

Firearm Injury Risk Among Primary Care Patients

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Background. Firearm injuries are the eighth leading cause of death in the United States. Evidence suggests that availability of guns in the home is associated with an increased risk of homicide, suicide, and unintentional injuries and fatalities. Our study examined five demographically diverse primary care practices in Oregon to determine the extent to which patients and members of their households might be at risk for firearm injuries.

Methods. Six hundred and four consecutive English-speaking patients who were at least 18 years old and seeking care at the five different practices were surveyed. Participants were asked about the presence of firearms in the home, methods of storage, history of firearm safety training, and history of firearm counseling by their physicians.

Results. Forty-two percent of respondents reported having at least one firearm in the home. In homes with fire-

arms, 48% contained at least one firearm that was stored unlocked, and 26% contained at least one firearm stored loaded. Twenty percent of homes with children contained at least one unlocked firearm, and 10% contained a loaded firearm. Forty-seven percent of those homes with both children and firearms had at least one gun that was stored unlocked, and 26% contained at least one loaded firearm. Those who reported having had formal firearm safety training were no more likely to store their firearms safely than those without such training. Only 3% of respondents reported that their physician had ever talked with them about gun safety.

Conclusions. Our data indicate that a substantial number of patients cared for by primary care physicians are at risk for firearm injuries.

Key words. Firearms; primary health care; accident prevention; safety. (*J Fam Pract* 1995; 41:158-162)

In 1992, firearm injury resulted in 37,776 deaths in the United States, making it the eighth leading cause of death.¹ It is estimated that for every firearm fatality, there are 2.6 nonfatal firearm injuries.² The economic cost of firearm injuries in 1990 was calculated to be \$20.4 billion, and the cost per firearm fatality is higher than that associated with any of the four leading causes of death.³

In recent years, violence and firearm-related injury and death have become increasingly recognized as public health problems.^{4,5} Accordingly, reports describing firearm ownership and safety practices have begun to emerge

in the medical literature.^{6,7} Although most of these studies have focused on adolescent populations or families with children, firearms present a potential danger to all persons regardless of age.

Evidence suggests that availability of guns in the home is associated with an increased risk of homicide, suicide, and unintentional injuries and fatalities.⁸⁻¹¹ It is estimated that there are over 200 million firearms in civilian hands and that firearms are present in almost one half of all US homes.^{12,13} A national survey of gun owners revealed that more than one third stored their guns loaded, and 53% did not store their firearms under lock.¹²

Primary care physicians are expected to routinely counsel their patients about lifestyle issues and health behaviors, but little is known about physicians' attitudes and practices concerning counseling on firearm injury prevention. Many physicians are unaware of which patients in their practices are at risk for firearm injuries. A study of Maryland pediatricians revealed that only 10% reported counseling at least one

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Table 1. Firearm Ownership, by Practice Setting and Firearm Type

Practice Setting	Respondents with a Firearm in the Home, %	Respondents with a Rifle or Shotgun in the Home, %	Respondents with a Handgun in the Home, %	Respondents with Both a Handgun and Either a Rifle or Shotgun in the Home, %	Respondents with Another type of Gun* in the Home, %
University (n=145)	32	25	17	10	3
Suburban (n=110)	35	29	17	12	2
Health department (n=110)	22	18	16	14	5
Rural-solo (n=110)	60	49	33	25	5
Rural-group (n=110)	65	58	32	28	6
All combined (n=585)	42	35	23	17	4

*Gun types in this category include BB (10 responses); not specified (5); pellet (4); black powder (2); spear (1); Uzi (1); and wrist rocket (1).

fourth of the families in their practices about firearm hazards.¹⁴ Many of these physicians believed that their patients were not at risk for firearm injuries.

The purpose of our study was to examine five demographically diverse primary care practices in Oregon to determine the extent to which patients and members of their households might be at risk for firearm injuries and to assess whether these patients received counseling on firearm injury prevention from their physicians.

Methods

Physicians at five different primary care offices in Oregon were contacted regarding participation in a study of their patients' firearm ownership and safety practices. This was a convenience sample chosen to represent a variety of practice styles and geographic and socioeconomic service areas in Oregon. Each one of the primary care offices contacted agreed to participate. The group included (1) a university-based family practice center in an urban area (referred to as "university"), (2) a multiphysician family practice office in a suburban neighborhood ("suburban"), (3) a county health department primary care clinic in an urban area ("health department"), (4) a solo private practice in a rural area ("rural-solo"), and (5) a multiphysician, rural family practice office 200 miles from the other rural locale ("rural-group").

