



# Screening for Access to Firearms by Pediatric Trainees in High-Risk Patients

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## ABSTRACT

**OBJECTIVE:** Access to firearms is an independent risk factor for completed suicide and homicide, and the American Academy of Pediatrics recommends that pediatricians screen and counsel about firearm access and safe storage. This study investigates how often pediatric residents screen for access to firearms or counsel about risk-reduction in patients with suicidal or homicidal ideation.

**METHODS:** Retrospective chart review of visits by patients younger than the age of 19 years presenting to the pediatric emergency department (ED) of a tertiary academic medical center from January to December 2016. Visits were eligible if there was an ultimate ED discharge diagnosis of “suicidal ideation,” “suicide attempt,” or “homicidal ideation” as identified by *International Statistical Classification of Diseases and Related Health Problems, 10th revision* codes and the patient was seen by a pediatric resident before evaluation by psychiatry. Descriptive statistics were used to analyze results.

**RESULTS:** Ninety-eight patients were evaluated by a pediatric resident for medical assessment before evaluation by a psychiatry team during the study period and were therefore eligible for inclusion. Screening for firearm access was documented by a pediatric resident in 5 of 98 (5.1%) patient encounters. Twenty-five patients (25.5%) had no documented screening for firearm access by any provider during the ED visit, including in 5 cases when patients were discharged home.

**CONCLUSIONS:** Pediatric residents rarely document screening for firearm access in patients with known suicidal or homicidal ideation who present to the ED. Additional understanding of the barriers to screening and potential strategies for improving screening and counseling are critical to providing appropriate care for high-risk pediatric patients.

**KEYWORDS:** guns; injury prevention; trauma

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## WHAT'S NEW

This study is the first to examine rates of screening for access to firearms and counseling regarding risk reduction by pediatric trainees in patients with active suicidal or homicidal ideation presenting to the emergency department.

FIREARM-RELATED INJURY among children and adolescents is a persistent public health problem in the United States. In particular, children at risk for self-harm or harm to others represent a population for whom understanding access to firearms is particularly important. Firearms represent one of the most lethal methods of suicide attempt, with completion in up to 90% of attempts.<sup>1,2</sup> Of all homicides in adolescents between 15 and 19 years of age, approximately 90% are firearm-related.<sup>3</sup> Adolescents are particularly vulnerable to firearm-related injuries, as they are more likely to exhibit impulsivity, and the presence of a firearm in the home repeatedly has been shown to

increase their overall risk of death.<sup>4-8</sup> Given these risks, the American Academy of Pediatrics has issued guidelines recommending that pediatricians routinely screen for access to firearms and counsel about risk reduction, including safe storage practices, as well as counseling families to remove firearms from the home of any adolescent.<sup>4,9,10</sup>

Although all pediatricians share the responsibility for this counseling, emergency department (ED) clinicians are often the first-line physicians to care for a child after disclosure of homicidal ideation, suicidal ideation, or a suicide attempt. Visits to pediatric EDs for psychiatric conditions continue to increase.<sup>11</sup> Therefore, physicians in the ED should be equipped to effectively screen for access to lethal means, including firearms, and counsel about risk reduction during these visits. Previous studies have shown that ED clinicians often do not screen for access to firearms, even in high-risk patients.<sup>12-15</sup> Limited previous data show that trainees also appear to have low rates of screening, with one study of psychiatry residents

showing that firearms access screening was documented in only 3% of patient encounters.<sup>16</sup> The rate of screening for access to firearms by pediatric trainees in high-risk patients presenting to the ED is unknown.

In our hospital, all patients 19 years of age or younger presenting for safety evaluations are seen by a pediatric emergency medicine attending, often in conjunction with a trainee (either a pediatric resident or emergency medicine resident rotating through the pediatric ED), for medical evaluation and determination of the need for involuntary hold before evaluation by the psychiatry team. Although access to firearms is an important factor to assess when determining a patient's risk of harm to self or others, we hypothesize that pediatric residents in the ED rarely assess and document this risk factor or provide counseling about risk reduction.

## METHODS

### DESIGN AND SETTING

We conducted a retrospective chart review of patients presenting to a single tertiary care ED in Boston, Massachusetts, that serves both pediatric and adult patients. We included visits of patients younger than 19 years of age who presented to the ED between January 1, 2016, and December 31, 2016, with a diagnosis of suicidal ideation, homicidal ideation, or suicide attempt as captured by *International Statistical Classification of Diseases and Related Health Problems, 10th revision* codes x71-x83, T14.91, and R45.85x. Identified patients were excluded if, on chart review, they were not evaluated by a pediatric resident during their visit. For example, this occurred if the patient was seen by an emergency medicine resident working in the pediatric ED or by an attending physician only.

