OPEN

Survey of American College of Surgeons Committee on trauma members on firearm injury: Consensus and opportunities

Deborah A. Kuhls, MD, Brendan T. Campbell, MD, MPH, Peter A. Burke, MD, Lisa Allee, MSW, Ashley Hink, MD, Robert W. Letton, MD, Peter T. Masiakos, MD, Michael Coburn, MD, Maria Alvi, MHA, Trudy J. Lerer, MS, Barbara A. Gaines, MD, Michael L. Nance, MD, Douglas J.E. Schuerer, MD, Tina L. Palmieri, MD, James W. Davis, MD, Douglas M. Geehan, MD, James K. Elsey, MD, Beth H. Sutton, MD, Mark P. McAndrew, MD, Ronald I. Gross, MD, Donald N. Reed, Jr., MD, Don H. Van Boerum, MD, Thomas J. Esposito, MD, Roxie M. Albrecht, MD, Babak Sarani, MD, David S. Shapiro, MD, Katie Wiggins-Dohlvik, MD, Ronald M. Stewart, MD,
and **for the American College of Surgeons Committee on Trauma**, *Chicago, Illinois*

AAST Continuing Medical Education Article

Accreditation Statement

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education through the joint providership of the American College of Surgeons and the American Association for the Surgery of Trauma. The American College Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this journal-based CME activity for a maximum of 1 *AMA PRA Category 1 Credit*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the *AMA PRA Category 1 Credit*™ listed above, a maximum of 1 credit meets the requirements for self-assessment.

Credits can only be claimed online

AMERICAN COLLEGE OF SURGEONS

Inspiring Quality:
Highest Standards, Better Outcomes

100+*years*

Objectives

After reading the featured articles published in the *Journal of Trauma and Acute Care Surgery*, participants should be able to demonstrate increased understanding of the material specific to the article. Objectives for each article are featured at the beginning of each article and online. Test questions are at the end of the article, with a critique and specific location in the article referencing the question topic.

Claiming Credit

To claim credit, please visit the AAST website at http://www.aast.org/ and click on the "e-Learning/MOC" tab. You must read the article, successfully complete the post-test and evaluation. Your CME certificate will be available immediately upon receiving a passing score of 75% or higher on the post-test. Post-tests receiving a score of below 75% will require a retake of the test to receive credit.

System Requirements

The system requirements are as follows: Adobe® Reader 7.0 or above installed; Internet Explorer® 7 and above; Firefox® 3.0 and above, Chrome® 8.0 and above, or Safari™ 4.0 and above.

Questions

If you have any questions, please contact AAST at 800-789-4006. Paper test and evaluations will not be accepted.

Disclosure Information

In accordance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this journal activity, must ensure that anyone in a position to control the content of *J Trauma Acute Care Surg* articles selected for CME credit has disclosed all relevant financial relationships with any commercial interest. Disclosure forms are completed by the editorial staff, associate editors, reviewers, and all authors. The ACCME defines a `commercial interest' as "any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients." "Relevant" financial relationships are those (in any amount) that may create a conflict of interest and occur within the 12'months preceding and during the time that the individual is engaged in writing the article. All reported conflicts are thoroughly managed in order to ensure any potential bias within the content is eliminated. However, if you'perceive a bias within the article, please report the circumstances on the evaluation form.

Please note we have advised the authors that it is their responsibility to disclose within the article if they are describing the use of a device, product, or drug that is not FDA approved or the off-label use of an approved device, product, or drug or unapproved usage.

Disclosures of Significant Relationships with Relevant Commercial Companies/Organizations by the Editorial Staff

Ernest E. Moore, Editor: PI, research support and shared U.S. patents Haemonetics; PI, research support, TEM Systems, Inc. Ronald V. Maier, Associate editor: consultant, consulting fee, LFB Biotechnologies. Associate editors: David Hoyt and Steven Shackford have nothing to disclose. Editorial staff: Jennifer Crebs, Jo Fields, and Angela Sauaia have nothing to disclose."

Author Disclosures

Maria Alvi: employment, American College of Surgeons. Beth H. Sutton: board member, American College of Surgeons. Ronald M. Stewart: travel, American College of Surgeons. The remaining authors have nothing to disclose.

Reviewer Disclosures

Reviewer #1: grants, Haemonetics; grant, TEM Systems, Inc. The remaining reviewers have nothing to disclose.

Cost

For AAST members and *Journal of Trauma and Acute Care Surgery* subscribers there is no charge to participate in this activity. For those who are not a member or subscriber, the cost for each credit is $25.

BACKGROUND: In the United States, there is a perceived divide regarding the benefits and risks of firearm ownership. The American College of Surgeons Committee on Trauma Injury Prevention and Control Committee designed a survey to evaluate Committee on Trauma (COT) member attitudes about firearm ownership, freedom, responsibility, physician-patient freedom and policy, with the objective of using survey results to inform firearm injury prevention policy development.

METHODS: A 32-question survey was sent to 254 current U.S. COT members by email using Qualtrics. SPSS was used for χ^2 exact tests and nonparametric tests, with statistical significance being less than 0.05.

RESULTS: Our response rate was 93%, 43% of COT members have firearm(s) in their home, 88% believe that the American College of Surgeons should give the highest or a high priority to reducing firearm-related injuries, 86% believe health care professionals should be allowed to counsel patients on firearms safety, 94% support federal funding for firearms injury prevention research. The COT participants were asked to provide their opinion on the American College of Surgeons initiating advocacy efforts and there was 90% or greater agreement on 7 of 15 and 80% or greater on 10 of 15 initiatives.

CONCLUSION: The COT surgeons agree on: (1) the importance of formally addressing firearm injury prevention, (2) allowing federal funds to support research on firearms injury prevention, (3) retaining the ability of health care professionals to counsel patients on firearms-related injury prevention, and (4) the majority of policy initiatives targeted to reduce interpersonal violence and firearm injury. It is incumbent on trauma and injury prevention organizations to leverage these consensus-based results to initiate prevention, advocacy, and other efforts to decrease firearms injury and death. (*J Trauma Acute Care Surg.* 2017;82: 877–886. Copyright © 2017 The Author(s). Published by Wolters Kluwer Health, Inc. on behalf of the American Association for the Surgery of Trauma.)