Six hundred four consecutive English-speaking patients who were at least 18 years old and seeking care at the five practices were surveyed. Each potential subject was approached by the same research assistant, informed that the office was participating in a project on firearm safety, and asked to privately complete an 11-question survey instrument. Potential subjects were informed that disclosed information would be kept confidential and

were asked not to record any identifying information on the questionnaire. Participants were asked questions regarding the presence of firearms in the home, methods of storage, history of firearm safety training, history of firearm counseling by their physicians, and basic demographic information.*

At the university practice, 150 consecutive patients were asked to complete the survey. At each of the other four sites, participation of consecutive patients was solicited until a total of 110 surveys were returned. The number of respondents at each site was determined by the amount of time a medical student research assistant was able to spend at each practice. One hundred ten patients at the suburban practice, 112 patients at the health department practice, 113 at the rural-solo practice, and 119 at the rural-group practice were asked to complete surveys. Data were analyzed using the SPSS computer software program.

Results

Five hundred eighty-five surveys were returned, for a response rate of 97%. Those who declined included five at the university practice, none at the suburban practice, two at the health department practice, three at the rural-solo practice, and nine at the rural-group practice. Seventy-five percent of respondents were female. The mean age of the subjects was 40 years. Thirty-four percent of respondents were 18 to 30 years old, 37% were 31 to 45 years old, 13% were 46 to 60 years old, and 16% were 61 years old or older.

Table 1 shows the percentages of subjects with fire-

*Copies of the questionnaire used in this study may be obtained from the authors.

Table 2. Reasons Cited for Firearm Ownership

Reason	Handgun Owners, %	Rifle or Shotgun Owners, %
Hunting	15	74
Protection	66	32
Gun Collection	25	18
Other*	18	11

*Other includes target practice, sport, job, inherited weapon, killing animal pests, unspecified.

NOTE: Respondents were able to cite multiple reasons; 213 respondents provided 286 responses.

arms in the home by type of gun and practice setting. Overall, 42% of respondents reported having at least one firearm in the home. Rural residents were significantly more likely to have a firearm in the home than were nonrural residents (Mantel-Haenszel statistic=58.0, degree of freedom [df]=1, $P<.01$). Rural residents were significantly more likely than nonrural residents to have a handgun in the home (Mantel-Haenszel statistic=19.0, $df=1$, $P<.01$). The same was true for rifles and shotguns (Mantel-Haenszel statistic=52.4, $df=1$, $P<.01$).

Table 2 lists reasons cited for firearm ownership. Some owners cited more than one reason. Hunting was the most frequently cited reason for owning a rifle or shotgun (74%), and protection was the most frequently cited reason for owning a handgun (66%).

Among subjects living in households with a firearm ($n=247$), 68% reported having more than one gun in the home. Twenty-one percent of respondents reported having two guns in their homes, 24% reported 3 to 4, 14% had 5 to 7, and 9% reported having 8 or more guns in their homes.

Sixty percent of all respondents lived in households with children under the age of 18. The presence of a firearm in the home did not differ significantly between homes with children and those without. Twenty percent of homes with children contained at least one unlocked firearm, and 10% had a loaded firearm. Handguns were more likely to be stored loaded than rifles or shotguns. Thirty-three percent of handguns and 18% of rifles or shotguns were stored loaded. Fifty-one percent of rifles or shotguns and 39% of handguns were stored without being locked away.

Twenty percent of all homes contained at least one unlocked firearm, and 11% had at least one loaded firearm. Forty-eight percent of the homes with firearms contained at least one unlocked firearm, and 26% contained at least one loaded firearm. Forty-five percent of those homes with both children and firearms had at least one gun that was stored unlocked, and 25% contained at least one loaded firearm (Table 3).

Table 3. Firearm Storage Patterns in Those Homes with Firearms

Home Type	Home with at Least One Firearm Stored Unlocked, %	Homes with at Least One Firearm Stored Loaded, %
All homes with firearms ($n=247$)	48	26
Home with firearms and children ($n=157$)	45	25
Homes with firearms and no children ($n=90$)	52	27

Only 3% of respondents reported that their physician had ever talked with them about gun safety. Interestingly, physicians were no more likely to counsel patients who had firearms in the home (3.2%) than those who did not (3.6%).

Forty percent of all respondents, 57% of males and 35% of females, reported having had formal gun safety training or classes. The military was the most frequently mentioned setting for this training. There were no statistically significant differences in method of firearm storage between those who reported having had firearm safety training and those who had not. Thirty percent of those with firearm safety training and 21% of those without training stored their guns loaded (Mantel-Haenszel statistic=1.8, $df=1$, $P>.05$). Fifty-one percent of those with firearm safety training and 49% of those without training stored their guns unlocked (Mantel-Haenszel statistic=0.1, $df=1$, $P>.05$).

