

HANDS-ON Health

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Proper Use of Antibiotics

Antibiotics, also known as antimicrobial drugs, are drugs that fight infections caused by bacteria. Alexander Fleming discovered the first antibiotic, penicillin, in 1928. The term "antibiotic" originally referred to a natural compound produced by a fungus or another microorganism that kills bacteria which cause disease in humans or animals. Some antibiotics may be synthetic compounds (not produced by microorganisms) that can also kill or inhibit the growth of microbes. Technically, the term "antimicrobial agent" refers to both natural and synthetic compounds; however, many people use the word "antibiotic" to refer to both.

Since the 1940s, these drugs have dramatically reduced illness and death from infectious diseases. Antibiotic use has been beneficial and, when prescribed and taken correctly, their value in patient care is enormous. However, these drugs have been used so widely and for so long that the infectious organisms the antibiotics are designed to kill have adapted to them, making the drugs less effective.

Antibiotic resistance is a growing public health concern worldwide.

When a person is infected with an antibiotic-resistant bacterium, not only is treatment of that patient more difficult, but the antibiotic-resistant bacterium may spread to other people.

When antibiotics don't work, the result can be:

- longer illnesses
- more complicated illnesses
- more doctor visits
- the use of stronger and more expensive drugs
- more deaths caused by bacterial infections

Examples of the types of bacteria that



have become resistant to antibiotics include the species that cause skin infections, meningitis, sexually transmitted diseases and respiratory tract infections such as pneumonia.

Antibiotics Fight Bacteria, Not Viruses

Antibiotics are meant to be used against bacterial infections. For example, they are used to treat strep throat, which is caused by streptococcal bacteria, and skin infections caused by staphylococcal bacteria.

Although antibiotics kill bacteria, they are not effective against viruses.

Therefore, **they will not be effective against viral infections such as colds, most coughs, many types of sore throat, and influenza (flu).**

Using antibiotics against viral infections:

- will not cure the infection
- will not keep other individuals from catching the virus
- will not help a person feel better
- may cause unnecessary, harmful side effects
- may contribute to the development of antibiotic-resistant bacteria

In This Newsletter: Antibiotics

Learn the proper use for antibiotics and how misuse can lead to antibiotic resistance a growing worldwide public health concern.

Test Your Knowledge

Take the antibiotic quiz and reprint it for students. (see page 3)

Q & As from the CDC

Read the CDC's campaign "Get Smart: Know When Antibiotics Work" (see page 4)

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Patients and health care professionals alike can play an important role in combating antibiotic resistance. Patients should not demand antibiotics when a health care professional says the drugs are not needed. Health care professionals should prescribe antibiotics only for infections they believe to be caused by bacteria.

As a patient, your best approach is to ask your health care professional whether an antibiotic is likely to be effective for your condition. Also, ask what else you can do to relieve your symptoms.

Follow Directions for Proper Use

When you are prescribed an antibiotic to treat a bacterial infection, it's important to take the medication exactly as directed. Here are more tips to promote proper use of antibiotics.

- **COMPLETE THE FULL COURSE OF THE DRUG.** It's important to take all of the medication, even if you are feeling better. If treatment stops too soon, the drug may not kill all the bacteria. You may become sick again, and the remaining bacteria may become resistant to the antibiotic that you've taken.
- **DO NOT SKIP DOSES.** Antibiotics are most effective when they are taken regularly.
- **DO NOT SAVE ANTIBIOTICS.** You might think that you can save an antibiotic for the next time you get sick, but an antibiotic is meant for your particular infection at the time. Never take leftover medicine. Taking the wrong medicine can delay getting the appropriate treatment and may allow your condition to worsen.
- **DO NOT TAKE ANTIBIOTICS PRESCRIBED FOR SOMEONE ELSE.** These may not be appropriate for your illness, may delay correct treatment, and may allow your condition to worsen.
- **TALK WITH YOUR HEALTH CARE PROFESSIONAL.** Ask questions, especially if you are uncertain about when an antibiotic is appropriate or how to take it.



Save antibiotics for what they do best — fight bacterial infections

FAST FACTS: Antibiotic Resistance

- Antibiotic resistance has been called one of the world's most pressing public health problems.
- The number of bacteria resistant to antibiotics has increased in the last decade. Many bacterial infections are becoming resistant to the most commonly prescribed antibiotic treatments.
- Every time a person takes antibiotics, sensitive bacteria are killed, but resistant germs may be left to grow and multiply. Repeated and improper uses of antibiotics are primary causes of the increase in drug-resistant bacteria.
- Misuse of antibiotics jeopardizes the usefulness of essential drugs. Decreasing inappropriate antibiotic use is the best way to control resistance.
- Children are of particular concern because they have the highest rates of antibiotic use.
- Antibiotic resistance can cause significant danger and suffering for people who have common infections that once were easily treatable with antibiotics. When antibiotics fail to work, the consequences are longer-lasting illnesses, more doctor visits or extended hospital stays, and the need for more expensive and toxic medications. Some resistant infections can even cause death.

