

# Why do physicians think parents expect antibiotics? What parents report vs what physicians believe

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## Abstract

**Objective** To examine the relation between parent expectations for antibiotics, parent communication behaviors, and physicians' perceptions of parent expectations for antibiotics.

**Study Design** A nested cross-sectional study with parallel measures of parents presenting children for acute respiratory infections (previsit) and physicians (postvisit) and audiotaping of the encounters.

**Population** Ten physicians in 2 private pediatric practices (1 community-based and 1 university-based) and a consecutive sample of 306 eligible parents (response rate, 86%) who were attending sick visits for their children between October 1996 and March 1997.

**Outcomes Measured** Communication behaviors used by parents expecting antibiotics and physicians' perceptions of parents' expectations.

**Results** Parents' use of "candidate diagnoses" during problem presentation increased the likelihood that physicians would perceive parents as expecting antibiotics (from 29% to 47%;  $P=.04$ ), as did parents' use of "resistance to the diagnosis" (an increase from 7% to 20%). In the multivariate model, parents' use of candi-

date diagnoses increased the odds that a doctor would perceive a parental expectation for antibiotics by more than 5 times (odds ratio, 5.23; 95% confidence interval, 3.74–7.31;  $P<.001$ ), and parents' use of resistance to a viral diagnosis increased these odds by nearly 3 times (odds ratio, 2.73; 95% confidence interval, 1.97–3.79;  $P<.001$ ).

**Conclusions** Parents perceived as expecting antibiotics may be seeking reassurance that their child is not seriously ill or that they were correct to obtain medical care. Physicians were significantly more likely to perceive parents as expecting antibiotics if they used certain communication behaviors. This study revealed an incongruity between parents' reported expectations, their communication behaviors, and physicians' perceptions of parents' expectations.

## Practice recommendations

- Physicians are more likely to prescribe an antibiotic if they believe a parent expects one.
- Parental pressure is not limited to verbal requests, but may include other behaviors, such as supplying a candidate diagnosis or resisting the physician's diagnosis and suggested treatment.
- Recognizing these communication behaviors may help the physician more directly communicate with parents about their expectations and desires.

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**W**hen physicians' perceptions of patient expectations were examined as a predictor of prescribing, physicians were significantly more likely to provide a prescription

if pre- or postvisit expectation for antibiotics was expressed by patients, even if antibiotics were inappropriate.<sup>1-8</sup> Patients who expected to receive a prescription were 30% to 45% more likely to receive one than patients who did not expect to receive one. Inappropriate prescribing of antibiotics for presumed viral infections is a serious problem,<sup>9-11</sup> particularly in the pediatric population.<sup>12-14</sup>

Research in the pediatric context has shown similar results. Mangione-Smith et al found that physicians' perceptions of parental expectations for antibiotics was the only significant predictor of prescribing when a viral diagnosis was assigned.<sup>13</sup> When physicians thought parents expected antibiotic treatment for their child, they prescribed it 62% of the time vs 7% when they did not think antibiotics were expected ( $P=.02$ ). In addition, when physicians thought parents expected antibiotics, they were significantly more likely to make a bacterial diagnosis (70% of the time vs 31% of the time;  $P=.04$ ). Parents' reports of their expectations were not significantly related to inappropriate prescribing. In all of these studies, physicians' perceptions were stronger predictors of prescribing behavior than were patients' reports of their expectations.

Missing from this line of research is an answer to the question: "How do physicians come to perceive that parents expect antibiotics?" Earlier work<sup>15-18</sup> identified and described several communication practices used by parents during acute pediatric encounters that may be related to physicians' perceptions of parent expectations for antibiotics. This study examined the relations between 3 parent communication behaviors and parents' reports of their expectations for antibiotics the relations between these communication behaviors and physicians' reports of their perceptions of parents' expectations for antibiotics.

## ■ METHODS

One community and 1 university pediatric practice were identified for possible inclusion in the

## Parents perceived as expecting antibiotics may be seeking reassurance that their child is not seriously ill

study. Parents were eligible for study participation if they spoke and read English and their children were 2 to 10 years old, were being seen for upper respiratory tract infection symptoms (cough, rhinorrhea, throat pain, ear pain, or ear tugging), had not been taking antibiotics for the previous 2 weeks, and were seeing a participating physician. Approval for all study procedures was obtained from the UCLA human subjects' protection committee.

