Injury Prevention: A Key Component of the Trauma System

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Disclosures


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
  - Identifying Risk Factors for injury in the community
  - Creating 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.
Application to Populations

- Intentionality
  - Intentional
  - Unintentional

- Demographics
  - Age
  - Gender
  - Ethnicity

- Local/Regional Data
  - WISQARS and other data sources
  - NTDB – trauma data from contributing trauma centers
Trauma Accounts for 47% of Deaths up to 46 Years of Age (2014)
Leading Causes of Years of Potential Life Lost Up to Age 75 (2014 CDC)

- **Injury**: 15.2% (Unintentional), 5.8% (Suicide), 3.1% (Homicide)
- **Cancer**: 21.3%
- **Heart Disease**: 15.1%
- **Chronic Lower Respiratory Disease**: 2.9%
- **Liver Disease**: 2.8%
- **Diabetes**: 2.7%

Percentage Contribution to Total Years of Potential Life Lost Before Age 75
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

- 10.6 deaths per 100,000 population for Motor Vehicle
- 10.5 deaths per 100,000 population for Firearm
- 10.4 deaths per 100,000 population for Falls

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

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
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
Organized and Effective Injury Prevention (IP)

• Prioritize IP activities based upon data
  – Trauma Registry
  – Epidemiology – several sources
    • 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;
- 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
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 motivated and ready for change.

- Choose Injury prevention programs that are proven or promising

- Leverage advocacy and media

- Track effectiveness
NASEM Recommendations – Injury Prevention

- **#1** The White House should set a national aim of achieving zero preventable deaths after injury and minimizing trauma-related disability.

- **#3** The Secretary of Defense should ensure combatant commanders and the Defense Health Agency (DHA) Director are responsible and held accountable for the integrity and quality of the execution of the trauma care system in support of the aim of zero preventable deaths after injury and minimizing disability.

- **#4** – sustained effort

- **#6** – best practices

- **#7** – strengthen research ... outcomes
Secondary Injuries

- Disabilities – physical
  - The civilian trauma centers likely have a lot to learn from our military colleagues

- Disabilities – emotional and psychological
  - Depression
  - PTSD
  - Interpersonal violence
  - Suicide

- Second Trauma
  - Families and significant others
Opportunities

- EMS – benefit 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

- Major initiative – firearm injury prevention, guided by survey of COT members, 29% of which have had military experience.
- [https://www.facs.org/quality-programs/trauma/ipc](https://www.facs.org/quality-programs/trauma/ipc)
Opportunities

Trauma Prevention Coalition

- 11 member organizations working together to develop effective strategies in injury/violence prevention

http://www.amtrauma.org/page/IPCS2017
Thank You

Let's Work Together on Action Steps
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