LEVEL OF EVIDENCE: Prognostic/epidemiologic study, level I; therapeutic care, level II.

KEY WORDS: Firearm injury; injury prevention; violence prevention; advocacy.

The debate about firearms and firearm-related violence in America centers on the concerns of personal liberties and personal safety. The nature of the debate has led to polarization and entrenched viewpoints; however, there appears to be agreement among health care providers that firearm-related violence is a public health problem and, like other issues involving violence or injury that impact the American public's health, this too must be approached in a similar fashion.[1–3]

Although firearm injured patients comprise only 4% of the patients U.S. trauma centers treat,[4] they account for over 17% of the overall burden of injury deaths in the United States. Since 2010, there have been on average 32,529 firearm deaths (per year) in the United States (rate of 10.2 per 100,000), which is roughly equivalent to deaths as a result of motor vehicle crashes or falls. In comparison, the mortality rate of nonfirearm violence is about 8 per 100,000.[5] As with other mechanisms of injury, most of these injuries are potentially preventable. In contrast to motor vehicle crash death rates, which have fallen (likely due to effective prevention strategies), U.S. firearm injury death rates have remained largely static. Additionally, the cost to care for these potentially preventable firearm injuries has continued to grow, with a cumulative cost in 2010 of US $174 billion.[6]

The American College of Surgeons (ACS) Committee on Trauma (COT) members have a long history of working to curb firearm violence. The ACS COT is committed to (1) addressing firearm injury as public health and trauma system problem; (2) implementing effective violence prevention strategies through the network of approximately 450 U.S. trauma centers; and 3) fostering and promoting the COT as a model forum for civil, collegial, and professional dialogue with the goal of moving toward a consensus on how to most effectively reduce firearm deaths and complications. As a part of this process, the Injury Prevention and Control Committee felt it was important to identify areas of agreement and disagreement within our organization to forge a meaningful and effective consensus approach to decreasing firearms-related injuries, deaths, and resultant health care costs in the United States. Therefore, to better understand the beliefs of our colleagues and to gain insight into areas of consensus on firearm injury prevention, we designed a survey of U.S. ACS COT members.[2] We hypothesized that the survey would help the ACS COT to identify topical areas and initiatives where consensus could be reached.

MATERIALS AND METHODS

The injury prevention and control committee of the ACS COT developed a 32-question anonymous survey to gather demographic data and to evaluate U.S. COT member attitudes regarding firearms and firearm injury. More specifically, survey questions were crafted to better understand COT member views on firearm ownership, freedom, responsibility and potential policy approaches to firearm injury prevention. All authors reviewed

Submitted: August 31, 2016, Revised: November 15, 2016, Accepted: November 18, 2016, Published online: February 24, 2017.

From the American College of Surgeons Committee on Trauma Injury Prevention and Control Committee (D.A.K., B.T.C., P.A.B., L.A., A.H., R.W.L., P.T.M., M.C., M.A., T.J.L., B.A.G., M.L.N., D.J.E.S., T.L.P, J.W.D., D.M.G., J.K.E., B.H.S., M.P.M., R.I.G., D.N.R., D.H.V.B., T.J.E., R.M.A., B.S., D.S.S., K.W-D., R.M.S.), Chicago, Illinois.

This study was presented at the 75th annual meeting of American Association for the Surgery of Trauma and Clinical Congress of Acute Care Surgery, September 14–17, 2016, in Waikoloa, Hawaii.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text, and links to the digital files are provided in the HTML text of this article on the journal's Web site (www.jtrauma.com).

Address for reprints: Deborah A, Kuhls, MD, University of Nevada, Reno School of Medicine, 1701, West Charleston Boulevard, Suite 490, Las Vegas, NV 89102; email: dkuhls@medicine.nevada.edu.

DOI: 10.1097/TA.0000000000001405

and edited multiple iterations of the survey for accuracy, clarity, readability and validity.

The research protocol and survey instrument were submitted to the Boston Medical College Institutional Review Board and determined to be exempt. The survey instrument was emailed to the 254 current U.S. COT members in December 2015, along with a cover email from the Chair of the COT. Multiple additional reminder emails were sent before the survey was closed in February 2016. Survey data were tabulated using Qualtrics software, version 12.2015 (Qualtrics, Provo, Utah). Incomplete surveys (33), surveys completed by COT members not residing in the United States,[7] and duplicate surveys from the same IP address[4] were excluded from analysis.

Data were analyzed using descriptive statistics. Groups were compared using χ^2 and exact tests for categorical variables and Mann-Whitney and Kruskal-Wallis nonparametric tests for ordinal variables. A significance level of 0.05 was used. Statistical analyses were performed using SPSS Statistics, version 21 (IBM, Armonk, NY).

Open-ended responses were reviewed by two independent reviewers for inter-rater reliability. The comments were categorized into five separate categories based on the level of support for COT efforts to address firearm violence. Each of the comments was then independently reviewed to identify major themes 3that emerged from the comments. The recurrent themes were then quantified to identify the most common response themes. Several demographic questions included options of "other" or "prefer not to specify."

RESULTS

Deidentified responses from 237 U.S. COT members comprised the cohort for analysis (237 of 254 or 93.3% response rate). There was at least one survey participant from each state, the District of Columbia and Puerto Rico.

The mean participant age was 52 years (range, 36–75 years), 88% men, 85% white, 3.4% Hispanic/Latino. Fifty-eight percent had one or more children residing in their home, and 29% had military experience. Eighty-one percent of respondents were trauma, general, or acute care surgeons, and 80% were from Level I trauma centers. Eighty-three percent of participants treat children with firearms injuries and 93% treat adult patients. Sixty-eight percent of respondents had firearms training. 43% had at least one firearm in the home. Fifty-four percent of those with a firearm in the home possess a concealed carry permit, 33% of respondents had themselves been personally injured, or had a family member or close friend(s) injured or killed by a firearm.

The presence or absence of firearms in the home by respondent demographic characteristics is included as Table 1. In comparison to the general study population, there were significant differences in the percentage of respondents with firearms in the home when analyzed by Hispanic/Latino ethnicity, military experience, Centers for Disease Control and Prevention region and firearm injury or death in relatives or close friends. There was no difference in firearms ownership rates by gender, race, practice location (not shown), or type of clinical practice (not shown).

