



March 2014 Briefing Summary

Pharmaceutical Waste in Wisconsin's Water: *Risks and Solutions*

Briefing Materials are available at: <http://uwphi.pophealth.wisc.edu/programs/health-policy/ebhpp/events/index.htm>

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Recent findings of pharmaceutical contamination in Lake Michigan

Dr. Rebecca Klaper from UW-Milwaukee reviewed her study on the "Pharmaceuticals and Personal Care Products Found in the Great Lakes above Concentrations of Environmental Concern."

- Tests of Lake Michigan for pharmaceuticals and personal care products (PPCPs) found high levels of contaminants, even large distances from sewage outlets, indicating that contaminants are not dissipating.
- Contaminants enter our waterways in several ways
 - Consumers and health professionals dispose of drugs by flushing them down the toilet
 - Medications are released in urine after taking prescribed medications
 - Chemicals are washed down the drain when they are used in soaps, shampoos, and perfumes
 - Flame retardants from clothing are released in the washing machine
 - Broken plumbing infrastructure releases chemicals into soil and groundwater
 - Agricultural use of chemicals and antibiotics are expelled through animal waste into soil and groundwater
- Current regulations do not account for the as-yet unknown impacts of these compounds and if they have different effects in combinations.
- The contaminants have shown various deleterious effects on fish health and behavior.
- Some potential solutions to such contamination include:
 - New removal technologies
 - Removal pre-waste stream
 - Green Chemistry - also called sustainable chemistry, which encourages the design of products and processes that minimize the use and generation of hazardous substances
 - Public awareness and change in habits

Potential human health implications of prolonged, low-level exposure to pharmaceutical contamination

The health effects of exposure to these chemicals remain somewhat unknown, but evidence suggests that prolonged low-level exposure poses negative affects on human health. Dr. Henry Anderson of WI DHS briefly discussed these risks, including increased antibiotic resistance, hormone mimicry (endocrine disruption), and



carcinogenicity. Some populations are more vulnerable to these health effects, including children, pregnant women and those with particular diseases. Further biomonitoring will help better understand human exposures to PPCPs from Wisconsin drinking water.

Challenges for municipal water systems posed by pharmaceuticals

MMSD Director Kevin Shafer addressed the challenges in filtering PPCPs from water.

- The principal contributors of pharmaceuticals to wastewater are hospitals, extended-care facilities, and private households via excretion and disposal
- Throwing drugs in the trash may not be a better solution - even if pharmaceutical waste is sent to a landfill, leachate from landfill is often sent to the wastewater utility for treatment.
- Contamination can be treated at the wastewater treatment plant or drinking water plant – treatment makes most sense at the wastewater point for ecological health, but current treatments are not completely effective in removing contaminants.
- Current EPA clean water standards do not account for the unknown risks associated with trace-level pharmaceutical contaminants that remain after treatment. Any solution must include a rigorous source control component – treatment alone is not the silver bullet.

Protecting Wisconsin's waterways from pharmaceutical waste

The DNR's Barb Bickford discussed the current state of household drug collection in WI, potential policy solutions, Wisconsin-based solutions, and how we might keep pharmaceuticals out of water.

- Drug Collections - Over 90% of Wisconsin counties have drug collections now but they only collect 2% of the estimated amounts of unused drugs. Some challenges for take-back programs include:
 - Destruction: Drugs must be shipped out of state for incineration.
 - Regulations: The Drug Enforcement Administration regulations have limited options in the past, but the DEA will be releasing new regulations in the next few months.
 - Funding: The cost of current WI collections is high and is funded mostly by local governments, with some help from state and federal agencies. The DEA pays for destruction of drugs collected by law enforcement but will stop this funding soon. DATCP Clean Sweep funding is very small considering what is being generated.
- Potential policy solutions:
 - Sources of funding may include local or state governments; drug possession fees; pharmacies; pharmaceutical manufacturers; and consumers.
 - Solutions with greater leverage include reducing drug waste and avoiding drug use by supporting non-drug interventions and prevention, shifting cultural attitudes and taking personal responsibility for our health.
- Wisconsin-based solutions: Despite the challenges, WI has been a leader in addressing drug waste.
 - [The Great Lakes Restoration Initiative](#) pharmaceutical waste project (funded by EPA) sponsored stakeholder dialogues, promoted public awareness and collaboration, piloted a mail-back program, and developed model public policies.
 - [The Jefferson County Sheriff's office](#) coordinates Wisconsin's "Witness Burn" shipments to an out-of-state incinerator.
 - [MedReturn](#) manufactures drug collection boxes in Wisconsin.
 - [The UW Extension's Pharmaceutical Waste Reduction](#) website offers proven strategies for reducing waste in healthcare facilities, and suggestions for households, pharmacies, researchers, manufacturers and policy makers.
 - The Wisconsin Crime Prevention Practitioners Association's [Good Drugs Gone Bad](#) project helps prevent drug abuse.
 - [The Wisconsin Community Health Alliance](#) is implementing the [SCAODA recommendations](#) in nine WI counties.
 - The Pharmacy Society of Wisconsin's [Wisconsin Pharmacy Quality Collaborative](#) improves the safety and effectiveness of prescription drug use.
- Future directions for eliminating water contamination include providing sustainable funding, expanding destruction options, raising consumer awareness, reducing and avoiding drug waste and banning certain ingredients.