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## Major Article

# Antibiotic stewardship with upper respiratory tract infection patients at student health centers: Providers' communication experiences and strategies

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**Keywords:**

antibiotic stewardship  
 provider-patient interaction  
 antibiotic resistance  
 student health  
 communication

**Background:** Effective provider-patient communication can improve antibiotic stewardship in primary care, but providers find it challenging to discuss antibiotics with patients. This study, focused on college student health centers, examines patients' tactics for obtaining antibiotics for upper respiratory tract infections and providers' communication strategies for improving patient understanding and reducing demand.

**Methods:** Health care providers (N = 103) employed at student health centers on large and primarily residential college campuses in the U.S. completed an online survey.

**Results:** Providers perceived patients as wanting antibiotics in approximately 50% of upper respiratory tract infection visits and noted multiple patient tactics to obtain them, including reports of prior prescribing, suggested diagnoses, and direct requests. Providers used multiple strategies to manage patient demand, including explanation of the diagnosis, antibiotic utility and risks, and treatment plan.

**Discussion:** This study extends prior research indicating that patients exercise a range of influence tactics to obtain antibiotics, and thereby create discomfort for providers. The study also elucidates providers' efforts to counter these influence tactics and steward antibiotics by educating patients.

**Conclusions:** Additional research is needed to specify the most effective ways for providers to respond to patients' influence tactics, including the best approaches to explaining diagnosis, treatment, and antibiotic resistance.

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**BACKGROUND**

Over 2.8 million people are infected with, and 35,000 people die from antibiotic-resistant bacteria annually in the United States.<sup>1</sup> Injudicious outpatient use of antibiotics contributes to the growth of antibiotic-resistant bacteria and reduced efficacy of antibiotics. Approximately 30% of all antibiotic prescriptions and 50% of prescriptions for upper respiratory tract infections (URTIs) in the U.S. are unnecessary.<sup>2</sup> To

reduce illness and death from antibiotic-resistant bacteria, it is critical to reduce unnecessary antibiotic use in primary care.<sup>3,4</sup>

Prior research indicates that providers perceive patient demand for antibiotics,<sup>5,6</sup> and this in turn drives unnecessary prescribing patterns due to concerns about patient satisfaction.<sup>7,8</sup> Effective provider-patient communication can improve antibiotic stewardship,<sup>9</sup> but providers often find it challenging to discuss antibiotics with their patients,<sup>10</sup> particularly when they perceive that patients have a strong desire for antibiotics.<sup>11</sup> This highlights the need for further inquiry on the nature of these interactions and for interventions to support providers' stewardship efforts.

Research examining the specific tactics that patients use to put pressure on providers, or the strategies that providers use to reduce or deflect patient influence on prescribing remains limited. Some studies suggest that providers may perceive more pressure than

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patients explicitly exert.<sup>5,12</sup> At the same time, there is evidence that patients convey their interest in antibiotics in a variety of ways. Scott et al<sup>13</sup> identified several ways in which patients pressure providers for antibiotics, including direct requests, but also suggesting or implying a bacterial diagnosis, highlighting illness severity, appealing to life circumstances, and mentioning previous use of antibiotics. Similarly, parents of children who had ear infections reported using influence strategies such as going into great detail about their children's symptoms and asking providers a lot of questions about those symptoms.<sup>14</sup> Indeed, when parents used these strategies, providers were more likely to prescribe antibiotics.

Mustafa et al<sup>11</sup> report that, in order to avoid confrontation, providers often avoid directly eliciting patients' expectations for antibiotics. They also utilize a "running commentary" strategy during the physical examination as an effort to influence those expectations, such as indicating that an infection doesn't appear bacterial. Nielsen<sup>15</sup> described a case where the provider responded to a direct request of antibiotics from a patient by emphasizing that they were properly diagnosed, explaining the difference between viral and bacterial infections, and conveying the risks of unnecessary antibiotic use. Correspondingly, Yates and colleagues<sup>16</sup> found that providers tend to focus their communication with patients about antibiotics on four pieces of information: differentiating between viral and bacterial infections, offering ways to manage symptoms, describing signs to watch for, and indicating the availability of follow-up care.

A fuller understanding of patients' tactics for obtaining antibiotics is critical for devising communication strategies for managing them, and providers' reports of their current communication strategies are a valuable resource for identifying potentially effective or ineffective approaches.

