CONDITION

# Byssinosis

Learn how cotton, flax, or hemp dust can affect the lungs, including symptoms of byssinosis, workplace testing, treatment, prevention, and when to seek urgent care.

**WHAT IT IS**
Work-related lung disease caused by textile dust

**BODY SYSTEM**
Lungs and breathing

**MAIN SYMPTOMS**
Chest tightness, coughing, wheezing, shortness of breath

**WHAT CAUSES IT**
Inhaled cotton, flax, or hemp dust

**HOW IT IS DIAGNOSED**
Exposure pattern and lung-function testing

**MAIN TREATMENT**
Reducing or stopping dust exposure

**CAN IT BE CURED?**
Sometimes - early symptoms improve off exposure

**IS IT AN EMERGENCY?**
Sometimes - severe breathing difficulty

**LONG-TERM OUTLOOK**
May progress to lasting airflow obstruction

## Overview

Byssinosis is a work-related lung disease caused by breathing dust from raw cotton and, less often, flax or hemp. It mainly affects people who process these plant fibers in textile mills or similar workplaces. It is sometimes called "brown lung disease."

The disease can cause chest tightness, coughing, wheezing, and shortness of breath. Symptoms may be most noticeable when a person returns to work after being away, such as on the first day of the workweek. This pattern led to older terms such as "Monday fever" or "Monday chest tightness." Symptoms may improve during later workdays, although that pattern can become less clear after years of exposure.

Byssinosis is not simply an allergy to cotton. Dust from raw plant material can contain tiny particles and substances released by bacteria, especially bacterial toxins called endotoxins.

These substances can irritate and narrow the airways. The resulting breathing problems may resemble asthma or chronic obstructive pulmonary disease, also called COPD.

Recognizing the connection with work matters. Continued exposure may lead to more frequent symptoms and lasting loss of lung function. Early workplace controls, medical assessment, and reduced exposure can help protect the lungs.

## Symptoms

Symptoms usually begin during or after exposure to textile dust. Early in the disease, a person may feel well when away from work and develop symptoms after returning.

Possible symptoms include:

A characteristic early pattern is chest tightness or breathing difficulty on the first day back at work after a weekend or other break. Symptoms may become less noticeable over the next few workdays. This does not mean the exposure is harmless. The airways may temporarily adjust while irritation continues.

With repeated or long-term exposure, symptoms may occur on more workdays or continue away from work. Exercise may become harder. A person may also develop persistent airflow obstruction, meaning air cannot move out of the lungs as easily as expected.

The timing of symptoms is important. Keeping a record of work tasks, dust exposure, symptoms, and days away from work may help a clinician identify a workplace pattern.

Seek prompt medical advice if breathing symptoms are new, are becoming more frequent, wake you from sleep, limit normal activity, or continue when you are away from work.

Call emergency services for severe breathing difficulty, blue or gray lips, confusion, fainting, severe chest pain, or an inability to speak in full sentences. These signs can occur with several serious conditions and require immediate assessment.

- Tightness or pressure in the chest
- Coughing
- Wheezing, which is a high-pitched sound during breathing
- Shortness of breath
- Increased mucus
- A feeling that it is harder to take a full breath
- Fever, chills, or a generally unwell feeling after heavy exposure in some cases

## Causes and risk factors

Byssinosis develops after inhaling dust produced while opening, cleaning, carding, spinning, or otherwise processing raw cotton, flax, or hemp. Risk is generally higher in work areas where raw fibers are handled and airborne dust levels are greater. Processing washed or finished material may create a different level of exposure.

Cotton dust is a mixture rather than a single substance. It may contain plant fragments, soil, fungi, and bacterial material. Endotoxins from certain bacteria are believed to play an important role in airway inflammation and narrowing.

Factors that may increase risk include:

Smoking does not cause byssinosis, but it can damage the lungs and add to the effects of workplace dust. It may also make it harder to determine whether symptoms come from byssinosis, COPD, asthma, or more than one condition.

People can carry dust home on clothing, but byssinosis is mainly linked to repeated workplace exposure. Changing clothes and following workplace laundering procedures can reduce dust outside the work area.

- Working around raw cotton, flax, or hemp dust
- Spending many years in dusty textile environments
- Performing tasks that release large amounts of dust
- Inadequate ventilation or dust-control systems
- Not having suitable respiratory protection when it is required
- Asthma, airway sensitivity, or another existing lung condition
- Cigarette smoking

## Diagnosis

There is no single test that proves a person has byssinosis. Diagnosis is based on the type of exposure, the timing of symptoms, lung-function testing, and assessment for other causes.

A clinician will ask about present and past jobs, not just the current workplace. Useful details include the fibers handled, specific work tasks, ventilation, respiratory protection, visible dust, spills or unusual exposures, and whether coworkers have similar symptoms.

