Predicting Clinician Injury Prevention Counseling for Young Children

Shari Barkin, MD, MSHS; Arlene Fink, PhD; Lillian Gelberg, MD, MSPH

Background: Injury is the primary cause of morbidity and mortality in children and an important topic for counseling.

Objective: To describe and explain clinicians’ reported counseling behavior during the well-child examinations for children aged 5 years and younger on the following 4 injury prevention topics: motor vehicle crashes, toxic ingestion, drowning, and firearm injuries.

Methods: A random sample of 465 pediatricians, family physicians, and pediatric nurse practitioners in an urban setting received mailed questionnaires; 325 (69.9%) responded. Multivariate logistic regression predicting counseling on each injury prevention topic was performed.

Results: Most reported discussing motor vehicle occupant protection (66.2%) and toxic ingestion prevention (62.1%) during the well-child examination. Only 31.8% stated they counseled on drowning prevention and 15.7%, on firearm injury prevention. Knowledge of injury mortality and morbidity rates was not associated with counseling. For most topics, female respondents were more likely to counsel than male respondents (motor vehicle crash odds ratio [OR], 2.24 [P = .03]; toxic ingestion OR, 1.82 [P = .05]; drowning OR, 1.97 [P = .04]). Health maintenance organization settings predicted injury prevention counseling for most topics (motor vehicle crash OR, 2.52 [P = .04]; toxic ingestion OR, 2.77 [P = .01]; firearm injury OR, 2.97 [P = .001]). Clinicians placing lower importance on counseling were less likely to counsel on drowning and firearm injury (drowning OR, 0.73 [P = .006]; firearm injury OR, 0.58 [P < .001]).

Conclusions: Clinicians’ knowledge of local injury epidemiology did not influence their counseling on these topics. Clinicians and their patients might benefit by using programs such as The Injury Prevention Program to help them standardize their approach to injury prevention counseling during the routine well-child examination.

Arch Pediatr Adolesc Med. 1999;153:1226-1231

Editor’s Note: Once again we find that knowledge has little effect on behavior. Ignorance is bliss, and knowledge is what? Catherine D. DeAngelis, MD

In the United States, injuries are the primary cause of mortality for children, adolescents, and young adults (birth through 19 years of age). Los Angeles County, California, is no different. A total of 4353 children died of injuries in Los Angeles County from 1990 through 1994. Although intentional injuries, such as homicide and suicide, accounted for 58.3% of total injury-related deaths, unintentional injuries, such as motor vehicle crashes, drowning, and toxic ingestions, accounted for 41.7%. However, for children aged 5 years and younger, unintentional outnumbered intentional injuries by 3:1. In Los Angeles County, for this age group, the top 3 injury-related deaths were due to motor vehicle crashes, drowning, and firearms.

Mortality statistics often seriously underestimate the full impact of injuries on children. For most common childhood unintentional injuries, the ratio of mortality to morbidity ranges from 1:2 to 1:14. In a study evaluating childhood drowning and near drowning, Wintemute discovered that for every child who drowned, 14.6 children were admitted to the hospital or discharged from the emergency department with some type of morbidity. The trend of nonfatal injuries outnumbering fatal injuries exists for other common injuries such as motor vehicle crashes, toxic ingestions, and firearm-related injuries.

Primary care providers examine young children on numerous occasions in...
SUBJECTS AND METHODS

MEASURES

We used a 37-question survey with close-ended responses regarding the 4 injury prevention topics. Most of the survey items were generated through semistructured interviews with clinicians, clinical judgment, and 4 rounds of pilot testing. When piloted, the questionnaire took 10 to 12 minutes to complete.

For our independent variables, we gathered information pertaining to clinician specialty, age, and sex; whether clinicians had children of their own; years since training; and the proportion of time spent performing well-child examinations during a typical week. Also, the respondents reported their medical practice setting as solo private practice, single or multiple specialty, university setting, a group or staff health maintenance organization (HMO) setting, community clinic, and other. Respondents then specified other.

To test their knowledge of injury prevention statistics, respondents were asked to select the single event that was more likely to result in injury (mortality and morbidity) to children aged 5 years and younger in Los Angeles County from a series of injury dyads. The injury dyads included drowning vs motor vehicle crash, firearm-related injury vs motor vehicle crash, motor vehicle crash vs toxic ingestion, toxic ingestion vs firearm-related injury, drowning vs firearm-related injury, and toxic ingestion vs drowning.

We compared their answers with the actual ranking of rates from the Los Angeles Department of Health Services.

