling or mucus in the airways and when they wear off, the muscle tightening can return.

**It is important to seek medical care if you have asthma.**

## Poorly controlled asthma can lead to:

- Urgent care and emergency room visits
- Hospitalizations
- Sick days
- Activity limitations
- Lower quality of life

## What YOU can do if you have asthma

- Identify and minimize contact with asthma triggers
- Understand and take medications as prescribed
- Recognize early signs that asthma is getting worse
- Know what to do if asthma is getting worse

# Work-Related Asthma

## What is work-related asthma?

Work-related asthma is asthma that is caused by, or is made worse by, exposures or triggers in the workplace. Over 250 workplace agents are associated with work-related asthma. See Table 1 for common examples.

**Table 1:**  
**Work-related Asthma Triggers**

Type of Substance	Examples
Air pollutants	tobacco smoke, diesel exhaust, aerosol agents, dusts, gases and vapors
Dusts (organic/inorganic)	wood, rock, coal, protein dusts, silica, asbestos, latex
Fumes and vapors	chemicals, cleaning materials, welding, solvents, isocyanates, anhydride from heating and cooling metals quickly
Molds	all varieties
Pollens	trees, flowers, weeds
Gases	formaldehyde, ammonia, chlorine, sulfur dioxide, ozone, nitrogen oxides
Mists	paints, lacquers, varnishes, hair spray, pesticides, cleaning products, acids, etc

## When is asthma work-related?

### Do symptoms:

- Occur only at work or occur regularly after the work shift?
- Improve on week-ends or vacations?
- Increase over the course of the work week?
- Improve after a change in the work environment?

Work-related asthma may not appear for weeks or months following exposure, as it takes time for the body to become sensitive to the substance(s) causing asthma. Once asthma has developed, symptoms may occur at lower levels of exposure to the substance(s).

## How common is work-related asthma?

- Up to 20% of all asthma adult cases may be work-related asthma
- Of those diagnosed with work-related asthma:
  - » 20 – 27% are those with pre-existing asthma who experience aggravated asthma attacks due to workplace exposures
  - » Up to 80% are new asthma cases due to work-place exposures

## How can work-related asthma be prevented?

- Use engineering controls to reduce exposure by:
  - » Modifying work processes and installing enclosures
  - » Automating work procedures
  - » Installing local exhaust ventilation systems
- Use individual preventative measures by:
  - » Minimizing exposures to known asthma triggers
  - » Using appropriate respiratory equipment

# Work-Related Asthma

Treatment of work-related asthma is not different than “ordinary” asthma.

## How is work-related asthma treated?

Asthma cannot be cured, but it can be controlled by using medications to control symptoms and prevent asthma attacks, or by avoiding and/or minimizing exposure to triggers. Generally there are two types of medications:

- **Controller** or **long-term**
- **Rescue** also called **Quick-relief**

Both types of medications are important in helping keep asthma under control. Each type is used for different purposes.

## Steps to take if workplace exposures are affecting your lungs

### 1. Gather information about:

- Symptoms you are experiencing
- When these symptoms began
- How often you have these symptoms
- Time of day or week that symptoms are worse
- Times that you feel better (e.g., when not working)
- Why you feel symptoms are related to work
- List of substances or materials that you are exposed to at work (see Material Safety Data Sheets (MSDSs) available at your workplace)
- List of previous jobs, hobbies, and smoking habits that may have or be affecting your lungs

2. Share the above information with your doctor.

## Work-related asthma resources

- American Lung Association  
[www.lungusa.org](http://www.lungusa.org)
- Asthma and Allergy Foundation of America  
[www.aafa.org](http://www.aafa.org)
- Asthma Program, Utah Department of Health  
[www.health.utah.gov/asthma](http://www.health.utah.gov/asthma)
- American Academy of Family Physicians – Patient Education  
<http://familydoctor.org>
- Canadian Centre for Occupational Health and Safety  
[www.ccohs.ca/oshanswers/diseases/asthma.html](http://www.ccohs.ca/oshanswers/diseases/asthma.html)
- National Heart Lung & Blood Institute  
[www.nhlbi.nih.gov/health](http://www.nhlbi.nih.gov/health)
- Occupational Safety and Health Association  
[www.osha.gov/SLTC/occupationalasthma/](http://www.osha.gov/SLTC/occupationalasthma/)

