THE TRAUMA PREVENTION COALITION WELCOMES YOU TO THE
3RD ANNUAL
INJURY PREVENTION COORDINATORS SYMPOSIUM

AGENDA - MONDAY, MAY 15TH, 2017
Navigating Chapter 18
A Prevention Professional’s Guide to the “Orange Book”

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Disclosures


Objectives

- Review Principles of Injury Prevention
- Review the Importance of Injury Prevention
- Review Key Points in Chapter 18 of the Orange Book
- Integrate Principles of Injury Prevention with Requirements of Chapter 18 of the Orange Book
Trauma Prevention Coalition
Letter of Agreement for Member Organizations

The Trauma Prevention Coalition seeks to combine the resources of major professional organizations addressing the acute healthcare needs of the injured and to promote collaborative efforts and develop effective strategies in injury/violence prevention while minimizing redundant and duplicative activities. In accordance to this mission, the coalition’s member organizations are responsible for designating a representative to participate in the coalition’s activities. The member organization is responsible for the reimbursement in accordance with that organization’s polices and practices for any associated expenses related to coalition activities in which its representative participates. The member organization will have the opportunity to review all material produced by the coalition prior to publication and/or distribution and offer suggestions as to future content.

Signed
Chair, Committee on Trauma
American College of Surgeons

Date: June 29, 2012
Goals of a Trauma System

- Organized approach to acutely injured patients that provides full and optimal care integrated with an EMS system.
- Pre-hospital to rehabilitation and beyond
- Major goal is to enhance community health → Injury Prevention is Key
  - Identify Risk Factors for injury in the community
  - Create solutions to decrease the incidence and severity of injury

→ 30-50% of injury-related deaths occur in the field and the only way to prevent the deaths is to prevent injuries.
Conclusions

The trauma death rate has alarmingly increased since 2000, whereas the cancer and heart disease death rates have decreased. As of 2010, trauma is now the leading cause of death in individuals 46 years and younger. It remains the single, largest cause for years of life lost. The number of trauma deaths is now higher than the number of cancer deaths until age 47—and higher than the number of heart disease deaths until age 49. The changing epidemiology of trauma mortality must be a focus of robust future investigations to make strides in preventing and treating trauma, the greatest increasing killer in our era.
National Academy of Sciences, Engineering & Medicine 2016 report

- Blueprint for National Trauma Action Plan building on progress made by military & civilian centers and systems
- Potential “plank” in national health platform; building health infrastructure

Magnitude: Trauma Accounts for 47% of Deaths up to 46 Years of Age (2014)
The Magnitude of the Problem

- Fifth leading cause of death overall
- More deaths in children than all other causes combined
- > 130,000 Americans die every year as a result of trauma
- 25% of all life-years lost = more than cancer + heart disease + HIV combined
- Most important problem for our children & our troops
- Health care costs + lost productivity = $676 billion/year
- 41 million ER visits; 2 million hospital admissions.
Leading Causes of Years of Potential Life Lost Up to Age 75 (2014 CDC)

<table>
<thead>
<tr>
<th>Cause</th>
<th>Unintentional</th>
<th>Suicide</th>
<th>Homicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
<td>24%</td>
<td>5.8%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Cancer</td>
<td></td>
<td>21.3%</td>
<td></td>
</tr>
<tr>
<td>Heart Disease</td>
<td></td>
<td></td>
<td>15.1%</td>
</tr>
<tr>
<td>Chronic Lower Respiratory Disease</td>
<td></td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td>Liver Disease</td>
<td></td>
<td>2.8%</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td>2.7%</td>
<td></td>
</tr>
</tbody>
</table>

Percentage Contribution to Total Years of Potential Life Lost Before Age 75
Where to Start - Application to Populations

- Intentionality
  - Intentional
  - Unintentional
- Demographics
  - Age
  - Gender
  - Ethnicity
- Local/Regional Data
  - WISQARS and other data sources – Death and Injury Data
  - NTDB – trauma data from contributing trauma centers and ED Data

10 Leading Causes of Death, United States
2005 - 2015, All Races, Both Sexes

Click on any colored box for detailed causes and ICD codes.
Click on any age group for percent.
Data/Epidemiology

Important to Examine Multiple Data Sources
Population Injuries: Patients Treated at U.S. Trauma Centers by Mechanism

Percentage of 2014 NTDB/TQIP Patients by Mechanism, N = 818,212

- Falls: 44%
- Traffic: 33.5%
- Firearms: 4%
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
Intentionality: Firearm Deaths in US
All Intentions in Adults & Children

Suicide Adults

Homicide Adults

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.
Geographic Distribution: Incidence and Intent of Firearm Fatalities by Location

Homicide

Suicide

2004-2010, death rates per 100,000 population

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

Reports for All Ages include those of unknown age.

* Rates based on 20 or fewer deaths may be unstable. States with these rates are cross-hatched in the map (see legend above). Such rates have an asterisk.

