

What Is Hypersensitivity Pneumonitis?

Hypersensitivity pneumonitis (HP) is a lung condition in which your immune system reacts to certain substances in the air you breathe. Repeated inhalation of these substances causes inflammation from the lung's immune reaction, called "pneumonitis." Because this inflammation due to HP can resemble pneumonia from an infection, it may take a long time to arrive at the correct diagnosis. Sometimes this inflammation will resolve, but other times, it can lead to scar formation in the lung and problems with absorbing oxygen into your body. Anyone can be affected, but some people are more at risk than others. This fact sheet addresses diagnosis of HP. For information about treatment, see the ATS Patient Information Series fact sheet "Treatment of Hypersensitivity Pneumonitis."



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While HP is much less common than asthma or pneumonia, the exposures known to cause it occur commonly in the air we breathe. These include high levels of mold spores, dust from pet birds, down feathers, and contaminated water aerosols from indoor hot tubs and humidifiers.

Who is at risk for developing HP?

The following occupations, activities, and substances are associated with HP following prolonged exposure.

Farming and grain processing and use

Inhalation of molds and bacteria commonly found in hay, grains, and animal feeds. The risk seems to be highest when these substances are stored in airtight conditions without first being dried, resulting in bacteria and mold contamination that can be inhaled during baling or unloading.

Indoor air and water contamination

Inhalation of molds and bacteria found in hot, humid conditions, such as hot tubs, whirlpools, humidifiers, dehumidifiers, or areas of water damage.

Birds and dusts from other animals

- Inhalation of airborne dusts generated from birds (mainly their feathers and droppings). This includes pet birds, such as pigeons, parakeets, and canaries, as well as those raised on family or corporate farms (chickens, turkeys). Workers who pluck feathers are also at risk.
- Bedding and other furnishings that contain bird feathers or down products.
- Veterinarians, or others who work with animals, who come into contact with animal droppings, body fluids, or feathers/fur, may also be at risk.

Chemicals, dusts, and other substances used in industrial manufacturing

- Working with certain chemicals has been associated with risk for HP, for example, isocyanates contained in two-part paints and polyurethanes.
- Machine operators who are exposed to machining aerosols or metalworking fluid that contain bacteria may be at risk.
- Lumber workers exposed to moldy wood bark that is being milled may be at risk.

Less common exposures

- Musical instruments (trombones, saxophones) that become contaminated with microorganisms.
- Workers exposed to dusts from oyster shells.

Why do some people get HP, and others do not?

You may develop HP even though your family, friends, or co-workers who share the same environment remain healthy. The reason why some but not other people develop HP is not known, but doctors think that it may have to do with the following:

- Some people inherit genes from their parents that may make them more sensitive to respiratory exposures that can cause HP. This is similar to what happens in the case of allergies.
- The length of time people are exposed and the intensity of exposure to substances that cause HP may be associated with risk for disease.
- Smoking status, viral infections and other unknown factors may play a role in risk for HP, but more research needs to be done to fully understand this.

What are common symptoms of HP?

Symptoms may occur suddenly and be quite noticeable (acute) while others may be more subtle and the onset harder to recognize (chronic). Acute symptoms tend to occur after shorter, higher exposures to substances that cause HP, while chronic symptoms are more often associated with repeated, lower exposures. Symptoms are nonspecific and may include:

- Shortness of breath, especially with activity
 - Frequent dry cough
 - Weight loss
 - Unusual fatigue
 - Recurrent flu-like symptoms of fevers, chills, and sweats
- Sometimes symptoms improve when you remove yourself from the environment in which the exposure is occurring (for example, going on vacation or taking a leave from work). In some people with the chronic form of HP, symptoms do not improve with avoiding a particular environment.

How is HP diagnosed?

Diagnosing HP can be challenging, because it requires that doctors consider the possibility of HP even when symptoms and medical

tests of lung function and chest imaging resemble other conditions, and may include:

Medical History

When your doctor asks about your health history, be sure to talk about:

- Current and former occupations, including use of certain chemicals and exposures to dusts known to cause HP.
- Current and former hobbies and recreational activities (both in and outside your home).
- Use of hot tubs, humidifiers or swamp coolers.
- The age, location, and condition of your home.
- Past episodes of water damage in your home.
- If you are frequently exposed to birds. Most pets do not increase the risk of HP, but birds do.
- Medications you take now or took in the past.
- Family history of HP or other form of pulmonary fibrosis.

