Injury Prevention and Childhood Obesity

Keshia M. Pollack, PhD, MPH
Assistant Professor
Johns Hopkins Bloomberg School of Public Health

IOM Committee on Childhood Obesity Prevention Policies for Young Children

June 8, 2010
Presentation Objectives

- Describe how injury relates to obesity risk and why we should consider injury prevention for childhood obesity (COB)
- Provide a brief overview of the literature on injury and obesity
- Discuss how injury prevention relates to promoting healthy eating and activity among infants and young children
- Discuss how injury prevention affects opportunities for activity and food consumption
- Suggest policy/areas for the committee to consider
Injury

- Injury refers to damage to cells and organs from energy exposures that have relatively sudden, discernible effects.
- Results from the transfer of energy (kinetic/mechanical thermal, chemical, electrical, and ionizing radiation) in quantities or at rates above or below the threshold of human tolerance.
- May be unintentional or intentional.
- Injuries are preventable.
Epidemiology of Injuries

- Unintentional injuries are the leading cause of death, ages 1 to 44 years
- Leading cause of years of potential life lost before 65 years
- Account for 33% of all ED visits and 8% of hospital admissions
- Disparities by socio-demographic factors
- Injuries are costly: direct costs - $80.2 billion and productivity losses - $326 billion

CDC, NCIIPC, 2010; Finkelstein et al. 2006
## 10 Leading Causes of Death by Age Group, United States – 2006

<table>
<thead>
<tr>
<th>Rank</th>
<th>Total</th>
<th>65+</th>
<th>55-64</th>
<th>45-54</th>
<th>35-44</th>
<th>25-34</th>
<th>15-24</th>
<th>10-14</th>
<th>5-9</th>
<th>1-4</th>
<th>&lt;1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Congenital Anomalies</td>
<td>6,919</td>
<td>Malignant Neoplasms</td>
<td>101,464</td>
<td>Malignant Neoplasms</td>
<td>101,464</td>
<td>Heart Disease</td>
<td>101,464</td>
<td>Heart Disease</td>
<td>101,464</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>2</td>
<td>Unintentional Injury</td>
<td>5,613</td>
<td>Malignant Neoplasms</td>
<td>439</td>
<td>Malignant Neoplasms</td>
<td>439</td>
<td>Heart Disease</td>
<td>439</td>
<td>Heart Disease</td>
<td>439</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>3</td>
<td>Con genital Anomalies</td>
<td>5-5</td>
<td>Malignant Neoplasms</td>
<td>0</td>
<td>Malignant Neoplasms</td>
<td>0</td>
<td>Heart Disease</td>
<td>0</td>
<td>Heart Disease</td>
<td>0</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>4</td>
<td>Malignant Neoplasms</td>
<td>4,566</td>
<td>Homicide</td>
<td>366</td>
<td>Homicide</td>
<td>366</td>
<td>Suicide</td>
<td>419</td>
<td>Suicide</td>
<td>419</td>
<td>Suicide</td>
</tr>
<tr>
<td>5</td>
<td>Maternal Pregnancy Comp.</td>
<td>3,566</td>
<td>Malignant Neoplasms</td>
<td>3,566</td>
<td>Malignant Neoplasms</td>
<td>3,566</td>
<td>Heart Disease</td>
<td>3,566</td>
<td>Heart Disease</td>
<td>3,566</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>6</td>
<td>Homicide</td>
<td>3,195</td>
<td>Malignant Neoplasms</td>
<td>1,105</td>
<td>Malignant Neoplasms</td>
<td>1,105</td>
<td>Heart Disease</td>
<td>1,105</td>
<td>Heart Disease</td>
<td>1,105</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>7</td>
<td>Respiratory Disease</td>
<td>2,925</td>
<td>Malignant Neoplasms</td>
<td>2,925</td>
<td>Malignant Neoplasms</td>
<td>2,925</td>
<td>Heart Disease</td>
<td>2,925</td>
<td>Heart Disease</td>
<td>2,925</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>8</td>
<td>Bacterial Sepsis</td>
<td>2,826</td>
<td>Malignant Neoplasms</td>
<td>2,826</td>
<td>Malignant Neoplasms</td>
<td>2,826</td>
<td>Heart Disease</td>
<td>2,826</td>
<td>Heart Disease</td>
<td>2,826</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>9</td>
<td>Preeclampsia</td>
<td>2,683</td>
<td>Malignant Neoplasms</td>
<td>2,683</td>
<td>Malignant Neoplasms</td>
<td>2,683</td>
<td>Heart Disease</td>
<td>2,683</td>
<td>Heart Disease</td>
<td>2,683</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>10</td>
<td>Unintentional Injury</td>
<td>1,113</td>
<td>Malignant Neoplasms</td>
<td>1,113</td>
<td>Malignant Neoplasms</td>
<td>1,113</td>
<td>Heart Disease</td>
<td>1,113</td>
<td>Heart Disease</td>
<td>1,113</td>
<td>Heart Disease</td>
</tr>
</tbody>
</table>

**Source:** National Vital Statistics System, National Center for Health Statistics, CDC.

**Produced by:** Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC.
## 10 Leading Causes of Injury Death by Age Group

