ARTICLE

Parent Expectations for Antibiotics, Physician-Parent Communication, and Satisfaction

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Objectives: To explore how parents communicate their preferences for antibiotics to their child's physician and to examine whether physicians can communicate why antibiotics are not being prescribed in a way that maintains satisfaction with the visit.

Design: Previsit survey of parents, audiotaping of the study encounters, and a postvisit survey of parents and physicians.

Setting: Two private pediatric practices.

Participants: Ten physicians (response rate=77%) and a consecutive sample of 295 eligible parents (response rate=86%) who attended acute care visits for their children between October 1996 and March 1997.

Main Outcome Measures: Physician-perceived pressure to prescribe antibiotics and parental visit-specific satisfaction.

Results: Fifty percent of parents expressed a previsit expectation for antibiotics. Among these parents, only 1% made a direct verbal request for them. Even when no direct requests for antibiotics were made, physicians still perceived an expectation for antibiotics 34% of the time. Among parents who did not receive expected antibiotics, those offered a contingency plan from the physician (ie, the possibility of receiving antibiotics in the future if their child did not get better) had a higher mean satisfaction score than parents not receiving a contingency plan (76 vs 58.9; $P<.05$).

Conclusion: Physicians should consider providing a contingency plan to parents who expect antibiotics for their children when there is no clinical indication. Further study is needed to determine how parents indirectly communicate their desire for antibiotics and what additional communication techniques physicians can use to resist the overprescribing of antibiotics.

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DESPITE A LARGE body of evidence that antibiotics have no role in the treatment of upper respiratory tract infections (URTIs),[1-7] an estimated 38% of children diagnosed with these infections leave the physician's office with an antibiotic prescription.[8] Approximately $40 million is spent annually in the United States on antibiotics for the common cold.[9] Frequent antibiotic use is a risk factor for the spread of drug-resistant strains of bacteria[10-13] that are costly,[14] are more difficult to treat, [10,15,16] and result in increased mortality.[17]

Several studies indicate that patient and parental pressure to prescribe antibiotics leads to increased rates of overprescribing,[18-28] but the mechanisms by which pressure is exerted are unknown. Physicians often do not correctly assess what the patient or parent expects.[20,21,23,26,27] This failure to accurately assess patient and parental expectations underscores the need to better understand what parental communication behaviors make physicians think that antibiotics are expected.

What happens in physician-patient and physician-parent interactions is a key determinant of the overprescribing of antibiotics.[18,20-25,27-29] However, little is known about whether parents influence prescribing choices when they directly or indirectly communicate their desire for antibiotics or whether physicians can effectively communicate reasons for not prescribing antibiotics inappropriately while maintaining satisfaction. This study examined physician-parent communication behaviors for the following reasons: (1) to determine how parents communicate their desire for antibiotics to physicians; (2) to explore what parent communication behaviors make physicians feel pressured to prescribe; and

SUBJECTS AND METHODS

The study design and survey data collection methods have been described in detail elsewhere.[23] Parents completed (1) a 15-item previsit expectations inventory that included 1 item about whether they thought it was necessary for the physician to prescribe antibiotics; (2) a postvisit questionnaire that asked whether previsit expectations were fulfilled; and (3) a postvisit satisfaction questionnaire. Physicians completed a postvisit checklist to indicate diagnosis, treatment, and whether they believed that the parent expected antibiotics for the child. Parents were eligible for participation if their child was between the ages of 2 and 10 years, was being seen for URTI symptoms (cough, rhinorrhea, throat pain, ear pain, or ear tugging), had not been taking antibiotics for the previous 2 weeks, and was seeing a participating physician. Parents of children younger than 2 years were excluded because the University of California, Los Angeles, Human Subjects Protection Committee believed that these subjects were too vulnerable to be approached for study participation. Parents of children older than 10 years were excluded because this study focused on physician-parent communication rather than physician-patient communication. We also excluded ongoing or concurrent episodes of presumed bacterial illness by excluding parents of children treated with antibiotics within 14 days of the study visit. This was done because we were most interested in studying encounters where parents potentially expected antibiotics but had not yet received them, rather than encounters likely to result in a change in the type of antibiotic prescribed for an ongoing bacterial illness.

