Development of an Evidence-Based Firearms Injury Prevention Program

Deborah A. Kuhls, MD
Chair, COT Injury Prevention Committee
Professor of Surgery
University of Nevada School of Medicine
Current COT Approach to Firearm Injury Prevention

1. Trauma system approach to firearm injury prevention
2. Implementing evidenced based violence prevention programs through our network of trauma centers
3. Fostering and providing a forum for a civil, collegial and professional dialogue within the COT – goal of moving towards a consensus regarding interventions aimed at reducing firearm injuries and deaths
Disclosures

• My presentation represents the work of an entire Committee:
• The American College of Surgeons COT Injury Prevention and Control Committee
Overview

- Facts
  - Summary of US Firearm injury data
  - Survey of ACS COT Members

- Next Steps
  - Moving forward on a controversial topic
Freedom

- **Personal liberty** – dearly held all Americans

- Two contrasting narratives regarding guns
  - Guns = Freedom & Safety
  - Guns = Limitation of Freedom & Violence
Sustainable freedom requires responsibility

Professional responsibility aligned with the highest traditions of the American College of Surgeons

Freedom with Responsibility
Narratives Create a *Perceived* Chasm

Wikipedia; Bill's_Bungy_Jump-2By Spy007au
Bridging the Chasm

- Foster dialogue respecting both narratives
- Develop a consensus on how to:
  - Reduce needless injuries (best for our patients)
  - Without limiting the personal freedom of legitimate, responsible gun owners. (best for our members)
- Professionalism
- Civility
  - Respect for opposing views—particularly minority views
  - Tolerance
  - Restraint
- Goal: Win—Win—or No Deal
Firearm Injury Epidemiology
Patients Treated at U.S. Trauma Centers by Mechanism

- Falls: 44%
- Traffic: 33.5%
- Firearms: 4%

Percentage of 2014 NTDB/TQIP Patients by Mechanism, N = 818,212
Burden of Death in the U.S. by Mechanism of Injury

Deaths per 100,000 population

- Motor Vehicle: 10.6
- Firearm: 10.5
- Falls: 10.4

CDC National Center for Health Statistics, 1999-2014
Adults– Firearm death all intents (Age 15-85+)

CDC Wonder 2014 Accessed February 2016, crude rates per 100,000
Children – Firearm death all intents (Ages 0-14)

CDC Wonder 2014 Accessed February 2016, crude rates per 100,000
As children age, and intentional mechanisms of injury become more prominent, the rate of firearm injuries increase.
Fatal injuries, ages 10-14, 2014

FIREARMS are the second leading mechanism of fatal injury in 10-14 year old children.
Incidence and intent of firearm fatalities by location

2004-2010, death rates per 100,000 population

- **High**
- **Moderate**
- **Low**

**Homicide**

**Suicide**

Produced by: the Statistics, Programming & Economics Branch, National Center for Injury Prevention & Control
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.
Firearm mortality data in 23 high-income countries showed...

- 90% of all women killed by firearms...
- 91% of children 0-14 killed by firearms...
- 92% of youth/young adults 15-24 killed by firearms...

Were in the

Motor Vehicle versus Firearm Deaths

The Epidemiology of Firearm Violence in the Twenty-First Century US Garen J.Wintemute, 10.1146/annurev-publhealth-031914-122535

Figure 1

Figure 2
COT Member Survey Design
Purpose

- Evaluate ACS COT member attitudes about firearm ownership, freedom, responsibility, and public policy.