Physical Exam

Your doctor will perform a physical exam to evaluate your lungs, neck, heart, and skin to help determine what might be causing the problems in your lungs.

Blood Tests

If the diagnosis of HP is uncertain, blood tests may be helpful. Special antibody blood tests to look for evidence that your immune system has reacted to an HP exposure may be done, but these are often negative in patients with HP.

Pulmonary Function Tests (PFTs)

- HP can cause your lungs to become inflamed and scarred. PFTs are breathing tests your doctor may use to evaluate your lungs for inflammation and scarring by measuring how fast air moves in and out of your lungs, how deep a breath you can take, and how much oxygen in your lungs is absorbed in your bloodstream. Also, your doctor will probably ask you to repeat PFTs at regular intervals to see if your lung disease is changing over time, and to monitor your response to treatment.
- Tests to check your oxygen levels, especially with walking or any kind of exertion, can be helpful to monitor lung inflammation and scarring from HP and to determine whether you need to use supplemental oxygen.

High-resolution Computed Tomography (HRCT)

HRCT, or thin slice chest CT scans, are a special type of lung imaging where your doctors can get detailed pictures of your lungs, heart, blood vessels, and lymph nodes. This is done to look for signs of infection, inflammation, and scarring. Chest HRCT scans are also useful to check your response to treatment and to monitor the status of your HP lung disease.

Bronchoscopy and Lung Biopsy

Bronchoscopy is a test where your doctor passes a tiny camera at the end of a long, flexible tube through your mouth or nose and into your lungs. This is done to check the fluid in your lungs for infection and inflammation, and may also be used to perform a lung biopsy. A lung biopsy is when doctors retrieve a small piece of lung tissue for evaluation under a microscope, which can be an important step in evaluating your lungs for HP. In some cases, a chest surgery may be required to biopsy the lung, but this decision will be made with you and your doctor, and will only be done if necessary to make a diagnosis.

How will HP affect my health?

Most cases of acute HP will get better if recognized early. Some people will have permanent changes, and others may develop a chronic form of lung disease with progressive scarring. Some

forms of HP require treatment in addition to getting away from the triggering agent. For more on treatment, see ATS Patient Information Series fact sheet "Treatment of Hypersensitivity Pneumonitis."

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Rx Action Steps

- ✓ Consult with your doctor if you are concerned you may have HP and to see if you need the help of an environmental/occupational specialist to remove harmful substances from your home or workplace.
- ✓ If you do have HP, take steps to avoid all possible exposure to what you are sensitized to.
- ✓ If you are diagnosed with bird-related HP:
 - You have to avoid exposure to birds.
 - You need to eliminate any remnant bird dust from your home.
 - You cannot keep pet birds in the house (moving a bird to a separate room will not eliminate your exposure).
- ✓ If diagnosed with HP from a workplace exposure, talk with your healthcare provider or HP specialist about:
 - How to avoid further exposure to causative/suspected substances at work.
 - Whether you need to file for worker's compensation benefits.
- ✓ If you have HP from any cause, the following are also essential in addition to avoiding ongoing exposure to the substance that caused your HP:
 - Having regular medical follow up and monitoring of lung function and need for medication.
 - Getting recommended immunizations such as yearly flu vaccine.
 - Stopping smoking and vaping and avoiding exposure.
 - Using oxygen if prescribed.

Healthcare Provider's Contact Number:

For More Information

American Thoracic Society

- <https://www.thoracic.org/patients>

American Lung Association

- <https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/hypersensitivity-pneumonitis/>

CHEST Foundation

- <https://foundation.chestnet.org/lung-health-a-z/hypersensitivity-pneumonitis/>

HPLung

- <https://www.hplung.com>

National Institutes of Health

- <https://www.nhlbi.nih.gov/health-topics/hypersensitivity-pneumonitis>

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