Introduction to Pediatric Injury Prevention

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Overview of Injuries in Childhood/Epidemiology

- Unintentional injuries are the leading cause of death in children from 1 - 21 years of age in the U.S.
- Each year, 20-25% of children sustain an injury requiring medical attention, missed school, and/or bedrest
- Leading cause of childhood medical spending in U.S.
Epidemiology cont.

- Children living in low-income neighborhoods such as ours are at increased risk of severe injury from both unintentional and intentional causes (Davidson et al.)
Injuries in Washington Heights

Incidence (/100,000) of Severe Injuries and Injury Mortality (/100,000), Children < Age 17, Washington Heights, 1999-2001

<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence or Severe Injuries</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>323.25</td>
<td>3.92</td>
</tr>
<tr>
<td>2000</td>
<td>306.75</td>
<td>5.86</td>
</tr>
<tr>
<td>2001</td>
<td>271.59</td>
<td>3.91</td>
</tr>
</tbody>
</table>
Incidence (per 10,000) of Severe Injuries to Residents of Washington Heights Zip Codes, Ages 0-16 Years, 1999-2001, by Cause & Year

<table>
<thead>
<tr>
<th>Cause</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>9.80</td>
<td>9.38</td>
<td>6.64</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>3.53</td>
<td>1.17</td>
<td>3.13</td>
</tr>
<tr>
<td>Bicycle</td>
<td>0.98</td>
<td>1.76</td>
<td>0.98</td>
</tr>
<tr>
<td>MV Occupant</td>
<td>0.78</td>
<td>2.15</td>
<td>0.39</td>
</tr>
<tr>
<td>Firearms</td>
<td>1.37</td>
<td>0.39</td>
<td>0.59</td>
</tr>
<tr>
<td>Poison</td>
<td>1.37</td>
<td>2.15</td>
<td>2.54</td>
</tr>
<tr>
<td>Burn/Fire</td>
<td>2.94</td>
<td>3.91</td>
<td>2.93</td>
</tr>
<tr>
<td>Cut</td>
<td>0.98</td>
<td>0.59</td>
<td>1.75</td>
</tr>
<tr>
<td>Strike</td>
<td>0.98</td>
<td>0.39</td>
<td>0.39</td>
</tr>
<tr>
<td>All Other</td>
<td>9.60</td>
<td>8.79</td>
<td>7.82</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32.33</strong></td>
<td><strong>30.68</strong></td>
<td><strong>27.16</strong></td>
</tr>
</tbody>
</table>
Example Injury Statistics: Drowning

- In 2002 – 838 children <14 years old died from accidental drowning
- 2003- 4200 children < 14 years old treated in ERs
- Typical medical cost “near drowning”- $8K for hospital visit up to $250K/year for long-term care
- Other sequelae - the witnesses, the families
Basics of Injury Prevention

- INJURIES ARE NOT ACCIDENTS
- Injuries are often understandable, predictable, and preventable
- Specific injuries share similar characteristics of person, place, and time
- By understanding injuries, interventions can be developed and implemented to prevent or limit the extent of a given injury
William Haddon and The Phase-Factor Matrix

- First conceptual framework for studying injuries causes and prevention, developed by William Haddon
- By studying a specific injury with this matrix in mind, one can identify **modifiable** risk factors and identify points of intervention in the causal sequence
Phase-Factor Matrix cont.

- Much like an infectious disease:
  - Host = person experiencing injury
  - Vector = e.g. a bicycle or car
  - Environment = physical and socioeconomic condition surrounding event
- Three Phases during which each factor must be evaluated:
  - pre-event phase
  - event phase
  - post-event phase
# Example

<table>
<thead>
<tr>
<th></th>
<th>Host</th>
<th>Vector</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-event</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Event</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Post-event</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Example: Ingestion

