

Bacterial Infections 101: Types, Symptoms, and Treatments

Reviewed By: [Charles Patrick Davis, MD, PhD](#)
Reviewed on 4/21/2020

What are Bacteria?

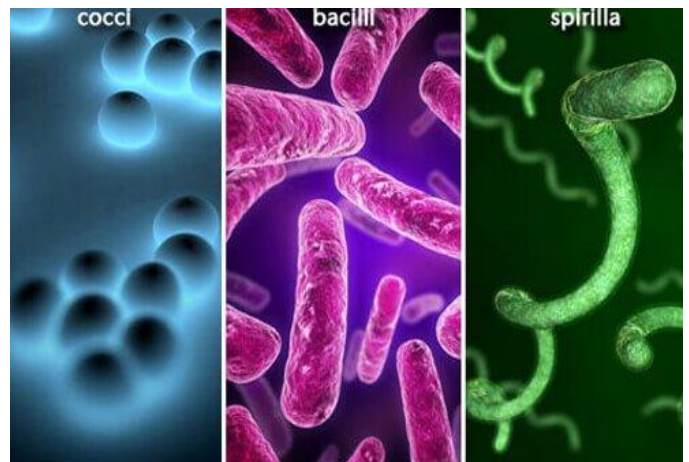
Bacteria are microscopic, single-cell organisms that live almost everywhere. Bacteria live in every climate and location on earth. Some are airborne while others live in water or soil. Bacteria live on and inside plants, animals, and people. The word "bacteria" has a negative connotation, but bacteria actually perform many vital functions for organisms and in the environment. For example, plants need bacteria in the soil in order to grow.

The vast majority of bacteria are harmless to people and some strains are even beneficial. In the human gastrointestinal tract, good bacteria aid in digestion and produce vitamins. They also help with immunity, making the body less hospitable to bad bacteria and other harmful pathogens. When considering all the strains of bacteria that exist, relatively few are capable of making people sick.



What Is a Bacterial Infection?

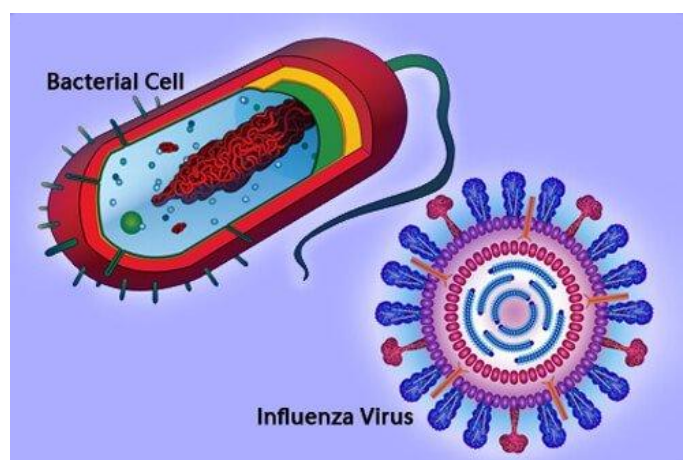
A bacterial infection is a proliferation of a harmful strain of bacteria on or inside the body. Bacteria can infect any area of the body. Pneumonia, meningitis, and food poisoning are just a few illnesses that may be caused by harmful bacteria. Bacteria come in three basic shapes: rod-shaped (bacilli), spherical (cocci), or helical (spirilla). Bacteria may also be classified as gram-positive or gram-negative. Gram-positive bacteria have a thick cell wall while gram-negative bacteria do not. Gram staining, bacterial culture with antibiotic sensitivity determination, and other tests like genetic analysis are used to identify bacterial strains and help determine the appropriate course of treatment.



Bacteria vs. Virus

Bacteria and viruses are different types of pathogens, organisms that can cause disease. Bacteria are larger than viruses and are capable of reproducing on their own. Viruses are much smaller than bacteria and cannot reproduce on their own. Instead, viruses reproduce by infecting a host and using the host's DNA repair and replication systems to make copies of itself.

The symptoms of a bacterial or viral infection depend on the area of the body that is affected. Sometimes the symptoms of the two can be very similar. For example, runny nose, cough, headache, and fatigue can occur with the common cold (virus) and with a sinus infection (bacteria). A doctor may use the presence of other symptoms (such as fever or body aches), the length of the illness, and certain lab tests to determine if an illness is due to a virus, bacteria, or some other pathogen or disease process.