### Inventory of parents' expectations

Before the encounter, parents completed a 15-item previsit expectations inventory that included 1 item about "how necessary" they thought it was for the physician to "prescribe antibiotics for your child (medicine for infection)." The other items in the inventory asked about previsit expectations for other medications (eg, cough medicine) and other tasks (eg, taking the child's temperature) and are described in detail elsewhere.<sup>13</sup>

The inventory was scored by using a 5-point scale: 1 = definitely necessary, 2 = probably necessary, 3 = uncertain, 4 = probably unnecessary, and 5 = definitely unnecessary. Parents who reported a score of 1 or 2 were coded as expecting antibiotics, and parents who reported a score of 3, 4, or 5 were coded as not expecting antibiotics. Each encounter was then audiotaped.

### Physicians' perceptions of expectations

Physicians completed a postvisit checklist to indicate diagnosis, treatment, and their perceptions of what the parents expected. One item asked the doctor to agree or disagree with the statement: "This parent expected me to prescribe antibiotics." Other items asked whether the physician thought

TABLE 1

| <b>Parent communication behaviors</b>      |   |  |                  |
|--|---|--|------------------|
| <b>Communication behavior</b>              | <b>Definition</b>   | <b>Example</b>   | <b>Frequency</b> |
| Symptoms-only problem presentation         | Parent presents child's problem by listing symptoms only  | "He has a runny nose and a sore throat"  | 51%* (n=151)     |
| "Candidate" diagnosis problem presentation | Parent presents child's problem by suggesting or implying a diagnosis   | "He's had a terrible sore throat so I thought maybe it was strep" or "He has green gunky nasal discharge," implying sinusitis  | 45%* (n=132)     |
| Diagnosis resistance                       | Parent questions the diagnosis or suggests an opinion that conflicts with physician's diagnosis               | After a diagnosis of no ear infection, the parent asks "He doesn't?"; or, after a no-problem diagnosis, the parent remarks, "It's just that this has been going on for so long"  | 17% (n=50)       |
| Treatment resistance                       | Parent questions the treatment or states preference for a treatment different than physician's recommendation | After a suggestion to use over-the-counter cough medicine, a parent questions the treatment being recommended: "The Robitussin just isn't working"; or, after a recommendation of an over-the-counter medication, the parent asks, "So, you don't think he needs any antibiotics?" | 12% (n=35)       |

\*These figures do not total 100% because in some cases physicians began the encounter with a question about the child's medical history and parents did not offer a presentation of their child's problem.

that the parent expected other medications (eg, cough medicine). This measure is also described in detail elsewhere.<sup>13</sup> These items were scored on a 5-point Likert scale: 1 = strongly agree, 2 = somewhat agree, 3 = uncertain, 4 = somewhat disagree, and 5 = strongly disagree. Scores of 1 and 2 were coded as the physician perceiving the parent as expecting antibiotics, and scores of 3, 4, and 5 were coded as the physician perceiving the parent as not expecting antibiotics.

### **Analysis of the doctor–parent interaction**

Conversation analysis was used as a qualitative method for analyzing the audiotaped data.<sup>19</sup> Conversation analysis looks for patterns in the interaction that form evidence of systematic usage such that they can be identified as "practices." To be identified as a practice, a particular communication behavior must be recurrently used and attract responses that systematically

discriminate it from similar or related practices. For example, when a physician asks, "How are you feeling?" patients recurrently respond with information about an ongoing health condition (usually the problem they were treated for in a prior visit) even if there were new problems to report to the physician.<sup>20</sup>

By relying on conversation analysis as a methodology, for these data 6 primary communication practices were found to be related to antibiotics.<sup>15</sup> Analyses of 3 of these practices have been published elsewhere.<sup>17,18</sup> For the purposes of this study, 4 communication practices that seemed most robust given the relatively small sample size were identified and operationalized in a coding scheme to test the relations between these behaviors and survey-based variables. All encounters were coded by 1 coder (T.S.), and a 15% sample was recoded by the same coder for intrarater reliability. All  $\kappa$  values exceeded .8 reliability, indicating substantial agreement above chance.<sup>21</sup> The communication behaviors that were coded are outlined in **Table 1**.