The clinician may ask whether symptoms:

Spirometry is an important test. It measures how much air a person can blow out and how

quickly it leaves the lungs. One key measurement is the forced expiratory volume in one second, or FEV1. Testing before and after a work shift may show a work-related decrease in airflow. Tests performed after time away from exposure can provide additional information.

A bronchodilator like albuterol or salmeterol test may be done during spirometry. The test is repeated after use of a medicine that relaxes airway muscles. Improvement can show reversible airway narrowing, but it does not by itself distinguish byssinosis from asthma.

Some people may be asked to record peak flow readings at work and away from work. Peak flow measures how quickly air can be forced out. Accurate records can help reveal a pattern, but testing should be planned with a clinician so the results are interpreted correctly.

A chest X-ray does not confirm byssinosis. It may be used to look for pneumonia, heart problems, other occupational lung diseases, or another explanation for the symptoms. Additional testing may be appropriate when asthma, COPD, infection, or heart disease is possible.

Workplaces covered by occupational safety rules may provide medical surveillance, including health questionnaires and periodic lung-function testing. A worker may also be referred to an occupational medicine clinician or a lung specialist.

- Start or worsen during a particular shift
- Are strongest after days away from work
- Improve on weekends or vacations
- Continue after leaving the workplace
- Occur with exercise, cold air, infections, or other triggers

## Treatment and management

The main part of management is reducing or stopping exposure to the dust that is causing symptoms. This may involve improving ventilation, enclosing dusty processes, changing work methods, cleaning with systems that do not spread dust into the air, or moving the worker to an area with lower exposure.

Employers are responsible for following applicable workplace safety requirements. Personal respirators can help in situations where they are required, but they should not replace engineering controls such as effective dust collection. A workplace respirator program should include selection of the correct equipment, fit testing, training, and maintenance.

Medical treatment depends on the pattern and severity of breathing problems. A clinician may consider inhaled bronchodilators, which relax the muscles around the airways. Some people

with ongoing airway inflammation may be treated with inhaled corticosteroids like budesonide or fluticasone. These medicines reduce inflammation and are different from muscle-building steroids like prednisone or hydrocortisone . Treatment is often guided by the person's symptoms, lung tests, and whether asthma or COPD is also present.

Severe breathing symptoms may require urgent treatment, such as additional inhaled medicines, oxygen, or other supportive care. These treatments should be given under medical supervision.

Other practical steps include avoiding tobacco smoke, receiving appropriate routine vaccines after discussion with a healthcare professional, and learning how to use inhalers correctly if they are prescribed. Pulmonary rehabilitation may be considered for people with lasting shortness of breath or reduced exercise ability. This supervised program combines exercise, breathing education, and support for managing chronic lung symptoms.

Workers should not make abrupt employment decisions based only on symptoms or a single test. Occupational medicine professionals can help discuss exposure controls, temporary restrictions, job modification, and relevant workplace protections.

## Complications

Early byssinosis symptoms may improve when exposure is reduced or stopped. However, repeated exposure over many years can contribute to chronic airflow obstruction. In this situation, coughing, wheezing, and shortness of breath may persist even when the person is no longer at work.

Possible complications include reduced exercise tolerance, difficulty performing physical work, repeated episodes of breathing distress, and long-term loss of lung function. Existing asthma or COPD may also become harder to control.

Not everyone exposed to cotton dust develops lasting lung disease. The course depends on the amount and duration of exposure, workplace controls, smoking, existing lung health, and how early the problem is recognized.

A sudden change in symptoms should not automatically be blamed on byssinosis. Infections, blood clots, heart conditions, asthma attacks, and other illnesses can also cause shortness of breath or chest discomfort.

## Follow up

Routine follow-up may include reviewing symptoms, checking inhaler technique, repeating

spirometry, and discussing whether workplace changes have reduced exposure. Follow-up is especially useful after a job modification or a period away from dust because lung function and symptoms may change.

Bring a list of job duties, safety data, respirator information, and prior workplace lung-test results to appointments when available. A symptom diary can also be helpful. Note the date, work area, task, exposure level, symptoms, and whether they improved away from work.

Contact a clinician sooner than planned if symptoms are worsening, begin occurring away from work, interfere with sleep or ordinary activity, or do not respond as expected to prescribed treatment. Fever with worsening cough, coughing up blood, or new chest pain also needs prompt medical assessment.

Emergency care is appropriate for severe breathlessness, fainting, confusion, blue or gray lips, severe chest pain, or rapidly worsening symptoms.

## Sources


- Occupational Safety and Health Administration. 29 CFR 1910.1043: Cotton Dust . U.S. Department of Labor.
- National Institute for Occupational Safety and Health. Criteria for a Recommended Standard: Occupational Exposure to Cotton Dust . DHEW (NIOSH) Publication No. 75-118; 1974.
- Merck Manual Professional Edition. Byssinosis . Merck & Co., Inc.
- MedlinePlus Medical Encyclopedia. Byssinosis . U.S. National Library of Medicine.