<table>
<thead>
<tr>
<th></th>
<th>Host (child)</th>
<th>Vector (medicine)</th>
<th>Environment (home)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-event</td>
<td>Age of child</td>
<td>How lethal</td>
<td>Where bottle stored</td>
</tr>
<tr>
<td>Event</td>
<td>Manual dexterity</td>
<td>Child proof package</td>
<td>supervision</td>
</tr>
<tr>
<td>Post-event</td>
<td>Other medical problems</td>
<td>How quickly absorbed</td>
<td>Proximity to hospital</td>
</tr>
</tbody>
</table>
Strategies for Prevention

Intervention or countermeasures are classified based on requirements for behavior change

- **Active** - rely on actions taken by an individual (e.g. storing meds in high/locked cabinets)
- **Passive** - do not rely on the efforts of an individual to be successful (e.g. packaging meds in nonlethal amounts/child safety caps)
Methods of prevention: The Three “E’s”

- Engineering
- Environmental change
- Education
Primary Care Based Injury Prevention Counseling

- American Academy of Pediatrics - injury prevention counseling is standard of care
- Residency Review Committee - among educational goals
Effectiveness of Primary Care Office Based Counseling

- Comprehensive review of the literature shows positive results
  - increased knowledge
  - improved behavior
  - decreases in number of certain injuries (Bass et.al.)
- Cost effective
  - for each dollar invested in effective program, return $13 (Miller and Gailbraith)
Outcomes of Counseling

- educational change
- behavioral change
- change in occurrence of injury
Need for Patient Education

- Parents think they would be most likely to obtain safety information from physician’s office; physicians were cited as parents’ first choice for such info (Eichelberger et.al.)

- Relatively small proportion of households with young children (39.3% of 0 - 14 year olds) report receiving injury prevention counseling (Quinlan et. al.)
AAP Policy Statement on Office-Based Counseling (1994)

Counseling as a standard of health care

- “All children deserve to live in a safe environment”
- “Anticipatory guidance for injury prevention should be an integral part of the medical care provided for all infants, children, and adolescents”
- “appropriate to age and locale”
Office Based Injury Prevention Counseling

An effective prevention program must

- emphasize most important injuries
- be developmentally focused
- offer achievable strategies for parents/patient
- actively engage parent/child
- take into account parent’s own viewpoint
- Be adaptable to office practice and incorporated into health supervision visits
The Injury Prevention Program (TIPP)

- Initiated in 1983 by the American Academy of Pediatrics
- Initially for children ages birth to 4 years
- October 1988 expanded to include children age 5 to 12 years
- 1994 - revised and updated to reflect the current pattern of childhood injuries
What is TIPP?

- A systematic educational program for pediatricians to use to counsel parents and children about adapting behaviors to prevent injuries
- Promotes behaviors that are effective and capable of being accomplished by most families
- Key topic areas: MV, drowning, burns, firearms, poisonings, falls, bicycles, choking, pedestrian hazards
Comprehensive TIPP Program

Guide to Safety Counseling in Office Practice

- Policy Statement
- Childhood safety counseling schedules and guidelines
- Package of materials - safety surveys and safety sheets for use in providing anticipatory guidance to parents and children
Counseling Schedules

- introduces and reinforces safety concepts in an organized manner
- emphasizes those injuries most important developmentally to help parents anticipate and prevent injuries
Safety Sheets

- Eight age-specific and color-coded Safety Sheets
- Topic-specific sheets also available
- Available in English and Spanish
How to implement in practice: A Checklist

- Discuss importance of injury prevention to child’s health
- Give parent/child age and language appropriate safety sheet
- Read through TIPP sheet with parent and child (minimum 3 topics)
- Ask if any questions
- Ask if any barriers to implementing
- Document counseling in medical record
Implementation continued

- Counsel at each well child care visit and during any other appropriate patient encounter (“teachable moment”)
- Ask follow-up questions on subsequent visits to see if parents are implementing
Summary

- You can make a difference
- Injuries are NOT accidents - they are often predictable and preventable
- By taking the time to effect behavioral change in your patients and patients’ families, you can have a huge impact on children’s lives.