Exposure to and Compliance With Pediatric Injury Prevention Counseling—United States, 1994

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ABSTRACT. *Background.* **Because injuries are the leading cause of death in children, injury prevention counseling is recommended as part of routine pediatric care. Increasing such counseling is a national health objective. Estimating the proportion of US children who receive such counseling and assessing their compliance with safety recommendations may help improve counseling efforts.**

Methods. **Respondents to a 1994 random digit-dial telephone survey of the US population were asked about receipt of age-appropriate injury prevention counseling at a medical visit and related safety practices for a randomly selected child 0 to 14 years of age in the household ($N = 1596$).**

Results. **Receiving any injury prevention counseling was reported for 39.3% of children 0 to 14 years old who had a medical visit in the past year and was more common among children who were younger, lived in urban areas, and lived in poverty. In general, receiving counseling was associated with safer behaviors. Counseling about ipecac was reported for 17.2% of children 0 to 6 years old; having ipecac in the home was more likely for those counseled (73.4% vs 32.0%). Counseling about posting the poison control number was reported for 24.9% of children 0 to 6 years old; posting this number was more common among those counseled (79.3% vs 52.6%). Counseling about bicycle helmets was reported for 18.6% of children 5 to 14 years old; a report of always wearing a helmet was more common among those counseled (43.9% vs 19.1%). Counseling about car seats and safety belts was reported for 25.4% of children 0 to 14 years old; a report of always using occupant restraints was more common among those counseled (89.0% vs 78.2%).**

Conclusions. **Injury prevention counseling is associated with reported preventive safety practices among US children, but a relatively small proportion of households with young children report receiving such counseling. Health care providers should increase efforts to provide injury prevention counseling.** *Pediatrics* **1998;102(5). URL: http://www.pediatrics.org/cgi/content/full/102/5/e55; *counseling, wounds and injuries, child, accident prevention.***

ABBREVIATION. ICARIS, Injury Control and Risk Survey.

Because injury is the leading cause of death among children and adolescents in the United States,[1] the American Academy of Pediatrics,[2] the American Academy of Family Physicians,[3] the American Medical Association,[4] and the United States Preventive Services Task Force[5] recommend including age-appropriate injury prevention counseling in the routine medical care of infants, children, and adolescents. Increasing the proportion of clinicians who routinely provide such counseling is a national health objective.[6]

We have found no report estimating the proportion of US children who receive injury prevention counseling at medical visits, although other studies have estimated the proportion of pediatricians delivering such counseling.[7] In 1994, the Centers for Disease Control and Prevention conducted the Injury Control and Risk Survey (ICARIS), a national survey designed to assess a wide variety of injury risk factors. This report summarizes ICARIS data about pediatric injury prevention counseling and the relationship of such counseling to associated preventive safety practices.

METHODS

We conducted a random digit-dial telephone survey from April 28, 1994, through September 18, 1994. From a proprietary listing of all exchanges in all 50 states and the District of Columbia, we stratified telephone exchanges by whether they had ≥10% of households occupied by minorities. Such exchanges were sampled at a higher rate than the others to improve minority representation. At least six attempts were made to contact each number.

To ensure equal numbers of male and female respondents, once a household was reached, we determined the number of men and women age 18 years and older residing there. Using a random procedure, we then selected one sex category from those applicable to the household; if more than one eligible individual was in the sex category, we asked for the individual with the most recent birthday.

If a household member agreed to participate, an English- or Spanish-speaking adult respondent reported on household and individual factors, such as total pretax household income and

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TABLE 1. US Children Receiving Any Injury Counseling Among Those Who Had Seen a Medical Provider in the Preceding 12 Months by Sociodemographic Characteristics, 1994[a]