AUDIOTAPE DATA COLLECTION AND INTERACTION ANALYSIS

Encounters were audiotaped, transcribed, and coded for communication events of interest. We used a modified version of a valid and reliable interaction analysis scheme called Taxonomy of Requests by Patients (TORP).[30] This scheme codes parent requests for information (eg, "Is this infection contagious?") and action (eg, "Can you start her on some Suprax before this gets out of hand?"), and physician responses to those requests. The pediatric version of TORP, TORP-P, was developed in collaboration with the team of researchers who created the original version. Because we were specifically interested in the outcome of satisfaction, we added a new dimension to TORP-P, which codes for physician-initiated information giving. We hypothesized that visit-specific satisfaction among parents would be higher when physicians responded to requests for information and action and when physicians spontaneously offered information without any prompting. We developed codes for physician-initiated statements of fact (eg, "Sally has the flu") and physician-initiated explanations (eg, "Sally has the flu, which is caused by a virus, so antibiotics really won't help"). We hypothesized that giving parents unprompted explanations would be associated with higher satisfaction than simply making factual statements about their child's illness or the treatment plan.

Encounters were also analyzed using 4 new codes developed specifically for this study. Codes were developed to identify whether discussions about antibiotics occurred and, if so, whether the parent or the physician initiated the discussion. Two additional codes were developed using

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(3) to explore what physician communication behaviors enhance parent visit-specific satisfaction.

RESULTS

As previously reported, 10 (77%) of 13 physicians agreed to participate, and 306 (86%) of 356 parents were willing to participate.[23] Of 295 audiotaped encounters, data were complete for 287 (97%). Parents in the sample were older (mean, 38 years), highly educated (mean, 16 years), and had high incomes (75% had an annual income >$50 000). Non-Hispanic white people made up two thirds of the sample, and 60% were enrolled in managed care plans.

Among the total sample of 287 encounters, physicians initiated discussions of antibiotics 74% (n=211) of the time, whereas parents initiated these conversations 8% (n=23) of the time. Antibiotics were not discussed at all in 18% (n=53) of encounters. In encounters where physicians did not initiate a discussion of antibiotics (n=76), parents who indicated on the previsit survey that they expected antibiotics (n=36) initiated conversations about them 11% of the time vs 5% if they reported no expectation for antibiotics ($P=.07$). Most discussions initiated by parents concerning antibiotics were not direct requests for them but indirect mentions. For example, the parent might say, "My neighbor's little boy was started on antibiotics yesterday because he's coughing and having fevers too. He plays with Jimmy a lot." Parents made direct requests for antibiotics in only 4 encounters, or 1% (eg, "I think you need to start Suprax before this gets too bad").

Physician perceptions of parent expectations for antibiotics were related to parent communication behaviors. Multivariate logistic regression analysis revealed that physicians were significantly more likely to perceive parents as expecting a prescription for their child when parents initiated a discussion about antibiotics during the visit (**Table 1**). When parents initiated discussions about antibiotics, physicians were 4 times more likely to believe that they expected antibiotics than if no discussion occurred. Physicians who initiated discussions about antibiotics were 4.5 times more likely to perceive parents as expecting antibiotics than physicians who did not initiate such discussions. Actual parental expectations for antibiotics were not associated with physician-perceived expectations (Table 1).

For patients diagnosed as having a virus, if the physician perceived a parental expectation for antibiotics without a direct request from the parent, antibiotics were prescribed 48% of the time vs 10% if no parental expectation was perceived ($P<.001$).

The mean±SD satisfaction score for parents (scale, 0-100) was 65±19. The only parent demographic charqualitative analysis techniques. We performed a qualitative analysis on a subset of 10 audiotapes of encounters where (1) parents expected but did not receive antibiotics; and (2) parent satisfaction levels fell into either the upper or lower quartile. This was done to identify recurrent communication themes subjectively associated with higher levels of satisfaction. The analysis was performed independently by 2 of the authors (R.M.S. and C.E.F.). Two themes emerged, and interaction analysis codes were developed. For the first theme, we developed a code called "MD contingency plan." We applied this code to statements in which the physician indicated that although antibiotics would not be prescribed at the current visit, if the child did not improve during the next day or two, they might be prescribed then. To account for situations where the physician invested substantial time or effort in addressing parental concerns that were subsidiary to the main reason for the visit, we developed a second code called "MD extra." For example, we applied this code when the main reason for the visit was an earache, the parent subsequently raised concerns about possible hyperactivity in the child, and the physician responded by giving a detailed explanation about possible approaches to evaluating the child for attention-deficit/hyperactivity disorder.

