

# Preventing Unwanted Prescription Drugs from Entering the Environment

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**Presented at Ottawa Co.  
Water Quality Forum**

November 19, 2007



# Presentation Outline

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Background on the issues:

- disposal of unwanted medicine
- medicines in the environment

Collection programs

What's happening in Michigan?



# Disposal of Unwanted Medicines

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In some cases, medicines are not entirely consumed due to:

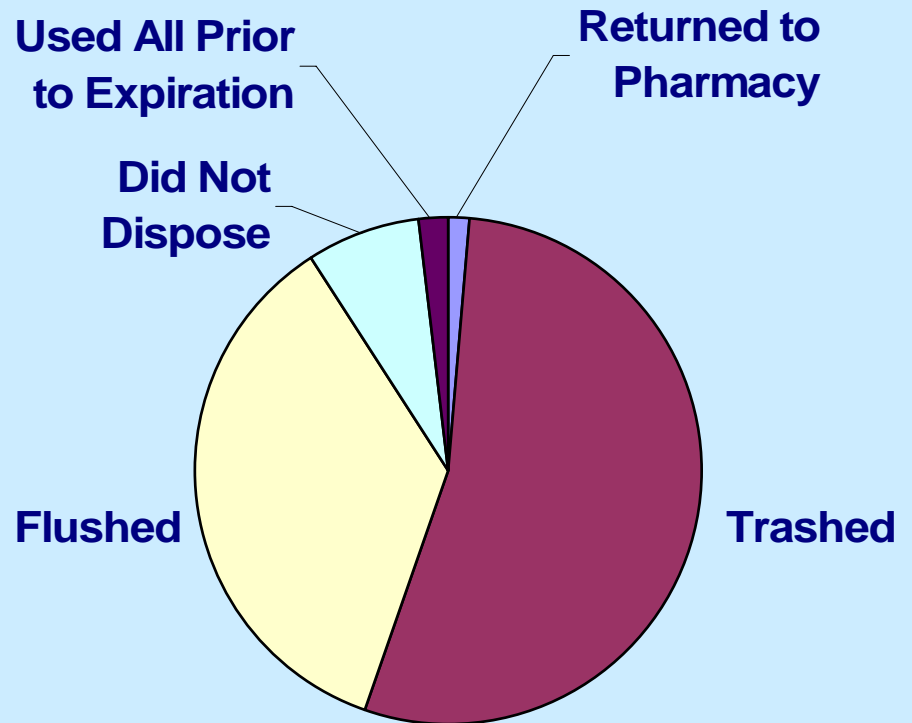
- Change in prescription
- Patient's health improves before finishing medicine
- Patient death
- Patient non-compliance
- Bulk "economy size" containers of over-the-counter medicines contain more than is needed before expiration date



# Expired Medication Disposal Habits

500 patients surveyed:

- 54% disposed of medications in the trash
- 35.4% flushed drugs down the toilet or sink
- 7.2% did not dispose of medications
- 2% used all medication prior to expiration
- 1.4% returned medications to the pharmacy



# Medicines in the Environment

## U.S. Geological Survey monitoring study

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- 139 streams analyzed in 30 states
- Contaminants identified in 80% of these streams
- 82 contaminants identified (many were pharmaceuticals)
- Co-occurrence common; average 7 distinct contaminants identified per stream

Kolpin, D.W. et al. 2002. "Pharmaceuticals, hormones, & other organic wastewater contaminants in U.S. streams, 1999-2000: A national reconnaissance." *Environmental Science & Technology*. 36(6):1202-1211.

