Proper Disposal of Unused Medicines: Outreach and Education Efforts of IISG

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Disclosure

The presenter DOES NOT have an interest in selling a technology, program, product, and/or service to CME/CE professionals.

Illinois-Indiana Sea Grant has nothing to disclose with regard to commercial relationships.

The content of this presentation does not relate to any product of a commercial interest. Therefore, there are no relevant financial relationships to disclose.
Main Risks of Improper Disposal Practices

- Environmental impact
  - Accumulation in waterways leads to concern about continuous, multigenerational exposure to wildlife

- Accidental ingestion
  - Between 2001-2008, > 430,000 children ≤ 5 yrs. were seen in ED due to poisonings from self-ingested prescription and OTC medicines

- Illegal use or theft
  - A survey of teens found that 62% who abuse prescription pain relievers said they do so because they are easily accessible through parents’ medicine cabinets.

- Unnecessary waste of healthcare dollars
Prozac Killing E. coli in the Great Lakes

An upper or a downer?

Presque Isle Lighthouse stands on the shore of Lake Erie in Presque Isle State Park, Pennsylvania.

Medicine Waste Management: Issues and Barriers

- Communicating the issue
- Lack of conclusive research
- Safe disposal
- DEA: Controlled Substances Act
- Funding for staff, disposal & publicity
- Privacy of medical information
- Misinformation
- Convenience
Disposal of Unwanted Medicines: A Resource for Action in Your Community

Content:

1. Introduction to the issue
2. Case Studies of Take-Back Programs
3. How to Hold a Collection Event
4. Materials for Public Outreach and Education
5. Pharmaceutical Donation/Take-Back Legislation
6. International Policy on Medicine Donations
7. Bibliography on Pharmaceuticals, the Environment, and Human Health
8. PowerPoint Presentation

http://www.unwantedmeds.org
Outreach

National Sheriff’s Association
June 20th and 21st
St. Louis, MO

American Veterinary Medical Association Convention
July 16-18th
St. Louis, MO
Education

• The Medicine Chest Curriculum developed in partnership with the P²D² Program at Pontiac Township High School

• Sensible Disposal 4-H Guide developed by Purdue Extension and IISG

• Integration of “Do Not Flush” message into displays, games, brochures, billboards, collection boxes
Unwanted Medicine Collection

- Local take-back programs
  - Single-day events
  - Permanent collection programs

- DEA sponsored take-backs
  1st: September 25, 2010: 242,000 lbs (121 tons)
  2nd: April 30, 2011: 376,593 lbs (188 tons)
  3rd: October 29, 2011

- Mail-back envelopes
IISG provided brochures and staff to help at a single-day collection event held in June 2011, in Machesney Park, IL.

1,455 households participated and 5,049 pounds of medicine were collected. All cardboard and plastic was recycled.
4,607 pounds of medicine collected in 2010
Mail-back Envelopes

- Working with University of Maine to expand pilot program: http://www.safemeddisposal.com/resources.php

- 775 envelopes to be distributed in IL and IN in communities w/in the Lake Michigan watershed.
Partnerships

- Great Lakes Sea Grant Network (IL, IN, PA, NY, OH)
  - Funded by 2010 Great Lakes Restoration Initiative
  - Undo the Chemical Brew (PI: Marti Martz, PA Sea Grant)
  - Main audiences:
    - Anglers
    - Teachers and students
    - 4-H leaders and youth members
    - Current and future medical professionals (e.g., medical, pharmacy, and veterinary students and practitioners)
Partnership with the American Veterinary Medical Association

• Best Management Practices for Pharmaceutical Disposal
  • Minimize unused pharmaceuticals
  • Follow federal and state guidance for disposal
  • Promote use of incineration
  • Client education strategies

• Together Reaching a Larger Audience
  • Vets can reach Pet owners
  • Professional membership base of 82,500 veterinarians, comprises ~ 83 – 85%
  • Veterinary student membership of ~ 95 – 100 %
**Funding Research**

**Study 1:**
Quantifying estrogen compound and nutrient reduction in a coupled wetland and groundwater flow-through system

Illinois State University, Dr. Eric Peterson

**Study 2:**
Trace organics in Lake Michigan: Concentration and detection frequency of pharmaceuticals in the near-shore water column

Ball State University, Dr. Melody Bernot
Trace organics in Lake Michigan: Concentration and detection frequency of pharmaceuticals in the near-shore water column
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Table 1. Concentrations of pharmaceuticals detected denoted as “other” in Figure 1. Values are ranges of concentrations detected across sites separated by sampling period (August, November 2011).

<table>
<thead>
<tr>
<th>Compound</th>
<th>Concentration Range (ng/L)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>August</td>
</tr>
<tr>
<td>Acetaminophen</td>
<td>2.5 - 5.1</td>
</tr>
<tr>
<td>Cotinine</td>
<td>1.5 - 4.7</td>
</tr>
<tr>
<td>Gemfibrozil</td>
<td>1.0 - 10.0</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>1.7 - 6.9</td>
</tr>
<tr>
<td>Lincomycin</td>
<td>1.5 - 3.1</td>
</tr>
<tr>
<td>Naproxen</td>
<td>5.0 - 10.0</td>
</tr>
<tr>
<td>Sulfadimethoxine</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td>Sulfamerazine</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td>Sulfamethazine</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td>Sulfathiazole</td>
<td>0.5 - 1.0</td>
</tr>
<tr>
<td>Triclocarban</td>
<td>2.5 - 10.0</td>
</tr>
<tr>
<td>Trimethoprim</td>
<td>1.5 - 3.1</td>
</tr>
<tr>
<td>Tylosin</td>
<td>1.5 - 6.7</td>
</tr>
</tbody>
</table>

Figure 1. Pharmaceuticals concentrations of near-shore (harbor) and open water sampling sites at four locations in Lake Michigan during August (left panels) and November (right panels) 2011. Pharmaceuticals denoted as “other” listed in Table 1.
Illinois
- Household Pharmaceutical Disposal Fund (HB2056, Public Act 97-0545)
- Safe Pharmaceutical Disposal Act (HB3090, Public Act 97-0546)

National
- Pharmaceutical Stewardship Act of 2011 (HR 2939), a federal EPR bill for pharmaceuticals.
Where to From Here?

- **Drug companies** – Green Chemistry
- **Doctors, Pharmacists, Veterinarians, Nurses** – prescribe & dispense mindfully w/ an understanding of ecological effects
- **Consumers** – use, store, and dispose of medicine correctly
- **Water treatment** – Improve technology
- **Researchers** – study long-term effects
To Learn More...

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graphic courtesy of Milwaukee Metropolitan Sewerage District