## References

- American Lung Association, Asthma in Adults Fact Sheet, July 2005. <http://www.lungusa.org>
- Arnaiz NO, Kaufman JD. New developments in work-related asthma. Clin Chest med. 2002 Dec; 23(4):737-47
- Cullinan, P, Clinical aspects of occupational asthma. Panminerva Med, 2004. 46(2): p. 111-20
- Henneberger, P.K., et al., Work-related exacerbation of asthma. Int J Occup Environ Health, 2002. 8(4): p. 291-6.
- Lombardo, LJ & Balmes JR. (2000) Occupational asthma: A review. Environmental Health Perspectives Supplements Volume 108 (S4), August, 2000
- Occupational Respiratory Disease: Your workplace and your lungs, [www.familydoctor.org](http://www.familydoctor.org)
- Utah Department of Health, Asthma Program, [www.health.utah.gov/asthma](http://www.health.utah.gov/asthma)

# COPD

## Chronic Obstructive Pulmonary Disease

### What is COPD?

Chronic Obstructive Pulmonary Disease, also known as COPD, is comprised of a set of lung diseases that limits air flow and is not fully reversible. It is usually progressive and is associated with inflammation of the lungs as they respond to harmful particles or gases. Treatment is available. COPD can be prevented by taking proper precautions and avoiding triggers.

### Two major types

#### Chronic Bronchitis

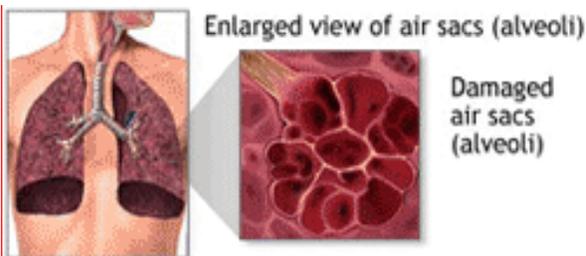
- Characterized by the presence of chronic inflammation and excess mucus production and the presence of a chronic productive cough.

It is estimated that 14 million people in the U.S. suffer from this disorder.

#### Emphysema

- Characterized by damage to the small, sac-like units of the lung that participate in the delivery of oxygen and removal of carbon dioxide from the lung.

It is estimated that 2 million individuals in the U.S. suffer from this disorder.



Cigarettes contain many hazardous substances that damage the lungs when inhaled



ADAM

### Symptoms of chronic bronchitis and emphysema:

The symptoms of chronic bronchitis and emphysema are similar.

Chronic Bronchitis	Emphysema
Chronic cough	Chronic cough
Shortness of breath	Shortness of breath
Frequent clearing of throat	Limited activity level
Increased mucus	

### What can cause COPD?

The primary risk factor for COPD is smoking. Long-term smoking is responsible for 80-90% of cases. A smoker is 10 times more likely to die of COPD than a non-smoker.

Other risk factors include:

- Childhood respiratory infections
- Genetic make-up
- Increasing age
- Prolonged exposure to harmful particles and gases (secondhand and industrial smoke, chemical gases, vapors, mists and fumes, and dusts from grains, materials and minerals)

### How common is COPD?

- About 13.9% of the U.S. adult population, ages 25 and older, have been diagnosed with COPD
  - » 15 – 19% of COPD cases are work-related
- 24 million other people have evidence of troubled breathing, indicating COPD is under diagnosed by more than 60%

**Smoking cessation is critical for all severities of COPD.**

# COPD

## Chronic Obstructive Pulmonary Disease

### What do we know about COPD in the mining industry?

Studies show:

- An increased number of cases of chronic bronchitis in coal and gold miners
- Long-term exposures to low levels of silica may lead to the development of chronic bronchitis and emphysema
- Chronic exposure to coal dust, particularly high levels, can cause severe emphysema

### How is COPD prevented or its progression slowed?

- Avoid exposure to second-hand smoke and other harmful substances in the air
- Stop smoking to prevent further damage

### How is COPD treated?

Treatment is different for each individual. It is based on severity of symptoms.