Bacterial Skin Infections

Bacterial skin infections are usually caused by gram-positive strains of *Staphylococcus* and *Streptococcus* or other organisms. Common bacterial skin infections include:

- **Cellulitis** causes a painful, red infection that is usually warm to the touch. Cellulitis occurs most often on the legs, but it can appear anywhere on the body.
- **Folliculitis** is an infection of the hair follicles that causes red, swollen bumps that look like pimples. Improperly treated pools or hot tubs can harbor bacteria that cause folliculitis.
- **Impetigo** causes oozing sores, usually in preschool-aged children. The bullous form of impetigo causes large blisters while the non-bullous form has a yellow, crusted appearance.
- **Boils** are deep skin infections that start in hair follicles. Boils are firm, red, tender bumps that progress until pus accumulates underneath the skin.

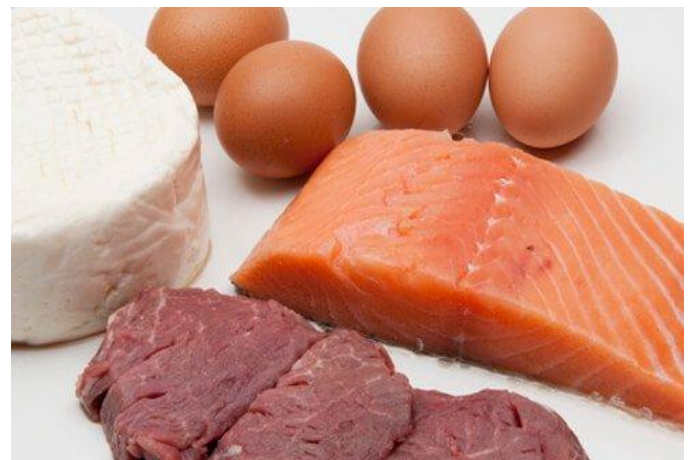
Bacterial skin infections are treated with oral or topical antibiotics depending on the strain causing the infection.



Foodborne Bacterial Infections

Bacterial infections are one cause of foodborne illness. Nausea, vomiting, diarrhea, fever, chills, and abdominal pain are common symptoms of food poisoning. Raw meat, fish, eggs, poultry, and unpasteurized dairy products may harbor harmful bacteria that can cause illness. Unsanitary food preparation and handling can also encourage bacterial growth. Bacteria that cause food poisoning include:

- **Campylobacter jejuni** (*C. jejuni*) is a diarrheal illness often accompanied by cramps and fever.
- **Clostridium botulinum** (*C. botulinum*) is a potentially life-threatening bacterium that produces powerful neurotoxins.
- **Escherichia coli** (*E. coli*) O157:H7 is a diarrheal (often bloody) illness that may be accompanied by nausea, vomiting, fever, and abdominal cramps.
- **Listeria monocytogenes** (*L. monocytogenes*) causes fever, muscle aches, and diarrhea. Pregnant women, elderly individuals, infants, and those with weakened immune systems are most at risk for acquiring this infection.
- **Salmonella** causes fever, diarrhea, and abdominal cramps. Symptoms typically last between 4 and 7 days.
- **Vibrio** causes diarrhea when ingested, but it can also cause severe skin infections when it comes in contact with an open wound.



Sexually Transmitted Bacterial Infections

Many sexually transmitted diseases (STDs) are caused by harmful bacteria. Sometimes, these infections aren't associated with any symptoms but can still cause serious damage to the reproductive system. Common STDs caused by bacterial infections include:

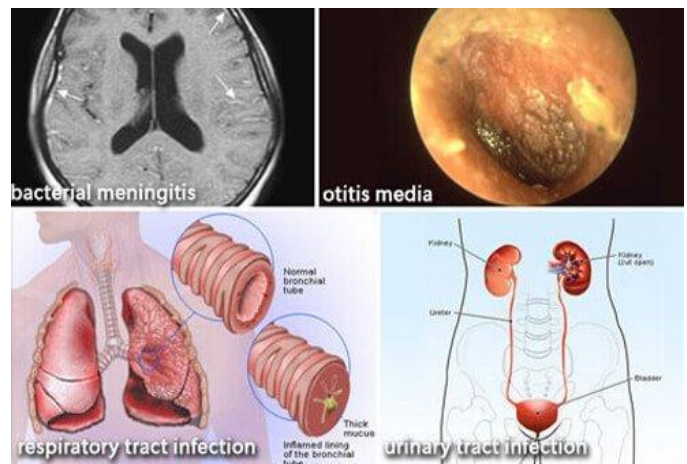
- **Chlamydia** is an infection in men and women caused by an organism called *Chlamydia trachomatis*. Chlamydia increases the risk of pelvic inflammatory disease (PID) in women.
- **Gonorrhea**, also known as "clap" and "the drip," is caused by *Neisseria gonorrhoeae*. Men and women can be infected. Gonorrhea also increases the risk of pelvic inflammatory disease (PID) in women.
- **Syphilis** can affect men and women and is caused by the bacteria *Treponema pallidum*. Untreated, syphilis is potentially very dangerous and can even be fatal.
- **Bacterial vaginosis**, which causes an overgrowth of pathogenic bacteria in the vagina (the CDC does not consider this a STD; see second text reference).



