

Inappropriate Use of Antibiotics

An **antibiotic** is a substance produced naturally by microorganisms or synthetically by chemists in a laboratory. Antibiotics are capable of inhibiting the growth of or killing **bacteria** (a particular class of germs). A Nobel Prize was awarded to Alexander Fleming for his discovery of penicillin in 1928. However, it wasn't until 1941 that penicillin was successfully produced for commercial use, in time to treat infections in soldiers injured during World War II. Since then many new antibiotics have been discovered and produced. Most have a limited number of the types of bacteria that they can inhibit or destroy. Other antibiotics are **broad spectrum**, meaning they can destroy many types of bacteria. Antibiotics should be used only for bacterial infections and are not effective against the viruses that cause many illnesses including influenza and most upper respiratory tract infections, including the common cold, or fungal infections like those caused by yeast. The inappropriate use of antibiotics for these types of infections as well as the more frequent use of broad-spectrum antibiotics has caused the emergence of newer strains of bacteria that are resistant to many antibiotics. The August 19, 2009, issue of JAMA includes an article about use of antibiotics in acute respiratory illness.

THESE INFECTIONS CAN USUALLY BE TREATED WITHOUT ANTIBIOTICS

- Common cold
- Influenza (flu)
- Most coughs and bronchitis (chest cold with a cough)
- Many ear infections (also called otitis media)
- Many skin rashes

INFECTIONS CAUSED BY INAPPROPRIATE ANTIBIOTIC USE

- Bacteria like *Staphylococcus aureus* (a bacterium that causes serious infections in immune-compromised persons) develop resistance to the antibiotics typically used to treat the infections they cause, leading, for example, to **methicillin** (a type of antibiotic)-resistant *Staphylococcus aureus* (MRSA), which can now affect individuals in hospitals and in the community and is difficult to treat effectively.
- Other bacteria, such as *Streptococcus pneumoniae* (common cause of meningitis, blood infections, and pneumonia), are also developing resistance to antibiotics.
- Multiple drug-resistant tuberculosis may occur when an infected person does not complete the several-months-long antibiotic regimen needed to cure tuberculosis.

PROBLEMS CAUSED BY RESISTANT BACTERIA

- Common infections become more difficult to treat and can become life threatening.
- Infected people often require longer, more expensive, and more toxic treatment during extended hospital stays.
- The spread of the resistant bacteria to family members, coworkers, and friends threatens communities.

Sources: American Academy of Pediatrics; American Academy of Family Physicians Clinical Practice Guideline; Harrison's Principles of Internal Medicine, 17th Edition; Centers for Disease Control and Prevention

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WHAT YOU CAN DO

- Take antibiotics only when prescribed to you by a physician.
- Follow all directions when taking antibiotics and take the entire prescribed regimen even if you feel better before finishing them.
- Throw away any unused antibiotics; don't save antibiotics for future use since partial and incomplete treatment regimens are ways that bacteria develop resistance to antibiotics.
- Do not share your medication and don't take antibiotics prescribed for someone else; specific antibiotics are prescribed for specific bacteria, since all antibiotics are not able to cure all bacterial infections.

FOR MORE INFORMATION

- Centers for Disease Control and Prevention www.cdc.gov/drugresistance/community/know-and-do.htm
- American Academy of Pediatrics www.aap.org/advocacy/releases/aomqa.htm

INFORM YOURSELF

To find this and other JAMA Patient Pages, go to the Patient Page link on JAMA's Web site at www.jama.com. Many are available in English and Spanish. A Patient Page on coughs, cold, and antibiotics was published in the May 28, 2003, issue.

