

## **Keeping Kids Safe from Guns: Talking about gun safety during hospitalization**

### **Background**

Pediatric firearm-related injuries are a public health crisis in the United States.<sup>1,2</sup> Over 25% of parents report owning guns, yet, less than 50% store them safely.<sup>3</sup> The American Academy of Pediatrics recommends a firearm-free household, but for gun-owning-families, safe storage with gun and ammunition locked separately to protect children.<sup>4</sup> Outpatient and emergency department counseling on firearm safety can increase the likelihood of safe storage, particularly when coupled with providing free safe storage devices.<sup>5-9</sup> The inpatient setting, where patients and families often have substantial downtime, has been successfully utilized for other family behavior change interventions for parents of hospitalized children, best studied with smoking cessation.<sup>10,11</sup> Currently, no published studies have examined the effectiveness of firearm safety counseling for parents in the inpatient setting.

Everytown for Gun Safety is a group promoting safer gun laws and safe storage of firearms, and created a non-political campaign aimed at safe firearm practices in the home—"Be SMART."<sup>12</sup> Be SMART focuses on adult responsibility to practice firearm safety, rather than relying on children, since child behavior interventions have been proven ineffective.<sup>13</sup> Be SMART also provides counseling for non-firearm-owning families, recommending asking about firearms prior to playing in another person's home. Be SMART can serve as a simple, universal counseling tool for all parents, but it has not been formally studied as an intervention tool. We hypothesize that utilizing this intervention can improve parental knowledge, attitudes and practices regarding firearm safety, particularly as it relates to asking about guns in the homes of others when their children go to play, and that formal physician reinforcement adds to its effectiveness. If successful, this would limit children's access to unsecured firearms.

The primary aim of the study is to determine whether the Be SMART campaign delivered to parents in a hospital setting leads to an improvement in knowledge, attitudes, and practices about firearm safety. The secondary aim is to determine whether the intervention is more effective when delivered with physician face-to-face counseling in addition to with video and written materials, or with standardized video and written materials alone.

### **Study Aims:**

1. To measure whether parents' knowledge, attitudes, and practices change after a brief educational intervention on gun safety
2. To measure the knowledge, attitudes, and practices of parents in a tertiary care children's hospital regarding firearm safety practices
3. To compare the efficacy of two methods of delivery of counseling: a video alone versus a video plus a physician-delivered intervention
4. To measure whether these changes in practices are sustained one month after the intervention

### **Methods**

*Study Design:* This is a randomized controlled 3-arm pre-/post-intervention study to investigate the effect of an educational intervention using a Be SMART video and written material on parental/legal guardian knowledge, attitudes and practices regarding firearm safety. We will collect information about baseline and post-intervention knowledge, attitudes and practices regarding firearm safety using survey questions developed in other published studies.<sup>6,14-18</sup> An

additional element of the study design includes a randomized controlled trial to investigate any additional effect of a pediatrician delivered educational intervention on parental/legal guardian knowledge, attitudes and practices regarding firearm safety. Given that tobacco smoke exposure interventions have been previously studied in hospitalized children, we will use a video and written materials on tobacco smoke exposure education as our control group.<sup>19</sup> We will use survey techniques to determine baseline and post-intervention knowledge, attitudes and practices regarding firearm safety in parents/legal guardians of hospitalized children <20 years old.

**Study population:** We will include all parents/legal guardians of children <20 years old hospitalized at CHAM, who reside with their child. We will exclude those previously enrolled in the study, parent/legal guardian preferred language other than English or Spanish, hospitalized in the Pediatric Intensive Care Unit/critically ill child, or parent/legal guardian acutely distressed.

**Study procedure:** After informed consent, study personnel will administer a verbal survey. The participant will be randomized (in blocks of 15) to one of three groups:

1. Be SMART alone group: To view the Be SMART video and to receive Be SMART written material alone, or
2. Be SMART + MD group: To view the Be SMART video and to receive Be SMART written material and subsequent review/reinforcement of all 5 elements of Be SMART (**S**ecure all guns, **M**odel responsible behavior, **A**sk about guns in homes of others, **R**ecognize risk of teen suicide, **T**ell your peers to be SMART) with a pediatrician (“materials + MD” group) using a standardized checklist.
3. Control Group: To view the “Kids and Smoke Don’t Mix”<sup>12</sup> and to receive written materials from the New York State Smokers Quitline.