Characteristic	Unweighted Number Counseled	Weighted Number Counseled	Weighted % Counseled (95% CI)
Total	654	23 168 187	39.3 (36.2–42.3)
Sex			
Boy	331	11 669 005	38.2 (33.9–42.4)
Girl	322	11 475 625	40.7 (36.3–45.1)
Age group (y)*			
0–1	181	5 169 946	71.6 (64.7–78.5)
2–6	225	8 399 001	39.9 (34.8–45.0)
7–12	199	7 453 001	33.1 (28.3–37.9)
13–14	49	2 146 239	26.3 (18.2–34.3)
Household income			
<$20 000	179	5 846 406	45.8 (39.5–52.1)
$20 000–$34 999	137	4 952 320	38.2 (31.6–44.8)
$35 000–$49 999	109	4 063 097	38.8 (31.4–46.3)
≥$50 000	175	6 399 870	34.9 (29.6–40.2)
Poverty**			
Yes	125	4 337 282	50.2 (42.1–58.3)
No	465	16 518 746	37.1 (33.6–40.6)
Highest educational level in household			
≤High school	197	7 040 369	39.7 (34.3–45.0)
>High school and <college graduate	197	6 808 188	36.4 (30.9–41.9)
College graduate	132	4 711 659	41.0 (34.1–47.8)
≥Postgraduate	116	4 236 042	42.1 (34.8–49.5)
Census region***			
Northeast	118	5 822 117	47.2 (39.7–54.8)
Midwest	115	4 634 707	32.2 (26.1–38.4)
South	251	6 912 436	36.8 (32.1–41.5)
West	170	5 798 926	43.0 (36.7–49.3)
County size****			
Urban	587	20 346 538	41.1 (37.7–44.4)
Rural	67	2 821 648	30.0 (22.6–37.4)

[a] Missing data not shown for sex (1), household income (54), poverty (64), highest educational level in the household (12).
* $P < .01$ (P values for this Table are for log-likelihood χ^2 test.
** $P < .01$.
*** $P = .01$.
**** $P < .02$; urban denotes metropolitan statistical areas with >20 000 households.

highest educational level. After the respondent gave the age and sex of each child 14 years and younger, one child was randomly selected. Respondents were asked whether this child had seen or visited a physician or nurse in the past 12 months. If they answered "yes" respondents were asked whether, during these visits, anyone gave the child or a family member written information or talked to them about injury prevention measures appropriate to the child's age. A positive response was considered counseling. These age-appropriate measures were smoke detectors (≤14 years), syrup of ipecac (≤6 years), storage of drugs or poisons (≤12 years), posting the poison control telephone number (≤6 years), storage of firearms (2–14 years), bicycle safety helmets (5–14 years), and car seats or seat belts (≤14 years). At various points during the interview, respondents were asked about age-appropriate safety behaviors related to these counseling topics; ie, whether they have any smoke detectors installed in the home, whether they now have any syrup of ipecac in their household, and whether the telephone number for a poison control center is posted on or near a telephone. Questions regarding firearms in the home covered whether guns are kept loaded and whether they are locked, and the proximity of locked or unlocked ammunition. Unsafe firearm storage was defined as having a loaded gun unlocked in the home or an unlocked gun with its ammunition unlocked in the same room. In addition, respondents were asked whether the selected child had ridden in a car, van, or truck during the past 30 days. If they answered "yes," respondents were asked how often during that time the child had used a child safety seat or seat belt. Respondents were asked whether the child had ridden a bicycle in the past 30 days. If the answer was "yes," respondents were asked whether the child had a bicycle helmet and, if so, how often the child had worn the helmet while riding during the preceding 30 days. Only responses of "always use" were counted as "use" for the child safety seat, seat belt, and bicycle helmet questions. Responses of "don't know" were counted as "no," and refusals to answer were counted as missing responses.

Data were weighted to provide national estimates and percentages. Child weights were based on the probability of selecting the randomly selected child in the household and ratio-adjusted to reflect the March 1994 Current Population Survey population counts by the age groups 0 to 4, 5 to 9, and 10 to 14 years of age.

To account for the complex survey design, we used SUDAAN[8] software for the statistical analysis of correlated data. This software package allowed us to obtain weighted estimates and 95% confidence intervals (CIs) using the proper design parameters and to compute appropriate standard errors of these estimates. Had we not taken these steps to account for the complex survey design, we might have underestimated the variance and subsequently overestimated the significance of associations. We assessed independence between our outcomes and selected demographic characteristics of our study population with the log-likelihood χ^2 test in SUDAAN.

