Poison Prevention Counseling

A Comparison Between Family Practitioners and Pediatricians

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Objectives: To compare the current opinions and practices of family practitioners with those of pediatricians regarding poison prevention anticipatory guidance (PPAG) and to further assess which factors, if any, are associated with providing counseling on this topic.

Design: Cross-sectional mail survey.

Participants: Family practitioners and pediatricians throughout the United States and Puerto Rico, randomly selected from the membership list of the American Medical Association.

Main Outcome Measure: Reported frequency of providing parents with PPAG.

Results: Of the 1000 physicians surveyed, 975 were eligible and 500 returned surveys that could be analyzed (227 family practitioners and 273 pediatricians), for a response rate of 51.3%. The majority of physicians in each field (family practice, 81.9%; pediatrics, 87.2%) reported that they believe it is their responsibility to provide PPAG to parents (P = .08). Family practitioners, however, were less likely than pediatricians to provide parents with PPAG (66.5% vs 91.9%; P < .001). When adjusted for other variables, such as age and sex, family practitioners were 5.4 times less likely than pediatricians to provide parents with PPAG (odds ratio, 0.19; 95% confidence interval, 0.09-0.37). Family practitioners, more often than pediatricians, cited lack of training on poisoning prevention as a reason for not providing parents with PPAG (46.1% vs 18.2%; P = .02). Among all physicians, those who received postresidency training on PPAG were more likely to provide PPAG than those who had not received postresidency training on this topic (odds ratio, 3.21; 95% confidence interval, 1.44-7.18). Having received residency training on poisoning prevention, however, did not increase the likelihood of providing PPAG (odds ratio, 1.69; 95% confidence interval, 0.86-3.30).

Conclusions: Although it is currently recommended to include PPAG as part of the routine preventive pediatric care, this study shows that one third of family practitioners do not provide parents with PPAG. Family practitioners should increase their efforts aimed at poisoning prevention. Those involved with training residents in family practice and pediatrics should place greater emphasis on this topic to increase the impact of this training on actual PPAG practices.


Editor’s Note: I suppose we shouldn’t be surprised by the findings in this study. You’re more likely to do something if it is emphasized in your education or training and especially if it’s part of your most focused time of specialty.

Catherine D. DeAngelis, MD

Unintentional childhood poisoning remains a significant cause of pediatric morbidity. In 1997, more than 1.3 million unintentional childhood poisonings were reported in the United States.¹ According to the American Association of Poison Control Center’s classification system, nearly 10,000 cases resulted in moderate to major medical effects such as altered mental status, seizures, and cardiopulmonary arrest.¹ Other investigators have reported that 5% to 7% of all pediatric emergency department visits are for treatment of a toxic exposure,² and that unintentional childhood poisonings account for 1% of all pediatric hospitalizations.³ A recently published cost-analysis study revealed that medical expenses for poisoning treatment totaled $3 billion in 1992 alone.⁴

Experts, both in childhood injury prevention and pediatrics, believe that anticipatory guidance is an important component in the effort to prevent unintentional childhood poisoning.⁵ ¹¹ In 1990, the US
PARTICIPANTS AND METHODS

This study was approved by the institutional review board of the Saint Louis University Health Sciences Center, St Louis, Mo. A 31-item questionnaire was developed to assess physicians’ previous poison prevention training, their opinions on this subject, and their routine PPAG practices. Data were collected on the types of written poison prevention materials that they provide and reasons for not providing PPAG. Information was collected on physician demographics and current practice type. To assess physicians’ knowledge of poisoning prevention, 10 true-or-false and multiple-choice questions on this subject were also included in the survey (Table 1). Knowledge questions were chosen based on their pertinence to this topic and were approved by the medical director of a regional poison center (A.J.S.). The questionnaire was piloted among 75 physicians in the St Louis area.

A random sample of 500 family practitioners and 500 pediatricians throughout the United States and Puerto Rico was generated from the membership list of the American Medical Association. Resident fellows and postresidency training fellows were excluded from eligibility because they were less likely to have an established clinical practice.

The survey was conducted between August and December 1997. An initial packet, consisting of a cover letter, self-administered questionnaire, and postage-paid return envelope was sent to all 1000 physicians. One month after the initial mailing, a second packet was sent to all nonrespondents. Two months after the initial mailing, a third packet including a handwritten note was sent to all nonrespondents. Two weeks after each mailing, a reminder postcard was sent. Telephone interviews were conducted on a random sample of nonrespondents (30 family practitioners and 30 pediatricians) to determine if they differed demographically from respondents.

