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## Pneumonia

Also called: Bronchopneumonia

### What is pneumonia?

Pneumonia is an infection in one or both of your lungs. It causes the air sacs of your lungs to fill up with fluid or pus.

Pneumonia can range from mild to severe, depending on what caused it, your age, and your overall health.

### What causes pneumonia?

Bacterial [https://medlineplus.gov/bacterialinfections.html] , viral [https://medlineplus.gov/viralinfections.html] , and fungal [https://medlineplus.gov/fungalinfections.html] infections can cause pneumonia.

**Bacteria** are the most common cause. Bacterial pneumonia can occur on its own. It can also develop after you've had certain viral infections such as a cold [https://medlineplus.gov/commoncold.html] or the flu [https://medlineplus.gov/flu.html] . Several different types of bacteria can cause pneumonia, including:

- *Streptococcus pneumoniae* [https://medlineplus.gov/pneumococcalinfections.html]
- *Legionella pneumophila*; this type of pneumonia is often called Legionnaires' disease [https://medlineplus.gov/legionnairesdisease.html]
- *Mycoplasma pneumoniae*
- *Chlamydia pneumoniae*
- *Haemophilus influenzae* [https://medlineplus.gov/haemophilusinfections.html] type b (Hib)

**Viruses** that infect the respiratory tract may cause pneumonia. Viral pneumonia is often mild and goes away on its own within a few weeks. But sometimes it is serious enough that you need to get treatment in a hospital. If you have viral pneumonia, you are at risk of also getting bacterial pneumonia. The different viruses that can cause pneumonia include:

- Respiratory syncytial virus [https://medlineplus.gov/respiratorysyncytialvirusinfections.html] (RSV)
- Some common cold [https://medlineplus.gov/commoncold.html] and flu [https://medlineplus.gov/flu.html] viruses
- SARS-CoV-2, the virus that causes COVID-19 [https://medlineplus.gov/covid19coronavirusdisease2019.html]

**Fungal** pneumonia is more common in people who have chronic health problems or **weakened immune systems** [https://medlineplus.gov/immunesystemanddisorders.html] . Some of the types include:

- *Pneumocystis pneumonia* [https://medlineplus.gov/pneumocystisinfections.html] (PCP)
- Valley fever [https://medlineplus.gov/valleyfever.html] (Coccidioidomycosis)
- *Histoplasmosis* [https://medlineplus.gov/histoplasmosis.html]
- Cryptococcal pneumonia

Aspiration can also cause pneumonia. It can happen when you aspirate (accidentally breathe in) food or fluid into the lungs. If you are not able to cough out the food or fluid, it may cause an infection.

### Who is more likely to develop pneumonia?

Anyone can develop pneumonia, but certain factors can increase your risk:

- Age; the risk is higher for children who are age 2 and under and adults age 65 and older.
- Exposure to certain chemicals, pollutants, or toxic fumes.
- Lifestyle habits, such as smoking [<https://medlineplus.gov/smoking.html>] , heavy alcohol use [<https://medlineplus.gov/alcohol.html>] , and malnourishment [<https://medlineplus.gov/malnutrition.html>] .
- Being in a hospital, especially if you are in the ICU [<https://medlineplus.gov/criticalcare.html>] . Being sedated and/or on a ventilator raises the risk even more.
- Having a lung disease [<https://medlineplus.gov/lungdiseases.html>] .
- Having a weakened immune system.
- Have trouble coughing [<https://medlineplus.gov/cough.html>] or swallowing [<https://medlineplus.gov/swallowingdisorders.html>] , from a stroke [<https://medlineplus.gov/stroke.html>] or other condition.
- Recently having been sick with a cold or the flu.
- Other chronic (long-lasting) health conditions, including diabetes [<https://medlineplus.gov/diabetes.html>] , heart failure [<https://medlineplus.gov/heartfailure.html>] , sickle cell disease [<https://medlineplus.gov/sicklecelldisease.html>] , liver disease [<https://medlineplus.gov/liverdiseases.html>] , and kidney disease [<https://medlineplus.gov/kidneydiseases.html>]

## What are the symptoms of pneumonia?

The symptoms of pneumonia can range from mild to severe and include:

- Fever [<https://medlineplus.gov/fever.html>]
- Chills
- Cough, usually with phlegm (a type of thick mucus made in your lungs)
- Shortness of breath [<https://medlineplus.gov/breathingproblems.html>]
- Chest pain [<https://medlineplus.gov/chestpain.html>] when you breathe or cough
- Nausea and/or vomiting [<https://medlineplus.gov/nauseaandvomiting.html>]
- Diarrhea [<https://medlineplus.gov/diarrhea.html>]

The symptoms can vary for different groups. Newborns and infants may not show any signs of the infection. Others may vomit and have a fever and cough. They might seem sick, with no energy, or be restless.