Following the intervention, study personnel will verbally administer a brief post-intervention survey, repeated one month later via telephone.

## **Evaluation**

**Primary outcome:** change in parent/legal guardian’s intention to ask whether or not there are guns when their child/children goes to play in another’s person’s home, as indicated by a Likert scale assignment of an ordinal value (1-5, 1= very unlikely, 2=unlikely, 3=unsure, 4=likely, 5=very likely).

**Secondary outcomes:** change in the primary outcome (intention to ask noted above) between the intervention groups (materials alone vs. materials + MD), demographic factors associated with primary outcome, and description of parents’ attitudes towards guns and regarding physicians discussing firearm safety with them.

**Data Analysis:** The main objective of the data analysis is to assess within each intervention group whether the general parental practice of asking about firearms in the homes of others when their children go to play is increased after the intervention. A secondary objective is to perform a head-to-head comparison of the magnitude of the intervention effects between the groups. Pilot data revealed the proportion of the population who either “always” or “most of the time” ask about firearms in the homes of others when their children went to play was 50%. With a sample size of 60 subjects in the Be SMART alone group, the study will have 80% power using the McNemar’s test with a two-sided alpha=0.05 level to detect an absolute increase of 20% between the pre-intervention and post-intervention responses (i.e. raising the proportion of those who either “most of the time” or “always” ask about firearms in the homes of others when their children went to play from 50% to 70%). For the Be SMART + MD group, we expect the pre- post intervention effect to be larger, i.e., increase from 50% before the intervention to 80% after the intervention in the proportion of the population who either “most of the time” or “always” asked about firearms. With a sample size of 60 subjects in the Be SMART + MD group, the

study will have greater than 95% power to detect this difference using the McNemar's test with a two-sided alpha=0.05 level. We expect minimal change in the pre- and post-survey responses in the control group. For the comparisons between treatment arms, we will focus on the subset of parents who initially responded that they were not likely to ask about firearms before the intervention (expected to be ~ 50% of parents) and assess whether the proportion who changed their response to "most of the time" or "always" after the intervention is greater in those who were in either of the Be SMART groups compared to the control group. With 60 subjects in each of the 3 study groups, the study will have 80% power to detect an increase in this proportion from 10% in the control group (which is a conservative assumption) to 40% in either the Be SMART alone or Be SMART + MD group using a two-sample test of proportions and a two-sided alpha=0.05 level.

We anticipate the majority of the subjects enrolled will complete the inpatient portion of the study, however, we estimate up to 20% will not be able to be reached by phone for the 30-day follow up call. Therefore, given that our primary outcome is based on behavior assessed at the 30-day follow up phone call, we will add to each study group 15 patients to give each study group a total of 75 patients, and the overall study population will be 225 patients.

For within-group data analysis, we will use standard descriptive statistics to summarize the data and McNemar's test or the paired T- test to assess the significance of pre-post intervention differences in binary and continuous outcomes, respectively. In secondary analysis, we will analyze the parents who responded before the intervention: "rarely", "never", or "sometimes" to ask about firearms in the homes of others when their children went to play groups and compare across interventions the proportion who changed their response to "most of the time" or "always" after the intervention using the chi-square or Fisher's exact test. We will also use logistic regression models to analyze factors associated with the likelihood to ask about firearms in the homes of others when children go to play.

### **Projected Outcomes and Future Studies**

If this intervention is found to be effective, it is a simple, relatively low-cost, reproducible intervention that could change practice to help limit children accessing unsecured firearms. Regardless of effect of this intervention, from enrollment survey questions, this study will describe general knowledge, attitudes and practices regarding firearm safety that may help direct future interventions in an urban, underserved population, and potentially also contribute needed data directed at policy and legislative efforts on gun safety.

Following this study, we would hope to do a multi-centered version of this study to examine the effect of this intervention in slightly different settings with potentially varied "gun culture". Further studies could also look at from this how to develop additional community resources to help decrease gun violence.

