Objective: To develop and evaluate an injury prevention anticipatory guidance training program for pediatric residents.

Design: Thirty-one residents were randomly assigned to an intervention or control group. Both groups attended a 1-hour seminar about injury prevention and the American Academy of Pediatrics TIPP (The Injury Prevention Program) materials. The intervention group also received 5 hours of experiential instruction on injury prevention content and counseling skills (SAFE Counseling Framework). Families with infants from birth to age 6 months were enrolled in the study (N = 196); they were followed up until the child was aged 12 to 18 months. Data were collected by means of baseline and follow-up interviews, audiotapes of medical visits, parent exit surveys, and home observations.

Setting: A hospital-based continuity clinic that serves families living in low-income, inner-city neighborhoods.

Outcomes: Physician counseling and parent satisfaction, knowledge, beliefs, and behaviors.

Results: Parents seen by physicians in the intervention group received significantly more injury prevention counseling for 5 of the 6 safety practices, and they were significantly more satisfied with the help their physicians provided on safety topics. They were no less satisfied with their physicians’ counseling on other anticipatory guidance topics. Parents’ knowledge, beliefs, and home safety behaviors did not differ between the 2 groups.

Conclusions: The frequency and impact of pediatric counseling can be enhanced by experiential training that targets specific injury hazards. Because low-income families face many barriers to carrying out the recommended safety practices, supplemental strategies are needed to ensure safer homes.

J Injuries are the leading health threat to children in the United States.1 Approximately one quarter of all children experience a medically attended injury each year.2,3 Every year there are more than 4 million injuries in the preschool-aged population, and fatal injuries claim more of these young lives than do childhood diseases.4,6 In addition to the human suffering, such injuries are expensive to society and to families. Miller7 estimated the annual lifetime cost of all injuries to children aged 14 years and younger in 1991 to be $180 billion. In 1997, a single pediatric hospitalization for a preschool-aged child was estimated to cost $2600 for poisonings, $2900 for falls, $12000 for scalds, and $22000 for burns (D. Bishai, MD, MPH, PhD, M.E.H.W., and A.C.G., unpublished data, 1999).

Many injuries can be prevented by modifying children’s environments and teaching parents safety practices. Pediatricians are in a unique position to encourage and support such injury prevention efforts. Not only do pediatricians have continuing access to parents, but parents rate them as an important source of information on injury prevention.8 Injury prevention counseling is included in the anticipatory guidance standards of care of the American Academy of Pediatrics (AAP),9 in the US Preventive Services Task Force Guide to Clinical Preventive Services,10 and in the national health objectives.11 A recent Delphi technique survey12 of 23 pediatric injury prevention experts also provided support for the importance of counseling and indicated consensus on high-priority safety topics.

Bass and colleagues13 reviewed the literature on the effectiveness of pediatric injury prevention counseling programs. Between 1964 and 1991, only 20 published studies were found to be of sufficient...
PARTICIPANTS AND METHODS

DESIGN

This study was undertaken in a pediatric continuity clinic in a large urban teaching hospital. Forty-four first- and second-year pediatric residents were invited to participate via a letter from the clinic director (J.R.S.) and the director of general pediatrics (M.E.H.W.), and written consent was obtained from the 31 residents (70%) who agreed to participate. A table of random numbers was used to assign 18 participating residents (58%) to the intervention group (IG) and 13 (42%) to the control group (CG). Both groups were invited to attend a standard 1-hour seminar on the problem of injuries and an overview of the AAP TIPP that was offered annually by the director of general pediatrics. Each resident received a complete AAP TIPP packet to keep. Because the residents’ schedules did not permit them all to attend the seminar, the TIPP packets were distributed by mail to those who could not attend (8 residents in the IG and 9 in the CG). Copies of TIPP safety sheets were also available in the clinic throughout the study. The IG residents also received training in EAG, as described in the “EAG Intervention” subsection. The family’s study group status (IG or CG) was determined based on their pediatrician’s study group assignment. Families are routinely assigned to a pediatric resident on a random basis, and that resident remains their primary care provider as long as the family attends the clinic or until the resident graduates. Families with children from birth to age 6 months were enrolled in the study during a clinic visit by the study interviewer, who was in the clinic on a daily basis. Written informed consent was obtained in accordance with the hospital’s institutional review board, which approved the study.