Older adults and people who have serious illnesses or weak immune systems may have fewer and milder symptoms. They may even have a lower-than-normal temperature. Older adults who have pneumonia sometimes may feel weak or suddenly get confused.

## What other problems can pneumonia cause?

Sometimes pneumonia can cause serious complications such as:

- Bacteremia, which happens when the bacteria move into the bloodstream. It is serious and can lead to septic shock [<https://medlineplus.gov/sepsis.html>] .
- Lung abscesses [<https://medlineplus.gov/abscess.html>] , which are collections of pus in cavities of the lungs.
- Pleural disorders [<https://medlineplus.gov/pleuraldisorders.html>] , which are conditions that affect the pleura. The pleura is the tissue that covers the outside of the lungs and lines the inside of your chest cavity.
- Kidney failure [<https://medlineplus.gov/kidneyfailure.html>] .
- Respiratory failure [<https://medlineplus.gov/respiratoryfailure.html>] .

## How is pneumonia diagnosed?

Sometimes pneumonia can be hard to diagnose. This is because it can cause some of the same symptoms as a cold or the flu. It may take time for you to realize that you have a more serious condition.

To find out if you have pneumonia, your health care provider:

- Will take your medical history, which includes asking about your symptoms
- Will do a physical exam, which includes listening to your lungs with a stethoscope
- May order various tests, such as:
  - A chest x-ray [<https://medlineplus.gov/xrays.html>]
  - Blood tests such as a complete blood count [<https://medlineplus.gov/lab-tests/complete-blood-count-cbc/>] (CBC) to see if your immune system is actively fighting an infection
  - A blood culture [<https://medlineplus.gov/lab-tests/bacteria-culture-test/>] to find out whether you have a bacterial infection that has spread to your bloodstream

If you are in the hospital, have serious symptoms, are older, or have other health problems, you may also have more tests, such as:

- Sputum test [<https://medlineplus.gov/lab-tests/sputum-culture/>] , which checks for bacteria in a sample of your sputum (mucus that is brought up from the lungs by coughing).
- Chest CT scan [<https://medlineplus.gov/ctscans.html>] to see how much of your lungs are affected. It may also show if you have complications such as lung abscesses or pleural effusions (a buildup of fluid in the pleural space).
- Pleural fluid culture [<https://medlineplus.gov/lab-tests/pleural-fluid-analysis/>] , which checks for bacteria in a fluid sample that was taken from the pleural space.
- Pulse oximetry or blood oxygen level test, [<https://medlineplus.gov/lab-tests/blood-oxygen-level/>] to check how much oxygen is in your blood.
- Bronchoscopy, a procedure used to look inside your lungs' airways.

## **What are the treatments for pneumonia?**

Treatment for pneumonia depends on the type of pneumonia, which germ is causing it, and how severe it is:

- Antibiotics [<https://medlineplus.gov/antibiotics.html>] treat bacterial pneumonia and some types of fungal pneumonia. They do not work for viral pneumonia.
- In some cases, your provider may prescribe antiviral medicines for viral pneumonia.
- Antifungal medicines treat other types of fungal pneumonia.

You may need to be treated in a hospital if your symptoms are severe or if you are at risk for complications. While there, you may get additional treatments. For example, if your blood oxygen level is low, you may receive **oxygen therapy** [<https://medlineplus.gov/oxygentherapy.html>] .

It may take time to recover from pneumonia. Some people feel better within a week. For other people, it can take a month or more.

## **Can pneumonia be prevented?**

Vaccines can help prevent pneumonia caused by pneumococcal bacteria or the flu virus [<https://medlineplus.gov/flushot.html>]. Washing your hands often [<https://medlineplus.gov/germsandhygiene.html>] , not smoking, and having a healthy lifestyle [<https://medlineplus.gov/healthyliving.html>] may also help prevent pneumonia.

