Oregon Health & Science University
School of Medicine

Scholarly Projects Final Report

Title *(Must match poster title; include key words in the title to improve electronic search capabilities.)*

Developing a method for harm reduction of firearms by universal screening and providing safe storage tools in the pediatric emergency department

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Project Course *(Indicate whether the project was conducted in the Scholarly Projects Curriculum; Physician Scientist Experience; Combined Degree Program [MD/MPH, MD/PhD]; or other course.)*

Scholarly Project Curriculum

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Project/Research Question

Does implementation of universal firearm screening and device distribution within the pediatric emergency department result in increased safe storage practices after 3 months?

Type of Project *(Best description of your project; e.g., research study, quality improvement project, engineering project, etc.)*

Harm reduction project

Key words *(4-10 words describing key aspects of your project)*

Harm reduction, firearm screening, safe storage practices, pediatric emergency department

Meeting Presentations
If your project was presented at a meeting besides the OHSU Capstone, please provide the meeting(s) name, location, date, and presentation format below (poster vs. podium presentation or other).

Publications *(Abstract, article, other)*
If your project was published, please provide reference(s) below in JAMA style.

Submission to Archive
Final reports will be archived in a central library to benefit other students and colleagues. Describe any restrictions below (e.g., hold until publication of article on a specific date).

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Next Steps
What are possible next steps that would build upon the results of this project? Could any data or tools resulting from the project have the potential to be used to answer new research questions by future medical students?

Next steps include the follow up 3 month post survey for analysis on continued firearm device usage. Additionally, sub-analysis on device preferences and demographics of populations most utilizing device distribution program may be helpful.

Please follow the link below and complete the archival process for your Project in addition to submitting your final report.

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Student's Signature/Date *(Electronic signatures on this form are acceptable.)*
This report describes work that I conducted in the Scholarly Projects Curriculum or alternative academic program at the OHSU School of Medicine. By typing my signature below, I attest to its authenticity and originality and agree to submit it to the Archive.

X Asia Cayetano 3/16/26

Student's full name

Mentor's Approval *(Signature/date)*

X Beech Burns, 3/19/2026

Mentor Name

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Introduction

In the United States, gun violence is the primary cause of death for children, teens, and young people under 24 years old[1]. A significant proportion of these tragedies unfold within the victim's own home, with 85% of firearm deaths among children under 12 and 39% among teenagers occurring within the household. Moreover, the accessibility of firearms to this demographic is on the rise. Recent data from the 2021 national survey on firearms revealed that approximately 30 million children under 18 reside in households where firearms are kept. Alarmingly, more than 35% of gun owners with children in the US keep their firearms unlocked at home, while 15% keep at least one firearm unlocked and loaded[2]. Studies further highlight that households experiencing firearm-related suicides or unintentional fatal injuries are significantly less likely—by 70% and 73% respectively—to store their firearms securely compared to control groups[3]. This coincides with the pressing issue of gun violence in K-12 schools in the United States. A recent study published in JAMA Pediatrics highlights handguns, not assault rifles, stolen from family or relatives are most used in incidents of school shootings[4].

Clearly, gun violence has become a public health emergency. To address this, the American Association of Pediatrics (AAP) now recommends universal screening for firearms in the home and implementing harm reduction policies. The most recent policy statement from the AAP highlights the importance of providing guidance on safer firearm storage as a part of routine injury prevention discussions[1]. It suggests that healthcare professionals engage in open, nonjudgmental conversations with families about storing firearms safely, including using "smart" gun safety technology or removing firearms from the home. Discussions should be tailored to the family's specific situation to encourage shared decision-making. For families with young children, the focus is on preventing accidental shootings, while for families with adolescents and young adults, the emphasis is on suicide prevention. Healthcare providers should communicate directly about the risks associated with having loaded or unlocked firearms in the house, emphasizing the importance of storing unloaded firearms in a locked box or safe, separately from ammunition, and out of children's reach. Safer storage practices include keeping firearms unloaded and securely locked away, preferably using safety devices like trigger locks or firearm lock boxes. The recommendation also includes providing resources on how to obtain these safety devices if they're not already in use.
Emergency medicine (EM) providers see patients at uniquely teachable moments and have an opportunity to implement harm reduction techniques by providing safe storage tools for families with firearms. In one study, 77% of parent participants responded that they believe pediatrician providers should open conversations around safe storage of firearms[5]. It is already common practice for an EDs to partner with their institution's safety center for provision of resources such as car seats and bicycle helmets, and most safety centers have readily available firearm resources[6]. Developing a streamlined method to connect families who screen positively for unsecured firearms in the home to a safety center with safe storage tools is a natural extension of the ED/safety center relationship. Several pediatric emergency departments (PED) have initiated firearm screening protocols and educational programs targeted at high-risk patients. These interventions have demonstrated tangible enhancements in promoting safer firearm storage practices[7,8]. In the existing programs, a patient will present with a mental health concern and therefore be screened for suicidal ideation or homicidal ideation. If the patient screens positive, they will be given a firearm safety device. This is a good first step in implementing a harm reduction strategy. However, these studies focus primarily on a patient's chief complaint as a risk factor, rather than firearm exposure or access risk. By only screening for patients who present with high-risk mental health complaints, other patients who may benefit from a firearm storage device can be missed.