DATA COLLECTION

Families completed a baseline interview at study enrollment and were then followed up until their child was aged 12 to 18 months. Each clinic visit was audiotaped, and parents completed a brief exit survey that included questions about satisfaction with the visit. All visits were included because it was not uncommon for parents to miss a well-child visit and then appear for an acute care visit shortly thereafter, in which case some well-child care (eg, anticipatory guidance) might have been included. At the 12-month well-child visit, parents completed a 15-minute follow-up interview about their safety knowledge, beliefs, and practices. Parents who were not reached at 12 months (because they did not return for the appointment or were missed by the study interviewer) were interviewed at their next well-child visit, which occurred at either 15 or 18 months. Home observation was scheduled to occur within 2 weeks of the follow-up interview. A community health worker who received special training in the study protocol and home safety conducted the observations. Data for the present analysis are taken from the baseline interview, parent exit surveys, audiotapes, and home observations.

Families were compensated $10 for each completed interview and for home observation. At the time of home observation, the community health worker provided instructions about correcting identified hazards, educational materials, and free home safety supplies (syrup of ipecac, 9-V battery, 911 and poison control telephone stickers, outlet plug covers, and a home safety booklet).

SAMPLE

Based on sample size calculations for moderate effect sizes, \( \alpha = .05 \) and \( \beta = .20 \), we sought to enroll 100 families in each study group. Between November 1, 1994, and July 31, 1995, 224 eligible families were approached in the clinic waiting room and invited to participate in the study. To be eligible, the parent or guardian accompanying the child had to be assigned to a participating resident, English speaking, and living with the child. The child had to be 6 months or younger and free of any serious medical problem that the physician thought would preclude his or her participation. Before each clinic session, a study interviewer reviewed the clinic registrar’s list of patients with scheduled well-child visits to identify eligible families and then approached those who appeared for their appointments in the waiting room. A total of 196 families (88%) were enrolled (120 in the IG and 76 in the CG); 3 families were ineligible and 25 (11%) declined to participate. No further information was collected from families who declined. Of those enrolled, 117 IG families (6.5 per resident) and 73 CG families (5.6 per resident) who completed at least 1 subsequent medical visit that was audi-taped are included in these analyses. Data analyzed from these families include 411 audiotaped visits (3.5 per patient) and 462 exit surveys (4.0 per patient) completed in the IG and 281 audiotaped visits (3.8 per patient) and 321 exit surveys (4.4 per patient) completed in the CG.

EAG INTERVENTION

The IG residents received 5 hours of training in the 6 safety practices being addressed and in communication skills for counseling parents. The training took place in two 2½-hour evening sessions held in pediatric faculty homes. The experiential training program, led by pediatric and health education faculty, included an introduction to a SAFE Counseling Framework, which was developed by five of us (A.C.G., M.E.H.W., E.M.M., J.R.S., and J.S.A.) for this project (Table 1); practice in role plays and homework assignments; and reinforcement with printed materials that summarized the framework and the injury content tailored to the age of the child. For each safety practice, residents were provided with specific strategies to discuss with their families (Table 2). Demonstration skill stations were also set up for each of the 6 safety practices, and residents spent approximately 15 minutes at each station, during which time faculty presented didactic material on the associated injury problem and demonstrated or discussed use of the safety products and allowed residents time to practice use or installation of the device and to ask questions. Additional background information about the theoretical underpinnings of the counseling intervention can be found in the publications of Gielen and McDonald20 and Sleet and Gielen.21

MEASURES

Counseling

Discussion of the targeted safety practices was assessed by audi-totaping all medical visits with study physician-parenting

Continued on next page
dyads. Two research assistants listened to the audiotapes and coded every use of any of the communication skills (Table 1) and every mention of a safety strategy (Table 2). We then tallied the total number of communication skills and the total number of safety strategies mentioned across all medical visits for each parent and for each safety practice.