Forty-three percent of all respondents, 64% of respondents with a firearm in the home, and 26% of those without, reported that children in their household had been taught about gun safety. Seventy percent indicated that this teaching had been provided by parents.

Discussion

Our findings indicate that a large number of patients seen by family physicians have firearms at home and that many of those firearms are stored unsafely. Overall, we found that 42% of respondents had a firearm at home. This figure is consistent with other published reports.^{6,7,15} In two practices, well over one half of the patients had firearms in their homes. Even in the practice reporting the fewest firearm owners, more than one in five had a firearm at home.

Firearms cause a significant amount of morbidity and mortality among US children. One in five adolescent deaths is caused by a firearm, and firearm injury is among

the top four causes of death by unintentional injury in children.^{16,17} Despite the obvious danger firearms pose to children, we found that homes with children were just as likely to have a firearm as those without children. Furthermore, there was a loaded gun in 10% of all homes with children, and in one of every four homes that had both children and firearms.

Most authorities, including the National Rifle Association, promote storing firearms unloaded and locked away. We found that 20% of all households contained at least one unlocked firearm and that 11% contained at least one loaded firearm. The presence of children in the home did not appear to alter firearm storage practices.

Handguns were more likely to be stored loaded. This is consistent with the finding that protection was the most common reason for owning a handgun. While gun possession may impart to its owner a feeling of security, in reality, the presence of a gun in the home has been reported to increase the risk of an occupant using it to commit suicide or homicide.^{8,10,11,18} Firearms kept in the home have been associated with a greater number of deaths of occupants or their friends than they are with the number of deaths attributed to self-defense.¹⁸

Firearm safety instruction did not appear to improve the safety of gun storage practices. In our study, respondents with firearm safety training were more likely to store their weapons loaded than were those with no such training. This is consistent with the findings of another study that showed that instruction did not seem to affect the probability of keeping loaded guns in the home.¹² Recommending formal gun safety instruction may have little influence on firearm storage practices.

Although formal firearm safety instruction does not appear to improve firearm safety practices, evidence suggests that advice from a physician may have an effect. A pediatric office survey of parents found that nearly all gun-owning parents indicated willingness to follow their pediatrician's advice about gun storage. In addition, almost three fourths of parents who did not own a gun indicated that they would be dissuaded from obtaining one if so counseled by their pediatrician.¹⁵

Health promotion and disease prevention are emphasized as important aspects of family medicine. Many family physicians have included injury prevention counseling as a routine part of anticipatory guidance and health maintenance counseling. Unfortunately, in our study only 3% of patients indicated that their physician had ever spoken with them about firearms.

Several methodological limitations restrict the generalizability of our findings. Five very different practices in Oregon were asked to participate in this study. They were chosen specifically to portray a variety of practice settings as well as some of the different geographic and socioeco-

nomie populations for which family physicians are likely to provide care. As such, this group may not be representative of family practices within Oregon or the United States.

It must also be kept in mind that the individuals surveyed were seeking care at the participating medical offices and may not fully represent patients cared for by family physicians in Oregon. As evidenced by their sex and age, this sample does not represent the general population. Finally, it was not possible to assess the validity of the self-reported data. The anonymity of the survey was an attempt to minimize this bias.

The American Medical Association⁵ has cited firearm injury and death as a critical public health issue and has called for health professionals to treat this public health matter with as much urgency as it would any severe disease. Some might argue that firearm injuries and deaths are social problems and, as such, are not within a health professional's scope of practice. A similar argument was made several decades ago about cigarette smoking and seat belt use. We have since learned that some lifestyle choices and behavioral factors that are important determinants of health can be modified through office-based interventions.

The focus of our study was on patient behaviors regarding firearm ownership and storage practices. Additional work is required to more clearly define risk factors for firearm injury and to identify strategies that are most effective in preventing them. As we have seen with efforts to decrease tobacco use and motor vehicle accidents, however, decreasing firearm injuries will likely require a combination of public policy initiatives and interventions by health professionals.

Firearms are now second only to motor vehicles as a cause of fatal injury, and if the present trend continues, it could become the leading cause of injury-related deaths by the year 2003.¹⁹ The presence of guns in the home is an important risk factor for sustaining a firearm injury.^{8-11,18} Our data indicate that a substantial number of patients cared for by primary care physicians are at risk for firearm injuries. One way for primary care physicians to play a role in reducing firearm-related injury and death is to initiate discussions with their patients about the risks of firearms and to counsel them accordingly.

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