*NIH: National Heart, Lung, and Blood Institute*

## **Start Here**

- Learn about Pneumonia [<https://www.lung.org/lung-health-diseases/lung-disease-lookup/pneumonia/learn-about-pneumonia>] (American Lung Association)
- Pneumonia [<https://familydoctor.org/condition/pneumonia/?adfree=true>] (American Academy of Family Physicians)
- What Is Pneumonia? [<https://www.nhlbi.nih.gov/health/pneumonia>]  (National Heart, Lung, and Blood Institute)  
Also in Spanish [<https://www.nhlbi.nih.gov/es/salud/neumonia>]

# Symptoms

- Pneumonia Symptoms and Diagnosis [<https://www.lung.org/lung-health-diseases/lung-disease-lookup/pneumonia/symptoms-and-diagnosis>] (American Lung Association)

## Diagnosis and Tests

- Chest X-Ray (Radiography) [<https://www.radiologyinfo.org/en/info/chestrand>]  (American College of Radiology; Radiological Society of North America)  
Also in Spanish [<https://www.radiologyinfo.org/es/info/chestrand>]
- Sputum Culture [<https://medlineplus.gov/lab-tests/sputum-culture/>]  (National Library of Medicine)  
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/cultivo-de-esputo/>]

## Prevention and Risk Factors

- Pneumonia Prevention and Control [<https://www.cdc.gov/pneumonia/prevention/>] (Centers for Disease Control and Prevention)  
Also in Spanish [<https://www.cdc.gov/pneumonia/es/prevention/prevencion-y-control-de-la-neumonia.html>]

## Related Issues

- Current Vaccine Shortages and Delays [<https://www.cdc.gov/vaccines/hcp/vaccines-us/shortages-delays.html>] (Centers for Disease Control and Prevention)
- Petroleum Jelly: Safe for a Dry Nose? [<https://www.mayoclinic.org/diseases-conditions/pneumonia/expert-answers/petroleum-jelly/faq-20057784?p=1>] (Mayo Foundation for Medical Education and Research)

## Specifics

- About Adenovirus [<https://www.cdc.gov/adenovirus/about/>] (Centers for Disease Control and Prevention)
- About Mycoplasma pneumoniae Infection [<https://www.cdc.gov/mycoplasma/about/>] (Centers for Disease Control and Prevention)
- Pneumococcal Infections: MedlinePlus Health Topic [<https://medlineplus.gov/pneumococcalinfections.html>]  (National Library of Medicine)  
Also in Spanish [<https://medlineplus.gov/spanish/pneumococcalinfections.html>]
- Pneumocystis Infections: MedlinePlus Health Topic [<https://medlineplus.gov/pneumocystisinfections.html>]  (National Library of Medicine)  
Also in Spanish [<https://medlineplus.gov/spanish/pneumocystisinfections.html>]
- Pneumonia in People with a Weakened Immune System [<https://www.merckmanuals.com/home/lung-and-airway-disorders/pneumonia/pneumonia-in-people-with-a-weakened-immune-system>] (Merck & Co., Inc.)  
Also in Spanish [<https://www.merckmanuals.com/es-us/hogar/trastornos-del-pulm%C3%B3n-y-las-v%C3%ADas-respiratorias/neumon%C3%A1tica/neumon%C3%A1tica-en-personas-con-un-sistema-inmunitario-debilitado?autoredirectid=24056>]
- Ventilator-associated Pneumonia Basics [<https://www.cdc.gov/ventilator-associated-pneumonia/about/>] (Centers for Disease Control and Prevention)
- Walking Pneumonia Signs, Diagnosis, & Treatment [<https://kidshealth.org/en/parents/walking-pneumonia.html>] (Nemours Foundation)  
Also in Spanish [<https://kidshealth.org/es/parents/walking-pneumonia.html>]
- Walking Pneumonia: What Does It Mean? [<https://www.mayoclinic.org/diseases-conditions/pneumonia/expert-answers/walking-pneumonia/FAQ-20058530?p=1>] (Mayo Foundation for Medical Education and Research)  
Also in Spanish [<https://www.mayoclinic.org/es/diseases-conditions/pneumonia/expert-answers/walking-pneumonia/faq-20058530?p=1>]