Most firearm ownership is self (91%), followed by spouse (39%), adult children (10%), and children younger than 18 years (12%). Firearms owned included: long guns/rifles 86%, hand guns 82%, magazine fed semiautomatic rifles (AR 15 type) 35%, NFA II weapons 7%, and black powder 11%. The mean number of firearms in the home was eight (range, 1–50). Firearms were used for target shooting (71%), self-defense (66%), hunting (51%), collecting (24%), competition (11%), and work (4%). Firearm safety included storage in a safe (72%), separation of ammunition (73%), and trigger locks (34%). Fifty-four percent of survey participants with home firearms possess a concealed carry permit. Among responders who do not have firearms in their home, 19% indicated someone in their household had owned firearm(s) in the past.

TABLE 1. Demographic Characteristics of COT Members With Firearms in the Home

Demographic Variable	Firearm in Home	% Firearm in Home
Male	90/207	43.5%
Female	11/29	37.9%
White	91/201	45.3%
Black	2/10	20%
Asian	3/13	23.1%
Other race	5/13	38.4%
Hispanic/Latino	0/8*	0%*
Not Hispanic/Latino	94/213*	44.1%*
Married	90/209	43.1%
Not married	10/23	43.5%
No military experience	62/168**	36.9%**
Military experience	39/69**	56.5%**
Northeast	5/35†	14.3%†
South	44/78†	56.4%†
Midwest	27/56†	48.2%†
West	25/66†	37.9%†
Experience firearm injury/death	41/78*	32.9%*
No experience firearm injury/death	60/159*	59.4%*

*$p < 0.05$ **$p = 0.006$ †$p < 0.001$.

Personal Opinion Results

Seven personal opinion questions related to mass casualty events, firearms injury prevention including research, firearms ownership, and physician right to counsel patients about preventing gun-related injuries showed no statistically significant difference when analyzed by demographic factors.

Over 86% of respondents indicated that health care professionals should be allowed to counsel patients (or parents of their patients) about preventing gun-related injuries. Eighty-eight percent of participants thought that the ACS should make gun-related injury a high (52%) or the highest priority (36%). Eighty-six percent felt that it was personally important for the ACS COT to agree on a plan to decrease gun-related violence. Ninety-four percent of survey respondents indicated that Federal funding should be allowed for research on the epidemiology and prevention of gun-related injuries.

In terms of personal ownership of firearms in the United States, 28% felt that firearms ownership is beneficial, a critical liberty/right; 24% felt ownership was generally beneficial, an important liberty; 16% had no strong opinion either way; 22% felt that personal ownership of firearms was generally harmful; 8% felt it was harmful and not a right; and 2.5% were unsure.

When asked if they were concerned that a mass shooting could happen in their community, 52% were extremely or very concerned and 35% moderately concerned. When asked if they would be more likely to purchase a firearm after a mass shooting, 21% were much more or somewhat more likely, 8% were somewhat or much less likely, 69% indicated they were neither more nor less likely, and 2% were unsure.

American College of Surgeons Advocacy Opinion Results

The COT participants were asked to rate their "opinion on the American College of Surgeons initiating efforts to advocate for or support legislation" in 15 specific areas. All responses were analyzed with respect to the presence or absence of firearms in the home, gender, and military experience of any type.

Table 2 presents the responses of COT participants in total, as well as responses sorted by presence or absence of firearms in the home. There was 90% or greater overall support for 7 of 15 potential advocacy initiatives; 80% or more support for 10 of 15 potential initiatives. In these 10 areas with greater than 80% support, respondents who had firearm(s) in the home had lower support in 8 of the 10 areas. Support was above 65% in all of these 10 areas for all subgroups analyzed (firearms in home, gender, military service, and ethnicity). Of the 15 potential initiatives, there were statistically significant differences in 13 based on presence of firearm(s) in the home.

Table 3 presents results of a comparison of those with and without military experience. Differences existed in support for 3 of the 15 initiatives: civilian access to assault weapons, ammunition designed for military or law enforcement use and the development of technology that identifies the ammunition purchaser. Those with military experience were less likely to support those initiatives compared to those without military experience. Table 4 presents the results by gender. Differences existed in 2 of 15 topical areas: mandatory background checks and restricting civilian access to assault weapons. Women were statistically more likely to support these initiatives than men.

Table 5 presents the combined results of COT member responses that strongly agree or agree on all 15 possible initiatives. Consensus at the 80% level existed in 10 of 15 advocacy topics.

TABLE 2. Firearm(s) in Home and Support for ACS Initiating Advocacy Efforts on 15 Topics