For each eligible visit, the chart was reviewed manually by the lead investigator (C.N.L.) and data were entered into a secure online REDCap database (Research Electronic Data Capture, Vanderbilt, Tenn), hosted by the Partners Healthcare Information Systems. The study was approved by the Partners Human Research Committee Institutional Review Board.

### MEASURES

The data extracted included patient demographics, medical and social history, and ED visit characteristics (including method of arrival and disposition). The co-primary outcomes were the proportion of visits in which there was documentation of patient access to firearms by any provider and documentation specifically by a pediatric resident. The secondary outcome was documentation of counseling about firearm risk reduction.

### DATA ANALYSIS

Descriptive statistics were used to compare firearms assessment among patients based on patient and ED visit characteristics, as well as provider type. Categorical variables were reported as percentages with 95% confidence

intervals and compared by Chi-square or Fisher exact tests. Statistical analyses were performed in SAS Software (Version 9.4; SAS Institute Inc, Cary, NC).

## RESULTS

In total, 139 patient visits were evaluated. Of these, 98 patients had a documented assessment by a pediatrics resident and were included in the analysis. The mean age was 14.3 years. The majority of patients were female (73.5%) and spoke English as their preferred language (87.8%). Most patients (94.9%) were authorized for temporary involuntary hospitalization. The reason for this involuntary hold was documented as suicidality in 84% of patients, homicidality in 5% of patients, both in 4%, and other in 7% (Table 1). In total, 33.7% of patients had a documented history of a previous suicide attempt. Patients arrived to the ED by ambulance in 32.7% of cases. Most patients (75.5%) were discharged to an inpatient psychiatry unit from the ED. In 17% of patient encounters, the authorization of temporary involuntary hospitalization was lifted and the patient was discharged directly home after the completion of the psychiatry evaluation (Fig. 1).

Of the 98 patients, 5 patients (5.1%) had documentation by the pediatric resident of screening for firearms access (Fig. 2). A total of 73 (74.5%) had documentation of screening for access to firearms during their ED stay by the psychiatry team (Fig. 2); all patients with documented screening by the pediatrics resident also had screening documented by the psychiatry team. No patient without documented screening by a pediatrics resident had screening documented by the pediatric emergency medicine attending. In 25 patients (25.5%), no documentation of access to firearms was present by any provider; and 5 patients (5.1%) were discharged to home without documented screening for access to firearms. One patient (1.0%) had documentation of counseling regarding firearms risk reduction (Table 2).

Patients who arrived by ambulance were significantly more likely to have documentation of firearms screening (odds ratio, 4.77; 95% confidence interval, 1.32–17.6;  $P = .01$ ). Comparison of other categorical variables revealed no other significant association with documentation of firearms screening (Table 2).

## DISCUSSION

Pediatricians across levels of training nearly universally believe that it is their responsibility to reduce the risk of firearm-related injuries through screening and counseling of patients and parents about their risks.<sup>17-19</sup> The majority of providers in the ED also believe that patients with active suicidal ideation always should be asked about their access to firearms.<sup>20</sup> However, our findings indicate that these beliefs often do not translate into practice; pediatric residents rarely document screening for access to firearms in high-risk patients who present to the pediatric ED. Our results are in line with multiple previous studies that have found that pediatric residents do not effectively screen for access to firearms in outpatient settings,<sup>21-23</sup>