- Objective → use survey results to guide firearm injury policy development
Survey Development

- Final Survey – Dec 2015; closed Feb 7, 2016
  - 32 Questions
  - Qualtrics
  - 254 COT members
- Results de-identified
Data Analysis

- SPSS
- Descriptive Statistics
  - $\chi^2$, Fisher’s exact test (categorical)
  - Nonparametric test (ordinal)
  - Statistical significance < 0.05
DEMOGRAPHIC RESULTS
Demographic Results

- RESPONSE RATE = 93%*
- Cohort Analyzed: 237

*Respondents from all 50 states
Demographic

- 88% Male (n=207)
- 88% Married
- 58% have one or more child in home
- Mean age = 52±7 (range 36-75)
- Race
  - 85% Caucasian
  - 6% Asian
  - 5% Black
  - 1% multiracial
Type of Clinical Practice

- 60% Acute Care Surgery
- 15% Trauma Surgery
- 7% Pediatric Surgery
- 6% General Surgery
- 5% Orthopedic
- 3% Neurosurgery
- 4% Other Specialties
Trauma Center Type

- 80% Level I
- 19% Level II
- 1% Level III/other
Firearm Use

- 81% have used a firearm
  - 46% <1 time/yr
  - 14% >1 time/yr
  - 15% <1 time/month
  - 7% weekly

- 19% Never have used a firearm
FIREARM(S) IN HOME = 43%
Mean of 8 (±5) firearms per household

- 86% Long guns
- 82% Handguns
- 35% Assault weapons
- 11% Black powder
- 7% NFA II weapons

- 54% have a concealed carry permit
Results and Initiatives Informed by Survey
33% had personal experience with family or friend being injured or killed by a gun

- 2% Personally Injured
- 18% Family/friend killed or injured
- 23% Suicide - family/friend attempted or completed
## Who has Firearms in the Home?
### Demographic Characteristics

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>Firearm in Home (n)</th>
<th>Firearm in Home (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>90/207</td>
<td>43.5%</td>
</tr>
<tr>
<td>Female</td>
<td>11/29</td>
<td>37.9%</td>
</tr>
<tr>
<td>White</td>
<td>91/201</td>
<td>45.3%</td>
</tr>
<tr>
<td>Black</td>
<td>2/10</td>
<td>20%</td>
</tr>
<tr>
<td>Asian</td>
<td>3/13</td>
<td>23.1%</td>
</tr>
<tr>
<td>Other race</td>
<td>5/13</td>
<td>38.4%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>0/8*</td>
<td>0%*</td>
</tr>
<tr>
<td>Not Hispanic/Latino</td>
<td>94/213*</td>
<td>44.1%*</td>
</tr>
<tr>
<td>Married</td>
<td>90/209</td>
<td>43.1%</td>
</tr>
<tr>
<td>Not Married</td>
<td>10/23</td>
<td>43.5%</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001, comparing No to Yes. Red text indicates where p was significant.*
Demographic Characteristics of COT Members with Firearms in the Home

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<th>Demographic Variable</th>
<th>Firearm in Home (n)</th>
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<tbody>
<tr>
<td>No Military Experience</td>
<td>62/168**</td>
<td>36.9%**</td>
</tr>
<tr>
<td>Military Experience</td>
<td>39/69**</td>
<td>56.5%**</td>
</tr>
<tr>
<td>Northeast</td>
<td>5/35***</td>
<td>14.3%***</td>
</tr>
<tr>
<td>South</td>
<td>44/78***</td>
<td>56.4%***</td>
</tr>
<tr>
<td>Midwest</td>
<td>27/56***</td>
<td>48.2%***</td>
</tr>
<tr>
<td>West</td>
<td>25/66***</td>
<td>37.9%***</td>
</tr>
<tr>
<td>Experience Firearm Injury/Death</td>
<td>41/78*</td>
<td>32.9%*</td>
</tr>
<tr>
<td>No Experience Firearm Injury/Death</td>
<td>60/159*</td>
<td>59.4%*</td>
</tr>
</tbody>
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Private Ownership of Firearms

- 28.7% Beneficial/critical liberty/right
- 24.3% Generally beneficial/important liberty
- 16.5% No opinion
- 22.6% Generally harmful/limits liberty
- 7.8% Harmful/critically limits liberty

Varied by Military Experience
Varied by Firearms in the Home
Priority ACS Should Give to Reducing Firearm Injuries

- 88% indicated **High or Highest** Level
  - Varied by Military Experience (77.9%)
  - Varied by Firearms in the Home (74.7%)
Should healthcare professionals be allowed to counsel patients (or parents of patients) about how to prevent gun-related injuries?