Early diagnosis and treatment can:

- Slow progress of the disease
- Relieve symptoms
- Improve an individual's ability to stay active
- Prevent and treat complications
- Improve quality of life

Medications used to treat COPD symptoms or to decrease the risk for complications include:

- Bronchodilators - to relax the muscles around the airways
- Steroids - to reduce inflammation
- Oxygen therapy - to help with shortness of breath
- Annual flu vaccine - to reduce the risk of the flu and its complications
- Pneumonia vaccine - to prevent a common cause of pneumonia

### When is it important to see a doctor?

- When first experiencing shortness of breath or other lung symptoms
- If symptoms get worse

Seek emergency medical treatment if:

- Breathing suddenly becomes more difficult

Note: If you are currently diagnosed with COPD, see your doctor 1-2 times a year to review treatment plan.

### Resources on the Internet

- [www.lungusa.org](http://www.lungusa.org)
- [www.nlm.nih.gov/health/COPD](http://www.nlm.nih.gov/health/COPD)
- [www.emphysema.net](http://www.emphysema.net)

### References

American Lung Association. Breathing Hazards at Work, Workplace Exposures can Generate Breathing Hazards. [www.lungusa.org](http://www.lungusa.org)

American Lung Association. Chronic obstructive pulmonary disease (COPD) Fact Sheet. 2003.

Centers for Disease Control, Department of Health and Human Services, CDC Programs in Brief-Workplace Health and Safety- Work-Related Lung Disease. 2005.

National Heart, Lung, and Blood Institute, National Institutes of Health. Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease (Updated 2003) - Executive Summary. 2003.

# Silicosis

## What is silicosis?

Silicosis is caused by exposure to respirable crystalline silica dust. Crystalline silica is a basic component of soil, sand, granite, and most other types of rock, and is used as an abrasive blasting agent. Silicosis is a progressive, disabling, and often fatal lung disease. Cigarette smoking adds to the lung damage caused by silica

## Effects of silicosis

- Lung cancer - silica has been classified as a human lung carcinogen
- Bronchitis/Chronic Obstructive Pulmonary Disorder (COPD)
- Tuberculosis (TB) - Silicosis makes an individual more susceptible to TB
- Scleroderma - a disease affecting skin, blood vessels, joints and skeletal muscles
- Possible renal disease

## Symptoms of silicosis

- Shortness of breath
- Dry, nonproductive cough
- Possible fever
- Fatigue
- Loss of appetite
- Chest pain
- Respiratory failure, which may eventually lead to death

## Sources of exposure

- Sandblasting for surface preparation
- Crushing and drilling rock and concrete
- Masonry and concrete work (e.g., building and road construction and repair)
- Mining/tunneling; demolition work
- Cement and asphalt pavement manufacturing

## Preventing silicosis

- Use all available engineering controls such as blasting cabinets and local exhaust ventilation
- Avoid using compressed air for cleaning surfaces
- Use water sprays, wet methods for cutting, chipping, drilling, sawing, grinding
- Substitute non-crystalline silica blasting material
- Use respirators approved for protection against silica; if sandblasting, use abrasive blasting respirators
- Do not eat, drink or smoke near crystalline silica dust
- Wash hands and face before eating, drinking or smoking away from exposure areas

For more complete information:

**OSHA**

Occupational Safety and Health Administration

US Department of Labor

[www.osha.gov](http://www.osha.gov)

# Beryllium Disease

## What is beryllium?

A metal found as a component of coal, oil, certain rock minerals, volcanic dust and soil. It is not harmful when held or touched. However, beryllium particles are a health hazard when they become air born in the process of cutting, grinding or otherwise working with it.