All audiotaped encounters were coded by 2 of 3 coders (R.M.S. coded 287 encounters; 2 trained research assistants coded 247 and 40 encounters, respectively). Of the original 295 encounters, 8 were not coded because of incomplete audiotape data. Both unitizing and interpretive reliability were calculated for the 2 coders on each encounter using the κ statistic.[31] Unitizing reliability is a measure of how often beyond chance 2 coders agreed that a statement should be coded. Interpretive reliability assesses only those statements that are coded by both coders, and examines how often beyond chance the 2 coders select the same code category. Our adapted version of TORP, TORP-P, was found to have both excellent unitizing and interpretive reliability. The unitizing κ statistic ranged between 0.76 and 0.78 for the 2 pairs of coders, and the interpretive κ statistic ranged between 0.89 and 0.91.

ANALYTIC METHODS

Previously analyzed survey data and coded audiotape data were merged to examine the relationships between parent communication behaviors and physician-perceived pressure to prescribe antibiotics, and between physician communication behaviors and parent visit-specific satisfaction. We tested the relationship between our predictor and outcome variables using bivariate analyses (χ^2 test of independence, Fisher exact test, *t* test, 1-way analysis of variance, and multiple linear regression). Results of these analyses were used (1) to develop a multivariate model to predict physician-perceived pressure to prescribe antibiotics; and (2) to assess which of the new communication variables should be added to our existing ordinary least squares regression model predicting parent visit-specific satisfaction.[23] Results of the first logistic regression model are reported as odds ratios with 95% confidence intervals. For the second model, which predicted parent satisfaction with the visit, results are reported as β coefficients. In ordinary least squares regression analysis, the β coefficient is the change in outcome associated with a 1-unit change in a predictor variable, holding all other predictor variables in the model constant. To examine the relationships between satisfaction, expectation fulfillment for antibiotics, and receiving a contingency plan, analysis of variance and the Tukey Studentized Range test were performed.

acteristics that were related to satisfaction were ethnicity and level of education (**Table 2**). Being white or Asian American was associated with an increase of 5.7 points in the satisfaction score, compared with being African American or Hispanic ($P=.03$). Parents with a graduate degree were 8 points less satisfied than those with a high school degree ($P=.002$). Providing a contingency plan (ie, the possibility that antibiotics might be provided if the child did not improve during the following 1 to 2 days) was associated with an additional 4 points in the satisfaction score ($P=.04$).

Parents who expected antibiotics but did not receive them were significantly more satisfied if the physician provided a contingency plan ($P<.05$; **Figure**). The top line in the Figure indicates the mean and the upper and lower 95% confidence limits for satisfaction scores among parents who expected antibiotics, did not receive them, and were provided with a contingency plan (mean=76; 95% confidence limit [66, 86]). This mean score is 11 points higher than the mean for the entire study population and 17 points higher than the mean score for parents who expected antibiotics, did not receive them, and did not receive a contingency plan (mean=59; $P<.05$). Contingency plans were important only for parents who expected antibiotics but did not receive them. Parents who did not expect antibiotics, did not receive them, and also did not receive a contingency plan had a mean satisfaction score of 68. Parents who did not expect antibiotics, did not receive them, but did receive a contingency plan had a mean satisfaction score of 66. Parents who expected antibiotics, did not receive them, but received a contingency plan tended to be more satisfied (mean=76) than parents who expected antibiotics and received them (mean=65; $P=.07$).

Parents also reported higher levels of satisfaction when physicians took the time to address subject matter outside the main reason for the visit ("extra" communication); however, this relationship only trended toward significance ($P=.07$). The original finding that unfulfilled expectations for communication events was a significant predictor of satisfaction did not change with the addition of the new communication variables to the right-hand side of the ordinary least squares model.[23]

In bivariate analyses, physician-initiated factual statements were observed to enhance satisfaction with the visit. Satisfaction was 3 points higher when 1 factual statement was provided and an additional 3 points higher if 2 to 4 such statements were made ($P<.05$). However, this communication variable was not a significant predictor of satisfaction in multivariate analyses ($P=.15$). Physician-initiated explanations were not predictive of satisfaction in either bivariate or multivariate analyses.