Mortality databases come from Los Angeles County death certificates, and the morbidity database is based on the Trauma and Emergency Medical Information Systems, which tracks injuries identified at trauma centers. Combined mortality and morbidity rates for the 4 injuries we studied for children aged 5 years and younger were 40.7/100 000 for motor vehicle crashes, 4/100 000 for drowning, 2.3/100 000 for firearm-related injuries, and 0.5/100 000 for toxic ingestions. These databases reflect the tip of the injury pyramid and do not include data from hospitals, the Emergency Medical System, emergency departments, or local physicians’ offices. Those data are not available; this makes determining accurate morbidity rates difficult.

Respondents were asked about their attitudes and behaviors regarding counseling on common pediatric injury prevention topics. To gauge the clinicians’ attitudes about the relative importance of these injury topics, they were asked, “If you only had 2 minutes to talk with the family of a 5-year-old patient, how would you rank order these topics?” The choices included the 4 injury types. Our dependent variable of clinician self-reported injury prevention counseling was measured on a 4-point scale from 1 (never counsel) to 4 (always counsel). This was assessed with the question, “During the well-child visit of a child aged 5 years or younger, how often do you discuss topics such as ...?” The same choices were given.

DATA COLLECTION

Surveys were mailed to 196 pediatricians and 208 family physicians, all of whom were randomly selected from the California Medical Association database. All identified Los Angeles County pediatric nurse practitioners belonging to the Los Angeles Chapter of Nurse Association of Pediatric Nurse Associates and Practitioners were contacted (N = 61). Three weeks after the first round of mailing, we conducted a follow-up mailing for nonrespondents.

STATISTICAL ANALYSIS

We examined clinician knowledge, attitudes, and self-reported prevention counseling behavior through univariate means and distributions. Bivariable analyses consisted of the χ² test with 2 df to test clinician characteristic differences among specialties. Multiple logistic regression analyses were performed to assess the predictors of clinician counseling “often” or “always” on our 4 prevention topics. Each model was run independently. The models each used the same predictor variables, including our independent variables listed as well as knowledge of the prevention topic and attitude regarding the importance of the topic. We computed odds ratios (ORs), with 95% confidence intervals and associated P values for each variable included in the model.

Because pediatric nurse practitioners differed from physicians across many clinician characteristics, we ran 2 models, one with all 3 clinician types and the other without pediatric nurse practitioners. The results were unaltered. Subsequently, we present the multivariate regressions using data from all clinician specialties.

the first 5 years of life, most regularly to administer well-child care such as immunizations and evaluation of the child’s growth and development. All of these visits are to ensure that children begin life with the maximum opportunity to attain good health. As part of these well-child examinations, the American Academy of Pediatrics Committee on Practice and Ambulatory Management and Bright Futures recommend that clinicians counsel on injury prevention.

Many previous studies have indicated that shrinking visit times affect a clinician’s ability to provide injury prevention counseling. As our health care system changes, clinicians have less time to spend with their patients. This means that clinicians must choose which injury prevention topics they will have time to address. A recent study tried to develop expert consensus regarding the relative priority that physicians place on injury prevention counseling. The authors of that study found lack of agreement among clinical experts on the relative importance of the major factors that determine their prioritization of counseling on injury prevention topics.

In our study, we evaluated primary care clinicians’ knowledge, attitudes, and behaviors regarding common childhood injuries to children aged 5 years and younger. We studied the 4 most common injuries causing mortality and morbidity in Los Angeles County in this age group, ie, motor vehicle crash, toxic ingestion, drowning, and firearm injury. We chose those common causes of injuries that have resulted in significant mortality and morbidity, excluding injuries due to falls because of limited available databases reporting on this injury. We defined a primary care provider as a pediatrician, family...
physician, or pediatric nurse practitioner, since these 3 clinician types provide medical care to most young children in Los Angeles County. Given the limited time clinicians have to counsel on injury prevention and the likelihood that only some topics will be addressed, we sought to examine how clinicians would rank order the 4 injury prevention topics in terms of importance of discussion during the routine well-child visits of children aged 5 years and younger.

To assess clinician counseling behavior on the 4 injury prevention topics, we assessed the proportion of clinicians who reported counseling their patients on any of the topics. In assessing the personal and professional characteristics that predicted injury prevention counseling behavior, we hypothesized that clinicians would counsel on those topics that they knew would pose the greatest risk for injury mortality and morbidity to their patients. We also hypothesized that specialty type would affect the degree of prevention counseling provided.

**RESULTS**

We mailed the questionnaire to 465 sampled clinicians and received a 69.9% response rate; 73.1% of pediatricians, 63.3% of family physicians, and 83.6% of pediatric nurse practitioners responded. Nonrespondents did not differ by sex or specialty.

Table 2 compares the percentage of respondents by specialty who answered the knowledge questions correctly. Although pediatricians, pediatric nurse practitioners, and family physicians knew that motor vehicle crashes were the primary cause of injury morbidity and mortality combined for children aged 5 years and younger, they were unclear about the relative prevalence of the 3 other injuries.