Advocacy Issue	Firearm(s) in Home	Strongly Support	Support	Neutral	Oppose	Strongly Oppose
a. Mandatory background checks and license/permit for all firearm purchases including those from authorized dealers, gun shows, or private sales before purchase	No†	89%	7%	3%	1%	0%
	Yes†	58%	14%	6%	7%	15%
b. Preventing people with mental health illness from purchasing firearms	No**	86%	9%	4%	1%	0%
	Yes**	73%	14%	6%	3%	4%
c. Mandatory prosecution of convicted felons who are unlawfully attempting to purchase a firearm or body armor, but denied due to background check	No	71%	23%	5%	1%	0%
	Yes	62%	29%	5%	0%	4%
d. Preventing people who are on the US No Fly list to purchase firearms	No*	74%	14%	9%	3%	1%
	Yes*	62%	17%	9%	6%	6%
e. Efforts to increase penalties for purchasers that provide guns to individuals illegally (straw purchasers) and dealers that sell firearms through illegal means or bypassing background checks	No*	85%	13%	2%	0%	0%
	Yes*	69%	16%	7%	3%	5%
f. Improve mental health screening and treatment for Americans to help reduce suicides and gun-related violence	No	71%	24%	4%	1%	0%
	Yes	67%	24%	5%	1%	3%
g. Preserving the right of physicians and health care providers to counsel their patients or the parents of their patients on safe firearm ownership	No†	80%	15%	5%	0%	0%
	Yes†	62%	22%	10%	3%	3%
h. Requiring safety features to promote gun safety, including child-proof locks and "smart gun" technology	No†	80%	15%	5%	0%	0%
	Yes†	44%	23%	11%	11%	11%
i. Encouraging the development and use of technology that identifies the purchaser of ammunition fired from a firearm	No†	71%	18%	7%	2%	1%
	Yes†	32%	23%	24%	10%	12%
j. Requiring firearms owners to be 21 years of age or older	No†	56%	14%	20%	7%	3%
	Yes†	28%	13%	22%	25%	12%
k. Identifying and implementing evidence-based injury prevention programs that decrease firearm injuries (in partnership with other professional organizations or independently).	No†	81%	16%	3%	0%	0%
	Yes†	58%	29%	8%	2%	3%
l. Creating a federal database to track firearm sales	No†	60%	23%	11%	3%	3%
	Yes†	35%	17%	17%	10%	21%
m. Advocacy efforts to restrict civilian access to assault rifles (magazine fed, semi-automatic, i.e., AR-15)	No†	75%	15%	6%	2%	2%
	Yes†	34%	10%	18%	12%	27%
n. Advocacy efforts to limit civilian access to types of ammunition designed for military or law enforcement use (i.e., armor piercing, large magazine capacity	No†	78%	15%	5%	0%	2%
	Yes†	40%	14%	14%	14%	18%
o. Making funds available for research to better understand gun violence and how to prevent gun violence	No†	84%	15%	1%	0%	0%
	Yes†	57%	25%	10%	3%	5%

*$p < 0.05$ **$p < 0.01$ †$p < 0.001$, comparing No to Yes.

TABLE 3. Military Experience and Support for ACS Initiating Advocacy Efforts on 15 Topics

Advocacy Issue	Military Experience	Strongly Support	Support	Neutral	Oppose	Strongly Oppose
a. Mandatory background checks and license/permit for all firearm purchases including those from authorized dealers, gun shows, or private sales prior to purchase	No	77%	11%	3%	4%	6%
	Yes	74%	9%	7%	3%	7%
b. Preventing people with mental health illness from purchasing firearms	No	82%	11%	4%	2%	1%
	Yes	77%	12%	6%	1%	4%
c. Mandatory prosecution of convicted felons who are unlawfully attempting to purchase a firearm or body armor, but denied due to background check	No	67%	26%	5%	1%	1%
	Yes	67%	23%	4%	1%	4%
d. Preventing people who are on the US No Fly list to purchase firearms	No	71%	14%	11%	2%	2%
	Yes	64%	19%	4%	9%	4%
e. Efforts to increase penalties for purchasers that provide guns to individuals illegally (straw purchasers) and dealers that sell firearms through illegal means or bypassing background checks	No	80%	5%	3%	1%	1%
	Yes	74%	12%	7%	3%	4%
f. Improve mental health screening and treatment for Americans to help reduce suicides and gun-related violence	No	70%	25%	4%	1%	0%
	Yes	67%	23%	6%	0%	4%
g. Preserving the right of physicians and health care providers to counsel their patients or the parents of their patients on safe firearm ownership	No	75%	17%	6%	1%	1%
	Yes	68%	17%	9%	3%	3%
h. Requiring safety features to promote gun safety, including child-proof locks and "smart gun" technology	No	68%	18%	7%	3%	4%
	Yes	56%	20%	9%	9%	6%
i. Encouraging the development and use of technology that identifies the purchaser of ammunition fired from a firearm	No*	59%	19%	13%	4%	5%
	Yes*	42%	25%	17%	9%	7%
j. Requiring firearms owners to be 21 years of age or older	No	46%	12%	22%	13%	7%
	Yes	39%	16%	19%	17%	9%
k. Identifying and implementing evidenced based injury prevention programs that decrease firearm injuries (in partnership with other professional organizations or independently)	No	73%	23%	3%	0%	1%
	Yes	68%	17%	9%	3%	3%
l. Creating a federal database to track firearm sales	No	53%	18%	14%	5%	10%
	Yes	41%	26%	12%	7%	14%
m. Advocacy efforts to restrict civilian access to assault rifles (magazine fed, semi-automatic, i.e. AR-15)	No**	62%	14%	7%	7%	10%
	Yes**	45%	10%	20%	6%	19%
n. Advocacy efforts to limit civilian access to types of ammunition designed for military or law enforcement use (i.e., armor piercing, large magazine capacity	No*	66%	13%	8%	6%	6%
	Yes*	51%	17%	10%	6%	16%
o. Making funds available for research to better understand gun violence and how to prevent gun violence	No	75%	16%	5%	2%	2%
	Yes	67%	24%	6%	0%	3%

*$p < 0.05$ **$p < 0.01$, comparing No to Yes Military Experience.

Even when there was significant variability based upon demographic groups analyzed, more than 65% of all groups responded as strongly agree or agree in 10 topical areas.

Survey Qualitative Results

Survey participants were given the option to share other open-ended comments they felt were pertinent. Ninety-one COT surgeons (91 of 237 or 38%) provided such responses. Of the 91 responses, eight were related to the survey content and were not used in the analysis. The remaining 83 responses were categorized into levels of support or opposition to ACS involvement in firearm injury reduction efforts. Ten individuals strongly opposed, 14 opposed, 24 were neutral, 26 supported, and 9 strongly supported the COT addressing firearm injury reduction efforts. Of the 83 responses, seven major themes emerged with eight or more individuals each. Many written responses included more than one theme (Fig. 1 and Supplemental Digital Content 1). http://links.lww.com/TA/A892).

The most common theme is concern that the COT is taking on a political agenda, reported by 16 individuals. Fourteen individuals expressed that focusing specifically on firearms oversimplifies the issue since violence is socially complex, and that we should focus on addressing the contributors to violence, such as poverty, gangs, and mental illness. Well represented among all levels of support included the belief that the COT should advocate for improved firearm injury and prevention research including developing evidence-based strategies and a public health approach for prevention, with 13 individuals noting this. Another 12 individuals supported that the COT should advocate for the rights of lawful firearm ownership while promoting personal responsibility, firearm safety, and reasonable gun policy efforts. Twelve individuals expressed that this is an important, high-priority issue for the COT and that trauma surgeons have an important role in helping reduce the burden of firearm-related injuries and deaths.

