



Using Lifesaving Drugs Responsibly and Effectively

The importance of antibiotic stewardship in health care settings

Overview

Antibiotic resistance, spreading rapidly around the world, poses a significant threat to public health. In the United States, drug-resistant pathogens cause an estimated 2 million infections each year, resulting in costly treatments, prolonged hospital stays, and at least 23,000 deaths, according to the Centers for Disease Control and Prevention (CDC).¹

Antibiotics have long been used to successfully treat life-threatening infections. However, the more they are used, the more opportunities bacteria have to evolve and defeat them, potentially leading to populations of bacteria resistant to multiple drugs.

Since the introduction of antibiotics more than 50 years ago, scientists and doctors have increasingly seen bacteria develop resistance, leaving patients today susceptible to serious, potentially fatal infections that were once easily treatable.

The inappropriate prescribing of antibiotics

Antibiotics are among the most frequently prescribed drugs in the United States, and CDC estimates that as much as 50 percent of those prescriptions are either unnecessary or inappropriate in drug choice, dose, or duration.² Such injudicious use, found in both hospitals and outpatient facilities such as primary care clinics, accelerates antibiotic resistance.

CDC found that prescribing rates varied significantly among hospitals that reported antibiotic use to its National Healthcare Safety Network.[†] Doctors at some facilities ordered three times as many antibiotic prescriptions as physicians working in similar locations at other hospitals.³ And the agency's survey of select hospitals found that as many as one-third of physicians had prescribed an antibiotic for urinary tract infections, a common condition, without first ordering the appropriate test or following prescribing guidelines.⁴

Inappropriate prescribing also occurs in outpatient facilities, which are where the majority of dollars spent on antibiotics in the United States occur.⁵ For example, in 2007 more than half of the almost 200,000 Medicaid patients diagnosed with acute respiratory tract infections, such as a cold and bronchitis, received antibiotics even though the medicine is generally not recommended for these types of conditions.⁶

Antibiotic use and patient safety

Increased antibiotic use puts patients at direct risk of harm. For example, *Clostridium difficile* (*C. diff*) infections, a cause of potentially life-threatening diarrhea, are associated with antibiotic use. This is because antibiotics not only target dangerous pathogens, but can also destroy good bacteria that naturally protect people from infection.[‡] The CDC, which considers *C. diff* an "urgent threat" to public health, estimates that the pathogen causes at least 250,000 infections and 14,000 deaths in the United States each year. Other side effects of antibiotic use include allergic reactions and various adverse events, such as those related to drug side effects and drug interactions.[‡]

† U.S. Centers for Disease Control and Prevention, "Vital Signs: Making Health Care Safer: Stopping *C. difficile* infections," March 2012, <http://www.cdc.gov/vitalsigns/pdf/2012-03-vitalsigns.pdf>.

‡ U.S. Centers for Disease Control and Prevention, *Antibiotic Resistance Threats in the United States, 2013*, accessed Nov. 12, 2014, <http://www.cdc.gov/drugresistance/threat-report-2013/>.

Conserving antibiotics through responsible use

All antibiotic use drives resistance, so these drugs should only be prescribed when truly necessary. Efforts by the health care community to promote responsible antibiotic use include implementing antibiotic stewardship programs, or ASPs. These programs aim to ensure antibiotics are used properly and only when indicated, that is to treat a bacterial infection with the most appropriate antibiotic at the right dose and duration of therapy.

CDC has developed core tenets for ASPs to help hospitals develop stewardship efforts.⁷ These broad recommendations include dedicating necessary resources, tracking prescribing and drug-resistance patterns, appointing a single leader accountable for program outcomes, and educating clinicians on appropriate use,

* The National Healthcare Safety Network is the nation's most widely used health care-associated infection tracking system. NHSN provides data to identify problem areas, measure progress of prevention efforts, and ultimately eliminate health care-associated infections.

among other priorities. While some hospitals have already recognized the need for formal ASPs in their facilities, CDC and other stakeholders recommend that hospitals nationwide should work toward full implementation.

Nursing homes and long-term care facilities can introduce formal ASPs tailored to the needs of those settings. Doctors practicing in outpatient settings can prescribe antibiotics only when clinically indicated, and work to educate patients on when antibiotic use is and is not appropriate.

Antibiotic resistance will always be a public health issue, but hospitals, physicians, and patients can help slow the process by using antibiotics responsibly.

The Pew Charitable Trusts works to reduce overuse of antibiotics in health care settings and food animal production and to spur innovation of new drugs. Learn more at pewtrusts.org/antibiotics.

Endnotes

- 1 U.S. Centers for Disease Control and Prevention, *Antibiotic Resistance Threats in the United States, 2013*, accessed Nov. 12, 2014, <http://www.cdc.gov/drugresistance/threat-report-2013>.
- 2 Ibid.
- 3 Scott Fridkin et al., "Vital Signs: Improving Antibiotic Use Among Hospitalized Patients," *Morbidity and Mortality Weekly Report* (March 7, 2014), http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6309a4.htm?s_cid=mm6309a4_w.
- 4 Ibid.
- 5 Katie J. Suda et al., "A National Evaluation of Antibiotic Expenditures by Healthcare Setting in the United States, 2009" *Journal of Antimicrobial Chemotherapy* (Nov. 11, 2012), doi:10.1093/jac/dks445.
- 6 Pengxiang Li et al., "Factors Associated with Antimicrobial Drug Use in Medicaid Programs," *Emerging Infectious Diseases* (May 2014), <http://wwwnc.cdc.gov/eid/article/20/5/pdfs/13-0493.pdf>.
- 7 U.S. Centers for Disease Control and Prevention, *Core Elements of Hospital Antibiotic Stewardship Programs*, accessed Dec. 15, 2014, <http://www.cdc.gov/getsmart/healthcare/pdfs/core-elements.pdf>.

For further information, please visit:

pewtrusts.org/antibiotics

Contact: Erin Davis, senior associate, communications **Email:** edavis@pewtrusts.org **Project website:** pewtrusts.org/antibiotics

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