RESULTS

Interviews were completed for 5238 households (response rate = 5238 completed interviews/[5238 completed interviews + 3630 refusals + 474 incomplete interviews] = 56.1%). Of these 5238 households, 1963 had a child 14 years of age or younger, and 1596 (81.3%) of these children had visited or seen a doctor or nurse in the past 12 months. Parents were the respondents for 1471 (92.2%) of these 1596 children (because exact age was unknown, 17 children were excluded). The proportion of children who had a medical visit in the past year varied by age as

TALE 2. Subject-specific Injury Prevention Counseling Received Among US Children Seeing Health Care Provider in Preceding 12 Months, 1994[a]

Subject (Age-targeted)	Unweighted Number Who Saw Medical Provider in Past 12 Months	Unweighted Number Receiving Counseling	Weighted % Receiving Counseling (95% CI)
Smoke detector (≤14 y)	1579	156	8.8 (7.2–10.5)
Ipecac (≤6 y)	803	147	17.2 (14.1–20.3)
Poison storage (≤12 y)	1365	332	21.8 (19.1–24.4)
Poison control telephone number (≤6 y)	803	210	24.9 (21.1–28.6)
Storage of firearms (2–14 y)	1327	91	6.3 (4.8–7.8)
Bicycle helmet (5–14 y)	957	178	18.6 (15.5–21.7)
Car seat/belt (≤14 y)	1579	426	25.4 (22.7–28.1)
Car seat/belt (≤6 y)	803	269	30.7 (26.8–34.6)
Seat belt (7–14)	776	157	20.5 (16.9–24.2)

[a] All responses of "don't know" were counted as "no" for each counseling subject. The number of "don't know" responses were as follows: smoke detector (46), ipecac (28), poison storage (40), poison control telephone number (20), storage of firearms (25), bicycle helmet (23), car seat/belt (≤6 y) (32), and seat belt (7–14 y) (20).

follows: 97.3% of children 0 to 1 year old, 90.7% of those 2 to 6 years old, 74.2% of those 7 to 12 years old, and 69.2% of those 13 to 14 years old (test for linear trend, $P < .01$).

Receiving counseling about any of the injury prevention topics we studied was reported for 654 (39.3%) of children 0 to 14 years old who had a medical visit in the past year (Table 1) and was more common among children who were younger ($P < .01$), lived in urban areas ($P = .01$), and lived in poverty ($P < .01$).

The proportion of US children for whom age-appropriate, topic-specific injury counseling was provided at a medical visit ranged from 6.3% (95% CI: 4.8%-7.8%) for safe storage of firearms to 30.7% (95% CI: 26.8%-34.6%) for using car seats and seat belts (Table 2). Families living in poverty were more likely than those not living in poverty to report receiving counseling about smoke detectors ($P < .01$), poison storage ($P < .01$), gun storage ($P < .01$), bicycle helmets ($P = .02$), and car seat/seat belts (for children 0 to 14 years old) ($P < .01$). Respondents with a high school education or less reported receiving counseling about smoke detectors ($P < .01$) and safe gun storage ($P < .01$) more often than those with more education. The proportion of families receiving advice about bicycle helmets varied by region of the country. Just 12.1% of respondents from the Midwest reported receiving such counseling compared with 16.5% in the South, 20.5% in the West, and 28.7% in the Northeast ($P = .01$).

In general, there was an association between receipt of subject-specific injury prevention counseling and the related safety behavior (Table 3). However, for children 2 to 14 years of age, receiving counseling about safe gun storage was associated with a lower rate of safe gun storage ($P = .01$). Just 27 respondents with guns in the home reported receiving such counseling, of which 17 were reported to comply. The coefficient of variation of the weighted percent (standard error/point estimate of the weighted percent) adopting safer storage among those so counseled was 23.7%.