Satisfaction

After each medical visit, parents completed an exit survey that included questions about the extent to which they believed their pediatrician had helped them with each of 4 anticipatory guidance topics: feeding, growth and development, behavior, and safety. Answer options were scored from 0 (did not discuss) to 4 (helped a great deal). Responses were tallied for each topic for all visits and averaged for each parent.

Knowledge

The follow-up interview included 12 agree/disagree items that were use to measure general knowledge of injuries (2 items) and specific knowledge about poisons (3 items), falls (4 items), and burns (3 items). Items were developed by us (A.C.G., M.E.H.W., E.M.M., J.R.S., and J.S.A) to reflect the most important information for physicians to communicate to parents for each of the injury topics of interest. A draft version containing additional items was pilot tested in the clinic before the start of the study, and only items with sufficient variation were retained in the final questionnaire (Table 3).

Beliefs

The EAG was also expected to shift families’ beliefs about how injuries occur, how they can best be prevented, and how strongly their pediatrician feels about home safety. The follow-up interview included 5 agree/disagree items that were used to measure these dimensions of beliefs (Table 3).

Safety Practices

Each of the 6 safety practices was assessed by self-report at baseline and follow-up and by home observation. To avoid influencing parents with the baseline interview, only a few general questions were included to assess self-reported safety practices at baseline. All were dichotomous answer options (yes/no), unless otherwise noted, and included (1) having a working smoke detector, (2) being able to provide the temperature of the hot water, (3) having a stair gate, (4) planning to use or using a baby walker, (5) keeping poisons locked or latched (all, most, some, or none), and (6) having syrup of ipecac. These questions were repeated at the follow-up interview.

During home observations, smoke alarms and tap water temperatures were tested. Observers recorded whether there were stairs in the home and, if so, whether there was a stair gate or door at the top and bottom of every set of stairs. Parents were asked if they had a baby walker (with wheels), and those that were produced by the parent or observed during the home visit were recorded. Observers asked where cleaning supplies, medicines and vitamins, hair and nail care products, and other hazardous materials were kept and then inspected these locations, recording what the substance was and whether it was stored in a place that was locked or latched. Parents were asked if they had syrup of ipecac, and, if so, the observer recorded its expiration date and storage location.

In the analysis, each safety practice was treated first as a dichotomous variable—"safe" or "unsafe. " Criteria used to be counted as safe for each practice were any working smoke detector, hot water temperature of 120° or less, no baby walker, all stairs protected with a gate or door, any poisons kept locked or latched, and at least 1 unexpired bottle of syrup of ipecac. Decisions about the criteria were made based on balancing what would offer the most protection with what families were actually doing. For example, no families kept all their poisonous substances locked, so we considered a home safe if any poisonous substances were kept locked or latched.

A total safety score variable was also constructed, counting the number of safe practices in each home for 4 safety practices: stair gates, poison storage, ipecac, and smoke alarm. Baby walkers were not included because by the time of home observation children were beyond the age at which walkers are typically considered an issue and we could not be confident that simply because we did not observe a walker none was present. Hot water temperatures were not included because most families in both study groups had safe water temperatures even though they did not report having tested or turned it down, suggesting that this issue was addressed structurally in these homes rather than because of any intervention on our part.

Sociodemographic and Family Variables

The baseline interview included items assessing parents’ age, ethnicity, education, employment, number of children and adults living in the household, and whether any of the respondents’ children had ever experienced an injury that required medical attention.