TEST YOUR KNOWLEDGE—TAKE THE ANTIBIOTIC QUIZ!

- Antibiotics fight infections caused by:
 - Viruses
 - Bacteria
 - Viruses and Bacteria
- Bacteria are germs that cause colds and flu.
 - True
 - False
- Which of these illnesses should be treated with antibiotics?
 - Runny Nose
 - Flu
 - Cold
 - Strep Throat
- Bacteria that cause infections can become resistant to antibiotics.
 - True
 - False
- I can prevent antibiotic-resistant infections when I: (*More than one may apply*)
 - don't take an antibiotic for a viral infection
 - don't save an antibiotic for the next time you are sick
 - don't take an antibiotic that has been prescribed for someone else
 - take an antibiotic exactly how it has been prescribed for you
- What can happen if I get an antibiotic-resistant infection? (*More than one may apply*)
 - I may have a longer-lasting illness
 - I may have to visit my doctor more
 - I may require hospitalization
 - I may need more costly medicine that may cause side effects
- Alexander Fleming discovered the first antibiotic in 1928. What was the antibiotic named?
 - Mold
 - Penicillin
 - Vancomycin
 - Doxycycline
- Antibiotic resistance has been called one of the world's most pressing public health problems.
 - True
 - False

ANSWERS

1. b; Bacteria

2. b; False. Bacteria cause strep throat, some pneumonia and sinus infections. Viruses cause the common cold, most coughs and the flu.

3. d; Strep Throat. Antibiotics cure bacterial infections, not viral infections. DO NOT take antibiotics for viral infections, such as the cold, flu, runny

noses, and sore throats that are not caused by strep.

4. a; True. Antibiotics kill or inhibit the growth of susceptible bacteria. Sometimes one of the bacteria survives because it has the ability to neutralize or escape the effect of the antibiotic; that one bacterium can then multiply and replace all the bacteria that were killed off. Exposure to antibiotics therefore provides selective pressure, which makes the surviving bacteria more likely to be resistant.

5. a,b,c,d

6. a,b,c,d

7. b; Penicillin

8. a; True. Antibiotic resistance has been called one of the world's most pressing public health problems. Almost every type of bacteria has become stronger and less responsive to antibiotic treatment when it is really needed.

Questions and Answers from the CDC's 'Get Smart: Know When Antibiotics Work' Campaign

Q: I'm sick. Don't I need a prescription for an antibiotic?

A: Your doctor has examined you and determined that your illness is caused by a viral infection. Antibiotics do NOT treat viral illnesses like colds, flu and most sore throats.

Q: If antibiotics don't treat viral illnesses like cold and flu, what do they treat?

A: Antibiotics are used to treat illnesses caused by bacteria. Examples of illnesses caused by bacteria include strep throat, tuberculosis and many types of pneumonia.

Q: Even though my illness may be caused by a virus, what harm can it do to take an antibiotic?

A: Taking antibiotics when they aren't needed contributes to the serious problem of antibiotic resistance.

Q: What is antibiotic resistance?

A: When bacteria cannot be killed by antibiotics, they have become resistant. Over time, some infections may have to be treated with different and stronger antibiotics. In the future, it is possible that no antibiotic will be effective in killing resistant bacteria.

Q: If antibiotics will not help me, what will?

A: A cold usually lasts only a couple of days to a week. Feeling tired from the flu may continue for several weeks. To feel better while you are sick:

- Drink plenty of fluids.
- Get plenty of rest.
- Use a cool mist vaporizer or a humidifier — an electric device that puts water into the air.
- Use saline nose spray to ease dry nasal passages.
- Use a medicine that reduces fever when needed.

Q: What can you do to protect yourself or your child?

A: When you use antibiotics appropriately, you do the best for your health, your family's health, and the health of those around you. "We want Americans to keep their families and communities healthy by getting smart about the proper use of antibiotics," said Lauri Hicks, D.O., medical director of CDC's Get Smart campaign.

- Talk with your healthcare provider about antibiotic resistance.
- When you are prescribed an antibiotic,
 - Take it exactly as the doctor tells you. Complete the prescribed course even if you are feeling better. If treatment stops too soon, some bacteria may survive and re-infect you.
 - This goes for children, too. Make sure your children take all medication as prescribed, even if they feel better.
 - Throw away any leftover medication once you have completed your prescription.