

Germs and Viruses: A Self-Defense Guide

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Summary

An infant comes into the world germ free. But not for long. In just a few days its mouth is a zoo of bacteria. Should parents be alarmed? No, they should celebrate! We think of germs as serial killers, but the vast majority behave more like servants. If we killed off all the germs on earth it would goodbye humans. We need germs to survive, but some kill and we need to protect ourselves.

Find out common misconceptions about micro-organisms and learn which to fear, which to welcome, and how to protect yourself. Consider **Germs and Viruses** a basic unit in cleanliness and personal hygiene.

Learn:

- The best measures to take in daily life to prevent germs, bacteria, and viruses from infecting you.
- How bacteria differ from viruses and what that difference means to your health care.
- How and why to wash your hands. Health care experts estimate that poor hand washing is a serious public health issue that costs billions of dollars yearly.
- By the way, water does not “drown” germs nor does soap kill them.
- Why we’ll never have an anti-biotic that fights the common cold.

- Why the overuse of anti-bacterial soaps and lotions might actually promote the growth of bacteria.
- How to use a public washroom and protect yourself against pathogens.
- How to keep a kitchen clean and why bacteria love sponges, dish rags, and soap dishes.
- How to keep food safe.
- How to avoid the common cold and what to take when you get one. Learn that the coughs, sneezes, and runny noses of a cold are not the disease, they are your body's effort to fight back.
- What is the "flu" and why is it far more dangerous than the killer viruses in medical thrillers.

Script Excerpts

Humans are walking bags of bacteria. And it's a good thing because you need bacteria to fight disease, digest food, and stay healthy.

Germ must have a lousy P.R agent. We think of them as serial killers, but the vast majority behave more like servants.

All these "good germs" crowd out unwanted germs much like a nice thick lawn crowds out weeds. Bacteria protects us from disease by posting "no vacancy" signs that keep disease causing germs (called pathogens) out.

So, let's imagine science finally perfects a spray that will kill all germs – wipe them off the face of the planet. It works. What happens? Goodbye humans. We need those germs to survive.

Germ is a general term for microscopic organisms that include about a million kinds of bacteria and thousands of different viruses.

Bacteria are single celled microbes that reproduce by dividing. They can live on their own. Bacteria can cause disease such as food poisoning, ear infections, pneumonia, meningitis, scarlet fever, anthrax, tuberculosis, cholera, gonorrhea, syphilis, and the plague.

Selective poisons called anti-biotics (such as penicillin or Cipro) stop the bacteria from reproducing.

Viruses are much smaller than bacteria -- a single drop of blood can hold six billion. It was not until 1939 that the first virus was seen with a microscope.

Bacteria can live on their own, but viruses, live and reproduce only inside cells. About 250 viruses can infect humans. They cause diseases as mild as the common cold or as deadly as AIDS, flu, measles, herpes, mumps, west nile, ebola, and chicken pox.

Anti-biotics do not work on viruses, because a virus is not a living, reproducing lifeform. If a virus is not ALIVE, it can't be "killed."

In order to stop the virus without killing the host, we use vaccines. A vaccine is a modified form of the virus that does not cause illness but forces the immune system to build its own defense against the virus.

Required vaccination of children has all but eliminated diseases such as smallpox and polio that once crippled and killed millions

Back in 1900 the leading causes of death in the U.S. were all infections: pneumonia, tuberculosis, and enteritis. These diseases caused over a third of all deaths. And, of the people who died, 40% were under five years old. Today, less than five per cent of deaths are caused by infectious disease.

Throughout history, more soldiers have died from

infectious disease than from enemy bombs and bullets. In World War I, disease (especially influenza) accounted for over half of America's 113,000 deaths.

You have more bacteria in your digestive tract right now than there are humans who have ever lived on earth. You're not going to wipe them out.

There is an effective and simple way to protect yourself against pathogens. Since we pick up about 80% of our infections from touch, the first line of defense is -- a good hand washing. But "wash your hands" sounds like advice for kids, yet it's the single most effective germ control tactic.

Water does not drown germs, and soap does not kill them. And hot tap water does not sterilize your hands. Water hot enough to kill germs would burn your hands. Soap and water make your hands so slippery they slide off and down the drain.

Placing your hands under running water for a few seconds is NOT a hand washing. You need to wash all surfaces -- wrists, palms, backs of hands, and between the fingers. That will take about 15-30 seconds of washing.

Many hand soaps today are labeled as "anti-bacterial." They kill some germs, but they don't help prevent disease.

Washing your hands well with soap and water is as good as it gets when it comes to warding off disease

causing germs. And remember that the common cold and flu are caused by viruses, not bacteria. Hand sanitizers use alcohol to kill bacteria. They are useful when soap and water are not available but are not a substitute.

Kitchen

Using a germ filled cloth to wipe a table simply spreads the bacteria around. Use a fresh cloth or paper towel, and dry the table top after wiping.

Replace dish towels at least daily. You can wash them in the dishwasher. But be sure to secure them so they don't come loose. The dishwasher's dry cycle heat is enough to kill bacteria.