All survey responses were handled confidentially. Partially completed surveys were included for data analysis if the respondent identified his or her field of medicine and completed the section on counseling opinions and practices. Data analysis was performed using SPSS version 7.5 software (SPSS Inc, Chicago, Ill). Pearson χ² and Fisher exact tests were performed where indicated for comparisons of categorical variables. Two-tailed independent t tests were used for comparisons of continuous variables.

To test the independent effects of factors potentially associated with PPAG, multivariate logistic regression was conducted. The dependent variable was providing either verbal or written PPAG to parents. In the first model, all physicians were included as the referent group and field of medicine was entered as a covariate into the regression model. To further explore potential associations within each group, in the second model, respondents were separated by field of medicine. Variables entered into each model included age, sex, medical school location, subspecialization, practice location, patient visits per week, feeling a responsibility to provide PPAG, and residency training and postresidency training on poisoning prevention. To reduce the problem of collinearity, type of practice, practice site, and years in practice were excluded from the models. The performance of each logistic model was evaluated using the Hosmer-Lemeshow goodness-of-fit test. Adjusted odds ratios (ORs) with 95% confidence intervals (CIs) are reported. An α of .05 was considered significant for all analyses.

RESULTS

Of the 1000 surveys distributed, 17 were returned with no forwarding address or by retired physicians (8 family practitioners and 9 pediatricians). Eight family practitioners indicated on their surveys that they did not see pediatric patients and were therefore excluded from the study. Of the remaining 973 eligible participants, 506 returned surveys. Six surveys were excluded because respondents failed to answer questions in the counseling practices section of the survey (3 family practitioners and 3 pediatricians). A total of 500 surveys were thus included in the data analysis (227 family practitioners and 273 pediatricians) for an overall response rate of 51.3%. Responses were received from 45 states and Puerto Rico.

Respondent demographics and previous poison prevention training are summarized in Table 2. Family practitioners and pediatricians were similar in age, years in practice, and number of patient visits per week. Family practitioners were more likely to be men, graduates of US or Canadian medical schools, office-based, in primary care, and practicing in suburban or rural locations. Family practitioners were less likely than pedian-
Table 1. Poisoning Epidemiology Knowledge Questions*

<table>
<thead>
<tr>
<th>Question</th>
<th>True</th>
<th>False</th>
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<tbody>
<tr>
<td>1. Accidental childhood poisonings occur more often in males than females.</td>
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<tr>
<td>2. Adults older than 45 years are more likely than younger adults to have the telephone number of a poison control center in their home.</td>
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<td>3. More than 50% of elderly patients in the United States choose non–child-resistant containers for medications.</td>
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<td>4. The peak time of day for accidental childhood poisonings is between 9 AM and 5 PM.</td>
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<td>5. The number of accidental childhood poisonings has decreased over the past 10 years.</td>
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<tr>
<td>6. The most frequent cause of accidental childhood poisoning ingestion fatalities is seen with (choose one): anticonvulsants, vitamins with iron, antihypertensives, oral hypoglycemics, analgesics.</td>
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<td></td>
</tr>
<tr>
<td>7. Age (in years) when accidental childhood poisonings most often occur?</td>
<td></td>
<td></td>
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<tr>
<td>8. Percentage of accidental childhood poisonings that occur with a grandparent’s medication?</td>
<td></td>
<td></td>
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<tr>
<td>9. Percentage of accidental childhood poisonings that occur outside the child’s primary residence?</td>
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<tr>
<td>10. Percentage of all homes that keep syrup of ipecac?</td>
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*References to correct answers are available upon request from the authors.

Table 2. Demographic Characteristics and Past Poison Prevention Training Among Family Practitioners and Pediatricians*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Family Practitioners (n = 227)</th>
<th>Pediatricians (n = 273)</th>
<th>P</th>
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<tbody>
<tr>
<td>Sex</td>
<td>Male (170 (75.6))</td>
<td>Female (55 (24.4))</td>
<td>&lt;.001†</td>
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<tr>
<td>Medical school</td>
<td>US or Canadian (183 (88.8))</td>
<td>Other (23 (11.2))</td>
<td>&lt;.001†</td>
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<tr>
<td>Subspecialization</td>
<td>Yes (27 (12.1))</td>
<td>No (196 (87.9))</td>
<td>.02†</td>
</tr>
<tr>
<td>Type of practice</td>
<td>Private (198 (91.2))</td>
<td>Academic (19 (8.8))</td>
<td>.004†</td>
</tr>
<tr>
<td>Practice site</td>
<td>Office (204 (92.7))</td>
<td>Hospital (16 (7.3))</td>
<td>&lt;.001†</td>
</tr>
<tr>
<td>Location</td>
<td>Urban (62 (30.2))</td>
<td>Suburban/rural (143 (69.8))</td>
<td>&lt;.001†</td>
</tr>
<tr>
<td>Poison prevention training</td>
<td>Yes (70 (31.1))</td>
<td>No (155 (68.9))</td>
<td>.008†</td>
</tr>
<tr>
<td>During residency</td>
<td>Yes (54 (24.4))</td>
<td>No (167 (75.6))</td>
<td>&lt;.001†</td>
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*Data are given as number (percentage) of respondents. Due to some missing data, percentage values equals valid percent.
†Indicates significance for level specified.

