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Antibiotics Aren't Always the Answer

By DEBORAH FRANKLIN

It's hard not to wheedle.

Your throat feels as if you've swallowed broken glass, your sinuses have been clogged for a couple of days, you're coughing up green stuff and you're slated to fly in a week.

Never mind that your doctor thinks you're suffering from a viral infection that antibiotics won't touch. Why not start a prescription of some powerful bacteria-busting drug immediately, just in case?

Dr. Alastair D. Hay, who teaches medical students at the University of Bristol in England and also treats patients, says that until recently, even he may occasionally have succumbed to the pressure to hand over a prescription.

"As a personal policy, I don't get into heated arguments with my patients," Dr. Hay said.

And giving the standard lecture about how antibiotics will not stop a virus but may contribute to the growing, worldwide problem of drug resistance rarely convinces sick people that they don't need the drugs. "Unless you can tell them that there's an immediate downside for them personally," Dr. Hay said, "the message just doesn't sink in."

Now, though, Dr. Hay can quote direct evidence of a downside. An increasing number of studies, including his own work, suggest that even a properly prescribed antibiotic can foster the growth of one or more strains of antibiotic-resistant bacteria for at least two to six months inside the person taking the pills.

"Carrying" a microbe inside you that is resistant to drugs also means that, during that time, you're likely to "share" the resistant bug with family, co-workers and others in your path.

That particular strain may not make you sick. But if you find yourself one day immune-suppressed after chemotherapy, cut open by a car accident or surgery or especially vulnerable to bacterial pneumonia after a bad flu, those resistant strains of bacteria living inside you increase the odds that any infection will be hard - or even impossible - to beat.

In a study published in the July 2005 issue of The Journal of Antimicrobial Chemotherapy, Dr. Hay and nine colleagues solicited urine samples from a broad cross-section of generally healthy people throughout southwest England.

They then checked the samples for E. coli, a common intestinal bacterium that can invade the urethra. Published surveys estimate that roughly 25 to 35 percent of women ages 20 to 40 in the United States have had a urinary tract infection, and E. coli is the most frequent cause.

Of the 618 men and women from whom Dr. Hay and his colleagues were able to isolate E. coli and also get extensive medical records, 39 percent carried a bacterial strain that was resistant to one or more of the first-line antibiotics commonly used to treat urinary infections.

More significantly, Dr. Hay said, a patient's likelihood of carrying a resistant organism was doubled if the patient had taken "any antibiotic for any reason within the previous two months, when compared with those who had not taken an antibiotic."

The findings dovetail with results from other studies that found a strong, though temporary, link between drug-resistant urinary tract infections and antibiotics taken in the previous six months.

"A lot of women have had the experience of having a urinary infection that doesn't seem to be treatable, or of going through more than one drug," said Abigail A. Salyers, a microbiologist at the University of Illinois and a co-author with Dixie D. Whitt of the new book "Revenge of the Microbes: How Bacterial Resistance Is Undermining the Antibiotic Miracle."

"Having to go through a number of drugs magnifies the time that you're miserable," she said.

But the implication of the research goes beyond urinary infections. Doctors are beginning to realize that any oral or injected antibiotic they prescribe to fight a particular infection also cuts a wide swath in bacterial neighborhoods throughout the body, mowing down microbes that are susceptible and leaving room, temporarily at least, for resistant bugs to colonize the empty real estate and thrive.

Bacteria differ in their ability to fend off antibiotics, and in the methods they use. The most worrisome are those that quickly and easily trade genetic material across species. A bacterium that was once vulnerable to any one of several drugs can overnight become impervious to *all of them*. It does this by picking up an extra loop of DNA - essentially a highly portable genetic suitcase containing several different resistance genes - from a passing microbe.

Public health officials used to assume that these sorts of superbugs arose mostly in hospitals, where a variety of conditions - including a concentration of seriously ill patients, open wounds, hands-on care and the wide use of powerful antibiotics - made the buildings incubators of drug resistance.

But just because hospitals are incubators doesn't mean that's where the problems start or stay.

"Many hospital infections walk in the front door, on the patient, or the patient's family, the doctors, or the guy in the next bed," Dr. Salyers says. "It's the opportunistic bacteria that we all carry around with us that are causing the trouble in hospitals."

Which brings us back to you, with your nasty sore throat, throbbing sinuses and cough, waiting in the exam room, hoping for a prescription from your doctor.

Dr. Ralph Gonzales, an internist at the University of California, San Francisco, is one of a growing cadre of researchers dedicated to improving the way antibiotics are prescribed and taken in community clinics.

Dr. Gonzales hopes to preserve the drugs' powerful benefits while minimizing resistance. Several years ago, he worked with medical associations and the Centers for Disease Control and Prevention to devise evidence-based guidelines for doctors to use in telling which patients need antibiotics for their respiratory infections and which patients do not.

But increasingly, Dr. Gonzales thinks it is the patients - particularly the 30- or 40-year-old professionals with bad colds and overwhelming deadlines - who need to be persuaded, as much as other doctors.

Studies have shown that when patients come into the clinic expecting a drug, Dr. Gonzales said, doctors are more likely to prescribe one.

"Very few ask directly for an antibiotic," he said. "Instead you'll hear, 'I have a wedding coming up - my wedding - and my cold won't go away.'"

To nip patients' expectations of receiving antibiotics before they see the doctor, Dr. Gonzales is putting up posters in exam rooms that, for example, help explain which symptoms suggest a bacterial infection and which indicate a viral source.

And at what looks like an automated teller machine in the lobby of the hospital's acute care clinic, patients waiting to see a doctor can now view video clips and answer questions aimed at guiding them to a better understanding of why antibiotics aren't always the answer.

Will such measures help? It's too soon to tell. But the last bit of advice that the modified A.T.M. dishes out on its touch screen will certainly reduce infections. Immediately find the nearest restroom, the machine advises, so you can wash your hands.

