

Physician Heal Thyself

Are Antibiotics the Cure or the Disease?

ALMOST EVERY DAY (and I suspect it would be every day if I read more journals), I read another study that purports to prove that physicians are letting their patients down by not doing something they are supposed to do or by doing something they should not do. For example, in a recent study of survivors of myocardial infarction, only 21% of eligible patients received β -blocker therapy, and nonrecipients of β -blockers were 1.75 times as likely to die in the next 2 years.¹ Here is a partial list of other things physicians do not do as frequently as at least one person or group thinks they should: (1) immunize children according to current guidelines²; (2) refer patients with diabetes for routine eye examinations³; (3) use angiotensin-converting enzyme inhibitors in patients with congestive heart failure⁴; (4) treat patients with atrial fibrillation with warfarin⁵; and (5) recommend exercise to sedentary adults.⁶ The list of things physicians do that they should not do is not nearly as long but generally close to the top, at least these days, is the overuse of antibiotics.

In this issue of the ARCHIVES, Mainous and Hueston⁷ report their findings from a study of outpatient antibiotic use for upper respiratory tract infections (URIs) in a Kentucky Medicaid population. Antibiotics were prescribed to 60% of the outpatients, who were primarily children. In only 6% of these encounters did the patients have a secondary diagnosis that might warrant an antibiotic, such as sinusitis or otitis media. Many of these patients were prescribed an antihistamine as well, for which evidence of effectiveness is also lacking. Even allowing for incorrect diagnostic coding in a substantial proportion of these episodes, which seems unlikely, the likelihood that a patient in this study left his or her physician's office with a prescription for an antibiotic for the treatment of a cold was high.

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These results are in agreement with the results of other studies that demonstrate a high rate of antibiotic use for conditions in which their efficacy is, at best, questionable.⁸ Mainous and Hueston note that the risk is not only to individuals but to the public's health as well, in the guise of common pathogens that are no longer sensitive to readily available nontoxic antibiotics. When we are faced with studies like this, we need to answer 2 questions: (1) Is the premise flawed, ie, do some patients warrant treatment with antibiotics for URIs? and (2) If the premise is correct, how do we change physician behavior?

Because the treatment of patients who have URIs with antibiotics is so widespread, perhaps there is something to the practice. Perhaps there is a subset of patients who improve more quickly with antibiotics. Kaiser and colleagues⁹ investigated this possibility when they performed a randomized, placebo-controlled trial of antibiotic therapy for patients with URIs who had nasopharyngeal aspirates positive for *Haemophilus influenzae*, *Moraxella catarrhalis*, or *Streptococcus pneumoniae*. Of the 300 patients who underwent aspiration, 20% had positive aspirates for one of the organisms listed and were treated with amoxicillin-clavulanate potassium. Although the authors concluded that the condition of patients treated with antibiotics was significantly improved after 5 days, only 27% of the treated group was considered cured and 70% complained of persistent symptoms even after antibiotic therapy. If this practice were to be adopted, every patient with a URI would have to undergo the difficulty and expense of nasopharyngeal aspiration to find the 5% (20% $\times$ 27%) of patients who might benefit. Obviously the temptation would be great to forego aspiration and treat everyone who has a URI with antibiotics, a scenario that would undoubtedly increase the incidence of penicillin-resistant strains of common bacterial pathogens.

The weight of the evidence is against the treatment of URIs with antibiotics¹⁰⁻¹²; until more evidence is found, we must accept the premise of the study by Mainous and Hueston that treatment of URIs with antibiotic therapy is not worthwhile and their conclusion that antibiotic use is excessive in this population.