STATISTICAL ANALYSIS

Bivariate analyses, including t tests and χ² statistics, were used to compare IG and CG parents at baseline and to compare families who completed the study (ie, had a home observation) with those who did not on sociodemographic characteristics and baseline safety practices to identify potential sources of bias and control variables. We evaluated the impact of the intervention on physician counseling and parent satisfaction using all available exit surveys and audiotapes. We then examined changes in parents’ knowledge, beliefs, and practices using data from the subset of families who completed the study (ie, had a home observation). Hypothesis testing included examining IG vs CG differences in (1) the number of communication skills used and safety strategies mentioned (using χ² statistics), (2) parent satisfaction (using t tests), (3) parent knowledge and beliefs (using χ² statistics), and (4) parents’ safety practices (self-reported and observed).

To evaluate differences in observed safety practices, we first used χ² statistics for overall, unadjusted comparisons of each safety practice and the total safety score.

Continued on next page
Second, we used logistic regression analyses to examine the effect of the intervention on each safety practice, adjusting for actual exposure to the counseling and testing for potential confounders using the sociodemographic and family variables. Finally, we used polytomous logistic regression to analyze the total safety score, adjusting for exposure and testing for potential confounders. For all adjusted analyses, exposure to the counseling was treated as a categorical variable, with number of safety strategies mentioned divided into tertiles (ie, low, medium, and high exposure).

When comparisons between the IG and the CG resulted in statistically significant differences, we reran the analyses using the generalized estimating equation (GEE) to confirm the finding. The GEE provides a more accurate estimate of the SE in the case of a repeated-measures design such as ours (eg, satisfaction surveys at each visit). This step is not needed when the traditional analysis for independent observations finds no statistically significant association because the adjustment in GEE widens the confidence interval, making it even less likely to find significant differences. We assumed that the underlying correlational structure was exchangeable in performing the GEE analyses.

Despite the endorsement of professional guidelines and evidence of its potential effectiveness, pediatric counseling is still not widely practiced. In an analysis of 178 audiotaped well-child visits with pediatric residents, only 47% mentioned injury prevention, and when an injury topic was discussed, only 1.08 minutes was devoted to it. Thompson noted that the potential for counseling as an intervention is underappreciated by physicians, who often lack skills in the application of patient behavioral change strategies. A national survey of pediatric residency programs found that injury prevention was less frequently taught than other disease prevention topics. Residency training programs can play an important role in enhancing pediatrics’ counseling skills and increase the amount and quality of injury prevention anticipatory guidance they provide their families.

The purpose of this study was to develop and evaluate an injury prevention anticipatory guidance training program for pediatric residents. The ultimate goal of the program was to improve parents’ safety practices for the prevention of burns, falls, and poisoning among children aged 0 to 2 years living in low-income, inner-city neighborhoods. The specific safety practices included using smoke detectors, lowering hot water temperatures, eliminating baby walkers, using stair gates, storing poisons safely, and having syrup of ipecac in the home. These safety practices were selected because they are recommended topics in the AAP TIPP (The Injury Prevention Program) materials, there is evidence of their effectiveness for reducing injury risk, and they address injury problems that are especially important in low-income neighborhoods. We hypothesized that enhanced anticipatory guidance (EAG) training of pediatric residents would result in their providing more injury prevention counseling, which in turn would positively impact parents’ satisfaction with their pediatric visit and their safety knowledge, beliefs, and home safety practices.