## What is beryllium disease?

Beryllium disease refers to various conditions that result from exposure to beryllium and its compounds or alloys. Exposure to beryllium most often occurs in mining, extraction and in the processing of alloy metals containing beryllium.

### *More common types*

- Beryllium sensitization - a person's immune system responds to the exposure
- Chronic beryllium disease - a slowly progressive respiratory disease that is treatable, but cannot be cured. It involves scarring of the lungs and may be fatal. It can take years to develop after the first beryllium exposure.

### *Less common type*

- Acute beryllium disease - has a sudden, rapid onset during or following high levels of exposure. Improved workplace controls have almost eliminated this form of the disease.

## How can beryllium disease be prevented?

- Use engineering controls to reduce exposure, such as
  - » Modifying work processes and installing enclosures
  - » Automating work procedures
  - » Installing local exhaust ventilation systems
- Use individual preventative measures, such as
  - » Wearing protective clothing and respiratory protective devices
  - » Showering and changing clothes at the end of the work day

### **\*WARNING\***

**Inhaling beryllium dust or fumes may cause serious, chronic lung disease, or cancer. It can be fatal.**

# Beryllium Disease

## Symptoms

### *Beryllium Sensitization*

- No symptoms
- Positive blood test for sensitivity

### *Acute Beryllium Disease*

- Inflammation of the lung, windpipe, skin, eyes, nose and/or throat

### *Chronic Beryllium Disease*

- Nonproductive cough
- Breathing difficulties
- Chest pain
- General weakness
- Loss of appetite
- Weight loss
- Formation of masses of tissue in the lungs (granulomas)
- Possible formation of granulomas in the skin, liver, spleen, kidney, bone, nervous system, skeletal muscles, lymph glands or wall of heart

## Treatment

### *Beryllium Sensitization*

- No treatment

### *Chronic beryllium disease*

- There is no known cure, but with treatment, progress of the disease may be slowed.
- Treatment goals:
  - » Improve symptoms
  - » Improve oxygen levels in bloodstream (Oxygen therapy)
  - » Protect lungs from further damage

## Resources/References

- Canada's national Occupational Health and Safety Resource. [www.ccohs.ca/oshanswers/diseases/beryllium.html](http://www.ccohs.ca/oshanswers/diseases/beryllium.html)
- National Jewish Center [www.nationaljewish.org/disease-info/diseases/occ-med/beryllium/about/beryllium/index.aspx](http://www.nationaljewish.org/disease-info/diseases/occ-med/beryllium/about/beryllium/index.aspx)
- Day, GA, Stefaniak, AB, Weston, A, Tinkle, SS. (2006) Beryllium exposure: dermal and immunological considerations. *Int Arch Occup Environ Health*. 79:161-164

# Black Lung Disease

## What is Black lung disease?



Black lung disease results from inhaling coal dust and carbon over a long period of time. Coal dust settles in the lungs, causing them to harden and make breathing difficult. It is a chronic, progressive, disabling, and often fatal lung disease. There are two types: simple and complicated. The complicated form, sometimes referred to as progressive massive fibrosis, affects less than 2% of those with the simple form. The complicated form involves progressive scarring of the lungs, which leads to premature disability and death. Cigarette smoking adds to the lung damage caused by coal dust.

