

More Evidence of Increasing Antibiotic Resistance

ARM YOUR PATIENTS TO PROTECT THEMSELVES

Anything that doesn't kill you outright makes you stronger, the old saying goes. This is an encouraging and uplifting notion when applied to courageous POWs surviving despite malnutrition and mistreatment, to accident victims found alive after a plane crash or earthquake, or to ordinary individuals with the fortitude to succeed despite seemingly insurmountable social and economic disadvantages. It is an appropriate description of the positive benefits of overcoming adversity and becoming a better person by building your character and your coping skills. It is also terrifyingly true of bacteria. Bacteria not only survive our antibiotic assaults on them, but grow into ever-stronger pathogens that threaten our health.

The development of antibiotics (antimicrobial agents) is usually included with radio, television, computers, genetic engineering and space travel as one of the landmarks of scientific achievement in the twentieth century (and even of the second millennium). As the century comes to a close, there is growing evidence, horrific and irrefutable, that antibiotics are strengthening the very disease-causing microbes they were created to target and destroy. These dire warnings have been featured in recent articles and editorials in such prestigious journals as the *New England Journal of Medicine* and the *Journal of the American Medical Association*.

Antibiotics do kill bacteria by the billions. Unfortunately, the process that kills most of a particular species of microbe can leave some mutant germs, which have a natural resistance to the antibiotic that wiped out their weaker relatives. This process of natural selection, by which humans create better bugs while eradicating less-adaptive ones, is fundamental to evolution, the natural process by which new species emerge and survive because they are better able to cope with a changed environment. In the twentieth-century environment of hospitals, clinics and nursing homes, and such in-patient and out-patient facilities as dialysis centers, antibiotics are regularly overprescribed and often indiscriminately dispensed. As a result, better microbes are constantly being created and thrive. What makes them better is their resistance to the antibiotics that helped bring them into existence. Being "better" in this way, makes existence much worse for human beings who are afflicted by them.

In the few decades since penicillin began to give humans apparent mastery over microbial infections, many new and seemingly stronger antibiotics have been developed to counter more diseases and overcome germs' resistance to earlier antibiotics. For a time, synthetically produced penicillin (methicillin) and combinations of antibiotics appeared to have bacterial infections in check. More-resistant bacterial strains have appeared. For the last two decades, vancomycin has been seen as the only drug that could be depended on to eradicate *Staphylococcus aureus*, a microbe that commonly infects hospital patients already weakened by illness or surgery.²

In 1996, the first case of a patient infected with avancomycin-resistant strain of *S. aureus* was reported in Japan.³⁻⁴ In the last two years, similarly resistant *S. aureus* strains have appeared in the United States in patients who had been treated with vancomycin. The vancomycin-resistant microbes in the first two U.S. patients were wiped out by a combination of vancomycin and other

drugs, but both patients still died. These were only the initial encounters with what could become an onslaught affecting the in-patient and out-patient medical facilities of entire cities.⁵⁻⁶ They should raise an alarm that all health care professionals must heed, because "the emergence of such resistance could produce morbidity and mortality similar to that caused by *S. aureus* infections in the era before antibiotics became available."¹

The natural selection of drug-resistant bacteria is a result of the unnatural and unnecessary overuse of powerful antibiotics that rapidly alter microbes in ways that are becoming harder to overcome. Merely creating yet-more-powerful drugs only leads to yet-more-powerful bacterial adversaries that may dispatch first the infected who are old, sick, infirm and institutionalized. Such "super bugs" could eventually be virtually unstoppable and begin incapacitating and decimating younger and otherwise healthier people.

All health care and public health professionals must be educated to implement guidelines for prescribing and dispensing antibiotics and even issuing "antibiotic stop orders" when appropriate.³ They must strive to use antibiotics only in the most judicious manner, to employ programs to detect antibiotic resistance and take all steps necessary to limit contagion.⁷⁻⁸

Chiropractors can protect and empower their patients by counseling them to demand judicious use of antibiotics. Patients must learn to ask doctors some critical questions when medications are prescribed for them or their loved ones:

1. Is the medication you're prescribing an antibiotic?
2. What good is it supposed to do?
3. What problems, side effects, or interactions with other medications or nutritional supplements might result from taking this antibiotic?
4. Is there reason to believe this or related antibiotics may contribute to the creation of antibiotic-resistant bacteria that could be difficult to combat in the future?
5. Can you recommend a less-potent medication or, better yet, other therapeutic approaches that may be equally protective and curative without the difficulties and dangers that antibiotic use can involve?

Members of the biomedical scientific community are echoing positions long held by doctors of chiropractic: Victory over drug-resistant bacteria can no longer be thought of in terms of increasing the strength of weapons used against microbes. It must take the form of "a major war against the misuse of antibiotics."¹

Chiropractors and now biomedical scientists are clearly enlisted in the war against injudicious use of antibiotics. But the war can be won only if medical clinicians, the MDs who are empowered to prescribe antibiotics, accept their responsibility for reducing overuse of antimicrobials. They decide if antibiotics are indicated. They must make the day-by-day, patient-by-patient decisions to stop the dangerous practice of using antibiotics as cure-alls--when the facts show they may be helping create bacteria that nothing can cure.

References

1. Waldvogel FA. New resistance in *Staphylococcus aureus*. *N Engl J Med* 1999;340:556-7.

2. Sieradzki K, Roberts RB, Haber SW, Tomasz A. The development of vancomycin resistance in a patient with methicillin-resistant *Staphylococcus aureus* infection. *N Engl J Med* 1999;340:517-23.
3. Smith TL, Peasom ML, Wilcox KR et al. Emergence of vancomycin resistance in *Staphylococcus aureus*. *N Engl J Med* 1999;340:493-501.
4. Hiramatsu K, Hanaki H, Ino T, et al. Methicillin-resistant *Staphylococcus aureus* clinical strain with reduced vancomycin susceptibility. *J Antimicrob Chemother* 1997;40:135-6.
5. Roberts RB, de Lencastre A, Eisner W. et al. Molecular epidemiology of methicillin-resistant *Staphylococcus aureus* in 12 New York hospitals. *J Infect Dis* 1998;178:164-71.
6. Wiener J, Quinn JP, Bradford PA, et al. Multiple antibiotic-resistant *Klebsiella* and *Escherichia coli* in nursing homes. *JAMA* 1999;281:517-23.
7. Recommendations for preventing the spread of vancomycin resistance: recommendations of the Hospital Infection Control Practices Advisory Committee (HICPAC). *MMWR Morb Mortal Weekly Rep* 1995;44(RR12):1-13.
8. Interim guidelines for prevention and control of *Staphylococcal* infections associated with reduced susceptibility to vancomycin. *MMWR Morb Mortal Weekly Rep* 1997;46:626-8, 635.

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