Table 1. Adjusted Predictors of Physician-Perceived Expectations for Antibiotics

Predictor Variable	Odds Ratio	95% Confidence Interval
Parent initiates discussion of antibiotics (n = 23)	3.89	1.17-12.9*
Parent directly requests antibiotics (n = 4)	5.19	0.51-53.1
Parent expects antibiotics (n = 141)	1.61	0.97-2.67
Physician initiates discussion of antibiotics (n = 233)	4.50	1.83-11.1*

*$P<.05$.

COMMENT

PREDICTORS OF PHYSICIAN-PERCEIVED EXPECTATIONS FOR ANTIBIOTICS

Perceived patient and parental pressure has been shown in multiple investigations to result in increased overprescribing of antibiotics.[18-25] In many cases, however, physicians are not good at predicting what parents or patients actually expect.[20,21,23,26,27] The current study represents an advance because it includes an in-depth analysis of what was said during the physician-parent encounter and links communication events to physician reports of pressure to prescribe antibiotics. Understanding how physicians acquire both accurate and inaccurate perceptions of parent expectations may facilitate the development of effective interventions to decrease inappropriate prescribing. Physicians' reports of pressure to prescribe have previously been assumed to result from parents directly asking for antibiotics during their child's visit.[32] In contrast, we found that parents rarely made direct requests for antibiotics; in 287 encounters, only 4 parents asked for them directly. This finding is consistent with those of Korsch and colleagues,[33] who reported that parent expectations often were not verbalized. However, we also found that any parent-initiated statement about antibiotics, whether it was a direct request or an indirect mention, increased the likelihood that the physician perceived the parent as expecting antibiotics. This finding may partially explain why physicians were frequently incorrect about parent expectations. Physicians in our study may have interpreted indirect mentions about antibiotics as direct requests for them. They may have been overresponsive to parent-initiated discussions about antibiotics.

Although there was a trend toward parents being more likely to initiate discussions of antibiotics when they expected a prescription than when they did not (11% vs 5%; $P = .07$), only 11% of those who expected antibiotics initiated such discussions. Physicians believed that a parent expected antibiotics in 34% of the study encounters, whereas parents brought the subject up (directly or indirectly) in only 8% of encounters. This leads us to conclude either that physicians are attributing expectations to parents that they do not actually have or that parents are communicating their expectations indirectly without ever mentioning antibiotics. Further work is needed to elucidate what parent communication behaviors, both verbal and nonverbal, are leading physicians to come to the conclusion (correctly or incorrectly) that antibiotics are desired. If this set of parent communication behaviors can be identified, physicians could be trained to directly assess what the parent expects when indirect communication cues are used. This may help physicians to avoid prescribing inappropriate antibiotics that the parent may not expect. We hypothesize that parents may be influencing physician perceptions of their expectations through indirect comments made during the visit (eg, bringing up additional symptoms when the physician clearly is not planning to prescribe antibiotics for their child). For example, the physician says, "Well, I think she's got the common cold," and the parent responds, "But her fever has been so high."

Table 2. Adjusted Predictors of Parent Satisfaction With the Visit

Predictor Variable	Change in Satisfaction Score (Points) Associated With Predictor* (β Coefficient)
Parent receives a contingency plan	4.2†
Physician addresses additional parent concerns beyond the main reason for the visit (change in score for each concern addressed)	1.1
Physician provides factual statements about the child's illness or its treatment (change in score for each factual statement provided)	2.0
Parent education level (change in score with each increase in level of education)‡	−4.0†
Parent is Asian American or white	5.7†
Each clinically necessary physical examination component expected but not provided§	−2.4
Each clinically unnecessary physical examination component expected but not provided‖	−2.8
Upper respiratory tract infection medications expected but not received¶	0.2
Each communication event expected but not delivered#	−3.6†

*Indicates all other variables are held constant.

†Indicates significant increase or decrease in satisfaction score (scale, 0-100) at $P<.05$.

‡Indicates 3 levels of education: less than 4 years of college, 4 years of college, and more than 4 years of college.