**KNOWLEDGE**

Table 2 compares the percentage of respondents by specialty who answered the knowledge questions correctly. Although pediatricians, pediatric nurse practitioners, and family physicians knew that motor vehicle crashes were the primary cause of injury morbidity and mortality combined for children aged 5 years and younger, they were unclear about the relative prevalence of the 3 other injuries.
For all but 1 knowledge question, the 3 types of primary care providers surveyed had the same lack of knowledge concerning toxic ingestions, drowning, and firearm injuries. The exception was the injury dyad concerning drowning vs firearm injuries. Pediatricians were more likely to be correct, followed by pediatric nurse practitioners, and then family physicians ($P = .007$). Although pediatricians were more likely to be correct, 50.4% of them did not know that drowning-related injuries were more common among children aged 5 years and younger in Los Angeles County than were firearm-related injuries.

### ATTITUDES

When clinicians were asked how they would rank order common injury prevention topics during a visit with a child aged 5 years or younger, more than half of respondents ranked a discussion of prevention of motor vehicle crashes first. About one fifth of respondents ranked a discussion of toxic ingestion and drowning prevention evenly as second and third in importance. Firearm safety counseling was ranked as least important by more than one third of respondents (Table 3).

### BEHAVIORS

As shown in Table 4, although two thirds of respondents reported that they often or always counseled on prevention of injury due to motor vehicle crashes, fewer than one third reported counseling about drowning prevention, and fewer than one fifth reported counseling about firearm injuries. Pediatric nurse practitioners were more likely to counsel on firearm injuries than physicians ($P = .05$). Fewer family physicians counseled often or always about drowning ($P = .05$) and toxic ingestions ($P = .01$) than did pediatricians and pediatric nurse practitioners.

Multivariate logistic regressions were performed to identify predictors of counseling often or always for the 4 injury prevention topics. Female sex significantly predicted counseling on prevention of injuries due to motor vehicle crashes (OR, 2.24; $P = .01$), toxic ingestions (OR, 1.82; $P = .05$), and drowning (OR, 1.97; $P = .04$). An HMO setting, compared with other practice settings, positively predicted prevention counseling for motor vehicle crashes (OR, 2.24; $P = .04$), toxic ingestions (OR, 2.77; $P = .01$), and firearms (OR, 2.97; $P = .001$).

### Table 3. Proportion of 302 Clinicians Who Rank Ordered the Importance of Discussing Injury Prevention Topics for Children Aged 5 Years and Younger

<table>
<thead>
<tr>
<th>Injury Topics</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor vehicle crash</td>
<td>60.1</td>
<td>23.2</td>
<td>12.0</td>
<td>4.7</td>
</tr>
<tr>
<td>Toxic ingestion</td>
<td>14.9</td>
<td>29.1</td>
<td>32.3</td>
<td>23.7</td>
</tr>
<tr>
<td>Drowning</td>
<td>8.3</td>
<td>26.1</td>
<td>29.9</td>
<td>35.7</td>
</tr>
<tr>
<td>Firearm injury</td>
<td>5.7</td>
<td>24.9</td>
<td>31.7</td>
<td>37.7</td>
</tr>
</tbody>
</table>

*For rating, 1 indicates most important; 4, least important.

### Table 4. Clinicians Who Reported Counseling Specific Injury Prevention Topics During Well-Child Counseling for Children Aged 5 Years and Younger

<table>
<thead>
<tr>
<th>Injury Prevention Topic</th>
<th>Pediatric Nurse Practitioner (n = 48)</th>
<th>Family Physician (n = 123)</th>
<th>Pediatrician (n = 135)</th>
<th>Total Sample (N = 306)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor vehicle crash</td>
<td>75.4</td>
<td>59.3</td>
<td>71.2</td>
<td>65.8</td>
</tr>
<tr>
<td>Firearm injury‡</td>
<td>29.0</td>
<td>13.1</td>
<td>14.9</td>
<td>15.9</td>
</tr>
<tr>
<td>Toxic ingestion‡</td>
<td>67.1</td>
<td>49.9</td>
<td>70.1</td>
<td>59.1</td>
</tr>
<tr>
<td>Drowning</td>
<td>31.1</td>
<td>25.2</td>
<td>36.8</td>
<td>31.6</td>
</tr>
</tbody>
</table>

*Data are presented as percentage of respondents.

†Test is significant at $P = .05$.

‡Test is significant at $P = .01$.

An attitude that drowning (OR, 0.73; $P = .006$) and firearm injury prevention counseling (OR, 0.58; $P = .001$) are less important than motor vehicle crash and toxic ingestion prevention counseling negatively predicted counseling. Nonsignificant predictors included clinician specialty, age, and sex; whether clinicians had children of their own; years since training; proportion of well-child examinations compared with all clinical visits in a typical week; and knowledge of injury statistics.

