

Call to Action: Drugs in Our Water

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One of the central issues healthcare currently faces is how to promote human health and wellness without further degrading the environment. Clean, safe, drinkable water is essential to life on earth. Not only will water scarcity impact health outcomes around the world, but water quality is degrading, and medicine is playing a lead role. Did you know that more than 80% of waterways tested in the United States show traces of such common medications as acetaminophen, hormones, blood pressure medicine, codeine, and antibiotics?¹ These medications fall under a class of chemicals called pharmaceutical and personal care products (PPCPs). The EPA considers the presence of PPCPs in the environment to be one of the most significant emerging health threats of the 21st century.²

How Do Medications Enter Our Water?

We rely heavily on pharmaceuticals in our current medical system. Four out of 5 patients leave their doctor's office with at least 1 prescription.³ After ingestion, many medications are not completely metabolized. Thus, these still-active compounds are excreted into residential sewage systems. Aside from excretion, other medications go unused or expire when prescribed in large quantities or are simply discontinued for good medical reason.

Unfortunately, large numbers of people simply flush these medicines down the toilet or throw them in the trash instead of properly disposing of them. In a series of 2006 take-back events (in which consumers return unused and expired medications; see sidebar), more than 1500 San Francisco Bay area residents disposed of 3634 pounds of pharmaceutical waste (approximately 2.37 pounds per person) at 39 locations.⁴ It was estimated that 45% of unused or expired medicines were flushed down the toilet and 28% were disposed directly into the trash.⁴

This is also true for nutritional supplements—some percentage is excreted, and many become expired unused and are subsequently flushed or trashed. A lack of safe disposal options and of proper information and education actually leave residents with little apparent choice but to dispose of unused pharmaceuticals in the toilet or trash. However, current waste treatment systems are ill-equipped for dealing with these bioactive compounds. In particular, trash disposal leads to wet-weather runoff as leachate from landfills, dissolving PPCP compounds into ground and water systems. In addition, landfills accept sewage sludge that can produce leachates carrying high concentrations of drugs. Over a 45-year period, researchers Holm et al found high concentrations of antibiotics and barbiturates in a Danish landfill.⁵

How Do Drugs Affect Our Environment and Human Health?

Current research provides evidence that PPCPs in the environment have a range of impacts on living organisms. Low concentrations of estrogens cause male fish to become female.⁶

Tips for Reducing Pharmaceutical Waste in Our Environment

- ▶ Do not prescribe more medication or supplements than can be used.
- ▶ Review and regularly reassess the patient's total consumption of medication and supplements.
- ▶ Prescribe starter packs and refill packs.
- ▶ Learn more about which drugs or supplements have large environmental impacts and consider this when prescribing.
- ▶ Donate unwanted physician samples to charity.
- ▶ Educate patients about the value of health promotion and healthy lifestyle to minimize their need for pharmaceutical interventions.
- ▶ Prescribe exercise, nutrition, and good sleep hygiene.
- ▶ Ensure patients understand proper disposal practices for unwanted medications and supplements.
- ▶ Educate patients, consumers, and colleagues about the importance of proper disposal of pharmaceutical and nutritional waste.
- ▶ Set up a medicine take-back site at your clinic or health-care facility.

What Consumers Can Do:

- ▶ Dispose of unwanted medications or supplements at take-back sites or events.
- ▶ Do not dispose of any medication down the toilet or in the trash.
- ▶ Purchase medications and supplements in small amounts, limiting medication expiration.
- ▶ Ask for medications with low environmental impact.
- ▶ Share the message of safe disposal with family and friends.
- ▶ Commit to wellness strategies reducing reliance on medications.

And antidepressants cause lobsters to be more aggressive.⁷ While evidence of direct consequences of PPCPs on human health is only beginning to be investigated, a landmark study in 2006 found that a mix of 13 common medications common to drinking water inhibits cell growth in human embryonic cells.⁸

What Can Be Done to Reduce Pharmaceutical Waste?

As health professionals, we can have a substantial impact on this environmental problem. First, promoting personal wellness strategies significantly reduces our reliance on pharmaceutical interventions. Second, for those required to take pharmaceuticals, proper disposal of unused medication and nutritional supplements through medicine take-back programs

Establishing a Medication Take-back Program

Proper disposal of unused pharmaceuticals is essential to reducing their environmental impact. As a physician, you have the ability to work directly with your patients. The time when you are prescribing a medication is ideal to educate patients about proper disposal habits. The best and most effective action you can take is to establish a Medication Take-back Program in your office. Once established, a waste management service licensed to handle medical waste can then dispose of the medications.

For more information on proper medical waste disposal, see

- ▶ EPA guidelines: www.epa.gov/epawaste/index.htm
- ▶ A Guide to Pharmaceutical Waste Disposal: www.medicalwastesolutions.com
- ▶ Teleosis: <http://www.teleosis.org/gpp-locations.php>

will substantially reduce the amount of biological active ingredients from entering the environment as waste.

Green Pharmacy Program

The Teleosis Institute's Green Pharmacy Program aims for zero pharmaceutical waste in the environment. Our program is a partnership with local pharmacies, health professionals, and public and private organizations that are committed to providing safe disposal for unwanted medicines. The Green Pharmacy Program provides the education and opportunity for everyone involved with the life cycle of the medicines to participate.

For more information about the Teleosis Institute or its Green Pharmacy Program or to find medicine take-back sites, please visit www.teleosis.org.

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