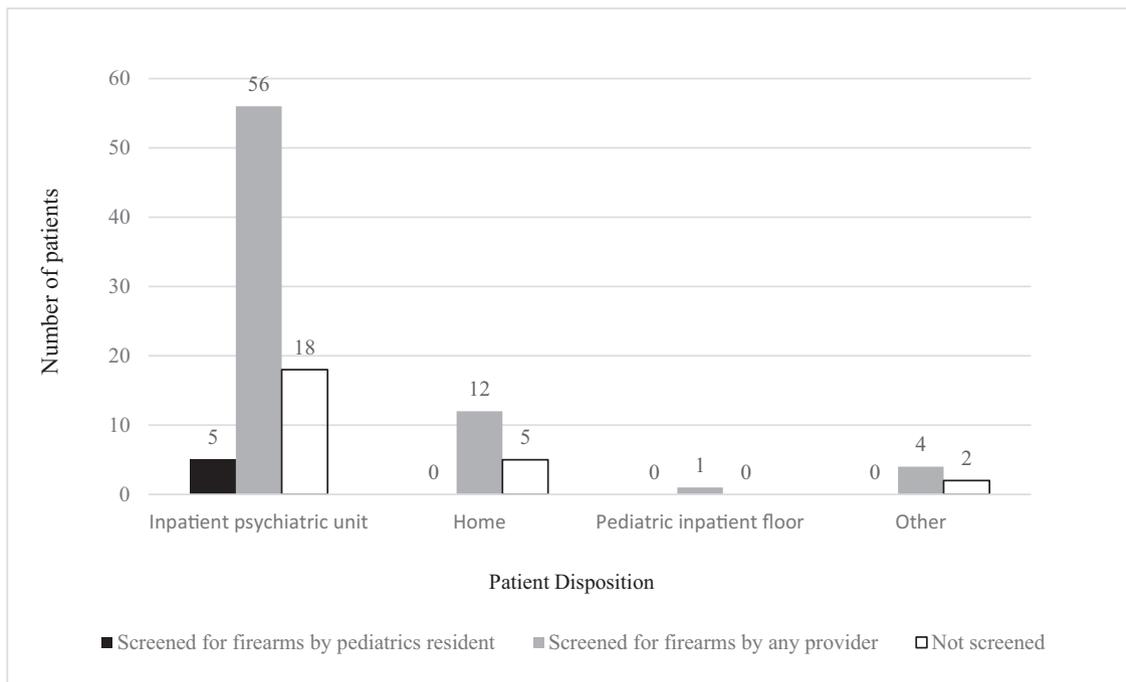
**Table 1.** Patient Characteristics (n = 98)

	n	%
Age, y		
0–9	2	2.0
10–14	47	48.0
15–17	49	50.0
Sex (female)	72	73.5
Primary Language is English	86	87.8
Authorization of temporary involuntary hospitalization filed	93	94.9
Reason for authorization of involuntary hospitalization		
Suicidality	82	83.7
Homicidality	5	5.1
Other	7	7.1
Insurance		
Private	39	39.8
Medicaid	54	55.1
Other/none	5	5.1
Documentation of substance use		
Alcohol	16	16.3
Tobacco	3	3.1
Marijuana	19	19.4
Other	8	8.2
None documented	70	71.4
History of previous suicide attempt	33	33.7
ED visit characteristics		
Method of arrival		
Private car/public transport/walking	33	33.7
Ambulance	32	32.7
Other/unknown	33	33.7
Disposition		
Home	17	17.3
Pediatric inpatient floor	1	1.0
Inpatient psychiatric unit	74	75.5
Other	6	6.1

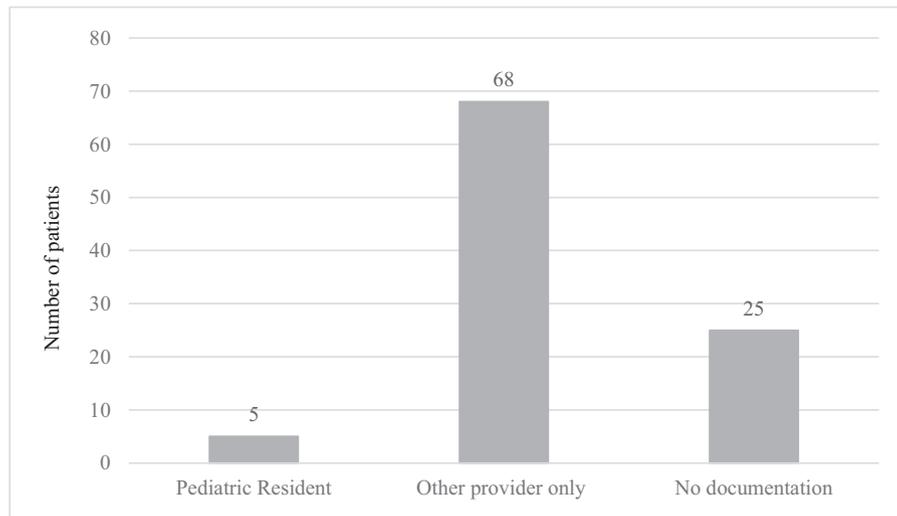
ED indicates emergency department.

