

## Antibiotic use

The role of the physician, above all, is to provide the best possible care to an individual patient. Whenever possible, however, the physician should also play a role in protecting the health of the public. While these two goals are generally compatible, there is at times a tension between them. One good example is the prescribing of antibiotics.

The role of antibiotics in combating bacterial infections is well established. Used appropriately, antibiotics play an enormous role both in alleviating symptoms and in saving lives. The injudicious use of antibiotics, conversely, causes a great deal of harm. Excessive antibiotic use contributes to the development of resistant strains of bacteria. Some of the newly emergent resistant strains are nearly impossible to kill with any available antibiotics. Additionally, antibiotics fail to distinguish between pathogenic (disease-causing) bacteria, and those that contribute to normal physiology (i.e., digestion). The indiscriminate killing of "friendly" and "non-friendly" bacteria by antibiotics can disrupt the body's balance (homeostasis) and even result in infection. One well-known example is yeast infection, or fungal vaginitis. Another example, particularly problematic among hospitalized patients, is clostridium difficile colitis. This severe diarrheal illness results when antibiotics kill off many of the bacteria that live in the colon, allowing overgrowth of others. Antibiotics also pose a threat of inducing allergic reactions, which can be life threatening. A variety of unpleasant side effects,

from metallic taste to vomiting, can occur with antibiotic use.

The problems associated with antibiotics do not imply that these drugs are to be avoided. Like all other medical interventions, antibiotics can do both good and harm. The use of antibiotics is appropriate when they are more likely to do good than harm for an individual patient. Often, this determination is somewhat subjective. While antibiotics do not improve the course of viral infections, distinguishing viral from bacterial sinusitis, otitis, bronchitis, and pharyngitis (to name a few) can be quite subtle. Often, physicians yield to the strong opinions of patients who feel they need antibiotics to get over some particularly unpleasant illness.

There is evidence that antibiotics are substantially over used in the US. Over use implies that patients who cannot benefit from antibiotics are getting them. Such prescribing practices are at odds with the priorities of medical care. When an individual with a viral infection receives antibiotics, they are exposed to the risks of the drug with no potential benefit. Such practices threaten the public health as well, by cultivating resistant organisms that will not respond when infection does truly need to be treated.

Several things are required to avoid inappropriate antibiotic use. First, doctors and patients must discuss both the benefits and risks of drug therapy. As long as antibiotic use is perceived as benign,



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patients will continue to request antibiotics, figuring "they can only help." Second, physicians must acknowledge the difficulty in distinguishing viral from bacterial infections. I believe doctors and patients can face this uncertainty together. Often, I tell my patients about my uncertainty, and about the potential hazards of antibiotic use. Then I give them a prescription and let them decide, based on the course of the illness, whether or not they should fill it. If symptoms worsen, the antibiotic is available; if symptoms improve without antibiotic use, unnecessary drug use was avoided.

While medicine in 1998 is quite advanced, there is still considerable uncertainty in medical decision-making. Further, no medical intervention is free of potentially harmful effects. The best defense of individual and public health in the context of risk and uncertainty is a doctor and patient willing to work together, be open-minded, and share decisions. In medicine, as in so many important endeavors, effective teamwork yields the best results.

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