<table>
<thead>
<tr>
<th>Table 1. SAFE Communication Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication Skill</strong></td>
</tr>
<tr>
<td>Solicit information</td>
</tr>
<tr>
<td>Advise parent</td>
</tr>
<tr>
<td>Focus on risks and barriers</td>
</tr>
<tr>
<td>Encourage compliance</td>
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<table>
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<tr>
<th>Table 2. Safety Practices and Strategies</th>
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</thead>
<tbody>
<tr>
<td><strong>Safety Practices</strong></td>
</tr>
<tr>
<td>Hot water</td>
</tr>
<tr>
<td>Smoke alarm</td>
</tr>
<tr>
<td>Baby walkers</td>
</tr>
<tr>
<td>Stair gates</td>
</tr>
<tr>
<td>Poison storage</td>
</tr>
<tr>
<td>Syrup of ipecac</td>
</tr>
</tbody>
</table>

### RESULTS

#### ENROLLED SAMPLE

**Baseline Characteristics**

Parents in both study groups were most often the child’s mother (96%) and were generally young (mean age, 24
At enrollment, babies were aged 1.90 months on average in the IG compared with 1.86 months in the CG. Living arrangements for most families included having more than one adult in the home (73% in the IG and 80% in the CG), 5 or more people in the home (56% in the IG and 64% in the CG), and only 1 other child younger than 5 years (68% in the IG and 63% in the CG). Few mothers were employed (12% in the IG and 15% in the CG) or married (14% in the IG and 17% in the CG), and approximately one third had less than a high school education (37% in the IG and 33% in the CG). Almost one third of families had a household income of less than $5000 (33% in the IG and 26% in the CG). None of these differences in sociodemographic characteristics between IG and CG parents were statistically significant (P > .05 by χ² or t tests).

Parents in the 2 study groups did not differ significantly on reported experiences with child injury or current safety practices at baseline (P > .05 by χ² or t tests). When asked if any of their children had been injured seriously enough to need medical care, 22% of IG and 18% of CG parents said yes. Most parents reported having a working smoke detector (93% in the IG and 92% in the CG). Only 3% of each study group reported knowing the temperature of their hot water. Slightly more than one third of each group (38%) reported keeping all poisons in places that locked or latched, although few parents reported having syrup of ipecac (12% in the IG and 16% in the CG). Most parents reported having a stair gate (81% in the IG and 84% in the CG) and planning to use a baby walker (72% in the IG and 65% in the CG).

### Clinic Visits

On average, IG residents had 6.72 families enrolled (with 29.89 visits) and CG residents had 5.85 families enrolled (with 28.77 visits) during the study. The proportion of visits that were for well-child care was 83% in the IG and 82% in the CG. Based on the length of the audiotapes, the average length of the visits is estimated to be 26 minutes in the IG and 24 minutes in the CG. None of these differences between the IG and the CG were statistically significantly different by t or χ² tests.

### Counseling

The mean ± SD number of mentions of safety strategies across all safety practices was 9.4 ± 6.8 (range, 0-30) in the IG and 3.7 ± 3.2 (range, 0-15) in the CG. On average, for all safety practices, the mean ± SD number of communication skills used was 15.1 ± 11.3 (range, 0-44) in the IG and 6.0 ± 5.5 (range, 0-26) in the CG. When analyzed for each safety practice, parents receiving care from physicians in the IG were significantly more likely than those seen by CG physicians to have safety strategies mentioned and SAFE Communication Framework skills used for every practice except poison storage (Table 4). The GEE analysis confirmed the significant χ² test results, using GEE for binary logistic models (Table 4).