# Effects on Aquatic Organisms: Cause for Concern

**Aquatic exposure – chemicals in the aquatic environment can result in continuous, multigeneration exposure.**



- **Feminization of fish - link to estrogen exposure?**

Ex: Boulder Creek, CO: female white suckers outnumber males by > 5 to 1; 50% of males have female sex tissue  
(David Norris, Univ. of Colorado at Boulder)



- **Effects of antidepressants on fish and frog development?**

Ex: Lab studies show low levels of common anti-depressants, including Prozac, Zoloft, Paxil and Celexa, cause development problems in fish, and metamorphosis delays in frogs  
(Marsha Black, Univ. of Georgia)

# Medicines in the Environment

## USGS/CDCP study of drinking water facility

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- Analyzed for 106 contaminants in 24 water samples from locations within a drinking-water- treatment facility and the 2 streams serving the facility
- 40 contaminants detected in 1 or more samples of stream water or raw-water supplies in the plant
- 34 contaminants detected in >10% of these samples
- Some prescription and non-prescription drugs and their metabolites were detected in finished water

Stackleberg, P.E. et al. 2004. "Persistence of pharmaceutical compounds and other organic wastewater contaminants in a conventional drinking-water-treatment plant." *Science of the Total Environment*. 329:99-113.

# The American Pharmacists Association and the U.S. Fish and Wildlife Service jointly recommend the following (2/14/07):

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- **DO NOT FLUSH** unused medications
- **When tossing unused medications, protect children and pets from the potentially negative effects:**
  - crush or dissolve solid medications
  - mix with kitty litter or a solid kitchen substance
  - place in a sealed plastic bag to reduce the poisoning risk
  - remove and destroy **ALL** identifying personal information
  - check for approved state and local collection programs or with area hazardous waste facilities
- **Talk To Your Pharmacist**



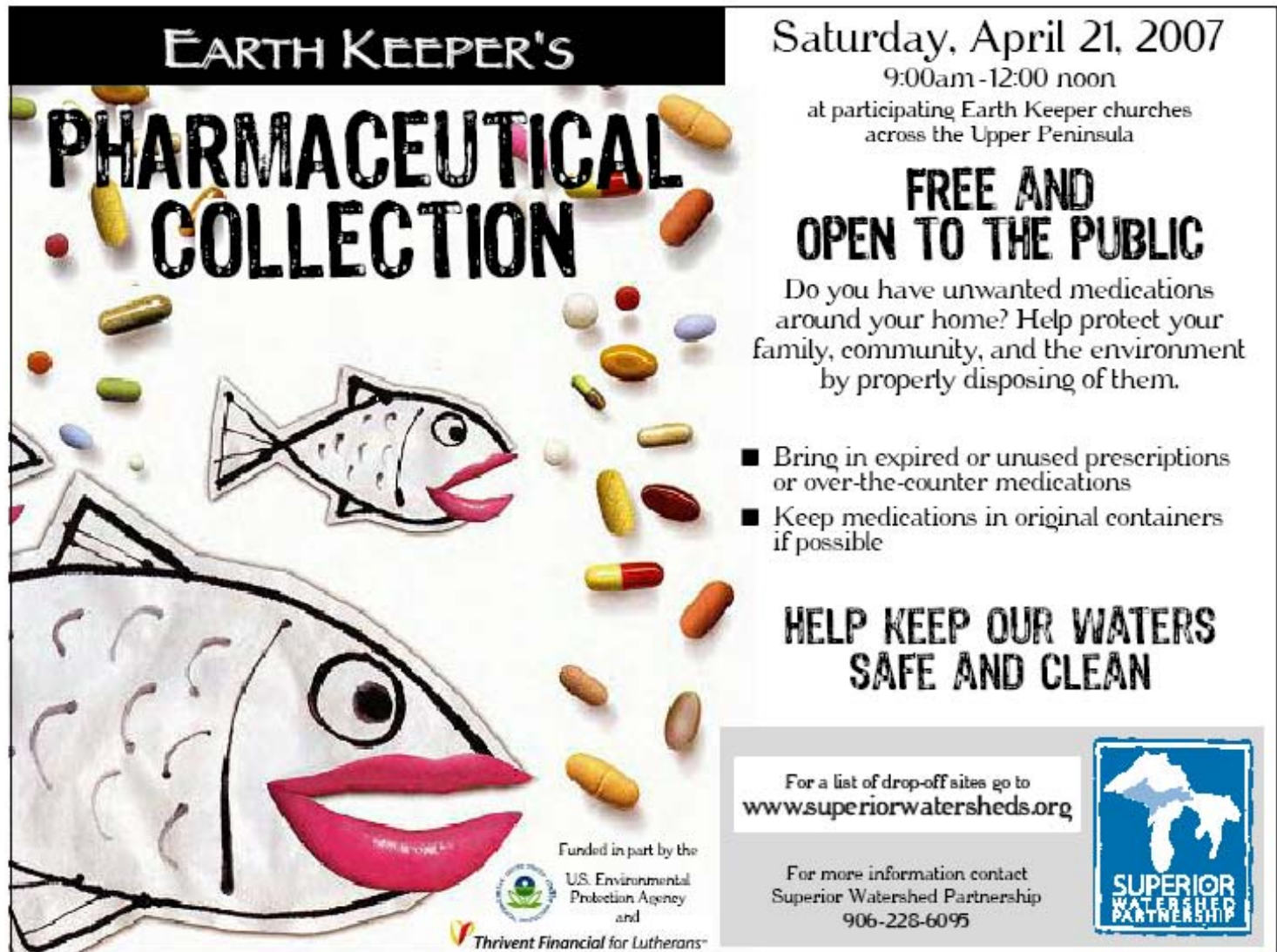
# What Can Be Done?

