

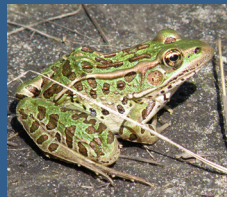
Help Keep Unwanted Medications & Chemicals Out of the Great Lakes



BE AN INFORMED CONSUMER

Learn about the Great Lakes aquatic environment & how you can help protect this vital natural resource.

A healthy Great Lakes benefits people, places, wildlife & the economy.



For More Information: www.unwantedmeds.org

Great Lakes Sea Grant Network: *Illinois-Indiana Sea Grant, Michigan Sea Grant, Minnesota Sea Grant, New York Sea Grant, Ohio Sea Grant, Pennsylvania Sea Grant, Wisconsin Sea Grant & Lake Champlain Sea Grant*

Resources & Publications:

- Disposal of Unwanted Medicines resource kit/Illinois-Indiana Sea Grant: www.iisgcp.org/unwantedmeds
- Erie Times-NIE/Great Lakes Sea Grant Network *Dose of Reality: Remedies to keep everyday chemicals out of waterways*: www.seagrant.psu.edu/publications/fs/Dose_of_Reality_Publication.pdf
- U.S. Environmental Protection Agency: The potential environmental impacts of pharmaceuticals: www.epa.gov/ppcp
- U.S. Geological Survey research on the presence of pharmaceuticals in the environment: <http://toxics.usgs.gov/regional/emc>

References:

- Lee, K.E., Barber, L.B., Furlong, E.T., Cahill, J.D., Kolpin, D.W., Meyer, M.T., and Zaugg, S.D., 2004, Presence and distribution of organic wastewater compounds in wastewater, surface, ground, and drinking waters, Minnesota, 2000-02: *U.S. Geological Survey Scientific Investigation Report 2004-5138*, 47 p.
- Painter M, Buerkley M, Julius M, Vajda A, Norris D, Barber L, Furlong E, Schultz M, Schoenfuss H, Antidepressants at environmentally relevant concentrations affect predator avoidance behavior of larval fathead minnows (*Pimephales promelas*); *Environmental Toxicology and Chemistry*, Vol. 28, No. 12, pg 2677-2684, December 2009
- Emerging Contaminants In the Environment: <http://toxics.usgs.gov/regional/emc/index.html>

Photo Credits: Cover map: NASA; photo: Anna McCartney, Pennsylvania Sea Grant (PASG); water background: Brian P. Whattam; pg 2: Anna McCartney, PASG; pg 3: photo: Anna McCartney, PASG; photo illustration: NASA Goddard Space Flight Center; pg 4: woman & child and rock bass fish w/lesion: Anna McCartney PASG; boy w/fish: USFWS; ducks: Wikipedia Commons, frog: Marti Martz, PASG; dune cherry: Mary Penney, NY Sea Grant

UNDO THE ENVIRONMENTAL CHEMICAL BREW: You Can Help Keep Unwanted Medications & Chemicals Out of the Great Lakes
by Helen M. Domske, New York Sea Grant

UNDO THE ENVIRONMENTAL CHEMICAL BREW Keep Unwanted Medications & Chemicals Out of the Great Lakes



You can help protect
the environment
& ecosystem of
the Great Lakes region

We All
Can Make
A Difference



This fact sheet from the
Great Lakes Sea Grant Network
and Great Lakes
Restoration Initiative
will help get you started on
learning about proper disposal
of unwanted medicines & other
potentially hazardous substances.

Sea Grant
Great Lakes Network

Great Lakes
RESTORATION

A New & Troubling Form of Water Pollution Threatens the Great Lakes

Each day, antibiotics, vitamins, pain medications, hormonal supplements, over-the-counter and prescription medications and other PPCPs are finding their way into the environment, including the waters of the Great Lakes region. *These substances represent a new form of water pollution.* PPCPs can cause harm if disposed of improperly when no longer needed or expired.

What Are PPCPs? Pharmaceuticals and Personal Care Products

PPCPs finding their way into the Great Lakes include:

- Antidepressants
- Antibiotics
- Birth Control Pills
- Blood Pressure Meds
- Cholesterol-lowering Medications
- Cosmetics
- Detergents
- Diet Supplements
- Fragrances
- Herbal Supplements
- Hormonal Substances
- Over-the-Counter Medicines
- Pain Medicines
- Prescription Medications
- Sun Screen
- Tranquilizers
- Vitamins

How do PPCPs enter the environment?