DISCUSSION

Key Findings

Briefly, the results of this survey demonstrate that COT surgeons are extremely engaged with this problem as evidenced by the 93% response rate to the survey. The COT surgeons are

TABLE 4. Gender and Support for ACS Initiating Advocacy Efforts on 15 Topics

Advocacy Issue	Gender	Strongly Support	Support	Neutral	Oppose	Strongly Oppose
a. Mandatory background checks and license/permit for all firearm purchases including those from authorized dealers, gun shows, or private sales prior to purchase	Male*	73%	12%	4%	4%	7%
	Female*	94%	0%	3%	0%	3%
b. Preventing people with mental health illness from purchasing firearms	Male	81%	12%	4%	1%	2%
	Female	76%	10%	10%	4%	0%
c. Mandatory prosecution of convicted felons who are unlawfully attempting to purchase a firearm or body armor, but denied due to background check.	Male	67%	25%	5%	1%	2%
	Female	65%	35%	9%	0%	0%
d. Preventing people who are on the US No Fly list to purchase firearms	Male	65%	15%	10%	5%	5%
	Female	61%	26%	13%	0%	0%
e. Efforts to increase penalties for purchasers that provide guns to individuals illegally (straw purchasers) and dealers that sell firearms through illegal means or bypassing background checks.	Male	79%	12%	4%	1%	3%
	Female	65%	26%	9%	0%	0%
f. Improve mental health screening and treatment for Americans to help reduce suicides and gun-related violence	Male	68%	26%	3%	1%	2%
	Female	74%	13%	13%	0%	0%
g. Preserving the right of physicians and health care providers to counsel their patients or the parents of their patients on safe firearm ownership.	Male	75%	16%	5%	1%	1%
	Female	78%	13%	4%	4%	0%
h. Requiring safety features to promote gun safety, including child-proof locks and "smart gun" technology	Male	60%	18%	9%	6%	6%
	Female	74%	17%	9%	0%	0%
i. Encouraging the development and use of technology that identifies the purchaser of ammunition fired from a firearm	Male	53%	20%	11%	9%	8%
	Female	48%	26%	26%	0%	0%
j. Requiring firearms owners to be 21 y or older	Male	42%	14%	18%	16%	10%
	Female	43%	9%	35%	13%	0%
k. Identifying and implementing evidence-based injury prevention programs that decrease firearm injuries (in partnership with other professional organizations or independently).	Male	71%	21%	5%	1%	2%
	Female	70%	26%	4%	0%	0%
l. Creating a federal database to track firearm sales.	Male	47%	21%	12%	8%	13%
	Female	52%	13%	26%	4%	4%
m. Advocacy efforts to restrict civilian access to assault rifles (magazine fed, semiautomatic, i.e., AR-15).	Male**	54%	10%	13%	8%	15%
	Female**	70%	17%	13%	0%	0%
n. Advocacy efforts to limit civilian access to types of ammunition designed for military or law enforcement use (i.e., armor piercing, large magazine capacity	Male	60%	13%	8%	9%	10%
	Female	61%	26%	13%	0%	0%
o. Making funds available for research to better understand gun violence and how to prevent gun violence	Male	71%	19%	5%	1%	3%
	Female	70%	22%	4%	4%	0%

*$p < 0.05$. **$p < 0.01$. Male to Female.

divided on their perceptions concerning firearms, freedom, and benefit; however, they are firmly unified in the belief that trauma surgeons must act to address firearm injury as a public health/trauma system problem (88% in strong support). On almost half of the policy options, the COT is nearly unanimous in its agreement, and these surgeons substantively agree on the vast majority of all policy options surveyed. In policy areas, where there was less agreement between subgroups, there was substantial overlap and room for further dialogue to explore future creative solutions.

Context and Purpose of the Survey

Inclusive discussions regarding strategies to reduce firearm injury in the United States have been challenging. Americans place a supreme value on personal freedom, and just as in this COT survey, Americans are divided on their views concerning the relationship between firearms, freedom, and general societal benefit or harm. The challenges regarding effective discussion are likely multifactorial, but one cause is the perception that such discussions threaten personal choice and freedom. A lack of discussion leads to entrenched, polar, and oversimplified positions, which then leads to even less discussion. Understandably, in such an environment, the chasm of opinion may seem too wide to cross. Metaphorically, bridging this chasm could be facilitated by a survey to identify locations favorable for building a bridge (or bridges) and, with a quality survey, perhaps locations are identified where the chasm is not as wide as it seems.

Our actual survey is part of a larger strategy aimed at reducing firearm injury and death in the United States. The survey tool was designed to create an accurate picture of where surgeons caring for firearm victims agree and where they do not agree. It was also an intentional tool to facilitate a dialogue among the surgeons being surveyed. It is the tradition and history of the COT to center this dialogue on how best to serve the interest of our patients. This is the responsibility of the COT and its individual members. Past experience has demonstrated that once members of the COT agree as to what is in their patients' collective best interest, significant change is not only possible, but likely.

Trends in Firearm Injury and Death

Homicides have decreased since the 1990s but have plateaued over the past 10 years, whereas firearm suicides have increased over this same period. Among firearm deaths, different age-related patterns exist. Although homicide is primarily a disease

TABLE 5. Advocacy Initiatives and Agreement Among COT Members Across Demographic Groups