## Sources of exposure

- Underground coal mines
- Preparation of coal for transport
- Transporting coal

## Results of prolonged exposure to coal dust may result in

- Chronic Obstructive Pulmonary Disorder (COPD) comprised of chronic bronchitis and/or emphysema
- Simple form of black lung disease
- Complicated form of black lung disease, progressive massive fibrosis
- Silicosis, if the quartz content of the coal is high
- Both black lung disease and silicosis

## Symptoms of black lung disease

### Early stages

- No symptoms or non-productive cough

### Later stages

- Shortness of breath
- Decreased tolerance for exercise
- May have emphysema with productive cough
- May have progressive massive fibrosis
- May have failure of right side of heart
- Respiratory failure, which may eventually lead to death

## Preventing black lung disease

- Use engineering controls
- Wear well-fitted appropriate respirators
- Participate in a respiratory protection program

## Treatment

- Eliminate or minimize exposure to dust
- Stop smoking
- Treat symptoms
- Use oxygen therapy as needed

1. The Merck Manual of Medical Information Online Medical Library, Second Home Edition. Black Lung. Last reviewed/revised 2/1/2003. <http://www.merck.com/mmhe/sec04/ch049.html>

2. U.S. Department of Labor, Mine Safety and Health Administration, National Mine Safety Academy, "Dust - What you can't see can hurt you." 1999

# Asbestos Diseases

## What is asbestos?

Asbestos is a naturally occurring silicate fiber.

## What diseases are associated with asbestos?

- Asbestosis - inflammation that results in scarring of the lung tissues
- Nonmalignant pleural disease - thickening and calcification of lung disease
- Cancer of the lung, larynx, pharynx
- Mesothelioma - a cancer affecting the lining of the lungs or abdomen
- Gastrointestinal cancer

## Means of exposure

- Inhaling dust that penetrates deep into the lungs
- Swallowing dust that is “coughed up”
- Eating contaminated food

Asbestos diseases occurs usually 15 or more years after initial exposure. The risk of developing lung cancer increases significantly in those with a history of exposure to asbestos and tobacco smoking. Family members may also be at risk for asbestosis if exposed to fibers transported on work clothing.

**Signs and symptoms will vary from person to person and the type of asbestos disease.**

## Signs and Symptoms

### *Early Symptoms*

- No symptoms
- Shortness of breath with activity
- Dry cough

### *Later stages*

- A persistent and productive cough (a mucus producing cough)
- Chest tightness or pain
- A dry, crackling sound while inhaling

## Sources of exposure

- Underground and open-casting mines
- Asbestos product manufacturing (insulation, roofing and building materials)
- Demolition and renovation of buildings containing asbestos
- Ship yards
- Automotive repair (brakes and clutches)
- Power plants and steel mills

# Asbestos Diseases

## Preventing asbestos diseases

- Use engineering controls to reduce exposure, such as
  - » Enclosing dust sources
  - » Using wet methods to prevent dust generation
  - » Substituting or using alternatives to asbestos
- Use individual preventative measures
  - » Wear an appropriate respirator
  - » Shower and change clothes at the end of the work day
  - » Avoid eating and drinking in exposure areas

**Together, smoking and asbestos exposure significantly increase your chance of developing one of the asbestos diseases.**

## Treatment

- Eliminate or minimize future exposure to asbestos
- Stop smoking
- Obtain pneumonia vaccinations
- Obtain an annual flu vaccination
- Treat bacterial infections promptly
- Supplement oxygen, if needed

## References

- <http://www.atsdr.cdc.gov>
- APHA Preventing Occupational Disease and Injury, 1991, page 114-125.
- Rosenstock L, Cullen MR, Brodtkin CA, Redlich CA Textbook of Clinical Occupational and Environmental Medicine, 2nd Edit., Philadelphia, El Sevier, 2005, p 374-377
- Asbestos Exposure and Your Job: At-Risk Occupations, Industries and Locations <http://www.mesothelioma-facts.com/atrisk.cfm>

# Respiratory Disease Educational Materials

Asthma, COPD, Silicosis, Black Lung,  
Beryllium, and Asbestos Diseases

**Mining Industry**



# Respiratory Disease Educational Materials

Asthma, COPD, Silicosis, Black Lung,  
Beryllium, and Asbestos Diseases

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