Overall, family practitioners and pediatricians did not differ with respect to their beliefs regarding the importance of providing PPAG. The majority responded that they believe it is their responsibility to provide PPAG to parents (family practitioners 81.9% vs pediatricians 87.2%; P = .08) and that physicians in their respective fields should be more involved in educational and legislative efforts to prevent unintentional childhood poisonings (family practitioners 88.3% vs pediatricians 87.8%; P = .97). The majority responded that they were willing to increase the amount of PPAG that they provide to parents (family practitioners 92.1% vs pediatricians 93.7%; P = .39). Among pediatricians, subspecialists were less likely than generalists to report feeling a responsibility to provide PPAG (75.0% vs 90.8% respectively; P = .002). Among family practitioners, subspecialists and generalists did not differ in their response to this question (81.5% vs 82.4%, respectively; P = .91).

The routine PPAG practices of respondents from both fields are shown in the Figure. Family practitioners were less likely than pediatricians to discuss poisoning prevention with parents, either alone or in combination with providing written poison prevention material (P<.001). Table 3 shows different types of written prevention material and the frequencies with which they were provided. Family practitioners were less likely than pediatricians to provide each type of written material to parents (P=0.001). Among physicians who provided written material, a similar number in each field reported that they obtained prevention material from a poison control center (family practitioners 61.2% vs pediatricians 54.8%; P = .27).

When adjusted for all other variables, family practitioners were 5.4 times less likely than pediatricians to provide PPAG to parents (OR, 0.19; 95% CI, 0.09-0.37). Within the field of pediatrics, subspecialists were less likely than those in primary care to provide PPAG (OR, 0.03; 95% CI, 0.01-0.16). This difference was not seen among family practitioners. In both groups, physicians who reported feeling a sense of responsibility to provide PPAG were more likely to do so (OR, 3.37; 95% CI, 1.62-6.99). Among all physicians surveyed, those who reported receiving postresidency training on poisoning prevention were more than 3 times more likely to provide PPAG than those who had not received postresidency training on this subject (OR, 3.21; 95% CI, 1.44-7.18). In the multivariate analyses, age, sex, medical school location, practice location, visits per week, and residency training on poisoning prevention were not associated with providing PPAG.
Table 4 summarizes the reasons given for not providing PPAG. Family practitioners were more likely than pediatricians to cite lack of training as a reason for not providing anticipatory guidance on this subject (46.1% vs 18.2%; P = .02). Overall, family practitioners scored slightly lower than pediatricians on the poisoning epidemiology questions (family practitioners mean score = 5.35, pediatricians mean score = 5.68; P = .03).

Both the American Academy of Pediatrics and American Academy of Family Physicians encourage physicians to include PPAG as part of the routine preventive care given to pediatric patients. This counseling should begin at or before the child’s 6-month well-child visit and continue throughout the preschool years. Ideally, to maximize understanding and retention, physicians should provide parents with both verbal and written information on poisoning prevention. Parents should be reminded to keep medicines and other dangerous substances locked up and in child-resistant containers, to have the local poison center telephone number posted in a prominent place near the telephone, and to keep a 30-mL bottle of syrup of ipecac at home.

Our results show that one third of family practitioners do not routinely provide this PPAG to the parents of their pediatric patients, a number significantly higher than that seen among pediatricians. This difference appears to be related, in part, to the amount of training received by family practitioners on this subject. In our study, family practitioners were less likely than pediatricians to have received training on poisoning prevention. Nearly one half of family practitioners who did not provide PPAG cited lack of training on this topic as a reason.

Previous studies have compared family practitioners and pediatricians on a number of other preventive care topics. In a 1994 national survey, Szilagyi et al concluded that most of the attitudes and practices regarding immunizations were similar among family practitioners and pediatricians. Other investigators, though, have demonstrated higher compliance rates among pediatricians on topics such as firearm injury prevention and tuberculosis screening. Similar to our findings, in these studies, differences in training and physician knowledge were implicated as reasons for lower compliance rates among family practitioners.