% COT Members Who Strongly Agree/Disagree With Advocacy in the Following Areas	All COT Members	No Home Firearm	Yes Home Firearm	No Military	Yes Military	Male	Female
Improve mental health screening and treatment to reduce suicides & gun violence	93.3%	95%	91%	95%	89%	94%	90%
Identify and implement evidenced based injury prevention programs	92.8%	97%*	87%*	99%	85%	92%	96%
Mandatory prosecution of convicted felons who attempt to purchase a firearm	92.4%	93%	91%	93%	90%	92%	93%
Increase penalties when guns provided to others illegally including dealers	92%	98%*	85%*	95%	86%	92%	93%
Prevent people with mental health illness from purchasing Firearms	92%	96%*	87%*	93%	88%	93%	86%
Make funds available for research to understand prevent gun violence	92%	99%*	82%*	92%	91%	91%	93%
Preserve the right of health care providers to counsel patients on safe Firearm ownership	90%	95%*	84%*	92%	85%	90%	90%
Background checks & license/permit for purchases including shows & private sales	86%	96%*	72%*	87%	83%	85%†	93%†
Prevent people who are on the US No Fly list from purchasing Firearms	84%	88%*	79%*	83%	90%	82%	90%
Require safety features, including child-proof locks & "smart gun" technology	83%	96%*	66%*	92%	86%	81%	93%
Limit civilian access to ammunition designed for military or law enforcement use	76%	93%*	54%*	80%**	68%**	74%	90%
Encourage development/use of technology that identifies ammunition purchaser	75%	90%*	55%*	71%**	67%**	74%	79%
Restrict civilian access to assault rifles (magazine fed, semi-automatic, i.e. AR-15)	70%	90%*	44%*	76%**	55%**	67%†	90%†
Create a federal database to track firearm sales	70%	83%*	52%*	71%	85%	69%	72%
Require firearms owners to be 21 y or older	58%	71%*	41%*	59%	55%	57%	52%

$p < 0.05$: *firearm vs no firearm in home; **military vs no military experience; †male versus female.

of young adults, with a peak incidence in the second to third decades of life, the rate rapidly declines thereafter. The rate of gun-related suicide, however, steadily increases as the population ages, and thus the resulting rate of overall firearm-related deaths is relatively constant.[5,7–9]

Although firearm death rates are relatively low among pediatric populations, their significant effect on lost potential is self-evident and dramatic. Within the 10- to 19-year age group, firearm injuries have become the second leading cause of injury mortality after motor vehicle crashes. For children age 10 to 14 years firearm-related homicides have stayed relatively flat over the last 10 years, whereas firearm-related suicide rates have shown a worrisome, steady increase.[5,6]

Differences also exist based upon gender. Fifteen percent of the total gun homicide victims are women, but they make up 50% of the victims in mass shootings. In over 50% of the mass shootings, the shooter killed a current or former spouse/intimate partner or other family member.

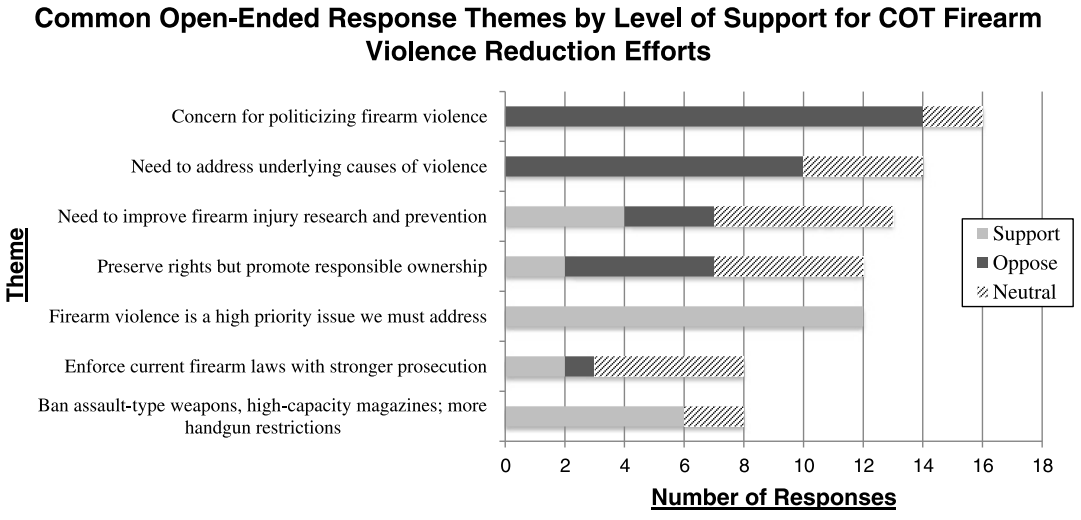

Figure 1. Major themes identified in open-ended survey responses.

Geographic variability of firearm mortality rates also exists. Increased rates of firearm homicide are concentrated across the southern regions of the U.S. firearm suicide rates are more concentrated in the intermountain west.[8]

When comparing the United States to other high income countries, firearm homicide rates are 25 times higher, firearm suicide rates are eight times higher, and unintentional firearm deaths are 6.2 times higher in the United States compared with the 23 other countries studied. The burden of death is especially notable among women and children; over 90% of women, children aged 0 to 14 years and young people aged 15 to 24 years killed by firearms among the studied countries occurred in the United States.[10]

Firearms in the Home

We hypothesized that the presence or absence of home firearms would contribute to differing survey responses. The overall presence of firearms in COT surgeons' homes was 43%; however, there was significant variability by geographic region, military experience (higher), Hispanic/Latino ethnicity (lower), and by personal experience with firearm injury/death (lower). Presence of a firearm(s) was the demographic variable most associated with differences in survey results, with some notable exceptions. There was 95% agreement that health care professionals should be allowed to counsel patients, with no difference in any demographic group. Seventy-four percent of those with firearms in the home felt that the ACS should place a high or the highest priority on reducing gun injuries. Regarding support for ACS initiating advocacy efforts, the presence of home firearms was associated with significant differences in levels of support in 13 of 15 initiatives. Despite differences, between those with and without home firearms, there was 80% or greater support among members with home firearms on 7 of the 15 initiatives and over 50% support on 13 of 15 initiatives. Topics with the highest level of support included improving mental health treatment, preventing those with mental health illness from purchasing firearms, funding research to identify evidence based injury prevention programs, penalties when guns are provided illegally and counseling patients on firearms safety.

Military Experience

Twenty-nine percent of COT members who participated in the survey had military experience; we predicted this variable would contribute to differing survey responses. There was a higher percentage of military experience COT members that had home firearms (56.5% vs. 36.9%). Interestingly, military experience contributed less overall to variability in survey responses than home firearms. There was no difference in support for federal research funding for firearms injury prevention or in preserving the right of health care professionals to counsel patients. Among the 15 possible advocacy topics, there were only three areas of difference: technology to identify the purchaser of ammunition, restrict civilian access to magazine fed, semi-automatic (AR 15 type) rifles and ammunition for military or law enforcement.