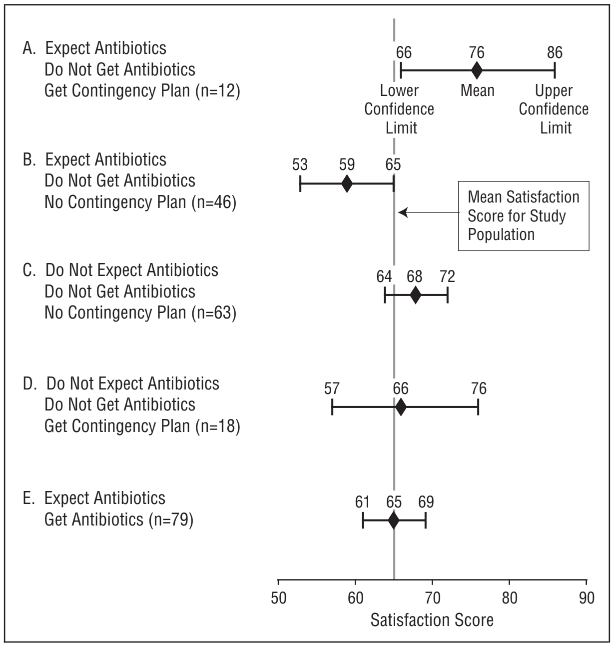
§Clinically necessary physical examination components for a child with symptoms of an upper respiratory tract infection include temperature, ear, nose, throat, and lung examination.

‖Clinically unnecessary physical examination components for a child with symptoms of an upper respiratory tract infection include weight, heart, abdomen, and extremity examination.

¶Upper respiratory tract infection medications include antibiotics, cough medicine, decongestants, and receiving a shot.

#Communication events include the following: (1) physician tells parent name of illness; (2) physician asks about child's symptoms; (3) physician listens to parent's ideas about how to manage child's illness; (4) physician explains how to make child feel better; and (5) physician explains cause of child's illness.

The current study is limited; we were unable to assess nonverbal communication cues because audiotapes rather than videotapes were used for data collec-



Contingency plans enhance satisfaction of parents who want antibiotics but do not receive them. Comparing groups A through E, the only 2 that were significantly different from each other at $P<.05$ were groups A and B.

tion. Parent facial expressions or body language may also be influencing physician perceptions of their expectations. Future studies should attempt to assess this potentially important aspect of communication.

When physicians perceived an expectation for antibiotics, they were significantly more likely to initiate discussions about them. This may represent physicians bringing up the subject of antibiotics in an attempt to prevent an inappropriate request for them by the parent. Alternatively, physicians may be acquiescing to perceived pressure and initiating the discussion about antibiotics to explain the treatment course they are planning to follow.

SATISFACTION

In the current competitive marketplace, many physicians worry that if they do not satisfy patient desires for medications, the patient will go elsewhere for care.[34] However, previous work has shown that satisfaction is not tied to the receipt of desired antibiotics or treatment, but rather to the quality of communication during the visit.[20,23,33,35] In our study we found that physicians can use a relatively simple communication technique in the face of feeling pressured to prescribe inappropriately; this is to provide the parent with a contingency plan. A contingency plan involves the physician suggesting that the parent make contact in the next couple of days if their child is not improving or is getting worse, and explaining that antibiotics might then be provided. Parents in our study who expected antibiotics but did not receive them were significantly more satisfied if the physician provided them with this type of follow-up plan. Using this communication technique has definite promise for potentially decreasing unnecessary prescribing of antibiotics. In a recent study by Cates,[36] the monthly number of amoxicillin prescriptions issued in a private physician's office decreased by 32% when parents were provided with a pamphlet on the potential risks of antibiotics for otitis media. They were also given a prescription for amoxicillin and were instructed to fill it only if their child did not get better in the next couple of days. In the current study, we found that simply indicating that antibiotics might be prescribed if a child did not improve not only prevented inappropriate prescribing but also significantly enhanced parents' satisfaction with care. Providing a follow-up plan that requires communication between the physician and parent emphasizes the continuity of the relationship to that parent. Previous studies have found continuity of care to be a key predictor of satisfaction.[37,38] Thus, it is not surprising that providing a contingency plan enhances satisfaction with care. However, in systems of care where continuity is not assured or where parents may not have easy telephone access to their child's physician, providing a contingency plan may not be an option. In such cases, a contingency prescription as in the Cates study might be a more reasonable alternative.[36]

In our data set, 52% of contingency plans implied that a second visit would not be necessary for antibiotics to be provided. Thus, the enhancement in satisfaction we observed with contingency plans may have resulted from the parent believing that a second visit would be unnecessary if the child became more ill and ultimately needed antibiotics, and that antibiotics could be prescribed by telephone. Theoretically, receiving expected antibiotics during the index visit would also have reduced the need for return visits. In our study, however, receiving expected antibiotics had no effect on parental reports of satisfaction with the visit ($P>.20$). Therefore, we believe that the continuity of care implied by the contingency plan is more likely to explain the observed increase in satisfaction.