---

### Table 3. Knowledge, Beliefs, and Safety Practices Reported at Follow-up by Study Group

<table>
<thead>
<tr>
<th>Knowledge Items (No. [%] Correct)</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. In the first 2 years of life most injuries occur on the playground.</td>
<td>42 (57)</td>
<td>28 (53)</td>
</tr>
<tr>
<td>2. Injuries are the leading cause of death for children.</td>
<td>59 (79)</td>
<td>40 (75)</td>
</tr>
<tr>
<td>3. Children are at greater risk for swallowing poisonous things when they are about 1 or 2 years old.</td>
<td>73 (91)</td>
<td>55 (98)</td>
</tr>
<tr>
<td>4. Baby walkers can cause serious injuries to children.</td>
<td>72 (91)</td>
<td>45 (85)</td>
</tr>
<tr>
<td>5. Falls down stairs are a common cause of serious childhood injury.</td>
<td>73 (91)</td>
<td>49 (92)</td>
</tr>
<tr>
<td>6. A child who uses a baby walker will learn to walk earlier than a child who does not use a baby walker.</td>
<td>57 (71)</td>
<td>41 (73)</td>
</tr>
<tr>
<td>7. You do not need to use a stair gate after your child has learned to walk.</td>
<td>8 (10)</td>
<td>7 (12)</td>
</tr>
<tr>
<td>8. Putting medicines on a high shelf will keep them safely out of your child’s reach.</td>
<td>51 (70)</td>
<td>31 (70)</td>
</tr>
<tr>
<td>9. Syrup of ipecac should be given only for certain types of poisons.</td>
<td>67 (90)</td>
<td>49 (92)</td>
</tr>
<tr>
<td>10. A baby’s skin burns more quickly in hot water than an adult’s.</td>
<td>67 (90)</td>
<td>49 (92)</td>
</tr>
<tr>
<td>11. In a 3-story house, 1 smoke detector is enough to keep everyone safe.</td>
<td>78 (98)</td>
<td>52 (93)</td>
</tr>
<tr>
<td>12. Smoke detector batteries should be changed at least twice a year.</td>
<td>49 (60)</td>
<td>38 (70)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Belief Items (No. [%] Agree)</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Test hot water temperature</td>
<td>60 (78)</td>
<td>47 (85)</td>
</tr>
<tr>
<td>2. If a toddler gets hurt, he or she will learn to be more careful.</td>
<td>14 (20)</td>
<td>9 (16)</td>
</tr>
<tr>
<td>3. Teaching a toddler to mind you is the best way to prevent injuries.</td>
<td>50 (63)</td>
<td>33 (60)</td>
</tr>
<tr>
<td>4. Most children’s injuries just cannot be prevented.</td>
<td>36 (45)</td>
<td>25 (45)</td>
</tr>
<tr>
<td>5. Baby’s physician feels strongly about childproofing.</td>
<td>83 (80)</td>
<td>57 (83)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety Practices (No. [%] Reporting)</th>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have a working smoke detector</td>
<td>77 (96)</td>
<td>54 (96)</td>
</tr>
<tr>
<td>2. Have a stair gate (among 136 families with stairs in their home)</td>
<td>35 (44)</td>
<td>24 (43)</td>
</tr>
<tr>
<td>3. Have no baby walker</td>
<td>64 (80)</td>
<td>39 (70)</td>
</tr>
<tr>
<td>4. Keep poisons locked or latched</td>
<td>49 (65)</td>
<td>31 (55)</td>
</tr>
<tr>
<td>5. Have syrup of ipecac</td>
<td>15 (19)</td>
<td>7 (12)</td>
</tr>
</tbody>
</table>

* Total number varied between 74 and 80 because of nonresponse on certain items.
† Total number varied between 44 and 56 because of nonresponse on certain items.
Parents in the IG rated the help they received with safety topics significantly higher than parents in the CG, and they did not differ in their ratings on any of the other anticipatory guidance topics (Table 5). Both groups were generally very satisfied (scoring >3.5 on scales that ranged from 0-4) with the amount of help they received with all 4 anticipatory guidance topics. A linear GEE model confirmed the significant \( t \) test results (Table 5).

HOME OBSERVATION SAMPLE

Of those enrolled in the study, 80 (67%) and 56 (74%) in the IG and the CG, respectively, completed home observation. Reasons for not completing home observation included parents moving out of the area, disenrolling from care at the clinic, declining further participation in the study, or being lost to follow-up despite multiple attempts to find usable telephone numbers or addresses. Families who completed home observation were compared with those who did not on sociodemographic characteristics, previous child injury experience, and safety practices reported at baseline. No differences were found in the CG; in the IG, completers were more likely to be unemployed (92% vs 80%; \( \chi^2 = 4.04, P = 0.04 \)) and to be the only adult living in the home (33% vs 15%; \( \chi^2 = 4.18, P = 0.04 \)). The average age of the children at the time of home observation was 14.4 months in the IG and 14.2 months in the CG, which was not statistically significantly different by \( t \) test.