## Statistics and Research

- FastStats: Pneumonia [<https://www.cdc.gov/nchs/fastats/pneumonia.htm>] (National Center for Health Statistics)

# Clinical Trials

- ClinicalTrials.gov: Pneumonia [<https://clinicaltrials.gov/search?cond=%22Pneumonia%22&aggFilters=status:not%20rec>]  (National Institutes of Health)

## Journal Articles

References and abstracts from MEDLINE/PubMed (National Library of Medicine)

- Article: Electrical Impedance Tomography-Guided Airway Clearance in Elderly Patients With Severe Pneumonia:... [<https://www.ncbi.nlm.nih.gov/pubmed/40653597>]
- Article: Early weaning from oxygen therapy in African children with severe pneumonia. [<https://www.ncbi.nlm.nih.gov/pubmed/40597123>]
- Article: The Value of Soluble Urokinase Plasminogen Activator Receptor (suPAR) as Predictive... [<https://www.ncbi.nlm.nih.gov/pubmed/40523722>]
- Pneumonia -- see more articles [<https://pubmed.ncbi.nlm.nih.gov/?term=%22Pneumonia%22%5Bmajr%3Aexp%5D+AND+humans%5Bmh%5D+AND+english%5Bla%5D+AND+%22last+1+Year%22+%5Bdat%5D+AND+%28patient+education+handout%5Bpt%5D+OR+guideline%5Bpt%5D+OR+clinical+trial%5Bpt%5D%29++NOT+%28letter%5Bpt%5D+OR+case+reports%5Bpt%5D+OR+editorial%5Bpt%5D+OR+comment%5Bpt%5D%29+AND+free+full+text%5Bsb%5D+>]

## Reference Desk

- How the Lungs Work [<https://www.nhlbi.nih.gov/health/lungs>]  (National Heart, Lung, and Blood Institute)  
Also in Spanish [<https://www.nhlbi.nih.gov/es/salud/pulmones>]

## Find an Expert

- American Lung Association [<https://www.lung.org/>]
- National Heart, Lung, and Blood Institute [<https://www.nhlbi.nih.gov/>] 
- National Institute of Allergy and Infectious Diseases [<https://www.niaid.nih.gov/>] 

## Children

- Chlamydia Pneumoniae Infections [<https://www.healthychildren.org/English/health-issues/conditions/chest-lungs/Pages/Chlamydia-pneumoniae-Infections.aspx>] (American Academy of Pediatrics)  
Also in Spanish [<https://www.healthychildren.org/spanish/health-issues/conditions/chest-lungs/paginas/chlamydia-pneumoniae-infections.aspx>]
- Mycoplasma pneumoniae Infections [<https://www.healthychildren.org/English/health-issues/conditions/chest-lungs/Pages/Mycoplasma-pneumoniae-Infections.aspx>] (American Academy of Pediatrics)  
Also in Spanish [<https://www.healthychildren.org/spanish/health-issues/conditions/chest-lungs/paginas/mycoplasma-pneumoniae-infections.aspx>]
- Pneumonia (For Parents) [<https://kidshealth.org/en/parents/pneumonia.html>] (Nemours Foundation)  
Also in Spanish [<https://kidshealth.org/es/parents/pneumonia.html>]

## Teenagers

- Pneumonia [<https://kidshealth.org/en/teens/pneumonia.html>] (Nemours Foundation)  
Also in Spanish [<https://kidshealth.org/es/teens/pneumonia.html>]

## Patient Handouts

- Aspiration pneumonia [<https://medlineplus.gov/ency/article/000121.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000121.htm>]
- Atypical pneumonia [<https://medlineplus.gov/ency/article/000079.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000079.htm>]

- Community-acquired pneumonia in adults [<https://medlineplus.gov/ency/article/000145.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000145.htm>]
- Hospital-acquired pneumonia [<https://medlineplus.gov/ency/article/000146.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000146.htm>]
- Mycoplasma pneumonia [<https://medlineplus.gov/ency/article/000082.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000082.htm>]
- Pneumonia in adults - discharge [<https://medlineplus.gov/ency/patientinstructions/000017.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/patientinstructions/000017.htm>]
- Pneumonia in children - community acquired [<https://medlineplus.gov/ency/article/007690.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/007690.htm>]
- Pneumonia in children - discharge [<https://medlineplus.gov/ency/patientinstructions/000011.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/patientinstructions/000011.htm>]
- Viral pneumonia [<https://medlineplus.gov/ency/article/000073.htm>] (Medical Encyclopedia)  
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000073.htm>]