DISCUSSION

Our data suggest that a relatively small proportion of children in this country receive injury prevention counseling from their health care provider. Increasing to 50% the proportion of primary care providers "routinely providing . . . [this] . . . service to 81–100% of patients" is a national health objective.[6] Baseline data for this objective from a 1993 survey showed that 45% of American Academy of Pediatrics members reported inquiring about and 58% reported pro-

TABLE 3. Association Between Injury Counseling and Related Safety Behaviors of US Children, 1994[a]

Subject (Age-targeted)	Unweighted Number Who Adopted Safe Behavior/ Number Counseled (Weighted %)	Unweighted Number Who Adopted Safe Behavior/ Number Not Counseled (Weighted %)	Log-likelihood *P* Value
Smoke detector (≤14 y)	146/156 (93.8)	1327/1423 (93.7)	NS[e]
Ipecac (≤6 y)	105/147 (73.4)	197/656 (32.0)	<.01
Poison control telephone number (≤6 y)	163/210 (79.3)	272/593 (52.6)	<.01
Storage of firearms (2–14 y)[b]	17/27 (50.1)	263/358 (77.4)	<.02
Bicycle helmet (5–14 y)[c]	66/138 (43.9)	109/568 (19.1)	<.01
Car seat/belt (≤14 y)[d]	360/407 (89.0)	912/1132 (78.2)	<.01
Car seat/belt (≤6 y)[d]	246/261 (96.0)	462/526 (86.9)	<.01
Seat belt (7–14 y)[d]	114/146 (79.0)	450/606 (71.2)	NS

[a] All responses of "don't know" were counted as "no" for each safety behavior. The number of "don't know" responses were smoke detector (1), ipecac (11), poison control telephone number (2), gun storage (6), bicycle helmet (6), car seat/belt (≤6 y) (3), and seat belt (7–14 y) (9). One respondent refused to answer a question regarding storage of firearms.
[b] Limited to homes with a gun.
[c] Limited to children who had ridden a bicycle in the past 30 days.
[d] Limited to children who had ridden in a car, van, or truck in the past 30 days.
[e] Not statistically significant.

viding advice about seat belt/child seat use to >80% of their patients.[7] What a physician reports saying to patients and what patients remember being discussed may be very different, however. A study of safety counseling by physicians in London, Ontario, indicated that although ~55% of physicians reported mentioning age-appropriate safety issues with their patients "always" or "most of the time," only 19% of the first-time parents who take their children to these physicians reported the same.[9] Given this discrepancy, it could be argued that injury prevention counseling objectives for both the nation and for individual clinicians should be that patients recall receiving this advice.

Our study found associations between specific injury prevention counseling and safety behaviors. A recent review of injury prevention counseling in primary care settings suggested a consistent positive effect of such counseling on use of car seats and seat belts.[10] Other reports have shown an association between physician counseling and obtaining ipecac, understanding its use, and posting the poison control number.[11,12] Although our study provides evidence that counseling at a medical visit about bicycle helmets is associated with increased reported helmet use, several reports suggest that such efforts should be a part of a multifaceted campaign including incentives, community education, and possibly legislation.[13–15]

The primary limitations of this study are those common to many cross-sectional surveys. For example, respondents who practice safer behaviors also may be more likely than others to remember safety advice that was mentioned during their visit with the physician (recall bias). Additionally, respondents may have had a tendency to provide socially desirable answers (ie, to report practicing safer behaviors than actually carried out). We have little reason to believe that this tendency would be greater in those who reported receiving injury prevention counseling at a medical visit and, therefore, it is unlikely that this accounts for the associations we observed between counseling and safer behaviors. We have no way to know whether injury prevention counseling led to the reported safer behaviors through a causal relationship.

The response rate of this study was only 56.1%. However, the sample of respondents in our study has a distribution of income, education, age, race, and sex very similar to that for the US population.[16] We have no reason to suspect that nonrespondents or refusers differ from respondents with respect to their children receiving injury prevention counseling from their health care providers.

The small number of gun owners who reported receiving counseling about safe firearm storage (N = 27) makes estimates of the association between counseling and safe gun storage unstable. Perhaps the most meaningful information we can draw from this study regarding gun storage is that a relatively small proportion of people bringing their children to a health care provider (6.3%) are counseled about the safe storage of guns. The large proportion of households that have a smoke detector among those not receiving counseling (~94%) made it difficult to detect any additional benefit associated with counseling.

This report adds to the mounting evidence that injury prevention counseling works to improve the safety practices in US households with children. It also appears that such counseling by pediatricians is cost beneficial.[17] Child health care providers should increase efforts to provide injury prevention counseling.

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