ED-based studies in which families reported that they never received risk-reduction counseling,<sup>24</sup> and reports showing that ED providers have low rates of screening on both self-report<sup>12,20</sup> and chart review.<sup>13,14,16</sup>

Our findings are especially concerning because 26% of patients had no documented screening about access to firearms by any provider during their visit, including 5 patients who were discharged directly home. Patients who arrived



**Figure 1.** Patient disposition.



**Figure 2.** Firearms access screening by provider type.

by ambulance were more likely to have documented screening for access to firearms by any provider than those arriving by other means (Table 2). We postulate that arrival by ambulance perhaps conferred a greater sense of urgency to the screening provider and patients may have been perceived to be at greater risk. No other variables in this study were found to be significant predictors of access to firearm

screening during their visit. Pediatric trainees may assume that a patient's access to lethal means will be assessed by other providers later in their visit, as previous research has shown that ED providers believe that this screening is the responsibility of the psychiatry team.<sup>12</sup> These data demonstrate that although this was true in some cases, screening by the psychiatry team was not universal.

**Table 2.** Patient Characteristics by Documentation of Firearms Access Screening

Demographic	Firearms Screening (n = 73)	No Firearms Screening (n = 25)	P Value
Age group, y			.57
0–9	1	1	
10–14	36	11	
15–17	36	13	
Sex			.23
Female	53	19	
Male/other	20	6	
Previous history of suicidality	23	10	.47
Authorization for temporary involuntary hospitalization	71	22	.10
Language			.48
English	62	24	
Spanish/other	11	1	
Method of arrival			.01
Ambulance	29	3	
Other	44	22	
Insurance type			.50
Private	26	13	
Medicaid	43	11	
None	1	0	
Other	3	1	
Substance use disorder			.23
None	49	21	
Alcohol	4	2	
Marijuana	13	1	
Other	7	1	
Disposition			.82
Home	12	5	
Pediatric inpatient floor	1	0	
Inpatient psychiatric unit	56	18	
Other	4	2	
Documentation of firearms risk reduction counseling	1	0	1.0

Although gun ownership in Massachusetts is below the national average, it is still estimated that 12.8% of Massachusetts households contain at least 1 firearm,<sup>25</sup> and 2 families in our review who were asked about firearm access reported the presence of a firearm at home. A recent study found that a child's history of mental illness did not influence caretaker decisions about having firearms in the home or storing them safely in accordance with the recommendations of the American Academy of Pediatrics,<sup>26</sup> which may be due to the fact that many adults are unaware that having a firearm in the home increases the risk of completed suicide.<sup>27</sup> Pediatricians have been shown to be ineffective at predicting which families own firearms<sup>18</sup>; therefore, universal firearms screening, especially in patients presenting with a demonstrated elevated risk of suicide or homicide, is critical.

Multiple barriers to screening previously have been identified, although data are limited and recent evidence is not available. Surveys of residents suggest that many feel they do not have adequate training to counsel on firearm safety.<sup>17,28</sup> Only a fraction of residency training programs in the United States reported having formal training on firearm risk-reduction counseling as part of their standard curriculum.<sup>29,30</sup> This deficiency is addressable. Multiple brief one-time interventions have been developed that have been shown to increase resident comfort with counseling about firearm safety with lasting efficacy.<sup>23,31</sup> Data from other settings also have shown that the use of electronic medical record–based templates can increase rates of screening for firearms,<sup>32</sup> but this strategy's efficacy has not yet been reported in the resident population.

In addition, both pediatric residents and emergency medicine providers have expressed a sense of futility, perceiving that their screening and counseling was unlikely to have an impact.<sup>12,17,33</sup> However, this too may be a point where further education is useful; although data are mixed, multiple studies have shown that physician counseling may have an observable impact on safe firearm storage practices.<sup>34–36</sup>

Our study has several limitations. Because of the retrospective design and chart review methodology, we may have missed instances in which a clinician asked about the presence of firearms in a patient's home or counseled about lethal means restriction if these interactions were not documented in the medical record. The study period included the hospital's transition between electronic medical records, which could have impacted documentation practices, and data from the single year reviewed for this study may not be representative of all patient interactions in our ED. Some patients presenting with suicidal or homicidal ideation may have had different *International Statistical Classification of Diseases and Related Health Problems, 10th revision* codes recorded on discharge and would not have been included in this cohort. In addition, as our data were collected at a single center in a state with a comparatively low prevalence of firearm ownership, the results may not be generalizable to pediatric residents in other programs or other areas of the country with different

levels of or perceptions about gun ownership. Broader data collection will be important for further understanding the scope of the problem and designing life-saving interventions.

## CONCLUSIONS

Pediatric residents rarely screen for access to firearms in high-risk patients in the ED, and many of these patients are not screened by other providers during their visit. The consequences of failing to recognize this significant, potentially modifiable risk factor for completed suicide or homicide can be devastating, and residency programs must work to prioritize training on this topic for pediatric residents.

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