In the present study, we will expand on the existing approaches by implementing universal screening in the pediatric emergency department, thereby creating an opportunity to offer harm reduction to all patients and their families. This expands the AAP's current recommendations to only implement harm reduction for

patients who screen “high risk” by the traditional definition. In a country where firearms are the leading cause of death in children and youth under the age of 24 years, we argue that anyone living in a home with a firearm is at risk, regardless of mental health status or reason for presenting for medical care. Moreover, existing studies have yet to extend their follow-up evaluations beyond 6 weeks post-intervention. The present study aims to fill this gap by conducting a more extensive follow-up period to investigate whether providing specific storage devices influences long-term firearm safety practices. The ED and Safety Center will collaborate to distribute three distinct types of storage devices—lock boxes, trigger locks, and cable locks. Participants will have the opportunity to select the device that best aligns with their preferences and requirements. This approach collects valuable data that will reveal both preferred devices at the initial time of screening and will demonstrate the most utilized devices over time. Understanding device preferences and utilization allows hospitals to direct resources towards interventions more likely to be effective long term.

Methods

We conducted a prospective survey study to evaluate the implementation of a universal firearm screening and safe storage intervention within the pediatric emergency department at Oregon Health & Science University’s Doernbecher Children’s Hospital. The study population included a convenience sample of adult legal guardians, aged ≥18 years, accompanying pediatric patients, aged <18 years, presenting in the ED for any chief complaint. Participants were excluded if no legal guardians were present, if the patient was medically unstable, or if the family had previously received a firearm storage device from the ED.

Universal screening workflow was integrated in the electronic health record (HER) and performed via nursing staff using a simple 3 question screen; if all firearms in the home are kept locked and away from children, if family is interested in no-to-low-cost storage devices provided in the ED, and if they are willing to be contacted as part of our research study. Families who reported firearms in the home were also offered educational materials on safe storage practices and device options available to them within the ED. Device options for safe storage included cable locks, trigger locks, quick access lockboxes, and biometric lockboxes.

Caregivers willing to participate in the research study were consented, and data collected was to be stored in the REDCap database. Demographic and visit-level data, including age, sex, race, ethnicity, and visit diagnosis were abstracted from the EHR and linked using unique study identifiers. Participants who received a firearms storage device were set to be contacted at the 3-month post-enrollment mark with an 8-item survey assessing device utilization, satisfaction, and ongoing storage practices.

Results

Due to delays in IRB approval and roll-out of this new departmental workflow within the pediatric emergency department for this project, this is an early analysis of a new universal firearm screen and safe storage intervention within the pediatric emergency department. Within the first two week rollout of this new screening workflow, 442 participants were screened for firearms in the home (Table 1). Of those screened at that time period, 294 participants expressed they did not own firearms at all, 98 participants stated all firearms owned were kept locked and away from children in the home, 43 participants stated not all firearms owned are kept locked and away from children in the home, and 7 participants stated they preferred not to answer these questions. Our data showed that among those who screened positive for unsecured firearm storage in a home with children present, interest in harm-reduction interventions

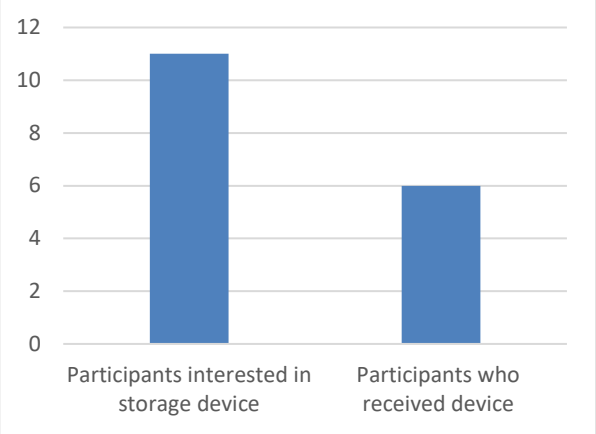
provided in the ED was surprisingly limited. Out of the 442 participants initially screened, roughly 10% endorsed at least one unsecured firearm was present in the home. This is in comparison with the national firearm survey that approximated 35% of firearm owners keep at least one device unsecured[2]. Only eleven families within the first two weeks of this project expressed interest in obtaining a no-cost firearm storage device during their visit to the pediatric emergency department, representing a small subset of those eligible (Table 1). Furthermore, only six families successfully received a storage device prior to discharge including either a cable lock, trigger lock, or quick access lockbox (Table 1). Remaining participants who had expressed interest in a safe storage device at the time of screening, did not appear to have received a device from our workflow charts when they left the department. The five participants who did not obtain a firearm safe storage device were followed up individually by the research members at the Tom Sargent safety center at Doernbecher Children's Hospital and device preferences and distribution were facilitated at a later period. These results were not reflected in the data collection graphs. All participants who were provided with safety storage devices were also given educational flyers on safe firearm storage practices.