Placing either a sponge or rag in the microwave for a minute will also help control germs. Sponges are difficult to keep clean and should be replaced often.

Some have anti-bacterial ingredients that control odor causing bacteria. Such sponges might smell better, and slow down germ growth on the sponge, but they're NOT designed to kill germs on surfaces you clean. Don't count on chemicals to keep you safe.

Every time we use an antibiotic we kill the weakest germs. A few survivors reproduce, and pass along the mutation that made them able to resist the antibiotic. In effect, the germs "learn" how to survive our cures – they become resistant to the antibiotic.

Food

Sometimes a germ that can cause disease-- a pathogen -- enters the body directly through food.

But the stomach is a harsh place for them. The human stomach is washed with a half gallon of gastric acid every day.

That means our immune system protects us quite well. For example, most chickens carry salmonella bacteria that can make humans very sick.

If we ate raw chicken, lots of people would get sick. But we don't, and thorough cooking to at least 180 degrees kills harmful bacteria. That's why chicken that's still pink on the inside is not safe to eat.

Food Preparation

Wash hands, utensils and cutting surfaces thoroughly between jobs, especially when handling raw foods. Wash fruits and vegetables thoroughly under running water.

Cook foods thoroughly to kill bacteria. These microscopic hitch-hikers reside IN, as well as ON food. To be safe, always use a meat thermometer. Refrigerate promptly! If left unrefrigerated more than two hours, even cooked food can become unsafe.

Divide food into small shallow containers for safe, quick cooling and storage. Remember, keep hot foods hot, and cold foods cold.

Colds

The common cold is caused by any of over 200 different viruses. Since so many viruses can cause a cold we never build up immunity against them. The viruses are clever. They irritate your nose and throat so you sneeze and propel them to new human hosts.....much like dandelion seeds. A sneeze

can help the virus multiply.

The coughs, sneezes, and runny noses of a cold are not the disease. They are signs of the body's fight against the virus. By the time sneezes and sniffles kick in you are well on your way to healing yourself. The medicines help make life a little more bearable.

A cold is self-limiting -- we cure ourselves in about a week, with or without medicines. If you want a medicine, pick your most irritating symptom and buy the simplest medication for that symptom. A decongestant to clear your nose for example, or a cough suppressant, or something to soothe a sore throat.

Flu and Killer Viruses

Colds are annoying, but what about more deadly viruses?

A popular theme of fiction is the spread of a killer virus. It always strikes unsuspecting victims, and produces a horrible death quickly. In a virus thriller if someone coughs or sneezes you know they'll be dead in twenty minutes.

But in the real world, such a killer virus is unlikely to cause an epidemic. It kills too quickly. The virus dies with its victim. If there is a list of viruses to fear the most, the one atop the list might surprise you.

This killer virus struck hard in 1918. It swept the world and killed well over 20 million people. More than 20,00 New Yorkers lost their lives in the fall of 1918. The virus killed about 2% of the population of the United States in a matter of months. Some cities

passed laws requiring people to wear surgical masks in public. So-called "mask-slackers" were subject to arrest. The name of the viral disease? The flu.

Flu is short for "influenza" because the disease was originally blamed on the "influence" of heavenly bodies. The real cause is a virus that still kills about 20,000 people a year in the United States.

Because we live in a densely populated country we build immunity to many viruses. That's why you don't get sick most of the time when contacting someone with a cold.

If you had no immunity you would get sick much easier. That's what happened to Aztecs, Mayans and American Indians when they were landed upon by the first European explorers. The Europeans who landed in the Americas in the early 1500s released millions of germs and viruses against which the natives had no defense. A European sneezed and hundreds of natives died of unknown diseases.

So, if you hear "supermarket chickens contain bacteria," you can say, "of course they do, but that doesn't mean I'll get sick from them." Cook it well and keep leftovers refrigerated.

If you see ads for expensive products that kill germs on contact you will be skeptical. You know that we can't wipe out germs. Unless you are very old, very young (under 6 months), or very ill, a few hundred bacteria on a spoon won't hurt you.

But you will take everyday precautions to prevent the

Practical Safeguards

Wash hands, utensils, and cutting surfaces between jobs while cooking, especially when handling raw foods.

Clean as you go! Dirty sinks and drains invite unwanted guests, so keep them clean and clear.

Keep sponges or dishcloths clean. These act as germ carriers and spreaders, so wash them often and replace frequently. Clean sponges in a dishwasher or microwave.

Refrigerate leftovers promptly. If left unrefrigerated more than two hours, even cooked food can become unsafe.

Use soap AND water to wash hands. Wash thoroughly including wrists, backs of hands, and between the fingers. Placing hands under running water is not a hand washing.

Wash and dry hands thoroughly after using the toilet, especially in a public washroom.

The best way to beat a cold is to avoid getting it. Wash hands frequently and don't share air with a sick person. Keep hands away from your eyes and nose.

A handkerchief is a great environment for microbes. Paper tissues, carefully disposed of after use, are cleaner.

Cook fish at high temperatures (about 450 degrees) for about ten minutes for each inch of thickness.