The current study focuses on experiences of providers who practice at student health centers on large, residential campuses. This patient population is particularly susceptible to URTIs, given group living, inadequate hygiene, and insufficient vaccination, so student health practice involves a lot of URTI visits and corresponding antibiotic-seeking from patients. Emerging adult patients are often uncertain about health matters and potentially easier to educate than some populations, but they are also developmentally prone to question authority and influenced by parents and peers who may promote antibiotic-seeking behavior. Although the experiences of these providers cannot generalize to all clinical contexts, student health centers are similar to both general practice and urgent care centers in seeing high volumes of URTI cases, and to urgent care centers insofar as providers often see patients with whom they have had no prior interaction.

Accordingly, the current study was designed to answer the following research questions:

RQ 1: What makes discussion of antibiotics with URTI patients challenging for providers?

RQ 2: What influence behaviors do providers report their URTI patients using to influence antibiotic prescribing?

RQ 3: What communication strategies do providers report using to manage the challenge of URTI patients' antibiotic expectations?

## METHODS

### Sampling

Study procedures were reviewed and approved by the Penn State IRB. To recruit participants, we used the Carnegie Classification to identify the large and mostly or primarily residential colleges and universities in the US ( $N = 171$  at the time of data collection). These are institutions with at least 10,000 students and at least 25% of students living on campus (often far more), so they are the most likely

colleges and universities to have large Student Health Centers (SHCs) staffed with healthcare providers. We sent e-mails directly to the medical or executive directors of these SHCs, or to general clinic e-addresses if directors' addresses could not be obtained. The e-mails asked directors to distribute the link to our online study to physicians, physician assistants, and nurse practitioners who were actively affiliated with and practicing primary care at their SHCs. Due to survey setup, we do not know how many individuals accessed the study but did not consent to participation or were not eligible due to exceeding our cap of 3 participants per SHC.

In total, 110 eligible individuals completed participation and were provided with a \$50 Amazon gift card as compensation for their time. Data from 7 participants was excluded from analyses due to suspiciously rapid completion of the survey and/or large numbers of missing responses. Although nonprobability sampling was used to obtain the sample, and we were unable to track which SHC directors read the recruiting email or distributed the survey link, the 103 retained participants were employed at a total of 50 distinct SHCs located in 32 states plus the District of Columbia. Of the 50 colleges and universities represented, 37 were public, 13 private.

### Data collection

Data was collected with an electronic, smartphone-compatible survey (Qualtrics Software) including both closed- (multiple choice and "slider") and open-ended (numeric or textual) questions (see Supplemental Materials for complete set of items). Participants were first asked to indicate their medical qualifications and the SHC currently employing them. Those who did not meet the inclusion criteria were dropped at this stage. Subsequent questions addressed providers' perceptions of patients' desire for antibiotics and factors motivating that desire, level of comfort discussing antibiotics with patients, behaviors utilized by patients to influence prescribing decisions, and provider strategies for discussing antibiotics with patients, including strategies specific to discussing antibiotic resistance. Participants reported their demographic information toward the end of the survey.

### Data analysis

Qualtrics survey data was anonymized and extracted to Microsoft Excel for analysis. To classify responses to open-ended questions, the third and fifth authors did a close reading of the responses and worked collaboratively to derive mutually exclusive categories that represented common types of responses to each question. This effort was aided by the typically succinct and straightforward responses given by most providers to the open-ended questions, and by easily identifiable commonalities in those responses. Then, the first and second authors and a research assistant each independently coded each question's responses into the categories for that question. Finally, the coders met to resolve differences through discussion, resulting in the data reported below.

## RESULTS

Table 1 presents the demographic characteristics of the 103 health care providers, primarily MDs and NPs, who completed the survey. Participants ranged in age from 26 to 69 years ( $M = 48.6$ ,  $SD = 10.8$ ). Most had practiced medicine for more than 10 years; years of practice at an SHC was more variable. The majority of participants identified as White and female. They also reported working an average of 39.02 hours per week ( $SD = 9.00$ ) and seeing an average of 43.9 patients ( $SD = 28.20$ ) with URTIs per week during cold and flu season. Almost half (44.7%) of providers indicated that their SHC did not have an antibiotic stewardship program ( $n = 46$ ) while 29.1% did have a