### **Study Team**

Our study team has experience successfully managing, completing and publishing pediatric clinical trials as well as large pediatric studies. Dr. Silver was the Principal Investigator (PI) for an inpatient pediatric clinical trial utilizing hypertonic saline for bronchiolitis (published in *Pediatrics*, December 2015). Drs. Azzarone and O'Connor were co-investigators in that trial. Dr. Rinke has been the PI for and recipient of several NIH grants resulting in several publications focused on reducing medical harm.

## References

1. Centers for Disease CaP. Web-based Injury Statistics Query and Reporting System (WISQARS). 2014.
2. Leventhal JM, Gaither JR, Sege R. Hospitalizations due to firearm injuries in children and adolescents. *Pediatrics*. 2014;133(2):219-225.
3. Farah MM, Simon HK, Kellermann AL. Firearms in the home: parental perceptions. *Pediatrics*. 1999;104(5 Pt 1):1059-1063.
4. Dowd MD, Sege RD, Council on Injury V, Poison Prevention Executive C, American Academy of P. Firearm-related injuries affecting the pediatric population. *Pediatrics*. 2012;130(5):e1416-1423.
5. Barkin SL, Finch SA, Ip EH, et al. Is office-based counseling about media use, timeouts, and firearm storage effective? Results from a cluster-randomized, controlled trial. *Pediatrics*. 2008;122(1):e15-25.
6. Carbone PS, Clemens CJ, Ball TM. Effectiveness of gun-safety counseling and a gun lock giveaway in a Hispanic community. *Arch Pediatr Adolesc Med*. 2005;159(11):1049-1054.
7. Kruesi MJ, Grossman J, Pennington JM, Woodward PJ, Duda D, Hirsch JG. Suicide and violence prevention: parent education in the emergency department. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1999;38(3):250-255.
8. Rowhani-Rahbar A, Simonetti JA, Rivara FP. Effectiveness of Interventions to Promote Safe Firearm Storage. *Epidemiologic reviews*. 2016;38(1):111-124.
9. McGee KS, Coyne-Beasley T, Johnson RM. Review of evaluations of educational approaches to promote safe storage of firearms. *Injury prevention : journal of the International Society for Child and Adolescent Injury Prevention*. 2003;9(2):108-111.
10. Ralston S, Roohi M. A randomized, controlled trial of smoking cessation counseling provided during child hospitalization for respiratory illness. *Pediatr Pulmonol*. 2008;43(6):561-566.
11. Ralston S, Grohman C, Word D, Williams J. A randomized trial of a brief intervention to promote smoking cessation for parents during child hospitalization. *Pediatr Pulmonol*. 2013;48(6):608-613.
12. Everytown for Gun Safety. Be SMART. 2015; <http://besmartforkids.org>. Accessed Feb 5, 2016.
13. Himle MB, Miltenberger RG, Gatheridge BJ, Flessner CA. An evaluation of two procedures for training skills to prevent gun play in children. *Pediatrics*. 2004;113(1 Pt 1):70-77.
14. DuRant RH, Barkin S, Craig JA, Weiley VA, Ip EH, Wasserman RC. Firearm ownership and storage patterns among families with children who receive well-child care in pediatric offices. *Pediatrics*. 2007;119(6):e1271-1279.
15. Sheley JF, Brewer VE. Possession and carrying of firearms among suburban youth. *Public health reports*. 1995;110(1):18-26.
16. Forbis SG, McAllister TR, Monk SM, Schlorman CA, Stolfi A, Pascoe JM. Children and firearms in the home: a Southwestern Ohio Ambulatory Research Network (SOAR-Net) study. *Journal of the American Board of Family Medicine : JABFM*. 2007;20(4):385-391.
17. Pelucio M, Roe G, Fiechtl J, et al. Assessing survey methods and firearm exposure among adolescent emergency department patients. *Pediatric emergency care*. 2011;27(6):500-506.
18. Stevens MM, Gaffney CA, Tosteson TD, et al. Children and guns in a well child cohort. *Preventive medicine*. 2001;32(3):201-206.
19. Walley SC, Chime C, Powell J, Walker K, Burczyk-Brown J, Funkhouser E. A Brief Inpatient Intervention Using a Short Video to Promote Reduction of Child Tobacco Smoke Exposure. *Hospital pediatrics*. 2015;5(10):534-541.