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## Patient information: Pneumonia in adults (Beyond the Basics)

### Authors

Thomas J Marrie, MD  
Thomas M File, Jr, MD

### Section Editor

John G Bartlett, MD

### Deputy Editor

Anna R Thorner, MD

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### PNEUMONIA OVERVIEW

Pneumonia is an infection of the lungs. It is a serious illness that can affect people of any age, although it is most serious in the very young, people over the age of 65, and those with underlying medical problems such as congestive heart disease, diabetes, and chronic lung disease. It is most common during the winter months, and occurs more often in smokers and men.

This article will focus on community-acquired pneumonia (CAP), which refers to pneumonia that develops in people in the community, rather than in a hospital, nursing home, or assisted-living facility. About four million cases of CAP occur each year in the United States, and approximately 20 percent of people require hospitalization.

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### LUNG FUNCTION

As we breathe, air is inhaled through the nose and mouth, and travels through the trachea and the bronchi to the bronchioles. At the end of the bronchioles, there are tiny air sacs, called alveoli. Alveoli have thin, porous walls that contain capillaries ([figure 1](#)).

The mouth and respiratory tract are constantly exposed to microorganisms as air is inhaled through the nose and mouth. However, the body's defenses are usually able prevent microorganisms from entering and infecting the lungs. These defenses include the immune system, the specialized shape of the nose and pharynx, the ability to cough, and fine hair-like structures called cilia located on the bronchi. Pneumonia can develop if your defenses are not adequate or the microorganism is particularly strong.

As microorganisms multiply, the alveoli become inflamed and accumulate fluid. These changes lead to the symptoms of pneumonia. (See '[Pneumonia symptoms](#)' below.)

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### HIGH-RISK GROUPS

Some groups of adults are at a greater risk of developing pneumonia. These include people who:

- Are greater than 65 years old
- Are cigarette smokers
- Are malnourished due to health conditions or lack of access to food

- Have underlying lung disease, including cystic fibrosis, asthma, or chronic obstructive pulmonary disease (emphysema)
- Have other underlying medical problems, including diabetes or heart disease
- Have a weakened immune system due to HIV, organ transplant, chemotherapy, or chronic steroid use
- Have difficulty coughing due to stroke, sedating drugs or alcohol, or limited mobility
- Have had a recent viral upper respiratory tract infection including influenza

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## PNEUMONIA CAUSES

Pneumonia can be caused by a variety of microorganisms, including viruses, bacteria, and less commonly, fungi. The most common cause of pneumonia in the United States is the bacterium *Streptococcus pneumoniae*, or pneumococcus.

Viruses are estimated to be the cause of adult CAP in at least 20 percent of cases. Fungi rarely cause pneumonia in people who are generally healthy; people with a weakened immune system (those with HIV, organ transplant patients, or those on chemotherapy) are at higher risk of fungal infection. Other organisms, such as *Mycoplasma*, are a common cause of mild pneumonia but can occasionally cause serious disease.

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## PNEUMONIA SYMPTOMS

Common symptoms of pneumonia include shortness of breath, pain with breathing, a rapid heart and breathing rate, nausea, vomiting, diarrhea, and a cough that often produces green or yellow sputum; occasionally the sputum is rust colored. Most people have a fever (temperature greater than 100.5°F or 38°C), although elderly people have fever less often. Shaking chills (called rigors) and a change in mental status (confusion, unclear thinking) can occur.

The characteristics of pneumonia are different than those of a more common infection, acute viral bronchitis, which does not usually cause fever and does not require treatment with an antibiotic. (See "[Patient information: Acute bronchitis in adults \(Beyond the Basics\)](#)".)

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## PNEUMONIA DIAGNOSIS

Pneumonia is usually diagnosed with a medical history and physical examination, as well as a chest x-ray. The need for further testing depends upon the severity of the illness and the person's risk of complications.

**Chest x-ray** — Chest x-ray and sometimes other imaging studies, such as CT scan, are used for diagnosing pneumonia when the history and physical examination also support the diagnosis.

**Sputum testing** — Sputum testing requires a sample of sputum, collected from a deep cough. Culture of sputum is used to identify the bacteria that caused the pneumonia and can help determine which antibiotic is best.

**Urine antigen testing** — Urine tests can be helpful for diagnosing pneumonia caused by two bacteria, *Streptococcus pneumoniae* and *Legionella pneumophila*. These tests are easy to perform, and provide rapid results.