**Table 1**  
Provider characteristics (n = 103)

Category	n (%)
US census category	
Asian	1 (1.0%)
Black or African American	5 (4.9%)
White	77 (74.7%)
More than One Race	8 (7.8%)
Prefer not to say	6 (5.8%)
Missing	6 (5.8%)
Gender	
Female	72 (69.9%)
Male	23 (22.3%)
Gender non-binary	1 (1.0%)
Other	1 (1.0%)
Missing	6 (5.8%)
Medical qualification	
Doctor of Osteopathic Medicine (D.O.)	4 (3.9%)
Doctor of Medicine (M.D.)	41 (39.8%)
Nurse Practitioner (N.P.)	41 (39.8%)
Physician's Assistant (P.A.)	16 (16.5%)
Age group (years)	
20-29	3 (2.9%)
30-39	17 (16.5%)
40-49	31 (30.1%)
50-59	24 (23.3%)
60+	21 (20.4%)
Missing	7 (6.8%)
Years of medical practice	
<5 yrs	8 (7.8%)
5-10 yrs	17 (16.5%)
>10 yrs	74 (71.8%)
Missing	4 (3.9%)
Years of practice at student health center	
<5 yrs	34 (33.0%)
5-10 yrs	28 (27.2%)
>10 yrs	37 (35.9%)
Missing	4 (3.9%)
Antibiotic stewardship program in student health center	
Yes	30 (29.1%)
No	46 (44.7%)
Unsure	27 (26.2%)

stewardship program (n = 30). The remaining (n = 27) were unsure. In the next sections, we address the three research questions proposed.

#### RQ 1: What makes discussion of antibiotics with patients challenging for providers?

Providers reported that they perceived patients to want antibiotics in approximately 50% of visits. The most frequently-reported drivers of desire for antibiotics (Table 2) were recovery from illness, past prescribing of antibiotics, patient misconceptions or misinformation, and social network influence.

Discussion of antibiotics with patients created an uncomfortable interaction in 21% of visits. Providers most frequently reported their discomfort in the form of feeling irritated (n = 28), defensive (n = 25),

**Table 2**  
Factors driving patients' desire for antibiotics

Category	n (%)
Recovery from illness	60 (58.3%)
Past antibiotic prescriptions	60 (58.3%)
Patient misconceptions/misinformation	44 (42.7%)
Social network influence	43 (41.7%)
Symptom-related concerns	26 (25.2%)
Desire for "real medicine"	13 (12.6%)
Media influence	7 (6.8%)
Cultural norms/international policies	7 (6.8%)

or pressured (n = 22). Certain situations caused providers more discomfort, including when the patient was dissatisfied (n = 32), required education (n = 27), attempted to influence the provider (n = 19), or had obtained antibiotics elsewhere (n = 19). Less often, providers reported feeling situational discomfort when the patient's parents were involved (n = 7), when the provider felt uncertainty about the diagnosis (n = 3), or when there was insufficient time in the visit (n = 2).

#### RQ 2: What behaviors do providers report their URTI patients using to influence antibiotic prescribing?

Providers reported a variety of patient behaviors employed to influence their prescribing (Table 3). Patients' most common influence tactics were reporting that they had received antibiotics for a prior infection, emphasizing symptoms to imply a need for antibiotics, suggesting diagnoses, and directly requesting antibiotics. Providers also regarded some patient influence behaviors as causing more discomfort than others. The greatest discomfort arose when patients reported receiving antibiotics for a prior infection, when they stated that another healthcare provider recommended antibiotics in the past, and when they directly requested antibiotics.

#### RQ 3: What communication strategies do providers report using to manage the challenge of patients' antibiotic expectations?

Providers reported a range of strategies employed to manage patients they perceived as wanting antibiotics, as well as strategies to reduce interest or demand for antibiotics in most or all URTI visits, regardless of perceived desire for antibiotics (Table 4). In visits where the provider perceived that the patient wanted antibiotics, providers most frequently reported explaining the diagnosis or disease (n = 58), explaining antibiotic utility and risks (n = 53), explaining the treatment plan (n = 48), explaining antibiotic resistance (n = 38), and discussing monitoring or follow-up options (n = 36). Regardless of whether patients were perceived as wanting antibiotics, providers reported the most frequent use of strategies that included explanation of the treatment plan (n = 44) and explanation of the diagnosis or disease (n = 31).