Follow-up data at the 3-month post enrollment mark were not yet available at the time of this interim analysis. Ongoing enrollment for this research project is underway and expected to reach the target sample size of 200 participants for an adequately powered study. More data will be available at that time for further statistical analysis of firearm storage device practices pre and post 3 month mark for device distribution. Once the study is completed further data extrapolating demographics of participants will also be reported.

Table 1: Number of firearm screening responses within the pediatric emergency department

Does not own firearms	294
All firearms kept locked and away from children in the home	98
At least one firearm not kept locked and away from children in the home	43
Prefers not to answer	7
Total participants screened	**442**

Figure 1: Number of firearm storage devices requested and distributed



Discussion

In our study, we found that approximately 9.7% of screened participants reported at least one unsecured

firearm in the home with children, which is substantially lower than the 35% prevalence reported in the 2021 national firearm survey[2]. Additionally, although eligible participants who screened positive for firearms in the home were offered no or low-cost storage devices, interest was limited, with only 11 families expressing interest. All together, these findings suggest that while universal screening appears feasible and accepted within the emergency department workflow, both disclosure of unsafe firearm storage practices and acceptance of harm-reduction interventions may be lower than anticipated in our population.

Several factors may explain the difference between observed and expected rates of reported unsecured firearm storage in home with children. First, there may be a social desirability bias influencing caregiver responses, particularly in a high stress setting like the emergency department. Participants may perceive judgement or possible consequences to their care related to firearm ownership. Second, variability in understanding or interpretation of safe firearm storage practices may have contributed to underreporting as caregivers may have considered certain practices as "safe" (e.g., hidden but unlocked firearms in the home) and mischaracterized their response. Third, our specific pediatric population at Oregon Health & Science University may not be capturing a representative look of statewide firearm storage practices compared to national firearms data, given locational access and there being several other emergency departments in the area that families may utilize. Finally, this initial analysis was conducted after two weeks of the new workflow implementation, thus the limited sample size may not yet be reflective of the broader population until our goal sample size is achieved at a later date.

Implementation-related barriers were also seen in our study as 11 families expressed interest in storage devices but only 6 families were reported to have been discharged with their preferred device. Upon further investigation it was found that integration of this new workflow was not consistent across various hospital services such as when patients were admitted to inpatient hospital settings and had left the pediatric ED context. This was addressed with the EHR team and families who did not receive their storage device once leaving the ED, were individually contacted by our safety resource center and provided their preferred devices at a later date which was not reflected in our survey numbers.

Overall, these findings have important implications for public health and harm reduction strategies regarding safe firearm storage. Even with lower-than-expected disclosure rates, only 7 families choose not to disclose or engage in this screen, which may indicate that this universal screen within the ED setting is acceptable to most families and represents a touch point for harm reduction education by ED providers. From a public health perspective, improving firearm safe storage practices by providing universal education and no- to low-cost storage devices remains a critical target given the established association between unsecured firearms and pediatric injury/mortality.

This study has several limitations. The use of a convenience sample at a single academic pediatric ED limits the generalizability. Additionally, self-reported data are subject to bias as discussed previously and may not be representative of actual firearm storage practices. The short duration of this initial analysis and incomplete enrollment limits interpretation of trends and does not yet provide enough data to answer or primary outcome of sustained device use after 3 months. Future steps include concluding this study analysis by conducting data and statistical analysis on participants at the 3-month post-enrollment mark. Continued refinement of survey language and education, staff training, and EHR workflow may improve enrollment and disclosure of firearm storage practices to better conduct safety discussion in the healthcare setting. Additionally, sub analyses on participant demographics may provide insight into how best to serve the needs of our specific gun owning population within the greater Portland area. Addressing these topics will help in shaping effective harm-reduction strategies and future injury prevention efforts across general

pediatric populations as opposed to prior studies that only those looked at populations deemed “higher risk” for firearm injuries.

Conclusions

Universal firearm screening in the pediatric emergency department is feasible and widely acceptable to families, but early implementation demonstrated lower-than-expected disclosure of unsafe firearm storage practices and uptake of no- to low-cost safety devices. These findings highlight the need for continued enrollment and follow-up to determine long-term impacts on safe firearm storage practices. Continued refinement of screening protocol and streamlined workflows will also help enhance identification of current firearm storage practices and preferred harm-reduction interventions.

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