Knowledge and Beliefs at Follow-up

Parents in the IG and the CG did not differ on any of the knowledge and beliefs measured (Table 3). More than three quarters of parents knew that injuries are the leading cause of death for children. In most cases, parents were knowledgeable about the hazards and prevention strategies, except that few parents knew that putting medicines on a high shelf was inadequate. Almost half of the sample (45%) thought that injuries were not preventable, and most (≥60%) agreed that teaching a toddler to mind is the best way to prevent injuries.

Safety Practices

Although most parents (≥80%) thought that the pediatrician felt strongly about childproofing, few families had tested the temperature of their hot water or reported having taken steps to prevent poisonings (Table 3). Almost all parents (96%) reported having a working smoke detector.

In the analysis of observed safety practices (Table 6), the IG and CG families did not differ on any of the safety practices or on the total safety score in the overall bivariate comparisons. There was considerable variation across the safety practices. For example, virtually all families had tap water temperatures at or below 49°C (120°F), whereas almost none stored poisons safely. Families stored poisonous substances in an average of 3 locations, most frequently in the bathroom and most often behind an unlocked door. Only 2 comparisons were in the expected direction, although not statistically significant: 36% of IG vs 30% of CG families had stairs that were protected by a gate or door; and 59% of IG vs 30% of CG parents had at least 1 working smoke alarm.

In the logistic regression analyses that included an adjustment variable for exposure to the intervention (ie, the number of safety strategies mentioned by the physi-
cian), for the IG relative to the CG, the odds ratios for each safety practice were 1.56 (95% confidence interval [CI], 0.70-3.79) for working smoke alarm, 1.56 (95% CI, 0.67-3.66) for protected stairs, 0.47 (95% CI, 0.09-1.80) for locked poisons, and 0.47 (95% CI, 0.12-1.78) for syrup of ipecac. Results did not change when we used other measures of exposure to the intervention or tested for potential sociodemographic confounders.

The total safety score was fairly evenly distributed in both groups, with approximately one third of families practicing none, 1, and 2 or more of the recommended safety practices (Table 6). In the polytomous logistic regression analysis that included the exposure adjustment variable, the odds ratio for the IG relative to the CG for practicing 1 vs none of the safety practices was 1.26 (95% CI, 0.42-3.80) and for practicing 2 or more vs none was 1.19 (95% CI, 0.37-3.87).

This is the first study, to our knowledge, to examine the impact of enhancing pediatric anticipatory guidance training on counseling parents about child safety. The results indicate that there are substantial benefits to such training in the context of clinical settings that serve low-income, inner-city families. Not only did IG residents provide significantly more injury prevention counseling than CG residents, but their families were more satisfied with the safety help they received. Moreover, parents were no less satisfied with the amount of help their pediatricians provided on other routine anticipatory guidance topics, suggesting that improved attention to safety topics can be achieved without compromising the attention given to other important concerns. It is possible that the satisfaction levels parents in the EAG group reported on these other anticipatory guidance topics was a result of their physicians’ improved global communication skills that generalized to other counseling topics. Future analyses of the audiotaped visits might be able to shed light on this issue. We conclude that the potential impact of the AAP TIPP materials, which both groups of residents received, can be enhanced with additional training that targets specific injury hazards and uses “hands-on” approaches to learning about the safety practices recommended to families.