It is imperative that the medical-legal aspects of providing a contingency plan or a delayed prescription, as in the Cates study, be considered by any physician who chooses to give one. If a parent calls back because a child is not improving or is worse, and if a physician provides antibiotics without reassessing that child, the physician clearly has put himself or herself at risk medical-legally. Future studies should examine how often children ultimately receive antibiotics when a contingency plan has been provided and how frequently this occurs without a second assessment by the physician. When giving a contingency plan, the physician should use language that implies the necessity of a return visit before antibiotics will be provided (eg, "If she's not doing better in the next day or 2 or certainly if she gets worse, we definitely need to have a second look to see if some antibiotics are in order"). We do not know how often this will result in a second visit or what the economic implications would be, that is, the parent's additional loss of time from work or the cost of a second visit. However, in a recent study by Pichichero et al,[39] the investigators reported that 29% (86 of 293) of children with respiratory illnesses who were not prescribed antibiotics during an initial visit ended up having a second unplanned visit. In contrast, children who received antibiotics at the first visit returned unexpectedly in 44% (40 of 90) of cases. Thus, it would seem reasonable that most parents receiving a contingency plan would not require a return visit. Pichichero et al also reported that 43% of the children not given antibiotics initially did not receive them at the second visit either. Future work in this area should assess how often giving a contingency plan results in the need for additional visits and the ultimate provision of antibiotics.

LIMITATIONS

Because our study was done in one geographic location with a small and relatively homogeneous group of parents and physicians, we do not know whether our findings would generalize to other settings with parents from different backgrounds. Our results also may not generalize well to encounters between physicians and parents of children younger than 2 years or older than 10 years. Because members of the University of California, Los Angeles, Human Subjects Protection Committee felt that parents with an ill child younger than 2 years were too vulnerable and should not be approached for study participation, our ability to completely assess the nonjudicious use of antibiotics for children with URTI was limited. We hope that future studies will include this group of parents. We elected to exclude parents of children older than 10 years because we hoped to capture physician-parent communication rather than physician-patient communication. Studying these issues in visits with adolescents would likely yield different conclusions and is an area of research that should be pursued.

Because we excluded parents of children prescribed an antibiotic in the previous 2 weeks, we may have failed to include an important predictor of the physician's decision to prescribe antibiotics at the current visit. Although parent expectations and physician-parent communication are likely to be influenced by visits during the prior 2 weeks that resulted in an antibiotic prescription, previous research indicates that most episodes of presumed bacterial illness in pediatric patients (66%-86%) result in only 1 physician visit per episode.[39,40] Thus, we do not believe that excluding these parents substantially affected our conclusions.

Because this was an observational study, we cannot make any conclusions about causation. Although we controlled for several confounding variables related to parent satisfaction, it is possible that other unknown confounders exist.

CONCLUSIONS

When physicians feel pressured to prescribe antibiotics that they believe are unnecessary, they should consider providing the parent with a contingency plan. This communication technique will enhance parent satisfaction and will simultaneously allow the physician to avoid prescribing antibiotics inappropriately. Further research is needed to identify other communication techniques physicians can use to avoid overprescribing antibiotics in the pediatric outpatient setting. The more communication tools physicians have at their disposal, the more successfully they will be able to avoid this problem. Further investigation is also needed to delineate more clearly what parent communication behaviors lead physicians to feel pressured to prescribe. Increasing physician awareness of such communication behaviors may facilitate direct responses that do not include inappropriate prescribing. In such cases, physicians should ask parents what they expect from the visit. Parents who seem to expect antibiotics may actually be seeking reassurance that their children are not seriously ill.

Investigating how to improve physician-parent communication will be most important for the next generation of physicians, who will be dealing with resistant infections on a daily basis if we are unable to find successful techniques for curbing inappropriate antibiotic prescribing. Additionally, as parents become more actively involved in health care decisions, successful physician-parent communication will be critical.

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