Quiz on Germs & Viruses

1. If you come in contact with bacteria you usually:
(A) Will get sick, (B) Need to scrub with anti-bacterial soap, or (C) Won't be affected.
2. When you wash your hands you: (A) Remove possible pathogens, (B) Kill most of the bacteria with soap and water, (C) Kill most of the bacteria with hot water, or (D) Weaken germs with soap chemicals.
3. Why not spray everything with disinfectant — kill all the germs? (A) Because disinfectant doesn't really kill germs, (B) Because we need germs to live, (C) Because bacteria is the problem, not germs.
4. It is most correct to say the common cold is caused by: (A) Contact with cold causing bacteria, (B) Contact with a cold causing virus, (C) Contact with cold causing germs, or (D) None of these.
5. A deadly virus swept the world in 1918-19, killing well over twenty million people. The epidemic was: (A) Ebola, (B) Polio, (C) Influenza, or (D) Cholera.
6. Which of these is most likely to cure a cold? (A) Prescribed anti-biotic, (B) decongestant, (C) cough suppressant, or (D) none of these.
7. The name for a bacteria that can cause disease is: (A) germ, (B), microbe, (C) pathogen, or (D) virus.

8. When European explorers contacted cultures in the Americas in the 15th and 16th centuries, they spread fatal diseases because: (A) Anti-bacterial drugs and cleansers were not yet invented, (B) The native peoples had no immunity to common European viruses, or (C) Europeans came from countries that practiced poor sanitation.

9. Running noses, sneezes, watery eyes, and coughs are: (A) The causes of the common cold, (B) Signs of the body's efforts to defeat the cold virus, or (C) What must be suppressed in order to cure a cold, or (D) Symptom of bacterial infection.

10. To avoid salmonella poisoning from chickens, (A) Buy organic chickens, (B) Wash chicken under running water, (C) Buy frozen chicken only, or (D) Cook chicken thoroughly before eating.

ANSWERS:

1-C 2-A 3-B 4-B 5-C 6-D 7-C
8-B 9-B 10-D

Germs Q&A

Your child has a sore throat and clogged nose. He coughs frequently and is miserable. You want him to feel better. So does your doctor. Should he prescribe an antibiotic “just to be sure”?

Usually not. Colds are caused by viruses which are not influenced by antibiotics. Antibiotics do work against strep throat, many ear and sinus infections, and other bacterial infections. They do NOT work against colds and flu, most mild coughs and sore throats, or other viral infections.

The Centers for Disease Control and Prevention estimates that fifty million needless prescriptions for antibiotics are written each year.

What do you have after you use a lemon-scented, all purpose cleaner on your kitchen counter?

Lemon scented germs. Many household cleaners now include an anti-bacterial chemical (often Triclosan). They claim to “kill germs by the thousands,” or “kill 99% of germs.” But that still leaves a few million germs around. Disinfectants are usually overkill in the struggle to stay healthy. They are more useful if someone in the household is sick or lives with a compromised immune system. We live in an environment of bacterial balance. Germs are essential to our good health. Trying to kill all the germs makes as much sense as trying to shut out all air because some might

contain contaminants.

Soap and water do not kill microorganisms, but they create an environment that makes them slide off. That's all you need.

Which medicine best cures colds?

None. Colds are self-limiting. They go away in about a week if you take cold remedies or seven days if you don't. Drugstore remedies are more about drying up leaky noses than fighting disease.

Coughs, sneezes, and runny noses are the result of the body's fight against the invading virus.

How useful are toys, mops, and consumer products with built in antibacterial agents?

They are very useful to corporate bottom lines but have little or no health benefits. The EPA has warned companies not to make misleading claims about these product's health benefits.

Just how many bacterium exist in our world?

We don't know. Microbiologists at the University of Georgia estimate something like five million trillion trillion. That's 5,000,000,000,000,000,000,000,000,000. If each bacteria were the size of a penny, you could stack them up one trillion light-years high. One implication of these vast numbers is that mutations that happen rarely in the laboratory happen all the time in nature. Ten billion years in the lab equals a mere second in nature.

Bibliography

A Field Guide to Germs by Wayne Biddle (Henry Holt, NY, 1995) brings readers face-to-face with nearly one hundred of the best-known (in terms of prevalence, power, historical important, or even literary interest) of the pathogens that we live with.

Killer Germs: Microbes and Diseases That Threaten Humanity by Barry E. Zimmerman and David J. Zimmerman (Contemporary Books, Chicago, 1996) is a fascinating examination of microscopic predators. As they point out in the introduction: *The agent of botulism food poisoning is too small to be seen with the naked eye, yet a 12-ounce glass of the toxin it produces would kill every human being—all 5.9 billion—living on the face of the Earth. As small as germs are, they rule the world.*"

The Secret Life of Germs by Philip M. Tierno Jr., Ph.D. (Simon & Schuster, NY, 2001) is a microbiologists look at germs and how to live with them.

Don't Touch That Doorknob! How Germs Can Zap You and How You Can Zap Back by Jack Brown, Ph.d. (Warner Books, NY, 2001) is a fine example of practical science.

The Invisible Enemy: A Natural History of Viruses by Dorothy H. Crawford (Oxford Univ. Press, NY, 2000)