PHYSICIANS HOME VISITS
COMPREHENSIVE QUALITY HEALTHCARE
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Seniors living healthy.

Bad Effects of Good Medicines

The development of antibiotics undoubtedly has been one the major successes of the twentieth century; through their use millions of lives have been saved. For many of us, it is hard to imagine a world where the use of antibiotics was not prevalent.

The medical community has nearly seventy years of experience using antibiotics against bacterial infections. Careful study over this period of time has revealed both intended and unintended consequences of the use of antibiotics. Not all of these consequences have been beneficial and this has led to the current re-evaluation of the widespread use of antibiotics throughout our lives.

Negative consequences of use of antibiotics include:

Opportunistic infections: The use of antibiotics frequently upsets the delicate balance between bacteria and other micro-organisms that exist on and in our bodies. For instance, this may occur with yeast species which populate in the mouth, a condition known as thrush, or in the skin folds, a condition known as intertrigo. In patients known to have weakened immune systems, such as from malnutrition, these opportunistic infections may cause more serious consequences.

Antibiotic associated diarrhea: The use of antibiotics also may upset the balance of bacteria that normally exist in the human "ecosystem." Antibiotic associated diarrhea may lead to frequent soiling, predisposition to pressure ulcers, disturbances in metabolism such as low potassium, and increased caregiver strain. One particular form of this condition, known as clostridium difficile colitis, is particularly virulent and sometimes causes life-threatening illness.

Pharmacological side-effects: These are highly variable, related to the individual patient characteristics and responses as well as differences in the chemical compounds of the many different antibiotic medications. Their severity, however, cannot be over emphasized. Antibiotics are the number one cause of drug induced liver failure in the United States. Anti-

biotics account for 25% of all medication related adverse events in the hospital also. Some antibiotics, such as gentamicin, are highly toxic to the renal system and may lead to sudden renal failure. Antibiotics may also interfere with the metabolism of other medications. The most frightening example is with the drug warfarin, an anticoagulant used to thin the blood. In this situation antibiotics have the potential to cause significant bleeding risks.

Allergic reactions: These are actually infrequent. Most of those that do occur are limited to skin eruptions. However, allergies to antibiotics may cause a serious reaction of the entire body, a condition known as anaphylaxis.

Antibiotic resistance among bacteria increases as the bacteria are exposed to more and different antibiotics, as frequently occurs in the overtreatment of mild or recurrent infections.

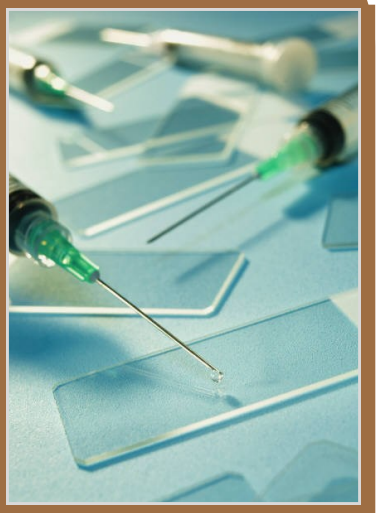
Drug resistant bacteria: This is perhaps the most serious consequence of the current use of antibiotics. In its recent annual report on global risk, the World Economic Forum concluded that "arguably the greatest risk …to human health comes in the form of antibiotic resistant bacteria." Bacteria are capable of developing resistance to the affects of antibiotics. One of the earliest bacteria to become drug-resistant was the staphylococcal species which developed into the MRSA (methicillin-resistant staphyllococcus aureus) strain. More recently we have become aware of the super bugs, assessed as the vancomycin resistant enterococcus (VRE) species, and the carbapenem resistant enterobacterioaceae (CRE) species. Infections by these organisms cannot be treated with currently available medicines. However, any bacteria may develop resistance to a particular antibiotic. For example, E. coli is a very prevalent bacteria usually living harmlessly in the large intestines of most every human and animal on the planet. Some kinds of E. coli, however, can cause diarrhea, while others cause urinary tract infections, respiratory illness and pneumonia. In 2000, only 3% of E. coli were resistant to ciprofloxacin, a commonly used antibiotic. However, by 2010, 17% of E. coli species were resistant to ciprofloxacin. In addition, antibiotic resistance among bacteria increases as the bacteria are exposed to more and different antibiotics, as frequently occurs in the overtreatment of mild or recurrent infections. Many bacteria become resistant to more than one antibiotic, often several different types at the same time. The development of multiple drug resistance limits the choice of antibiotics a healthcare provider may use in treating a patient's illness. Often it is necessary for the provider to choose medications with higher side effect profiles. The development of drug-resistant bacteria species has led nearly all major medical societies and organizations to call for avoiding the indiscriminate or unnecessary use of antibiotics in day-to-day practice.

Just as concerning is the inappropriate use of antibiotics in the agricultural industry. The industrial raising of livestock in the United States accounts for over four times as much antibiotic use when compared to medical use in humans. The potential

for antibiotic resistance is greatly increased through the wastes of these treated livestock or the antibiotic compound itself when either reaches the environment through runoff in measurable concentrations. Other bacteria may also come in contact with these compounds and develop resistance without ever being exposed to them in the course of their typical use.

Although antibiotics have benefitted humans immensely, it is apparent that their indiscriminate use may lead to other health concerns for individual patients and for the health of the public at large.

The accidental discovery of antibiotics transformed medicine. The morning of September 3rd, 1928, Professor Alexander Fleming was sorting through a number of glass plates which had previously been coated with staphylococcus bacteria as a part of his research. One of the plates had mold on it. The mold was in the shape of a ring and the area around the ring seemed to be free of the bacteria staphylococcus. Fleming concluded that the bacteria on the plate around the ring had been killed off by some substance that had come from the mold.



Further research on the mold found that it could kill other bacteria and that it could be given to small animals without any side-effects. Ten years later Howard Florey and Ernst Chain, working at Oxford University, isolated the bacteria-killing substance found in the mold—and penicillin was born.

In 1941, Dr. Charles Fletcher had heard of their work. He had a patient who was near to death as a result of bacteria getting into a wound. Fletcher used some of Chain's and Florey's penicillin on the patient and the wound made a spectacular recovery. Unfortunately, Fletcher did not have enough penicillin to fully rid the patient's body of bacteria and the patient died a few weeks later. However, penicillin had shown what it could do on what had previously been a lost cause. The only reason the patient did not survive was because they did not have enough of the drug, not that the drug did not work.

Florey convinced an American drug company to mass produce the penicillin and by D-Day enough was available to treat all the bacterial infections that broke out among the allied troops. Penicillin was nick-

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Contact Us

We would like to hear from you!

If you have any questions or suggestions, please let us know.

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Physicians Home Visits is a team of physicians, nurse practitioners, nurses and clinical assistants providing primary care for seniors throughout the Piedmont region of North Carolina. We provide comprehensive healthcare centered upon the patient as a whole person. We want to prevent illnesses, promote wellness, provide acute care and manage chronic illnesses, ensuring the patient and caregivers are fully informed in their care plan. In all cases, we use evidence-based medicine and clinical support tools to guide the decisions the patient and their family must make.

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