### Analytic methods

The survey data were merged with the coded audiotape data to examine the relations between (1) parents' reports of their expectations for antibiotics, (2) parents' communication practices, and (3) physicians' perceptions of parents' expectations for antibiotics. We tested bivariate relationships between the main outcome variables and several hypothesized predictors by using the  $\chi^2$  test of independence and Fisher's exact test. Variables significant at the  $P=.05$  level were included in a multivariate logistic regression predicting physicians' perceptions of parents' expectations for antibiotics. Whether the diagnosis was bacterial or viral was controlled for in the model. A similar multivariate logistic regression examining the relations between parental expectations and their communication behaviors was developed. Both included separate intercepts for each physician. All tests

## Physicians are more likely to provide a prescription if they believe the patient expected one

were 2-sided and conducted at the .05 level of significance. Results were then corrected for clustering with the Huber correction.<sup>22,23</sup> Results of the logistic regression models are reported as odds ratios (ORs) with 95% confidence intervals (CIs).

### RESULTS

As previously reported, 8 of the 10 full-time physicians in 2 practices agreed to participate, and 306 of the 356 eligible parents agreed to participate (response rate, 86%). Eleven visits were excluded because of incomplete data. Thus, there were 295 complete encounters. Data were collected between October 1996 and March 1997. Parents in the sample were highly educated (mean years of education, 16), older (mean age, 38 years), and had high incomes (75% had household annual incomes greater than \$50,000). Nonwhites comprised one third of the sample, and 60% were enrolled in managed care plans.<sup>13</sup> Parents reported having an expectation for antibiotics in 49% ( $n=144$ ) of cases. In contrast, physicians reported perceiving parents to expect antibiotics in 34% ( $n=100$ ) of cases.

Qualitative analysis of the audiotaped data identified 4 primary communication behaviors associated with prescribing of antibiotics (see **Table 1**). When a parent presented the child's problem by offering a possible or "candidate" diagnosis (45% of cases), physicians responded as though the parent was seeking antibiotics as contrasted with a "symptoms only" presentation (51% of cases). The results of the qualitative analysis have been described in detail elsewhere.<sup>17</sup> Candidate diagnoses (eg, ear infection, sinus infection, pneumonia, or strep throat) imply bacterial infections. In response physicians behave as though parents are seeking antibiotics. For example, they routinely confirm or deny the need for antibiotic

TABLE 2

**Multivariate logistic regression model predicting physicians' perceptions that parents expected antibiotics and parents' reports of their expectations\***

| Independent variables   | Prediction that physician perceived that parent expected antibiotics<br>OR (95% CI) | Prediction that parent reported expectations for antibiotics<br>OR (95% CI) |
|---|---|---|
| Parent suggests "candidate" diagnosis                           | 5.23 <sup>†</sup> (3.74–7.31)   | 1.48 (0.94–2.32)  |
| Parent resists viral diagnosis                                  | 2.73 <sup>‡</sup> (1.97–3.79)   | 0.69 (0.46–1.02)  |
| Parent resists bacterial diagnosis                              | 0.36 (0.10–1.27)  | 0.96 (0.33–2.80)  |
| Parent resists treatment recommendation for viral diagnosis     | 3.18 (0.15–68.82)   | 1.14 (0.96–1.36)  |
| Parent resists treatment recommendation for bacterial diagnosis | 0.87 (0.06–12.44)   | 2.54 (0.50–12.90)   |

\* Controlling for listed behaviors, bacterial diagnosis, and allowing independent physician intercepts. Data are presented as odds ratio (95% CI).  
<sup>†</sup>  $P < .05$ .  
<sup>‡</sup>  $P < .0001$ .  
 OR, odds ratio; CI, confidence interval

treatment. Other qualitative research has associated these behaviors with inappropriate prescribing of antibiotics.<sup>24</sup>

When a physician announces a diagnosis (whether framed positively as a viral condition or negatively as not a bacterial condition), parents sometimes "resist" that diagnosis. This resistance typically involves questioning the physician's physical examination findings or questioning the actual diagnosis. As with candidate diagnoses, this behavior does not explicitly mention antibiotics, but physicians routinely respond to diagnosis resistance as having communicated that the parent is seeking antibiotics by confirming or denying a need for them. This behavior was found in 17% (n=50) of cases.