Having failed to find a scientific basis for the rate of antibiotic prescription in these patients, we must seek non-scientific reasons for this behavior. These have been summarized as follows: inappropriate antibiotic prescribing is common because it is easy, patients want antibiotics, prescribers want to "cover all the bases," and antibiotics are perceived to be nontoxic.¹³ The low reimbursement that physicians receive for the treatment of Medicaid recipients could contribute to antibiotic overuse as well, as providers attempt to work faster to see more patients. It is most physicians' belief that patients given a prescription for an antibiotic do not complain and leave the office satisfied and quickly, while those who are not given an antibiotic require an explanation that is time consuming, tedious, and frustrating for both parties (however, at least one study has found no relationship between a prescription for antibiotics for URIs and patient satisfaction¹⁴). Those not given antibiotics may call back at night or return the following day. Perhaps the only wonder is that antibiotics are not prescribed even more frequently than they already are!

Having answered the first question, we turn to the second: What do we do about this? Several reviews of the subject of changing physician behavior have appeared recently. The interventions that have been studied are summarized as follows: (1) educational interventions, including educational materials, formal continuing medical education programs, outreach visits ("academic detailing"), use of local opinion leaders, patient-mediated interventions such as educational materials, audit with feedback, and reminders; (2) quality improvement or quality management methods; (3) administrative barriers (either increased or decreased); and (4) financial incentives or penalties.¹⁵⁻¹⁷

Of the educational interventions, the most effective strategies included outreach visits, opinion leaders, use of reminders, patient-mediated interventions, and some combination of these. Outreach visits, in which a professional meets with physicians in their practices to provide information, have been effective in reducing inappropriate prescribing and increasing the use of preventive services.¹⁶ Davis and colleagues¹⁵ also concluded that formal continuing medical education activities had little effect unless accompanied by some reinforcing strategy.

Some organizations, such as managed care organizations, hospitals, and nursing homes, have sought to alter physician behavior by involving physicians in the study of a problem, ie, by using quality improvement or quality management methods. In this way, physicians in the organization help to set the standards by which their behavior will be judged. However, no study of these methods has yet reported definite improvement in patient care.¹⁷

Another way to alter physician behavior is to create barriers to the behavior or otherwise construct some type of administrative roadblock. Every physician already is familiar with interventions that alter behavior by creating barriers. The use of restricted formularies, requiring consultations before ordering certain therapies or tests, and simply requiring the completion of forms before durable medical equipment can be ordered are some examples. The institution of the Omnibus Budget Reconciliation Act of 1987 nursing home guidelines regarding the use of psychotropic medications has dramatically decreased the use of these medicines.¹⁸ Sometimes overlooked is the converse: favorable behavior can be encouraged by reducing barriers.

Last, it seems obvious that instituting financial incentives or penalties should have distinct effects on physician behavior, but there are few randomized trials of these interventions.¹⁷ In one study, the immunization rates of British general practitioners increased when these physicians received bonuses for high immunization rates in their practices.¹⁹ In another example, physicians in health maintenance organizations were less likely to hospitalize patients if they were paid by salary or by capitation.²⁰

To return to the problem of antibiotic overuse for URIs, Mainous and Hueston recommend the development of profiles of physician practices for antibiotic use and then the feedback of this information to the practitioners. Randomized trials of these types of interventions have had mixed results, with 10 positive outcomes and 14 negative ones found in the review by Davis and colleagues.¹⁵ The most important lesson from the literature on changing physician behavior is that, as Oxman and col-

leagues¹⁶ observed, while there are many interventions that are moderately effective, there are "no magic bullets." In the example of antibiotics used to treat URIs, this would suggest that physician profiling would be more effective in reducing antibiotic use if this method were to be combined with another intervention, such as introducing a barrier to prescriptions (eg, requiring the indication to be written on the prescription for any antibiotic) or giving financial rewards to prescribers with good profiles or penalties to prescribers who overuse antibiotics.

Now that we understand more and more about the scientific basis of medical practice, the challenge before us is to find the best ways to implement this knowledge, without being heavy handed or interfering with the relationship between physician and patient. We physicians often know what to do, but our practices often fall short. Daily, each of us encounters patients whose behavior we seek to change. While difficult, perhaps our biggest challenge is learning how to change our own behavior.

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