## MEDICAL ENCYCLOPEDIA

[Aspiration pneumonia](https://medlineplus.gov/ency/article/000121.htm) [<https://medlineplus.gov/ency/article/000121.htm>]

[Atypical pneumonia](https://medlineplus.gov/ency/article/000079.htm) [<https://medlineplus.gov/ency/article/000079.htm>]

[Chest CT](https://medlineplus.gov/ency/article/003788.htm) [<https://medlineplus.gov/ency/article/003788.htm>]

[Chest x-ray](https://medlineplus.gov/ency/article/003804.htm) [<https://medlineplus.gov/ency/article/003804.htm>]

[CMV pneumonia](https://medlineplus.gov/ency/article/000664.htm) [<https://medlineplus.gov/ency/article/000664.htm>]

[Community-acquired pneumonia in adults](https://medlineplus.gov/ency/article/000145.htm) [<https://medlineplus.gov/ency/article/000145.htm>]

[Hospital-acquired pneumonia](https://medlineplus.gov/ency/article/000146.htm) [<https://medlineplus.gov/ency/article/000146.htm>]

[Lung needle biopsy](https://medlineplus.gov/ency/article/003860.htm) [<https://medlineplus.gov/ency/article/003860.htm>]

[Mycoplasma pneumonia](https://medlineplus.gov/ency/article/000082.htm) [<https://medlineplus.gov/ency/article/000082.htm>]

[Parapneumonic pleural effusion](https://medlineplus.gov/ency/article/000139.htm) [<https://medlineplus.gov/ency/article/000139.htm>]

[Pleural fluid culture](https://medlineplus.gov/ency/article/003725.htm) [<https://medlineplus.gov/ency/article/003725.htm>]

[Pneumonia - weakened immune system](https://medlineplus.gov/ency/article/000093.htm) [<https://medlineplus.gov/ency/article/000093.htm>]

[Pneumonia in adults - discharge](https://medlineplus.gov/ency/patientinstructions/000017.htm) [<https://medlineplus.gov/ency/patientinstructions/000017.htm>]

[Pneumonia in children - community acquired](https://medlineplus.gov/ency/article/007690.htm) [<https://medlineplus.gov/ency/article/007690.htm>]

[Pneumonia in children - discharge](https://medlineplus.gov/ency/patientinstructions/000011.htm) [<https://medlineplus.gov/ency/patientinstructions/000011.htm>]

Sputum culture [<https://medlineplus.gov/ency/article/003723.htm>]

Sputum direct fluorescent antibody (DFA) test [<https://medlineplus.gov/ency/article/003553.htm>]

Sputum Gram stain [<https://medlineplus.gov/ency/article/003765.htm>]

Viral pneumonia [<https://medlineplus.gov/ency/article/000073.htm>]

## Related Health Topics

COVID-19 (Coronavirus Disease 2019) [<https://medlineplus.gov/covid19coronavirusdisease2019.html>]

Haemophilus Infections [<https://medlineplus.gov/haemophilusinfections.html>]

Legionnaires' Disease [<https://medlineplus.gov/legionnairesdisease.html>]

Lung Diseases [<https://medlineplus.gov/lungdiseases.html>]

Pneumococcal Infections [<https://medlineplus.gov/pneumococcalinfections.html>]

Pneumocystis Infections [<https://medlineplus.gov/pneumocystisinfections.html>]

## National Institutes of Health

The primary NIH organization for research on *Pneumonia* is the National Heart, Lung, and Blood Institute [<http://www.nhlbi.nih.gov/>]

## Other Languages

Find health information in languages other than English [<https://medlineplus.gov/languages/pneumonia.html>] on *Pneumonia*

## NIH MedlinePlus Magazine

Achoo! Cold, Flu, or Something Else? [<https://magazine.medlineplus.gov/article/achoo-cold-flu-or-something-else>]

Getting an Accurate Read on Pulse Oximeters [<https://magazine.medlineplus.gov/article/getting-an-accurate-read-on-pulse-oximeters>]

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