Gender

Although survey participants were 88% men, gender contributed little to the overall statistical variability of responses—mandatory background checks and civilian access to assault rifles. Given the relative small number of women, the survey may not have been powered to detect gender differences. While not statistically significant, there appears to be little opposition to the 15 possible advocacy initiatives among the female survey participants.

Consensus and Opportunities

Ninety percent or more of COT members support each of these seven advocacy initiatives:

1. mental health screening and treatment to reduce suicides and gun violence;
2. prevent people with mental health illness from purchasing firearms;
3. prosecute convicted felons who illegally attempt to purchase a firearm;
4. increase penalties for straw purchasers for those who are providing guns illegally to others;
5. implement evidence based firearm injury-related prevention programs;
6. federal funds for research on firearm violence; and
7. preserve the right to counsel patients.

If we examine potential levels of consensus, we have discussed topics with very high levels of agreement. In many circumstances, such as legislative, a majority (51%), two thirds (66%), or three fourths (75%) is the level of agreement to effect change. These comparisons help us realize how significant the results of this survey are. Although full description of possible implementation plans is beyond the scope of this article, a range of implementation vehicles are available to move from concept to concrete steps to reduce firearm injury and deaths. Each of the pillars of the ACS COT is available to assist with implementation: (1) advocacy, (2) quality, (3) trauma systems, and (4) education. As an example in the quality pillar, trauma centers verified by the ACS are required to implement injury prevention programs. Evidence-based violence or firearm violence programs can be formally introduced as a standard, which would effectively roll out these programs in the more than 450 ACS verified U.S. trauma centers.

Specific pillar-based implementation strategies are already moving forward. Lastly, the COT is committed to working with other leading professional organizations. The COT can facilitate and convene effective partnerships such as the successful Coalition for National Trauma Research between the AAST, the National Trauma Institute, the Eastern Association for Trauma, the Western Trauma Association, the COT, and other injury prevention organizations. The magnitude of firearm injury impact on the United States beckons for such a plan.

Regarding initiatives with less agreement overall and with larger differences between demographic groups, including assault weapons and munitions, we will actively continue the conversation to develop recommendations that can help ensure that firearms of all types are owned and used in a manner that decreases the possibility of injury and death.

CONCLUSION

In conclusion, this survey is one of the initial concrete steps in a comprehensive COT strategy aimed at significantly reducing firearm injury and death in the United States. Although COT members report divergent opinions regarding firearms and freedom, these surgeons are firmly united by the belief that those who care for victims of firearm injury must act to address the problem as a critically important public health/trauma system

problem. On almost half of the policy options, the COT is nearly unanimous in its agreement. These COT surgeons substantively agree on the vast majority of all policy options presented, and in policy areas with less agreement between subgroups, there was still substantial overlap and room for further dialogue to explore future creative solutions.

It is incumbent on the ACS COT and other trauma organizations to use their considerable influence to effectively reduce the burden of firearm injury and death. To achieve this goal requires continued efforts at improving the quality of our national conversation regarding comprehensive effective strategies to reduce firearm violence. This conversation must be centered on the best interests of our patients and our fellow citizens and requires freedom with responsibility.

AUTHORSHIP

All authors were involved in the conceptualization and design of the survey, interpretation of results and preparation of the article. Additionally, M.A. was responsible for the administration of the Qualtrics survey and compiling results; T.L. performed the statistical analysis; L.A. and A.H. performed qualitative analysis.

ACKNOWLEDGMENT

We thank the members of the American College of Surgeons Board of Regents (special thanks for our BOR liaisons Drs. Beth Sutton, Jim Elsey, Henri Ford and Lenworth Jacobs), the COT Executive Committee, Dr. David Hoyt and numerous staff of the American College of Surgeons for their support and guidance on this important initiative.

DISCLOSURE

The authors declare no conflicts of interest.

REFERENCES

1. Crebs J, Sauaia A, Moore E. Gun violence in the United States: a call to action. *J Trauma Acute Care Surg*. 2016;80(6):847–848.
2. Stewart RM, Kuhls DA. Firearm injury prevention: a consensus approach to reducing preventable deaths. *J Trauma Acute Care Surg*. 2016;80(6):850–852.
3. Weinberger SE, Hoyt DB, Lawrence HC 3rd, Levin S, Henley DE, Alden ER, Wilkerson D, Benjamin GC, Hubbard WC. Firearm-related injury and death in the United States: a call to action from 8 health professional organizations and the American Bar Association. *Ann Int Med*. 2015;162(7):513–516.
4. American College of Surgeons. National Trauma Database. Available at: https://www.facs.org/quality%20progrrams/trauma/ntdb.
5. Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999–2014 on CDC WONDER Online Database released 2015. Data are from the Multiple Cause of Death Files, 1999–2014, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Available at: http://wonder.cdc.gov/ucd-icd10.html. Accessed February 4, 2016.
6. Lee J, Quraishi SA, Bhatnagar S, Zafonte RD, Masiakos PT. The economic cost of firearm-related injuries in the United States from 2006 to 2010. *Surgery*. 2014;155(5):894–898.
7. Kellermann AL, Rivara FP, Somes G, Reay DT, Francisco J, Banton JG, Prodzinski J, Fligner C, Hackman BB. Suicide in the home in relation to gun ownership. *N Engl J Med*. 1992;327(7):467–472.
8. Firearm Fatalities: Homicide 2004–2010, United States Death Rates per 100,000 Population, Firearm, Homicide, All Races, All Ethnicities, Both Sexes, All Ages Annualized Crude Rate for United States: 3.99. Produced by the Statistics, Programming & Economics Branch, National Center for Injury Prevention & Control, CDC Data Sources: NCRS National Vital Statistics System for Numbers of Deaths: US Census Bureau for Population Estimate. Accessed February 4, 2016.
9. Siegel M, Ross CS, King C 3rd. The relationship between gun ownership and firearm homicide rates in the United States, 1981–2010. *Am J Public Health*. 2013;103(11):2098–2105.
10. Grinshteyn E, Hemenway D. Violent death rates: the US compared with other high-income OECD countries, 2010. *Am J Med*. 2016;129(3):266–273.