### Highlighting Unintentional Injury Deaths, United States – 2006

<table>
<thead>
<tr>
<th>Rank</th>
<th>Age Groups</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unintentional Suffocation 245</td>
<td>11,626</td>
</tr>
<tr>
<td>2</td>
<td>Homicide Unspecified 125</td>
<td>5,613</td>
</tr>
<tr>
<td>3</td>
<td>Unintentional MV Traffic 179</td>
<td>5,308</td>
</tr>
<tr>
<td>4</td>
<td>Unintentional Other Spec., Classific 75</td>
<td>4,295</td>
</tr>
<tr>
<td>5</td>
<td>Unintentional Drowning 265</td>
<td>3,944</td>
</tr>
<tr>
<td>6</td>
<td>Unintentional Fire/burn 268</td>
<td>3,857</td>
</tr>
<tr>
<td>7</td>
<td>Unintentional Suffocation, Other 113</td>
<td>3,851</td>
</tr>
<tr>
<td>8</td>
<td>Unintentional Fire/burn 26</td>
<td>3,614</td>
</tr>
<tr>
<td>9</td>
<td>Homicide Suffocation 34</td>
<td>3,614</td>
</tr>
<tr>
<td>10</td>
<td>Unintentional Suffocation 42</td>
<td>3,614</td>
</tr>
</tbody>
</table>

### Notes
- Three causes are: Accidental falls, undetermined unspecified and unintentional falls
- Two causes are: Unintentional Suffocation and unintentional poisoning

**Source:** National Vital Statistics System, National Center for Health Statistics, CDC.

**Produced by:** Office of Statistics and Programming, National Center for Injury Prevention and Control, CDC.
Childhood Injuries

- Leading causes of injury death for children 1-4 and 5-9 years old
  - MVCs, drowning, fire/burns
  - Less than 1 year old - suffocation
- Unintentional injuries are the leading cause of ED visits and hospital admissions for children
- Leading causes of nonfatal injuries treated in the ED for children
  - Falls (<1, 1-4, 5-9 years old)
  - And, struck by/against, bite/sting, foreign body (<1, 1-4 years old)

CDC, NCIPC, 2010
Why Consider Injury Prevention for COB?

- Public health impact of injuries on children
- Rich history (field began 1970s): successful policy, environmental, legal, and behavioral interventions that have made people safer
- Known effective and promising interventions exist
- Key objective for both fields: keep people safe
  - May be beneficial to include injury prevention frameworks and strategies

Haddon 1970; Haddon 1973; Runyan and Baker 2009
Deliberate effort by injury research community to be included in discussions about active living

Concern among injury researchers that there is a need to promote SAFE activity

CDC/SAVIR partnership: pedestrian injury

“"It Wouldn’t Hurt to Walk: Promoting Injury Prevention Research” (Sleet et al. in press, Injury Prevention)

Partner meetings with ALR, NHTSA, and FHWSA

Active Living Research Commissioned Paper - due Feb 2011
**Literature on Injury and Obesity**

- Limited; mostly for adults and related to MVCs and work; obesity as a risk factor
- Increased attention to crime and safety related to being active, but limited inclusion of injury prevention strategies
- My own research relevant to children:
  - “Injury Prevention Perspective on COB” (Pollack 2009)
  - Obesity and injury risk and distribution, children ages 9-15 in MVCs (Pollack et al. 2008)
  - Walking to school and neighborhood incivilities, children ages 9-11 (Gibbons et al. in press); + other papers
Literature on Injury and Childhood Obesity

- **Transportation**
  - Car seats: estimated that children are at a weight that may not allow them to safely use currently available car seats (Trifiletti et al. 2006)

- **Safe Routes to Schools**
  - Pedestrian safety
  - Bicycle safety

- **Physical activity**
  - Playground-related injuries
  - Some attention to sports injuries (competitive)
Playground-Related Injuries (2001-2008)

- Playgrounds promoted as a place for children to be active
- Estimated 220,000 ED-treated injuries/year
- CPSC:
  - 54% injuries to children < 5 yrs; mainly falls
  - Home and day care centers*
- ED visits:
  - 53% to children 5-9 years; mainly falls
  - School or parks
- These injuries are preventable!

ALR 2010; CPSC 2009; CDC/NCIPC
Safe Routes to Schools (SR2S)

- Overcome barriers to active transport
- 4 E’s: engineering, enforcement, education, encouragement (5th ‘E’ – evaluation)
- Effective way to increase activity for kids
- Do not equally assess injury risk; but known interventions exist to minimize injuries
- My research in this area: implementing walking school buses and increasing SR2S activities in Baltimore
  - Emphasis on pedestrian and bicycle safety

US DOT 2010
Injury and Food Consumption

- Choking-related injury
- Anecdotal reports – unintentional and intentional injuries may impact access to food
- Injury risk: nutrition and bone susceptibility as a mechanism for increased risk of injury (fracture)

- Obesity induced by a high-fat diet has been linked to a reduction in the quality of developing bone, both in terms of the density of trabecular bone (Woo et al. 2009) and in terms of the fracture strength of cortical bone (Ionova-Martin et al. 2010)
Policy Considerations

- Transportation policies
  - Safe Routes to Schools
  - Complete Streets Policies
    - Active living and active commuting: to work, supermarkets, etc.
- Physical activity-related policies
  - Implement and enforce policies to keep children safe
    - Pedestrian and bicycle safety, and playground design
  - Day care and school settings – increase surveillance and reporting to better understand problem
**Concluding Thoughts**

- All children deserve access to safe places to play
- Obesity + safety/injury = makes sense!
- Built environment literature pays homage to safety, but not enough
- Food literature - hardly any mention of injury; need more research
- Partnerships with injury researchers to identify, measure, and intervene to reduce risk of injury
- Include injury prevention and control (concepts and interventions) when designing COB interventions
Contact Information

Keshia Pollack
410-502-6272
kpollack@jhsph.edu