- **95% YES**
- No difference when analyzed by gender, military experience, or firearm in the home
Should the NIH, CDC, and other sources of research funding be allowed to fund research on the epidemiology and prevention of gun-related injuries?

» **96% YES**

» Varied by Firearm in the Home (90.7%, p<.001)

» Did not vary by gender or military experience
Rate Opinion on the ACS Initiating Efforts to Advocate for or Support Legislation in 15 Areas:

- **Analyzed Results by:**
  - Firearms in Home
  - Gender
  - Military Experience

- Mann Whitney U Test where significance is p<.05
## ACS Advocacy Initiatives and Agreement among COT Members Across Demographic Groups

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

- **Political**: 14 Support, 2 Oppose, 2 Neutral
- **Improve Data**: 4 Support, 3 Oppose, 6 Neutral
- **Responsible Ownership**: 2 Support, 5 Oppose, 5 Neutral
- **Important Role for Trauma Surgeons**: 12 Support, 5反对, 4 Neutral
- **Complex Issue**: 5 Support, 1 Oppose, 5 Neutral
- **Enforcement**: 2 Support, 1 Oppose, 5 Neutral
- **More Restrictions**: 6 Support, 2 Neutral
Conclusions

- 88% indicated **High or Highest** Level of Priority for the ACS to address Firearm Injuries and Death

**Support for Policy Initiatives:**

- >90% support – 7 of 15
- 80%-90% support – 3 of 15
- 70%-80% support – 4 of 15
- Less than 70% support – 1 of 15
COT Injury Prevention Committee, Special Guests and ACS Staff

Michel Aboutanos  
Roxie M Albrecht  
Darrell C Boone  
Peter Burke  
Brendan Campbell  
Mark Cipolle  
Michael Coburn  
Jim Davis  
Corey Detlefs  
Barbara Gaines  
Doug Geehan  
Ronald Gross  
Ashley Hink (RAS)  
Fernando Joglar  
Bob Letton  
Peter Masiakos  
Mark McAndrew  
Leon Moores  
Tina Palmieri  
Don Reed  
Dave Shapiro  
Tom Esposito  
Mike Nance  
Douglas Schuerer  
Ronald Stewart  
Don Van Boerum  
Sonlee West  
Babak Sarani  
Jim Elsey – Regent Representative  
Beth Sutton – Regent Representative  
Katie Wiggins – RAS Liaison  
Dr. Ronald Stewart  
Dr. Michael Rotundo  

**Guests:**

Lisa Allee  
Trudy Lerer  

**ACS Staff:**

Maria Alvi  
Tamara Kozyckyj  
Holly Michaels  
Justin Rosen  
Matt Coffron
Evidence-based Violence Prevention Programs

- Hospital Based
- Outreach
- Multi-disciplinary approach
- Leverage existing evidence and contribute to the evidence
- Encourage consistent approach
- Address populations at risk across intentionality, demographic groups
Firearms Injury Prevention – Next Steps

Maximize Safety

• Firearms safety, safety education and safe storage
• Raise awareness
• Educate at risk populations
• Review and contribute to the literature about effectiveness of safety measures

Suicide

• Needs to be a theme across all action steps
Advocacy to address initiatives:

- Research funding
- Increase mental health funding
- Preserve the right of physicians to counsel patients
- Stop the Bleed
**Data:**

- Identify **gaps** in data on firearms injury and death and develop plan to address gaps to better inform injury prevention efforts.

- Data will help trauma centers to understand the magnitude of the problem and will inform targeted interventions.
Begin to address the culture of violence

- Complex issue
- Root cause
- Develop actionable items

Continue the Conversation

To help us determine who should have firearms and who should not – evidence based decisions
Violence Prevention = Understanding its Causes

The Social-Ecologic Model

Individual
- Demographics
- Acceptance of violence, normalization
- Conflict resolution
- Substance abuse
- SE status, employment
- Mental illness
- Firearm access

Interpersonal
- Family violence, dysfunction
- Lack of support
- Exposure to violence
- Past abuse
- Reinforcement vs. discouragement in social circles
- Cultural norms