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- Education and awareness
- Extended producer responsibility
- Legislation (regional and national)
- Creative thinking on collection
- Collections
  - One-day drop-off events
  - Long-term take-back programs for consumers' unneeded medicines

(both need collaboration with reverse distributors, pharmacies and/or local police departments)

# What's Happening in Michigan?



**EARTH KEEPER'S**

## PHARMACEUTICAL COLLECTION

**Saturday, April 21, 2007**  
9:00am - 12:00 noon  
at participating Earth Keeper churches  
across the Upper Peninsula

**FREE AND OPEN TO THE PUBLIC**

Do you have unwanted medications around your home? Help protect your family, community, and the environment by properly disposing of them.


- Bring in expired or unused prescriptions or over-the-counter medications
- Keep medications in original containers if possible

**HELP KEEP OUR WATERS SAFE AND CLEAN**

For a list of drop-off sites go to [www.superiorwatersheds.org](http://www.superiorwatersheds.org)

For more information contact  
Superior Watershed Partnership  
906-228-6095

Funded in part by the  
U.S. Environmental Protection Agency  
and  
Thrivent Financial for Lutherans™



# Michigan Pharm Waste Workshop

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- Organized by MI Sea Grant, CEGLHH
- Date and Location TBA (April 2008?)
- Potential Collaborators/Attendees
  - Household hazardous waste contractors
  - Health departments
  - Solid waste managers
  - Wastewater treatment operators
  - TRIAD groups (law enforcement, senior citizens, community group partnership)
  - Concerned citizens

# IL-IN Sea Grant Resource Kit:

## Disposal of Unwanted Medications A Resource for Action in Your Community

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Includes:

- Background
- Take-back program case studies
- Guidance for organizing medicine collections
- Legislation on disposal and donation of unneeded medication
- Materials for public education and outreach
- Bibliography of news articles and scientific reports



<http://www.iisgcp.org/Unwantedmeds/>

# Acknowledgments

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- U.S. EPA Great Lakes National Program Office
- Scott Morgan, Indiana Household Hazardous Waste Task Force, Inc.
- Joanie Burns, Wisconsin Department of Natural Resources
- Bart Hagston, Illinois Counties Solid Waste Management Association
- Sgt. Jeff Hoffmann, Chicago Police Department
- Lara Polansky, UC Santa Barbara & NOAA Hollings Scholar Program
- Sonia Joseph, Michigan Sea Grant & GLERL Center of Excellence for Great Lakes and Human Health