We found the impact of the EAG to be insufficient to support significant behavioral changes in the families, although in 2 cases (smoke alarms and protected stairs) the differences between IG and CG families were in the predicted direction. In the analyses of total number of safety practices, the adjusted odds ratios also favored the IG, but the differences were not statistically significant. Although these results might be attributable in part to the study’s relatively small sample size, it is also likely that low-income families face many barriers to carrying out pediatric advice that can be overcome only by supplementing counseling with other supportive services, such as improved access to affordable safety supplies. This hypothesis is supported by other research, including a survey of low-income families in Baltimore, MD,22 and a recent childhood injury prevention intervention trial in England.23

The parental knowledge, beliefs, and prevalence of injury hazards found in this study may provide useful information for planning injury prevention programs for low-income families in urban areas. For example, virtually all families reported having a working smoke detector, yet only half actually did have one when we conducted home observations. A substantial proportion of families also did not know that smoke detector batteries should be changed at least twice a year. That families think they are protected when they are not is of particular concern in the context of low-income neighborhoods, where the risk of house fires is high. In addition, these results underscore the importance of including observed behaviors when evaluating injury prevention programs.

The virtual absence of poison prevention strategies (safe storage and syrup of ipecac) suggests a potentially high priority area for intervention. Messages need to address the widespread misconception that putting medicines on a high shelf will keep them safely out of the reach of children. Our families also stored poisonous substances in an average of 3 different locations throughout their homes, making it even more difficult to maintain proper storage over time. Prevention messages should include recommendations to reduce the number of places such items are kept to make safe storage easier.

Two thirds of the sample had stairs that were unprotected by a stair gate or door, representing a substantial fall hazard to infants and toddlers. One third of the sample continued to have a baby walker in their home, which might be an underestimate because some additional walkers may not have been visible to the home observer. Parents’ knowledge about fall hazards was generally high, suggesting that other barriers and facilitators to eliminating them need to be explored (eg, difficulty in obtaining stair gates and perceived benefits of using baby walkers).

This study was implemented in a large urban teaching hospital clinic that serves low-income inner-city fami-
lies, which has implications for understanding the results. First, we were able to use random assignment of physicians to study groups, which is a strength of the design and should ensure comparability between the groups. However, a smaller proportion of the CG attended the initial training seminar compared with the IG, which suggests that there might have been differences between the groups on variables that we did not measure that could account for our results (eg, knowledge and enthusiasm about injury prevention). We do not believe that this is a major threat in this study because all physicians received a complete TIPP packet and TIPP materials were widely available in the clinic. Also, there were no systematic differences between the study groups on any of the other indicators of potentially greater concern (eg, number of visits and length of visits). A second issue concerns generalizability of the results to other settings. Because the participating physicians were first- and second-year pediatric residents, results cannot be widely generalized to other practitioners or settings, such as pediatrics who have been in practice for several years or who serve middle class, suburban populations. Nevertheless, low-income families are an important audience for injury prevention because of their elevated injury risk and because many receive care in residency training settings. Such settings should consider incorporating EAG along with other strategies to better promote childhood injury prevention.

Enhanced anticipatory guidance seems to be an effective strategy for improving parent satisfaction, an important outcome of medical care in its own right, especially in the current managed care climate. The EAG training that we provided successfully in this project may serve as a useful model to other pediatricians and health care providers. Because pediatricians are expected to provide injury prevention, anticipatory guidance routinely provides a strong rationale for developing the most effective counseling. For those who serve low-income families, however, additional strategies that help parents act on their pediatrician’s advice are necessary.

Accepted for publication August 15, 2000.

This study was supported by grant MCJ-240638 from the Maternal and Child Health Bureau (Title V, Social Security Act), Health Resources and Services Administration, US Department of Health and Human Services, Rockville, Md.

We thank the participating physicians and parents for making the study possible and David Bishai, MD, MPH, PhD, Debra Roter, PhD, Larry Wissow, MD, MPH, Susan Larson, MS, and Mary Kay Oberle, BA, for advice and technical assistance.

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