

# Clinicians who prescribe unnecessary antibiotics fuel future antibiotic use

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Receiving an initial antibiotic prescription for a viral acute respiratory infection—the type of infection that doesn't respond to antibiotics—increases the likelihood that a patient or their spouse will seek care for future such infections and will receive subsequent antibiotic prescriptions, according to the findings of a study from

Harvard Medical School and the Harvard T.H. Chan School of Public Health.

The analysis, published online August 10 in *Clinical Infectious Diseases*, is believed to be the first to measure how variation in clinicians' antibiotic-prescribing patterns impacts patients' care-seeking behavior and [antibiotic use](#) in the long term.

The findings are alarming because they suggest that once such prescriptions are given improperly for a viral infection they could become a gateway to more antibiotic use, the researchers said. Overuse of antibiotics is common. Previous studies have shown that nearly a quarter of antibiotics prescribed in an outpatient setting are given inappropriately for a diagnosis that does not warrant antibiotic treatment.

"The choices physicians make about prescribing antibiotics can have long-term effects on when individual patients choose to obtain care," said lead study author Zhuo Shi, an HMS student in the Harvard-MIT Program in Health Sciences and Technology program. "A physician who prescribes an antibiotic inappropriately needs to understand that it's not just one little prescription of a harmless antibiotic but a potential gateway to a much bigger problem."

The researchers used encounter data from a national insurer to analyze more than 200,000 initial visits for acute respiratory infections (ARIs) at 736 urgent care centers across the United States. At those centers, the researchers found that antibiotic prescribing rates for ARIs varied greatly among clinicians. In the highest quartile of prescribers, 80 percent of clinicians prescribed antibiotics for viral respiratory infections, and in the lowest, 42 percent did. To understand the impact of greater antibiotic prescribing, the researchers exploited the fact that patients do not choose their urgent care clinician. They are essentially randomly assigned to a clinician.

In the year after an initial ARI visit, patients seen by clinicians in the highest-prescribing group received 14.6 percent more antibiotics for ARI—an additional three antibiotic prescriptions filled per 100 patients—compared with patients seen by the lowest-antibiotic-prescribing clinicians. The increase in patient ARI antibiotic prescriptions was largely driven by an increased number of ARI visits, an increase of 5.6 ARI visits per 100 patients, rather than a higher antibiotic prescribing rate during those subsequent ARI visits, the analysis showed.

It's not that they were more likely to get antibiotics on repeat visits, the researchers found, simply that each return visit provided another opportunity to receive antibiotics.

Why? In the case of a viral illness, patients wrongly attribute improvement in symptoms to the antibiotics. Naturally, next time they have similar symptoms they believe they need more antibiotics, the researchers said.

"You'll hear lots of people say, 'Every winter I need antibiotics for bronchitis,'" said study senior author Ateev Mehrotra, an associate professor of health care policy in the Blavatnik Institute at Harvard Medical School and a hospitalist at Beth Israel Deaconess Medical Center. "The antibiotics don't actually help, but patients tend to perceive a benefit. The fancy term for this psychological phenomenon is 'illusionary correlation.'"

"They get antibiotics and they feel better, not because the antibiotics have worked but because the infection has run its course," Mehrotra said. "The next time they become ill with similar symptoms they go back to the doctor to get another prescription."

And the lesson isn't just learned by the patients themselves. Their

spouses showed similar increases in visits and use of antibiotics for ARIs.

The inappropriate use of antibiotics is a serious problem, the researchers said, noting that the practice increases spending unnecessarily, exposes patients to the risk of side effects for no medical reason and helps to drive the rise of antibiotic-resistant strains of bacteria.

Using encounter data from a national insurer, the researchers categorized clinicians within each urgent care center based on their ARI antibiotic prescribing rate. The fact that urgent care patients are randomly assigned to a clinician ruled out the possibility that patients might be choosing a physician they knew would likely give them antibiotics for their viral infection, enabling the researchers to examine the impact of physician behavior on future patient behavior. The researchers examined the association between the clinician's antibiotic prescribing rate and the patients' rates of ARI antibiotic receipt as well as their spouses' rate of antibiotic receipt in the subsequent year. Several members of the research team first applied this method to examine patterns of opioid prescribing.

While there is plenty of anecdotal evidence that some physicians say they give antibiotics to patients who request them to improve patient satisfaction, the researchers wanted to see whether and how physician prescribing behavior might be fueling the effect. They set out to answer the question: Could an initial prescription from a high-prescribing physician drive future antibiotic-seeking behavior among patients?

It does, the analysis showed, and the study, the researchers said, underscores the ongoing need to educate clinicians and patients on judicious prescribing practices to reduce inappropriate prescribing, as well as the overall overuse of [antibiotics](#) and its associate risks.

**More information:** Zhuo Shi et al, Association of a clinician's antibiotic prescribing rate with patients' future likelihood of seeking care and receipt of antibiotics, *Clinical Infectious Diseases* (2020). [DOI: 10.1093/cid/ciaa1173](https://doi.org/10.1093/cid/ciaa1173)

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