

Drugs in Our Drinking Water

What do we do with unused medicines?

By **Susan Q. Stranahan** February 27, 2009 –



Photo: Getty Images

Millions of Americans are drinking water laced with minute quantities of drugs, including antibiotics, steroids, antidepressants and hormones. Although the drugs appear to pose no immediate health risk to humans, experts concede that they really don't know how long-term exposure will affect people—or aquatic life—even at extremely low levels.

While research continues on the health implications, efforts are under way to keep drugs out of the nation's waste stream. And that may require a top-to-bottom reassessment of how medications are prescribed, dispensed and discarded in this country.

Health and environmental considerations aren't the only factors driving this effort. Costs also play an important role. "Health care is paying for good medicines being flushed down the toilet," says Virginia Thompson, coordinator of the mid-Atlantic sustainable health care sector for the Environmental Protection Agency (EPA).

A decade ago, more than \$1 billion worth of medicines was discarded, experts estimate. Since then, pharmaceutical purchases in this country have increased 72 percent. Today, the average American takes more than 12 different prescription drugs each year, with more than 3.8 billion prescriptions purchased annually, according to the [Kaiser Family Foundation](#). A portion of those drugs is never used. One recent survey estimated the amount of wasted drugs was as high as 45 percent, although the pharmaceutical industry says it is much lower.

The presence of pharmaceuticals in the nation's water should come as no surprise. Prescription medications, as well over-the-counter drugs and personal care products, enter the environment in three ways: They are excreted by the human body, they wash off during bathing or they are discarded. The recommended method of getting rid of many medications has been to flush them down the toilet or pour them down the drain. Tons of other drugs are thrown out in the trash.

A March 2008 [investigation by the Associated Press](#) found trace amounts of drugs in the water supply of 24 major metropolitan areas, meaning at least 41 million Americans have tiny levels of drugs in their drinking water. The [EPA has identified](#) more than 100 individual pharmaceuticals and personal care products in drinking water.

Scientists have known about pharmaceutical waste in water supplies since the mid-1970s, but only recently has improved testing equipment been able to detect chemicals in the parts-per-trillion range. Currently, there are no safety limits on drugs in drinking water, and few municipal water authorities even test for their presence at extremely low levels.

The drug industry says there is no cause for concern. "Studies conducted to date do not suggest that the quantities of pharmaceuticals detected in the environment would be harmful to human health," says Ken Johnson, senior vice president of the Pharmaceutical Research and Manufacturers of America (PhRMA). The average level of active pharmaceutical ingredients in samples is 18 parts per trillion, according to PhRMA's Alan Goldhammer, who adds

that “one part per trillion is about one second in 32,000 years or one penny in \$10 billion.”

But even at those low amounts, scientists have discovered changes in aquatic species that they attribute to drugs, notably hormones. For example, researchers have linked fish in the Chesapeake Bay that have abnormal male and female characteristics to the active ingredient in birth control patches and injections. Some scientists also worry that certain drugs may work synergistically—that is, be stronger in combination than separately—to become more potent pollutants.

How to keep drugs out of drinking water is a matter of debate. One side promotes improvements in water treatment processes while the other favors reducing the amount of pharmaceuticals in circulation before they enter the waste stream. Enhanced water treatment is expensive. Without a compelling reason to produce cleaner water—such as a proven health threat—municipal governments are unlikely to pay for such improvements.

Attacking the problem from the supply end could be cheaper. But stemming the flood of medicinal products in everyday life is likely to run into opposition from the drug industry. Reducing the amount of drugs prescribed to avoid waste would also require a major change in attitude among physicians, health insurers and the Medicare and Medicaid programs.

Drugs are left over for several reasons: A drug regimen may change, the patient may not take all the medications prescribed, or the patient may die. Today, many physicians prescribe 30 or 90 days’ worth of medications, in part due to insurance requirements. If the patient experiences side effects or the drug doesn’t work, the unused portion goes to waste. Ideally, waste reduction proponents say, drugs should be prescribed in small quantities until it is obvious the medication is effective.

“Any pharmaceutical leftover represents a failure of health care of some sort,” argues Christian G. Daughton, chief of the environmental chemistry branch at EPA’s [National Exposure Research Laboratory](#). Daughton is a leading expert on pharmaceuticals in drinking water. “The emphasis should

be on putting in place a system where you shouldn't have to dispose of drugs."

Federal [guidelines](#) list nine drugs, including Percocet and OxyContin, that have a high potential for abuse or are acutely toxic, and recommend that they be flushed. (More than a dozen states and some local governments, however, have established policies that discourage flushing drugs.) For other drugs, authorities recommend mixing the medication with kitty litter or coffee grounds and placing it in the trash, to avoid accidental poisoning or the pilfering of controlled substances.

When it comes to disposal guidelines, "unfortunately, there is not a clear message," says Scott Cassel of the [Product Stewardship Institute](#) in Boston, which is trying to devise one.

Competing interests are driving that effort. Environmental and health concerns call for keeping the drugs out of water supplies, but placing them in the trash is also risky. "There is a very delicate balance with the immediate need to avoid potential abuse versus the long-term need to protect the environment," says Catherine J. Woods of Philadelphia-based [excelleRx](#), which provides prescription medication and care planning for hospices.

The EPA and the federal Drug Enforcement Agency currently are working to clarify federal disposal policies, but that will take time. Meanwhile, several states and local communities have devised drug take-back efforts. Leading the nation in that effort is Maine, where residents can obtain prepaid mailers at 100 sites, such as pharmacies and hospitals, around the state, in which medicines can be returned free of charge for safe disposal. The program was initially underwritten with a \$150,000 grant from the EPA; additional state funding has allowed it to expand and continue for two years.

Who pays for drug take-back programs "is the sticking point for absolutely everyone," says Mary Hendrickson, whose Milwaukee company, Capital Returns Inc., incinerated drugs collected during a pilot program in Wisconsin last year. Collection efforts are not sustainable until funding is assured, she says.

Some advocates contend funding should come from the drug manufacturers. A bill reintroduced this year in Washington state would, in fact, require the industry to underwrite drug collections. Other states are considering similar measures.

Although interest in the issue of drug disposal is increasing, key players are missing from the discussions, including private health insurers and the federal Centers for Medicare & Medicaid Services, says Cassel of Product Stewardship. Experts say the drug industry also is reluctant to get involved. But Daughton of the EPA believes that if the environmental and health care communities do eventually collaborate, a solution to the waste problem can be found. If so, he adds, "this could be one of those very rare win-win situations."

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