A chi-square test revealed that the rate of different strategies being employed varied between interactions with patients perceived as wanting antibiotics and with patients in URI visits overall ( $X^2(9) = 22.36, P < .01$ ). A post hoc test with Bonferroni adjustment showed that, of the different strategies, explaining treatment plan was significantly more likely to be used in general URI visits ( $P = .01$ ), whereas in visits with patients perceived as wanting antibiotics, providers were more likely to explain antibiotic resistance ( $P = .04$ ). Additional analyses were performed to test whether providers' engaging in (vs refraining from) each strategy was associated with the type of visit. Results showed that when patients were perceived as wanting antibiotics (vs overall visits), providers were more likely to explain diagnosis or disease ( $X^2(1) = 13.37, P < .001$ ), antibiotic utility and risk ( $X^2(1) = 17.54, P < .001$ ), and antibiotic resistance ( $X^2(1) = 30.10, P < .001$ ). They were also more likely to discuss or provide monitoring and follow-up ( $X^2(1) = 5.52, P = .02$ ), use patient-centered communication strategies ( $X^2(1) = 8.67, P = .01$ ), provide handouts/flyers/websites/resources ( $X^2(1) = 5.95, P = .01$ ), and explain the side effects of antibiotics ( $X^2(1) = 10.91, P < .001$ ). Overall, providers were more likely to make use of the communication strategies when perceiving their patients as wanting antibiotics. The rate of their explaining treatment plan and antibiotic resistance, in particular, differed significantly between the two scenarios.

Although many providers reported hesitating to talk with patients specifically about antibiotic resistance (n = 91, 88.3%), they nonetheless reported discussing this topic in approximately 50% of URTI visits

**Table 3**  
Provider perceptions of patients' influence tactics

Category	Average % of visits	Providers perceive as creating discomfort n (%)
Patients report receiving antibiotics for a prior infection	50%	66 (64.1%)
Patients emphasize symptoms to imply need for antibiotics	45%	39 (37.9%)
Patients suggest a diagnosis	44%	42 (40.8%)
Patients request antibiotics	35%	60 (58.3%)
Patients report that someone else received antibiotics during a prior illness	32%	36 (35.0%)
Patients state that a non-healthcare provider recommended antibiotics	30%	41 (39.8%)
Patients inquire about provider reasoning for not prescribing antibiotics	32%	40 (38.8%)
Patients state that a healthcare provider recommended antibiotics in the past	21%	61 (59.2%)
Other behaviors	12%	11 (9.2%)

**Table 4**  
Communication strategies when discussing antibiotics

Category	With patients providers perceive as wanting antibiotics n (%)	At most URI visits, regardless of whether a patient seems to want antibiotics n (%)
Explain diagnosis or disease	58 (56.3%)	31 (30.1%)
Explain antibiotic utility and risk	53 (51.5%)	23 (22.3%)
Explain treatment plan	48 (46.6%)	44 (42.7%)
Explain antibiotic resistance	38 (36.9%)	5 (4.9%)
Discuss or provide monitoring and follow-up	36 (35.0%)	20 (19.4%)
Patient-centered communication (eg, listening, validating, teach-back)	34 (33.0%)	15 (14.6%)
Handouts/flyers/websites/resources	24 (23.3%)	10 (9.7%)
Explain side effects of antibiotics	22 (21.4%)	5 (4.9%)
Prescribing tactics (eg, delayed prescribing, scripts for over-the-counter meds)	7 (6.7%)	4 (3.9%)
Conduct/offer testing	5 (4.9%)	1 (1.0%)

( $M = 48.02\%$ ,  $SD = 29.19$ ). Providers reported the greatest likelihood of talking about antibiotic resistance when the patient expected, demanded, or requested antibiotics ( $n = 46$ ) or when addressing specific types of illness such as sinusitis or bronchitis ( $n = 40$ ; illness type varied by provider). Antibiotic resistance was also discussed with diagnosis or treatment plans ( $n = 19$ ), when the patient had a history of antibiotic use ( $n = 19$ ), and less frequently for other reasons (eg, when not prescribing an antibiotic or when an antibiotic is unnecessary ( $n = 11$ )). When discussing antibiotic resistance, providers most frequently talked about its cause ( $n = 42$ ) and the harms associated with it ( $n = 42$ ), along with other aspects of the topic (Table 5).

**Table 5**  
Strategies providers use to discuss antibiotic resistance

Category	n (%)
Cause of antibiotic resistance	42 (40.8%)
<i>Resistance stems from use/overuse of antibiotics, provider overprescribing</i>	
Harms from antibiotic resistance	42 (40.8%)
<i>Antibiotics failing to work, problems with antibiotics for resistant infections, future infections difficult or impossible to treat, death</i>	
Nature of antibiotic resistance	29 (28.2%)
<i>Bacteria evolve to become resistant, superbugs, types of antibiotic-resistant illness (eg, methicillin resistant staphylococcus aureus), prior and subsequent resistance</i>	
Medical care	19 (18.4%)
<i>Bacterial vs viral diagnosis, lack of evidence for bacterial infection, following up if symptoms don't improve, secondary bacterial infection</i>	
Susceptibility to antibiotic-resistant illness	14 (13.6%)
<i>Patient/personal, global, growing, common, frequent (eg, at that clinic)</i>	
Antibiotics as resources	14 (13.6%)
<i>Benefits, useful for bacterial illness, few drugs in development, needed for future</i>	
Patient stewardship behavior	13 (12.6%)
<i>Completing course of antibiotics, throw out old antibiotics, handwashing</i>	
Harms of antibiotics	6 (5.8%)
<i>Harms other than those associated with resistance, (eg, gut microbiome disruption, diarrhea, obesity risk)</i>	