In response to physicians' nonantibiotic treatment recommendations, parents may "resist" the recommended treatment. As with the other behaviors, this resistance usually does not involve an explicit request for antibiotics, but physicians nonetheless typically respond to treatment resistance as if parents are searching for antibiotics. This behavior was found in 12% of (n=35) cases.

After the qualitative analysis of these behaviors, each audiotaped encounter was coded for their presence so that these communication variables could be merged with survey data variables for quantitative analysis. Bivariate associations between each identified communication behavior and the 2 survey variables (parents' reports of

their expectations for antibiotics and physicians' perceptions that parents expected antibiotics) were tested. The relation between candidate diagnoses and parents' reports of their expectations trended toward, but did not reach, significance ( $n=295$ ,  $\chi^2_1=3.141$ ,  $P=.08$ ), and parents who reported an expectation for antibiotics were no more likely to resist a physician's treatment recommendation (eg, for an over-the-counter or nonantibiotic remedy) than parents who did not expect antibiotics ( $n=295$ ,  $\chi^2_1=0.29$ ,  $P=.59$ ). The strongest trend shown in these data was that, when parents expected antibiotics, they were more likely to resist a viral diagnosis ( $n=259$ ,  $\chi^2_1=3.71$ ,  $P=.59$ ,  $P=.05$ ).

Although none of the identified parental communication behaviors were significantly associated with parents' reports of their expectations for antibiotics, there were significant associations between 2 of the 4 communication behaviors and physicians' perceptions that parents expected antibiotics: when parents offered candidate diagnoses, physicians were significantly more likely to perceive the parents as expecting antibiotics. If a parent offered a candidate diagnosis in the problem presentation, the physician was 62% more likely to think the parent expected antibiotics (an increase from 29% to 47%;  $P=.04$ ).

"Symptoms only" problem presentations were more frequent than "candidate diagnosis" presentations. However, among the candidate diagnosis presentations ( $n=132$ ), 82% were for conditions that could be treated appropriately with antibiotics.

In cases in which a viral diagnosis was assigned, a physician was more likely to perceive a parent to expect an antibiotic if the parent resisted the diagnosis. When parents offered resistance to the diagnosis, physicians perceived them to expect antibiotics 20% of the time vs 7% of the time when they did not offer resistance (Fisher exact test,  $P=.047$ ).

Parent resistance to nonantibiotic treatment

## Parents may not be intending to communicate pressure (or even an expectation) for antibiotics

recommendations was not associated with physicians' perceptions of parents' expectations for antibiotics (Fisher exact test,  $P=.122$ ).

Each communication behavior was included in a multivariate logistic regression model predicting physicians' perceptions that parents expected antibiotics. For parallelism, all were also included in a model predicting parents' reports of their expectations for antibiotics. The type of diagnosis (ie, bacterial or viral) was also controlled for.

In the model predicting parents' expectations, none of the communication behaviors reached significance as predictors. The results are shown in **Table 2**. After controlling for diagnosis and other communication behaviors, the odds that a physician would perceive a parent as expecting antibiotics were more than 5 times higher if the parent used a candidate diagnosis problem presentation. Similarly, the odds that a physician would perceive a parent as expecting antibiotics were nearly 3 times higher if the parent resisted a viral diagnosis.

The CIs for the associations of these 2 measures with physicians' perceptions of expectations did not overlap with the corresponding CIs for parent-reported expectations, suggesting significantly stronger associations with physicians' perceptions than with parents' expectations. Neither treatment resistance nor resistance to a bacterial diagnosis reached significance as a predictor of physicians' perceptions that parents expected antibiotics within the multivariate model.