In our study, physicians from both fields who had received postresidency training on poisoning prevention were more likely to provide PPAG. Whenever possible, poisoning prevention topics should be included in continuing medical education courses as this appears to have a positive impact on physician practices. In neither field was an association found between residency training and providing PPAG. This finding supports the concern of those who believe that preventive health care is relatively underemphasized in residency training curricula. A 1992 survey of family practice residency program directors throughout the United States revealed that the mean time devoted to structured outpatient pediatric training was only 1.6 months and that 9% of programs surveyed required no formal pediatric outpatient training. Although poisoning prevention is considered a standard topic in pediatric residency training, the true emphasis placed on this and other injury prevention topics has been questioned. In a recent study, Gielen et al examined injury prevention counseling practices of pediatric residents during well-child continuity clinic visits. They found that in 53% of visits, residents did not discuss PPAG or any other type of injury prevention with parents. We conclude from our data that family practice and pediatric residency pro-
programs should place greater emphasis on the topic of poisoning prevention to increase the impact of this training on actual physician practices.

It is noteworthy that among pediatricians, subspecialists were significantly less likely than generalists to provide poison prevention counseling to parents. Although we intuitively believed that PPAG practices would differ between these groups, the difference found in our study was even more dramatic than expected. This is particularly concerning, given the potential toxicity of many of the medications routinely prescribed by subspecialists (ie, anticonvulsants, tricyclic antidepressants, cardioactive drugs, etc). In our study, pediatric subspecialists were less likely than generalists to feel responsible for providing PPAG to parents. It is likely that many subspecialists believe that this is a job to be left up to the generalists. We note, however, that the American Academy of Pediatrics recommendations for providing PPAG are not overly burdensome and could feasibly be included with information on medication side effects that is already provided by subspecialty physicians when prescribing medications.

Important limitations of our study warrant discussion. The primary limitation is the use of a self-reported survey. Although this design is easier to conduct with a large group of physicians, the validity of self-reported practices, in general, may be questioned. Without actually observing physicians counseling parents, it is difficult to determine if counseling occurred as reported. In addition, the potential for recall bias exists, particularly when asking physicians to recall training that they may have received years or even decades prior to this study. We suspect, however, that these biases would be equally present in both groups and would, therefore, not change the direction of the results found in our study. The magnitude of difference seen between the two fields of medicine with respect to PPAG practices, to some extent, mitigates the relatively low response rate to our survey. Nonresponse bias, however, is a persistent threat to any survey study. In the present report, a random sample of nonrespondents from each field of medicine revealed that nonrespondents were more likely to be in busier practices, averaging more than 200 patient visits per week. Because of time constraints, physicians in these busier practices may devote less time to providing PPAG. If this is true, our study may have overreported PPAG practices in both fields of medicine. On the other hand, it may be that physicians in busier practices are simply less inclined to participate in survey studies. It is impossible to know with certainty how nonresponse bias might influence the conclusions drawn in our study.

An additional limitation of the present study was the use of nonvalidated poisoning epidemiology knowledge questions. These questions were included in the survey as a means for objectively comparing the knowledge of both groups of physicians on this topic. It is unclear how knowledge or lack of knowledge on these specific questions actually translates into specific attitudes and practices regarding PPAG. Moreover, the difference in scores between family practitioners and pediatricians on these questions, although statistically significant, was small. This relatively small difference does not fully explain the much larger difference seen between these groups of physicians with regard to reported PPAG practices.

Several explanations for this shortcoming are hypothesized. First, by being limited to a relatively small number of nonvalidated questions, our study may have failed to recognize an even greater difference in poisoning knowledge between the two groups of physicians. Alternatively, our study, which was more heavily weighted to assess physician knowledge, may have failed to identify significant attitudinal differences between the groups regarding the importance of providing PPAG. For example, we did not ask physicians to rank the importance of PPAG to their other patient-related responsibilities. Had we asked more detailed attitudinal questions, we may have found that family practitioners place relatively less importance on this topic than do pediatricians. Additional studies are needed to resolve this issue and to identify which poisoning epidemiology knowledge points are of greatest importance for physicians to possess.

In summary, despite its limitations, we believe that several important conclusions can be drawn from our work. This study shows that, currently, a significant number of physicians do not provide PPAG to the parents of their pediatric patients. This is particularly true among family practitioners, who more often reported a lack of training on this topic as the reason for not providing PPAG. Whenever possible, medical educators of family practitioners and pediatricians, alike, should include poisoning prevention topics at continuing medical education conferences as this appears to have a positive effect on PPAG practices. Finally, future efforts should be directed at residency training in both fields of medicine with the hope of increasing the impact of this training on actual PPAG practices.

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REFERENCES