Session Title: Pediatric Toxicology – “One Pill Killers – Do They Really Exist?”

Time Required: 75 minutes

Intent: The concept of medications or toxic substances that can kill the pediatric patient with one pill, or one dose strikes fear into the heart of many. In this session we will explore the agents that can indeed cause significant outcome, as well as the care and actions that can be taken in the pre-hospital setting that will have dramatic impact on patient outcome.

Objectives: At the end of this session the participant should be able to:

- Assess a pediatric patient with a possible toxic exposure
- Formulate a general treatment plan when presented with a pediatric patient exposed to any toxic substance
- Discuss the concept of “one pill killers”
- Identify specific substances that may have fatal outcomes with minimal doses in the pediatric patient
- Manage a pediatric patient who has been exposed to specific toxic substances which may cause fatal outcome after low doses

Materials: Flip-chart and markers
LCD Projector or Overhead projector
One Pill Killers – Do They Really Exist? presentation or overheads
Projection Screen
Computer
Handout (Copies of referenced articles)


Prepared By: Robert Vroman
**Attention / Motivation:**

“You respond to a call for a 2 year old patient who is unconscious and unresponsive. Upon your arrival you find “Johnny” who is unconscious, pale, and moist. He is also bradycardic, presenting with a third degree heart block, and hypotensive. The family reports that they believe he swallowed one of his grandmother’s blood pressure pills. After treating and transporting him you check in him a few hours later when delivering another patient to the ER. You learn he died. [Question for audience: Is this possible?] Pause….. I ran this call about 7 years ago, the question is, what happened?”

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<tr>
<th>Instructor Notes</th>
<th>Outline</th>
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<tr>
<td><strong>Facilitated discussion</strong></td>
<td>1. Common medical emergency in young children in U.S.</td>
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<td>Field responses from the audience about possible causes of the patient’s death</td>
<td>2. Ingestions account for most exposures</td>
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<td>Provide overview of pediatric toxicology</td>
<td>3. Significant decline since the 1960’s due to engineering controls</td>
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<td><strong>Time: 5 minutes</strong></td>
<td>4. Majority suffer little harm, but cause rapid deterioration, serious illness, or death</td>
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<tr>
<td><strong>Lecture</strong></td>
<td>5. Poisoning continues to be a significant cause of morbidity and mortality in the US</td>
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<td>Discuss epidemiology</td>
<td>1. Approximately 1 million poisonings per year in children &lt; 6 yo reported to U.S poison control centers</td>
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<td>Discuss common ages</td>
<td>2. 2006 more than 2.4 million exposures to toxic agents</td>
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<tr>
<td>Discuss common agents</td>
<td>3. Most common exposures under 6 are cosmetic and personal care products, cleaning agents, analgesics, cough/cold medications, vitamins, plants, antihistamines, Cardiovascular drugs, alcohols, Hydrocarbons, Antidepressants, sedative/hypnotics</td>
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<td>Discuss prevention methods</td>
<td>4. Most poisonings are acute, occur at home, involve children under 6, and are unintentional</td>
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<td><strong>Time: 5 minutes</strong></td>
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| Small group activity | 1. Discuss potential toxic substances found in the household setting  
|                       | 2. Discuss prevention methods to reduce accidental exposure in the pediatric population |
| Dividing the class into small groups and have them devise a list of potential toxic substances found in households and methods of reducing accidental exposures.  
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<th>After each group develops their responses have them present them to the class</th>
<th>Time: 10 minutes</th>
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| Lecture | 1. General Principles  
| Remember, the focus of this session is on the “one pill killers”. Therefore this section is meant to be a BRIEF review only. Do not spend too much time on general principles at the expense of the main focus of the session | 2. General Treatment  
| Time: 5 minutes | a. Most ingestions only require supportive care which can be more important than specific antidotes.  
| | b. Look for clues of ingestion and provide supportive care before administering specific antidotes  
| | c. Clinical condition dictates treatment rather than substance ingested  
| | d. Patients can rapidly deteriorate  
| | 1. Because most exposures under 6 are exploration and |
Discuss the various “one pill killers”, their mechanism, clinical effects, and treatment.

See references for detailed information in these areas

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<th>Time: 55 minutes</th>
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- not attempts to harm they are generally benign.
- Takes large amounts to become toxic and generally those amounts not taken in young children
- There are several agents that can result in significant toxicity even when taken at low doses
- For each of the following medications provide an overview, the clinical effects, and treatment
  - e. Calcium channel blockers
  - f. Camphor
  - g. Clonidine
  - h. Cyclic Antidepressants
  - i. Opiates and Opioids
  - j. Diphenoxylate
  - k. Salicylates
  - l. Sulfonylureas

Summary

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- Despite the decline in pediatric toxic exposures since the 1960s, they remain a common cause of pediatric encounters.
- Exposures in children less than 6 years of age are exploratory in nature resulting in minimal toxic effects. It is not until the age of 13 and older that fatalities secondary to intentional ingestion occur.
- The majority of these encounters are easily treated with general supportive care.
- There are several substances that can cause significant toxicity in children even at low doses. It is imperative that the pre-hospital provider be familiar with these substances so prompt recognition and treatment is possible in order to avoid catastrophic outcome.

Evaluation

If presented in a conference setting, none. If presented in the classroom setting this material will be represented on the unit written exam and appropriate simulations will be incorporated into the lab setting.