## DISCUSSION

Prior research has suggested that parents commonly pressure physicians for antibiotics by overtly requesting antibiotics.<sup>6,7,25,26</sup> In this study this overt parent behavior was quite rare (for fur-

## Parents in search of reassurance may not be appeased by medication

ther discussion of these cases, see work by Mangione-Smith et al<sup>16</sup> and Stivers<sup>18</sup>). This study suggests that physicians form their perceptions of parents' expectations for antibiotics from far less direct communication behaviors such as parents' candidate diagnoses or diagnosis resistance. Given the association between a physician's perception of a patient's or parent's expectation for antibiotics with increased rates of inappropriate antibiotic prescribing,<sup>1-3,13</sup> it appears that when a parent exhibits one of these behaviors, physicians may feel pressure to prescribe. Qualitative analyses of these data support this analysis.<sup>17,24</sup> Physicians appear to treat parents who use these communication practices as indicating an expectation and a desire for antibiotic treatment. However, parents may not always be intending to communicate pressure or even an expectation for antibiotics. This study found no association between the communication behaviors described and parents' reports of their expectations for antibiotics.

This finding suggests 2 possible interpretations. Parents may not be accurate reporters of their expectations; they may be unwilling to admit to an expectation for antibiotics before the visit. Possibly, parents may accurately report their expectations before their medical encounters, but physicians misunderstand their behaviors as indicating such an expectation. Some parents may offer a candidate diagnosis because they feel that antibiotics are necessary; others may offer a candidate diagnosis to show competent parenting, or as a reflection of their concern that their child has a more serious illness, or of their concern that their visit may have been premature or unjustified. In the latter cases parents may be seeking reassurance from the physician, and they may not realize that they may be understood by physicians as pressuring for antibiotics.

However, as this study suggests, physicians do not differentiate between these alternative motivations and may tend to understand these behaviors as pressure to prescribe. The problem of mismatched parental expectations and physicians' perceptions of those expectations is further exacerbated because it is rare for parents to explicitly state their desire for, or opposition to, antibiotic treatment.

### Limitations

Because the data for this study were from 2 practices in the same geographic area and with a relatively homogeneous group of parents and physicians, we do not know whether the findings will generalize to other settings involving participants from more diverse backgrounds. In addition, we may have failed to detect associations that could exist between treatment resistance or diagnosis resistance and physicians' perceptions of parents' expectations or parent-reported expectations due to the relatively small sample size, the rarity of some of the behaviors, and the association of parental communication behaviors with one another. For these behaviors, we had 80% power to detect only true multivariate odds ratios that were relatively large.<sup>1,11-14</sup> Further research on these behaviors with larger sample sizes is indicated.

We may have introduced measurement error through reliance on parent and physician self-reports of 2 of the variables we studied. In relying on a single-item measurement of parents' expectations for antibiotics, there may be some unreliability in the assessment of parents' expectations.

### CONCLUSIONS

Two parental communication behaviors in particular resulted in physicians feeling pressured to prescribe antibiotics: the use of candidate diagnoses and resistance to viral diagnoses

were more strongly associated with physicians' perceptions of parents' expectations than with parents' reports of their expectations. This finding indicates an incongruity between physicians' perceptions of parents' expectations and parents' reports of their expectations. Future research needs to determine when physicians are accurate in perceiving antibiotic pressure, and when they should perceive other parental concerns for which reassurance would be the most desirable responsive action. Although antibiotics clearly are relevant in these pediatric encounters, physicians may be overly sensitive and thus too quick to understand certain communication behaviors as in search of antibiotics. Not only do such perceptions lead to inappropriate prescribing, but they also potentially contribute to dissatisfaction because parents who are in search of reassurance are not necessarily appeased by medication.<sup>3,13,16,25</sup>

Further, parents who were in search of reassurance but who receive neither medication nor reassurance may be still less satisfied. This study has provided an initial step toward linking communication behaviors with survey reports of parents' expectations and physicians' perceptions. Future research is needed to translate these findings into communication-based interventions to decrease inappropriate prescribing. Physicians who recognize parental communication behaviors as communicating pressure for antibiotic treatment may be able to directly communicate with parents about their expectations and thus more directly assess and address parents' expectations or desires. Future interventions should consider alternative communication practices physicians can use as resources for addressing perceived parental pressure.<sup>16</sup>

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