Bioactive chemical substances in PPCPs affect the living tissues of the body and enter the environment in several ways: **1)** excreted as waste with compounds not completely metabolized by the body; **2)** flushed down the toilet by people thinking they are properly disposing of unused/unwanted medicines; **3)** discharged as wastewater treatment plant (WWTP) effluent — many bioactive chemicals are not removed by standard WWTP operations (WWTP effluent has been scientifically documented as a pathway for pharmaceuticals, hormones and other organic wastewater compounds to enter the environment); **4)** applied as wastewater treatment sludge (biosolids) used as fertilizer/soil supplement; **5)** discharged after veterinary application with family pets and farm animals through wastewater treatment systems, from pastures and manure- and fertilizer-treated fields, and as leachate from animal feedlots and aquaculture facilities near streams, creeks and other water bodies; and **6)** discharged from improperly built landfills.

Cause for Concern

More research is needed to evaluate the effects of low-level and long-term PPCP exposure on aquatic organisms and to continue to identify the ecological impacts of these emerging contaminants on water quality, fish and wildlife health and reproduction.

- U.S. Geological Survey and U.S. Environmental Protection Agency water monitoring studies have found pharmaceuticals, including antidepressants and hormones, in streams, rivers and the Great Lakes.
- Scientists have identified freshwater fish with both male and female sexual characteristics (this intersex condition is a form of endocrine disruption) in streams and rivers across the U.S. and in the Great Lakes. An unnatural imbalance in the ratio of female to male fish in some fish populations can have obvious consequences on the reproductive potential of the species impacted.
- Antidepressants have been found in surface waters of the Great Lakes. Researchers at the Aquatic Toxicology Laboratory at St. Cloud University in Minnesota found that minnows they exposed to mixtures of four antidepressant pharmaceuticals showed slowed predator avoidance behaviors.

What about the greater food web? Alterations caused by antibiotics and other pharmaceuticals on bacteria at the base of our aquatic food webs will be felt well up the food chain as fish and other organisms consume the various levels of food sources. Pharmaceutical-based changes in behavior and reproduction have already been documented in frogs, mussels and other freshwater organisms.

The U.S. Environmental Protection Agency and U.S. Geological Survey consider the presence of PPCPs in the environment a significant emerging threat.

Proper PPCP Disposal

What You Can Do

- Become an informed and proactive consumer to reduce the amount of PPCPs you need to discard.
- Take unwanted/expired medicines to local “drop-off” events or other take-back programs for pharmaceuticals and unwanted personal care products.
- If no drop-off, take-back or return programs are available in your area, check county/state guidelines and with your trash removal provider for recommended best medicine/pharmaceutical disposal procedures for your area. Some areas may accept unwanted medicines in the trash if they have been mixed with kitty litter, fireplace ashes or coffee grounds in a sturdy container (e.g., original container, margarine tub, coffee can), and sealed with duct or packing tape. Place container in trash and out of reach of children and animals. If you dispose of medicines in original containers, cover patient name with permanent marker. Do NOT flush down the toilet
- Partner with your doctor to avoid accumulating unwanted or unused medicines that will require disposal. Avoid taking “samples” you may be unlikely to use. Finish an entire prescription as prescribed. Properly store medicines together to avoid overpurchasing or asking your doctor for additional, unnecessary medications.
- Ask your pharmacy/drug store to accept unwanted/unused/expired medicines.
- Keep all medicines out of reach of children and pets.

What You Should NOT DO:

- Do not flush unwanted/unused medicine down the toilet or pour them down the drain unless the label specifically advises you to do so.
- Never give or sell unused or unwanted medicines to others.
- Never put unwanted/unused medicines in the trash without some form of disposal containment as suggested above

Proper disposal of unused and expired medicines and other bioactive chemicals is critically important to protect the water we drink and the Great Lakes ecosystem.



Few standards have been established for identifying the impacts of wastewater effluent content on human health or aquatic animal health.

The proper disposal of PPCPs reduces:

- environmental impact;
- risk of poisoning; especially by children or pets;
- illegal use of drugs; and
- identity theft from personal information found on prescription containers.

A Finite & Delicate Supply

The Great Lakes are the source of drinking water for 42 million people in the U.S. & Canada. In the last 100 years we have added tons of toxins to the finite system of the world's freshwater supply that is continuously cycling through our air, soils & waters.

If we all learn to properly dispose of unwanted or unused medicines, we will be reducing an environmental threat and its potential impacts on our vital Great Lakes aquatic ecosystem.