DISCUSSION

Dr. Ernest E. Moore (Denver, Colorado): I congratulate Dr. Kuhls for her superb presentation and the Committee on Trauma under the capable direction of Dr. Stewart to formulate a plan for trauma surgeons to play a leadership role in mitigating the ongoing tragedies from gun violence in the United States. For full disclosure, I own 12 guns and have always been an avid wapiti hunter. But I have also experienced the Columbine School and Aurora Theater shootings and I do not own an AR-15.

An astounding fact is that gun homicide rates in the United States are 25 times higher than any other high-income country in the world. The objective of this Committee on Trauma survey was to identify areas of consensus to develop action plans.

Although laudable, this process carries a risk of merely supporting the bandwagons already in motion. In that light, I would like to focus on the conspicuous area of disagreement, specifically, civilian access to assault rifles. These weapons are designed to permit the shooter to deliver sequentially, as fast as the trigger can be pulled, life-threatening moderate energy missiles, resulting in multiple deaths at short distance over a short time period.

The debate is not about ammunition. These same bullets are used for small game hunting, but at a longer distance. The fundamental issue is the magazine capacity of rifles, housing 30 or more bullets, enabling rapid shooting. Mass shootings, defined as greater than or equal to five victims, are currently an epidemic in our country, reported as literally occurring every week. The volatile issue in controlling gun violence is eliminating assault rifles to reduce mass shootings and fundamentally distills into the interpretation of the Second Amendment "to keep and bear Arms." I do not believe a randomized, prospective trial is necessary to establish the fact that mass shootings are only feasible because irresponsible individuals have access to these weapons, designed by the military to accomplish this mission.

The urgency of this issue is heightened by the reality that mass shootings are increasingly inspired by terrorist activity, beyond individuals traditionally considered mentally ill. I am certain many of you have seen the recent report in *JAMA* describing a ban on assault rifles enacted in Australia in 1996, with no further mass shootings in the ensuing 20 years in that country.

Thus, I have only one question for the authors. How do you intend to confront the contentious issue of access to assault rifles? Are there intermediate approaches that can be instituted now as we deliberate this question as a responsible society?

Dr. Sheldon Teperman (New York, New York): I rise to congratulate and applaud the efforts not only of Deb Kuhls and Ronnie Stewart at the COT but, Gene, you and Jen Crebs at the *Journal of Trauma*, in particular your very forward-thinking editorial.

So my question is also about assault weapons, and Alex [Eastman] is about to tell us how he faced a horrible day in Dallas with his colleagues dying by his side with a lot of bullets from assault weapons.

So you did look at—and we went by it very quickly—the COT members who favored assault weapons, pushing that back, I think it was 90%, but, also, specifically, high-capacity magazines, which could also be used not only in assault weapons but in the garden-variety semi-automatic. What do the COT members feel about high-capacity magazines and also going back over the assault weapons?

Dr. Alexander L. Eastman (Dallas, Texas): Deb, great work. Really important information to put out there. I think one of the things that has happened across our country is we have spent a lot of time focusing on the fringes of this argument when, in reality, many of us fall directly in the middle of rational, responsible ownership with responsibility.

I can tell you from the perspective of someone who spent several hours being shot at by someone who had a bigger weapon than I did that it's a very uncomfortable feeling.

And I think anyone who questions Gene's point about magazine capacity and the role that plays in mass shootings in the United States needs to Google a video that's out there about what an active shooter would look like if we all still carried muskets. It's a little bit tongue-in-cheek but it's a striking demonstration of exactly what this problem would look like today with the weapons of yesterday.

I think, Deb, my question is how do we as the trauma surgery community focus on the available evidence that's out there —and Marie Crandall's paper in the *Journal of Trauma* that just came out this month, the evidence-based review from EAST is a good step—but how do we fashion rational, reasonable evidence to help drive the argument and push it forward?

Because I think at the end of the day when you fall on people's feelings they tend to get hurt and broken and people go to the fringes but if we do what we do here every day during this meeting and rely on our role as scientists that really will forge the way forward in meaningful policy change.

Thanks.

Dr. Matthew Martin (Olympia, Washington): Deb, that was great. Thanks for doing this important survey. I was actually a little surprised that among the group that has firearms in the home almost 20% were against research into better ways to prevent firearm injury. Not gun control or regulations, just research.

I was just wondering if in the text comments from the survey you had any clarification of that and why they would be against just simple research into this question. Thanks.

Dr. John B. Holcomb (Houston, Texas): Firearms is a broad term, as Dr. Moore said. Did you break this down into long guns, type of long guns, or handguns?

There is an emphasis on mass casualty, active shooter, but my guess is there is many more daily everyday penetrating trauma problems rather than mass casualties.

And then as a white male, born, raised and living in the south with prior military experience, I applaud your efforts in limiting this epidemic of gunshot wounds across the United States.

Thank you.

Dr. Deborah A. Kuhls (Las Vegas, Nevada): Thank you very much, Dr. Moore, for your review and questions and others for their questions. And they, in the light of full disclosure, I have treated over 1,000 adult patients who had been shot and greater than 100 children during my short career.

Dr. Moore, when we've looked at civilian access to assault rifles, this is perhaps one of the most divisive issues as well as ammunition as well. And we feel there really needs to be very senior leadership really taking it on as well as grassroots initiatives. There have been attempts in the past that have failed because people would technically get around the restrictions.

With regard to Australia, their access to rifles, they live under a very different form of government. This is a constitutional right and would need to be clarified in order to take action like that.

Dr. Eastman, you commented on responsibility. And I think that all of us —and I would say I am a former firearms owner and everyone in my family owns firearms—we all need to take on the responsibility for safe storage, safe use, teaching others and keeping in mind the greater good. This may be an area that we need to set aside some of our personal feelings in order to move forward.

Dr. Teperman, the same to your comment, just like we are all focused on teaching, we are all focused on taking care of our patients, we all need to be focused on preventing patients coming to us with these injuries.

It's a very complex issue. And there were no comments specifically on research and those people who objected to research. Some of them mildly agreed and some of them mildly disagreed so I'd have to look at the data in more detail.

Thank you very much for the honor.