Organizational
- Supportive & protective institutions
- Access to SA, MI care
- Employment opportunity
- Prevention efforts

Community
- Gangs/community violence
- Levels of poverty, inequality
- Economic opportunity
- Policing
- Access to illegal weapons

Policy
- Prosecution of crime, penalties
- Firearm laws
- Housing, economic, health, employment policy
- Funding for violence prevention

Hospital-Based Violence Prevention Programs

- **Trauma centers, ED**
  - Uniquely identify individuals at risk
  - Screening, case management, social work, substance abuse, injury prevention and mental health support

- **Integrated Hospital and Community programs**
Intentional injury
  » 20-40% recidivism rate after assault

Mental illness and suicidal ideation

Intimate partner violence (IPV)

Child abuse

Youth and young adult community violence*
  » 20% homicide victims have a violent injury treated in past 5 years
Trauma Centers – Patient Populations at Risk

- Teens and young adults presenting from assault are more likely to have:
  - Previous assaults
  - Previous fights requiring medical treatment (OR 35.5)
  - Illegal firearm possession
  - Illicit SA, ETOH abuse, mental illness
  - Retaliatory attitudes
  - Witnessed firearm violence

Figure 1. Distribution of ED dispositions for firearm-related injuries, by age, 2001.

50% of victims of firearm injuries under 25 are treated and released from the ED

Noteworthy Programs

Operation Peaceworks, Ventura, CA
Violence Intervention Program (VIP), Baltimore, MD
Wraparound Project, San Francisco, CA
Project Ujima, Milwaukee/Madison, WI
Violence Intervention Program, Richmond, VA

Hospital + Community-based Intervention Programs
- Victims of violence, risk factors for violence
- Case management, social work -> link to resources
- Community resources: mental health, SA, employment, education, gang outreach, family support

Findings
- Decreased firearm assaults
- Decreased violence and injury recidivism
- Decreased arrests, incarceration
- Increased receipt of community resources
Successful and Cost Effective

- Systematic review of trauma center based youth violence programs (Ages 10-24)
  - 90% demonstrated improved outcomes
    - >50% showed lower recidivism
  - Individual + intensive community-based case management are most successful

Mikhail JN, J Trauma, Violence & Abuse, 2015.
Future Directions

- Prioritizing violence prevention and intervention in research, funding, practice
  - Improving trauma center services
  - *Resources for the Optimal Care of the Injured Patient*

- Utilize current injury prevention educators, case managers, social workers, public health
Resources for Program Development

Welcome

Violence is a preventable health care issue. Violence prevention and intervention programs are a powerful way to stop the revolving door of violent injury in our hospitals and communities. Engaging patients in the hospital, during their recovery, is a golden opportunity to change their lives and reduce retaliation and recidivism.

The National Network of Hospital-based Violence Intervention Programs (NNHVIP) brings together the best and most exciting programs to share knowledge, develop best practices, collaborate on research, affect policy change, and more.
Trauma centers care for high-risk patients at risk of intentional injury recidivism and suicide.

Programs can be successful at reducing recidivism, cost effective.

- Use of hospital and community resources
  - Case managers, social workers, mental health, substance abuse, injury prevention
  - Partnering with community stakeholders

There is support for program development, grant funding.
Steps Forward

- Dissemination of process and approach
  - Published special report in May, 2016 issue of Journal of Trauma
- Dissemination of survey results
  - AAST presentation September 14, 2016
  - Journal of Trauma manuscript published May, 2017
- ACS Board of Governor’s survey
- AAST/EAST Survey
Initial Steps Forward

- Safety – across all demographics
- Violence Prevention
- Data and Research
- Advocacy
- Encourage dialogue between polar groups
- Focus on right thing for our patients and our citizens
- Website: https://www.facs.org/quality-programs/trauma/ipc
Stop the Bleed – A Platform

BULLETIN

See Something,

Do Something:

Improving Survival

Strategies to Enhance Survival in Active Shooter and Intentional Mass Casualty Events: A Compendium
Questions?

• dkuhls@med.unr.edu