Other Bacterial Infections

Harmful bacteria can affect almost any area of the body. Other types of bacterial infections include the following:

- **Bacterial meningitis** is a severe infection of the meninges, the lining of the brain.
- **Otitis media** is the official name for an infection or inflammation of the middle ear. Both bacteria and viruses can cause ear infections, which commonly occur in babies and small children.
- **Urinary tract infection (UTI)** is a bacterial infection of the bladder, urethra, kidneys, or ureters.
- **Respiratory tract infections** include sore throat, bronchitis, sinusitis, and pneumonia. Bacteria or viruses may be responsible for respiratory tract infections. Tuberculosis is a type of bacterial lower respiratory tract infection.



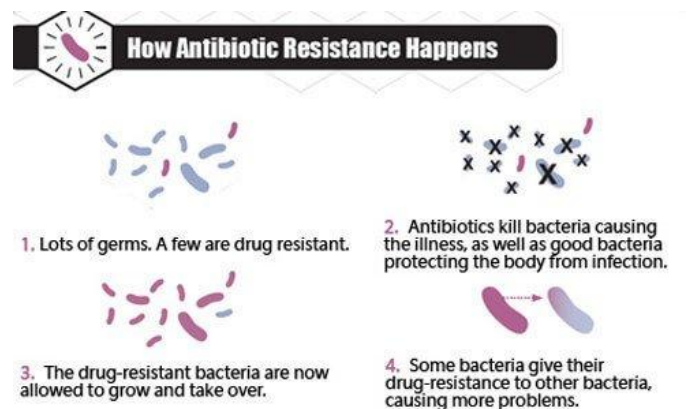
Antibiotics

Antibiotics are medications that fight bacterial infections. They work by disrupting the processes necessary for bacterial cell growth and proliferation. It's important to take antibiotics exactly as prescribed. Failure to do so could make a bacterial infection worse. Antibiotics don't treat viruses, but they're sometimes prescribed in viral illnesses to help prevent a "secondary bacterial infection." Secondary infections occur when someone is in a weakened or compromised state due to an existing illness.



Antibiotic Resistance

Overuse and misuse of antibiotics has led to a rise in antibiotic resistance. Antibiotic resistance occurs when bacteria are no longer sensitive to a medication that should eliminate an infection. Antibiotic-resistant bacterial infections are potentially very dangerous and increase the risk of death. About 2 million people in the U.S. suffer from antibiotic resistant infections each year and 23,000 die due to the condition. The CDC estimates 14,000 deaths alone are due to *Clostridium difficile* (*C. difficile*) infections that occur because of antibiotic suppression of other bacteria allow *C. difficile* to proliferate. Most deaths due to antibiotic resistant infections occur in hospitalized patients and those who are in nursing homes.



Source: CDC. Antibiotic Resistance Threats in the United States, 2011

Good Bacteria and Probiotics

Beneficial bacteria live in the human gastrointestinal (GI) tract and play an important role in digestion and immunity. Most people know it's smart to eat yogurt after completing a course of antibiotics to repopulate the GI tract with helpful bacteria that were wiped out from the antibiotics. Some studies have shown probiotics can shorten the duration of infectious diarrhea. They may also reduce the risk of developing diarrheal illness due to antibiotic use. Probiotics seem to reduce gas, bloating, and abdominal pain associated with irritable bowel syndrome (IBS). Ongoing research seeks to determine the types and dosages of bacteria that are most beneficial to human health.



Sources:

This tool does not provide medical advice. [See additional information:](#)

© 1996-2020 [WebMD, LLC](#). All rights reserved

https://www.medicinenet.com/bacterial_infections_101_pictures_slideshow/article.htm