## DISCUSSION

This study corroborates and extends prior research indicating that providers perceive patients as wanting antibiotics for upper respiratory tract infections, that patients attempt to influence providers' prescribing behavior, and that patient influence tactics make URTI visits uncomfortable for providers.<sup>5,6,11–14</sup> While it remains possible that providers sometimes perceive more pressure than patients intend,<sup>5</sup> the current study provides evidence regarding the diversity and ubiquity of patient influence tactics, indicating that patient expectation for antibiotics is a reality underlying many URTI visits.

Our findings indicate that certain influence strategies make providers particularly uncomfortable. These include when patients report a past prescription or provider recommendation for antibiotics, and when patients directly request antibiotics. This discomfort is understandable. The first two tactics constitute challenges to a provider's expertise and prescribing authority, and are likely to require that providers give an account for the difference between past and present prescribing. Similarly, direct requests put providers in the position of needing to refuse and explain why they won't prescribe. Faced with these and other influence efforts, providers need communication strategies that enable them to simultaneously withstand pressure, respond professionally and compassionately to maintain satisfaction with care, and educate patients in ways that reduce future efforts to obtain unnecessary antibiotics.

Indeed, the current study displays the diversity of strategies providers use with patients in their efforts to remain good stewards of antibiotics. Overall, in this sample, providers reported a high frequency of attempts to educate patients on diagnosis, treatment, and antibiotic-related risk and to discuss monitoring and follow-up with patients. These strategies, along with the patient-centered communication strategies, the provision of educational materials and resources, and the explanation of side effects of antibiotics, however, are more likely to be put to use when providers perceive the patients as wanting antibiotics. On the one hand, this suggests that providers are well aware of the need to respond effectively to antibiotic-seeking

patients, and have content they routinely utilize, despite the discomfort they may feel in these interactions. On the other hand, it also shows that the opportunity to improve patient antibiotic stewardship has not been as fully exploited in average URTI visits, indicating that providers may need support to proactively create conversational spaces to reduce future antibiotic-seeking with patients who do not present with a desire for antibiotics at the time of visit. The observation that antibiotic resistance, a key point of education, is discussed at a significantly lower rate in average URTI visits further demonstrates the need to equip providers with communication skills to effectively convey the risk of antibiotics to patients even when they do not perceive the patients as expecting antibiotics for a given visit. Further, since providers report having strategies but remain uncomfortable in these conversations, this study indicates that more research is needed to determine which provider strategies are most effective (in general, with specific patient populations, and in response to particular influence tactics), and the best ways to carry out specific strategies (eg, how best to explain the risk of antibiotic resistance).

Like all research, this study has limitations that should be considered in interpreting the findings. All providers in this study were employed at student health centers situated at large, residential colleges and universities and were therefore reporting principally on medical visits with college students, most of whom are young adults. The type and frequency of patient influence tactics and provider communication strategies may differ in other populations or contexts, as may the strategies that will prove most effective in reducing the demand for antibiotics. Low health literacy, for example, is likely to be a larger problem in patient populations with less education.<sup>17</sup> In addition, the providers who self-selected into the study may be distinct from the larger population of providers (eg, more concerned about antibiotic stewardship) and consequently perceive patient behaviors differently or utilize different communication strategies. It is also important to note that this study was limited to self-report data from providers, so patients' and providers' actual communication behavior may vary from these reports. At the same time, self-report data provides useful insight on what providers perceive their patients doing—perceptions that are foundational for providers' behavior.

## CONCLUSIONS

Primary care providers at student health centers frequently encounter URTI patients who utilize various influence tactics with the goal of obtaining antibiotics. These providers employ patient education strategies in response to these influence efforts, but experience continued discomfort in these interactions. Additional research is needed to specify the most effective ways for providers to respond to patients' influence tactics, including the best approaches to explaining diagnosis, treatment, and antibiotic resistance. Through identifying these communication challenges, providers will be better able to understand the complex patient-provider dynamic and optimize antibiotic stewardship and care.

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## SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.ajic.2022.05.013>.

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