Produced by: the Statistics, Programming & Economics Branch, National Center for Injury Prevention & Control, CDC
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.
Injury Prevention Can Make a Difference: 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

Firearm homicide rates were at their highest, and it was also the case for most of the twentieth century (62). There has been a notable divergence in firearm suicide and homicide rates since 2006; homicides have decreased, but suicides have increased by a like amount. As a result, nearly two-thirds (64.0%) of deaths from firearm violence were suicides in 2012. We explore the increase in suicide further in the next section.

Figure 2
Haddon’s Matrix – Common Paradigm

- William Haddon, 1974
- **Modifiable** Human, Vector and Environmental Factors in three phases of injury:
  - Pre-event
  - Event
  - Post-event

**Pre-Event Phase**

1. Prevent the creation of the hazard; prevent the “exposure” to the hazard. For example, prevent childhood exposure handguns.
2. Reduce the amount of the hazard. Reduce speeds of vehicles.
3. Prevent the release of the hazard that already exists. Placing a trigger lock on a handgun.
Haddon’s Matrix – Event Phase

**Event Phase**

4. **Modify** the rate or spatial distribution of the release of the hazard from its source. For example, seatbelts, airbags.

5. **Separate** in time or space the hazard being released from the people to be protected. For example, separation of vehicular traffic and pedestrian walkways.

6. **Separate** the hazard from the people to be protected by a mechanical barrier. For example, protective helmets.

7. **Modify** the basic structure or quality of the hazard to reduce the energy load per unit area. For example, breakaway roadside poles, rounding sharp edges of a household table.

8. Make what is to be protected (both living and nonliving) more resistant to damage from the hazard. For example, fire and earthquake resistant buildings, prevention of osteoporosis.
Haddon’s Matrix – Post-Event

- **Post-Event Phase**

9. Detect and counter the damage already done by the environmental hazard. Examples, emergency medical care, trauma care.

10. Stabilize, repair, and rehabilitate the damaged object. Examples, acute trauma care, reconstructive surgery, physical therapy.

   Monitor for secondary effects of trauma: depression, PTSD, suicide ideation, other
Role of Injury Prevention in Trauma Centers

- Resource Guide for Optimal Care of the Injured Patient
- Also online
- New Criteria Quick Reference Guide
- Changes are noted in Orange
- Chapter 18; 6 Criterion Deficiencies
- Published in 2014
- Also online: New Criteria Quick Reference Guide Changes are noted in Orange
Organized and Effective Injury Prevention (IP)

- Prioritize IP activities based upon local data (CD-1)
  - Trauma Registry
  - Other Sources of Epidemiology
    - Coroner data
    - CDC data – state or regional
    - Local and State Health Department
    - Other
  - NEW for Levels III and IV Trauma Centers
Organized and Effective Injury Prevention (IP)

- Community partnerships with experts in specific injury prevention, advocacy; (CD-6)

- Exchange of data to better understand the root cause of the problem and how to intervene to decrease injury/death.

- **Must be effective programs:** (Evidence-Based)
  - Data driven
  - Evidence based reviews (East, Cochrane, others)
Effective Leadership – Designated IP Coordinator

- Must be a designated injury prevention coordinator with a job description that includes IP (CD-2)
- L1 – must be a person separate from trauma program manager; must have salary support for IP
- L2-4 – may be the trauma program manager (TPM) only if job description includes detailed responsibilities in IP and IP does not interfere with the other responsibilities of the TPM
Effective Injury prevention

- 3 most common causes of injury and traumatic death in trauma center community

- Target contributing factors:
  - Drugs and alcohol; Behavioral problems
  - Education alone is not necessarily effective
  - Target audience is not necessarily ready for change.

- Choose Proven or Promising Programs
- Leverage advocacy and media
- Track effectiveness
Proximate Cause

• Screening and brief intervention for alcohol
  – Required of all trauma centers (CD-3)
  – Effective screening instrument (CDC, other)
  – Cutoff Score
  – How do you track
    – Have all patients who screen positive received a brief intervention by trained personnel at Level I and II Trauma Centers? (CD-4) New for Level II
  • How do you track and document?
Proximate Cause – Other Examples

• Screening for other drugs of abuse could benefit from research (suggestion!)

• Firearm Injuries
  – Safe Storage
  – Violence Intervention

• Socioeconomic, cultural, environmental, engineering
  – Auto versus pedestrian
  – Falls
Proven and Promising Programs

• Proven and promising – others are using and/or researching with promising results

• Complete review of the literature (East, CDC, Cochrane)

• Adapt programs to your community

• **Level 1 and Level 2 centers** must implement at least 2 programs that address one of the major causes of injury in the community (**CD-5**)

• Collect data – numbers, effectiveness, follow-up
Summary Criterion Deficiencies

1. Prioritize IP activities on local data (CD-1)
2. Designated injury prevention coordinator (CD-2)
3. Screening and brief intervention for alcohol (CD-3)
4. Perform Brief intervention (Level I and II) (CD-4)
5. Implement at least 2 programs that address one of the major causes of injury in the community (CD-5)
6. Community partnerships with experts in specific injury prevention, advocacy; (CD-6)
Secondary Injuries and Second Trauma