### KNOWLEDGE

It is surprising that Los Angeles County primary care providers did not know the relative prevalence of the injuries that affected their patient population. For example, clinicians did not know that, in Los Angeles County for children aged 5 years and younger, drowning led to a greater number of injuries than toxic ingestions and firearms. Across all clinician types studied, the same dearth of knowledge existed. The only exception to this was that pediatricians' knowledge of firearm injury to children aged 5 years and younger was significantly better than that of family physicians and pediatric nurse practitioners. In particular, nurse practitioners and family physicians thought that firearm injuries were more common. This perception could be due to the emphasis in the media on firearm injuries.

### ATTITUDES

When clinicians were asked to rank order the 4 injury topics in terms of relative importance for counseling, most were clear that they would discuss motor vehicle crash injury prevention first, but there was general dis-sent about which injury prevention topic was next in importance. A previous study suggested that pediatric experts prioritized injury prevention topics based on their perception of effective prevention strategies that existed. This could explain some of the respondents’ choices, but our study did not examine this question directly. Although most previous studies indicated that clinicians recognized the effectiveness of creating a pool...
The good news is that two thirds of clinicians counsel on motor vehicle crash prevention. However, few counsel on drowning and firearm injuries. Why not? It was disappointing to note that knowing does not affect counseling behavior for the injury prevention topics we addressed. However, previous studies indicate that knowledge is not always related to health behavior, and perhaps this pertains to counseling behavior as well.24,25 Therefore, although knowledge is a necessary prerequisite for providing education, it is not sufficient for motivating clinicians to counsel. Also, previous studies regarding disease prevention counseling support our finding that female clinicians were more likely to counsel on injury prevention.27-29

Our data also suggest that working in an HMO group or staff model setting actually encourages more prevention counseling than working in other practice settings. Perhaps this reflects an orientation toward prevention that other settings do not maintain, or perhaps HMOs provide their staff with forms that commonly include prompts to discuss specific issues.

Believing that it was less important to counsel on drowning and firearm injury prevention significantly decreased the likelihood that clinicians would do so. Drowning and firearm injury prevention might differ from motor vehicle crash and toxic ingestion prevention in that clinicians do not have the same proven ready resource of a recommendation that is enforced by law (ie, child restraint use) or a clear prescription to offer (ie, ipecac for toxic ingestions).

LIMITATIONS

Our study has several limitations. Our sample was limited to Los Angeles County and therefore may only apply to large, diverse, urban settings. In addition, as with all self-reported data, respondents’ answers can tend toward a socially desirable bias that may not reflect their true behaviors. However, given that only one third of respondents reported counseling on drowning prevention and that one fifth reported counseling on firearm injury prevention, if they answered in a socially desirable manner, the truth is likely to reveal even lower rates of counseling.

Also, we determined if clinicians’ knowledge of injury statistics was correct based on data from death certificates and trauma centers. Although this is the best information available, it does not reflect those injuries that are not recorded in any of these databases. Clinicians might have responded to the injury dyads based on their clinic-based experiences.

Clinicians’ determination of what injury topics to discuss during the well-child examinations of children aged 5 years or younger does not seem to be based on knowledge but instead is influenced by their attitudes. In our study, clinicians chose topics to discuss in an unpredictable manner. The American Academy of Pediatrics created The Injury Prevention Program to ensure that the most significant injury prevention issues are discussed consistently during the well-child examination. Rather than asking clinicians to know their local community epidemiology, perhaps we should ask them to use consistently materials that are already developed to standardize their approach to injury prevention education.

Accepted for publication April 21, 1999.

Supported by the University of California-Los Angeles Robert Wood Johnson Clinical Scholar program (Dr Barkin) and National Research Service Award 1 T32 HS00046-01 from the Agency for Health Care Policy and Research, Rockville, Md (Dr Barkin). Dr Gelberg is a Robert Wood Johnson Generalist Physician Faculty Scholar.

The views expressed herein are those of the authors and do not necessarily reflect those of the Robert Wood Johnson Foundation or the Agency for Health Care Policy and Research.

We acknowledge Tom Rice, PhD, for his help in reviewing the manuscript and Jeff Johnson, MPH, from the Los Angeles County Department of Health Services for his help in reviewing the mortality and morbidity databases.

Reprints: Shari Barkin, MD, MSHS, Department of Pediatrics, Wake Forest University Baptist Medical Center, Medical Center Boulevard, Winston-Salem, NC 27157-1081 (e-mail: sbarkin@wfubmc.edu).

REFERENCES


©1999 American Medical Association. All rights reserved.


