# Hypersensitivity Pneumonitis (Extrinsic Allergic Alveolitis)

## What is hypersensitivity pneumonitis?

The term hypersensitivity pneumonitis (also known as extrinsic allergic alveolitis) refers to a group of lung diseases in which your lungs become inflamed as an allergic reaction resulting from exposure to dusts of animal and vegetable origin. The name “extrinsic allergic alveolitis”, although complicated, describes the origin and the nature of these diseases.

- “extrinsic”– cause originating outside the body
- “allergic”– caused by the allergic reaction of the body to a specific substance or condition
- “alveolitis”– an inflammation in the inner part of the lungs (alveoli are the small air sacs in the lungs)

### What causes hypersensitivity pneumonitis?

Intense or prolonged exposure to animal or vegetable dusts can result in hypersensitivity pneumonitis. The dust particles must be 5 microns or smaller to get into the alveoli. Animal and vegetable dusts are complex mixtures originating from many different sources such as husks, bark, wood, animal dander, and microorganisms including bacteria and fungi. The microorganisms produce toxic chemicals that form part of the mixture. Insects and insect fragments, bird droppings and dried urine of rats may also be found in the dusts. Mouldy hay, straw, grain, and feathers are other sources of dust.

### How does hypersensitivity pneumonitis develop?

Hypersensitivity pneumonitis does not develop on the first day of exposure to animal and vegetable dusts. Repeated and prolonged exposure is necessary. Even then, only some workers develop allergic reactions to the dusts. Ten to forty percent (10 – 40%) of exposed people do not show any symptoms.

The allergy is triggered by complicated reactions of the body’s natural defense system that normally protects the lungs from foreign substances. In some individuals, the chemical reactions of the defense system that would ordinarily protect the lungs actually cause the inflammation and lung damage. The body’s

changing response to the presence of dust in the lungs is called sensitization.

## What are the symptoms of hypersensitivity pneumonitis?

Hypersensitivity pneumonitis, once a person is sensitized, can show three different types of responses: acute (intense) response, sub-acute (recurrent) response, and chronic (long-term) response. Signs and symptoms will vary between people.

The acute attack begins by heavy exposure to the trigger. It starts with fever, muscular aches and a general, unwell feeling or malaise. These symptoms are accompanied by tightness in the chest, a dry cough, and shortness of breath. Symptoms may develop between 4 and 8 hours after exposure.

The sub-acute response occurs most frequently to people exposed to relatively low levels of dust. It is marked by cough, chronic bronchitis, shortness of breath, or anorexia or weight loss.

The chronic response develops after persistent acute attacks and recurrent sub-acute responses. It is marked by increasing cough, chronic bronchitis, shortness of breath,  anorexia or weight loss, and lung fibrosis. The victim suffers permanent lung damage.

## How is hypersensitivity pneumonitis recognized and treated?

In diagnosis, the best evidence for hypersensitivity pneumonitis is the patient’s occupation and a history of exposure to animal or vegetable dusts. Although the doctor may want to do some tests, such as lung x-rays, blood tests or lung function tests, these are not specific and may not distinguish between hypersensitivity pneumonitis/extrinsic allergic alveolitis, and/or other lung problems.

Following diagnosis, the person must avoid future exposure to animal and vegetable dusts. This action alone results in improvement. For serious cases, patients need medications that make breathing easier.

## What are the occupations at risk?

Hypersensitivity pneumonitis occurs in many, diverse occupations. This list is not complete.

The following table lists several examples and the related occupations.

**Examples of Hypersensitivity Pneumonitis**

| Disease | Exposure | Preventive Maintenance |
|---|---|---|
| **Air conditioner / humidifier lung** | **Humidifier water** | **Maintenance of air and water handling systems.** |

| | | |
|---|---|---|
| **Animal handlers' lung** | **Dust of dander, hair particles, dried urine of rats** | **Good exhaust ventilation.** |
| **Bagassosis** | **Mouldy sugar cane** | **Application of propionic acid to bagasse. Good exhaust ventilation. Keeping moisture content above 20%. Enclosure of processes.** |
| **Bird fanciers' lung** | **Droppings and feathers** | **Good exhaust ventilation. Water spraying of droppings while cleaning.** |
| **Cheese washers' lung** | **Cheese mould** | **Wrapping the cheese in foil during aging.** |
| **Farmers' lung** | **Mouldy hay, straw, grain** | **See "Dust Control" in next section.** |
| **Hot tub lung** | **Bacteria in mist from hot tub** | **Maintain disinfectant level for water. Regular hot tub cleaning. Good exhaust ventilation.** |
| **Maltworkers' lung** | **Mouldy malt** | **Application of mechanical methods in the malting process.** |
| **Maple bark strippers' disease** | **Mouldy maple bark** | **Spraying of logs during debarking. Remote control of some operations.** |
| **Mushroom workers' lung** | **Mouldy mushroom compost** | **Good exhaust ventilation.** |
| **Sequoiosis** | **Mouldy sawdust** | **Good exhaust ventilation. Enclosure of processes.** |

| | | |
|---|---|---|
| **Sewage sludge disease** | **Dust of heat-treated sludge** | **Good exhaust ventilation. At outside facilities, stand upwind of storage piles.** |
| **Wheat weevil lung / Miller’s lung** | **Mouldy grain, flour, dust** | **See “Dust Control” in next section.** |
| **Suberosis** | **Mouldy cork dust** | **Good exhaust ventilation.** |
| **Wood pulp workers’ disease** | **Mouldy wood chips** | **Good exhaust ventilation. Remote control of some operations.** |

## How can we prevent hypersensitivity pneumonitis?

The means for reducing dust exposure (dust control) include engineering control and personal protective equipment. Education is also important, and educational programs should emphasize the significance of animal and vegetable dust in causing diseases. Managers and workers should learn about methods of storing materials to prevent mould formation and to reduce dust.

Methods of engineering control include local exhaust ventilation, general ventilation, process enclosure and process isolation (separating the worker from the dusty process).

On farms, prevention of particle release and control of dust cloud formation are achieved by well-designed, leakproof ducting, and enclosed conveyor systems for grains and feeds. Buildings should have local ventilation systems in areas frequented by workers engaged in egg-handling and feed storage and preparation. Within enclosed livestock units, temperature and relative humidity should be monitored. Adequate ventilation and sufficient fresh, replacement air should be provided. For field operations, tractors or combine harvesters with enclosed cabs provided with filtered air should be used.

Personal protective equipment may be vital but it should be considered as the last resort for respiratory protection. Personal protective equipment should not be a substitute for proper dust control. Respirators, including dust masks, should only be used:

- when engineering or administrative controls are not technically feasible,
- when engineering controls are being installed or repaired, or
- when emergencies or other temporary situations arise (e.g., maintenance operations).

If respiratory protective equipment is needed for the job, then a full respiratory program should be put in place that includes selection, use, and care of respirators plus training and education for the worker. Because respirators provide different levels of protection, it is very important to

assess the airborne contaminant before selecting the specific type of respirator.