- Disabilities – emotional and psychological
  - Depression
  - PTSD
  - Interpersonal violence
  - Suicide
- Second Trauma
  - Families and significant others
Many Opportunities

- **EMS** – benefits us all – work with EMS providers – they are healthcare providers – falls prevention; they have access to homes

- **Share data** and publications

- **Share interventions** and injury prevention strategies and tactics

- **Identify risks** in our populations that overlap

- **Don’t forget advocacy!**
Child Restraint Law in Nevada
NRS 484B.157

• Existing law: children <6 years and ≤60 lbs. must be secured in a Child Restraint System (CRS).
• Proposed bill will extend CRS requirements to include children <8 years and <57 inches in height.
• Child safety seats reduce the risk of injury by 71-82%, and risk of death by 28% as compared to seat belts.
• For children 4- to 8-year-olds, booster seats reduce injury risk by 45 percent compared to seat belts alone.
• AAP Recommendations:
  • Children who have outgrown a forward-facing seat should use a booster seat until the lap-and-shoulder belt fits properly (generally 4 ft. 9 and between 8 and 12 years old).
  • Children should ride in the back seat until age 13 years of age.
Center for Traffic Safety Research
University of Nevada, Reno School of Medicine

New Injury Severity Score Groups
Children age 4-7 (N=240)
Linked NDOT-Trauma Years 2005-2014

No injury  Minor-Moderate  Serious-Critical

<table>
<thead>
<tr>
<th></th>
<th>CRS</th>
<th>No CRS</th>
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</thead>
<tbody>
<tr>
<td>No injury</td>
<td>27</td>
<td>7</td>
</tr>
<tr>
<td>Minor-Moderate</td>
<td>42</td>
<td>106</td>
</tr>
<tr>
<td>Serious-Critical</td>
<td>14</td>
<td>44</td>
</tr>
</tbody>
</table>

CRS = Child Restraint System
New Injury Severity Score Groups
Children age 6-7 (N=124)
Linked NDOT-Trauma Years 2005-2014

- No injury: 6 CRS, 5 No CRS
- Minor-Moderate: 15 CRS, 73 No CRS
- Serious-Critical: 4 CRS, 21 No CRS
Center for Traffic Safety Research
University of Nevada, Reno School of Medicine

Average Hospital Charges
Children age 4-7 (N=240)
Linked NDOT-Trauma Years 2005-2014

- Lack of CRS equates to an average additional $19,000 in hospital charges per child aged 4-7
- From 2005-2014, use of CRS among Nevadans aged 4-7 could have saved over four million dollars or $420,000 per year in hospital charges.
- Children age 6 – 7 with NO Child Restraint System accrued higher hospital charges compared to those in a Child Restraint System.
- From 2005-2014, use of CRS among Nevadans aged 6-7 could have saved 2.8 million dollars or $280,000 per year.
- The passage of this law should result in decreased injury in children involved in MVC in the State of Nevada.
Children under 13 should ride in the back?
Center for Traffic Safety Research
University of Nevada School of Medicine
Linked NDOT-Trauma data 2005-2012

- 32% of children age 0 – 12 rode in the front seat suffered serious to critical injuries based on their New Injury Severity Score (NISS) compared to 29% of children age 0 - 12 with a car/booster seat.
Children age 0 – 12 who rode in the front seat accrued higher hospital costs compared to those who were in the back seat.
Conclusion:
The needs to address Nevada’s Child Restraint Law Gap

- Booster seats save lives and reduce injuries!

- Gaps that need to be addressed:
  - Age 6 – 7 year olds, there is no requirement under Nevada law that they are restrained in a booster seat, as recommended by the American Association of Pediatrics.
  - There is no requirement under Nevada law that children ride in the back seat until age 13 years old.
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2005-2014 Data from NDOT Crash data linked with all four Nevada Trauma Center Data or Trauma Data only.
Chi-square, and Mann Whitney U (SPSS v.24) were used to analyze the Nevada crash data.
The significance level was set at p<.05

**Epidemiology:**

- In 2014, 121,350 children aged 0-12 were injured in a Motor Vehicle Crash (MVC). During this period 602 children died in MVCs, 34% of whom were unrestrained (CDC 2016). Many more children are improperly restrained.
- For every death, 18 children are hospitalized and 500 receive medical attention.
- Child Restraint Systems (CRS) reduce risk of injury by 71-82%, and risk of death by 28% as compared to seat belts.
- **Booster seats reduce risk on nonfatal injury by 45% in children 4-8 years old.**
- According to National 2014 injury death data, MVCs are the leading cause of unintentional death for persons aged 5-24, and the second leading cause for those aged 1-4.

**Nevada Data:**

- In Nevada, from 2009-2013 MVCs were the leading cause of injury death for children and youth aged 5-19.
- **Eighty percent** of children aged 6-7 years treated at...
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Questions?
YOU Make a Difference

Thank You

Let's Work Together on Action Steps and Generating Data
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