

# Removing Unused Drugs from the Environment Westchester County's "Take Back" Pilot Program

by Thomas Lauro and Susan Gerry

## The Problem

Pharmaceuticals are used everywhere in our daily lives from over-the-counter (OTC) drugs to prescription drugs of controlled and non-controlled substances. Total prescriptions filled in pharmacies and by mail order in New York State are more than 225 million annually.

Recently there has been quite a lot of interest in the press and around the country concerning pharmaceuticals in lakes, streams, rivers and, ultimately, our drinking water supply. The United States Geological Survey (USGS) and US Environmental Protection Agency (USEPA) started sampling various water supplies for wastewater "chemicals" back in 2001 to determine emerging contaminants of concern. They were looking for chemicals from industries, animal feed lots, wastewater treatment plants, individual septic systems and runoff. What they found were chemicals grouped into antioxidants, detergents metabolites, disinfectants, fire retardants, fragrances/flavors, insect repellents, non-prescription drugs, PAHs, pesticides, plasticizers, solvents, and steroids. These contaminants were found in parts per billion, trillion and trace amounts.

In Vermont, nonylphenol and fragrances, AHTN and HHCb, were found and have been shown to disrupt reproduction and growth in fish. In the Denver area, concentrations of 1 µg/L (microgram per liter) of nonprescription drugs and steroids were found in urban streams. In Atlanta, Paril, Keflex and Amoxicillin were found in parts per billion as well as Advil, caffeine, and nicotine. In Louisiana, Tylenol and birth control hormones were found and, in New Mexico, birth control hormones, anti-seizure medications, anti-depressants and the pain killer Darvon were revealed. Closer to home, the USGS and NYS Department of Health (NYSDOH) tested New York City source water and found trace amounts of heart medicine, infection fighters, estrogen, anti-convulsants, mood stabilizers and tranquilizers. The list goes on and on across the country where drugs for pain, infections, high cholesterol, asthma, epilepsy, mental illness and heart problems are found in water sources.

As a result, there is growing agreement that we need to develop better methods to prevent the drugs from entering the water supply. Different regulators, municipalities and researchers are looking to water and wastewater treatment processes to be more effective such as activated sludge, ultra filtration, carbon and oxidation treatment. However, these are treating the problem instead of attacking the cause, and can be prohibitively expensive to implement. Therefore, these same agencies are also looking at ways of keeping drugs from getting to the water supply in the first place. At issue are the drugs that are indigested. Some portion of medications are metabolized by our systems, but some passes through and is ultimately excreted into wastewater systems. The amount of a medication that passes through without being metabolized varies by medication and by person. For instance, according to data collected by chemist James Shine at the Harvard School of Public Health, the body metabolizes or uses 50 percent of acetaminophen and the antidepressant fluoxetine. Other drugs like some antibiotics are absorbed at a rate of 50 percent, while others, such as those used to treat diabetes and high blood pressure, are only absorbed by the body at a rate of 20 percent.

In addition to the drug components that enter the environment

due to incomplete absorption, many expired or otherwise unused medications are either flushed down the toilet or thrown out in the trash. Both methods of disposal result in these unwanted medications eventually finding their way into source water supply. Estimates are that these improperly disposed of medications comprise about three percent of the total prescriptions issued annually, or about 6,758,300 prescriptions in New York State alone.

## Disposal Solutions

The proposals for remedying this problem have included a discussion relating to improving the absorption rates of medications to minimize the amounts which find their way into the waste water through excretion. In addition, there is an increased focus on educating both the medical community and the public on the need to have the proper size prescription and to take all medications as they are prescribed. The Pharmaceutical Research and Manufacturers of America, the US Fish and Wildlife Services, and the American Pharmacists Association recently signed an agreement and announced a new campaign, SMARxT Disposal, to encourage proper disposal of medication. Further, New York is in the process of amending the Environmental Conservation Law (A840-B Englebright and S7560-A Alesi) that, "Provides for the Management and Disposal of Drugs." The law is aimed at educating not only the public but institutions in the proper disposal of unused chemicals.

## Westchester's Contribution

In response to the growing evidence of the presence of pharmaceuticals in water supplies, Westchester County began to explore methods to capture unused medications and ensure proper, safe disposal. It is worth noting that, during the course of researching this issue, it became abundantly clear that the medication disposal issue is both an environmental and a public safety concern. In addition to medications being found in source water for drinking supplies, there is ample evidence that poisoning deaths have been on the rise in this country at an alarming rate over the last decade. Across the country, approximately thousands of children are treated for poisoning in hospital emergency rooms each year and too many die. Statistics show that medicinal substances account for up to 45 percent of these hospitalizations. Seniors are also at risk as prescriptions pile up in medicine cabinets, often causing confusion and potentially leading to dangerous misuse. There is also the element of illegal drug use by adolescents. These are not street drugs, but substances often found in a parent or relative's medicine cabinet, including: depressants, morphine, stimulants, codeine, and amphetamines.

In addition to reviewing the Medication Take Back practices that were underway across the country, Westchester County also enlisted the assistance and expertise of the NYS Department of Environmental Conservation (NYSDEC), NYSDOH and the Westchester/Rockland Society of Pharmacists, led by its chair, Joe Fiscella. The Illinois-Indiana Sea Grant program was an invaluable resource in this effort, providing a wealth of institutional information on the topic, sample program materials, contacts throughout the country, in addition to grant funding. In fact, the Illinois-Indiana Sea Grant is a virtual clearinghouse of information on the

*continued on page 46*

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Medication Take Back programs operating domestically and abroad (<http://www.iisgcp.org/unwantedmeds/>).

**Take Back the Meds**

In 2008, Westchester County and the Westchester/Rockland Society of Pharmacists began a pilot program which involved the collection of unused medications at the County’s roving Household Recycling Days (HRD, formerly called Household Chemical Cleanup Days). At these events, the County manages the collections of such items as solvents, pesticides, acids, bases, electronic waste, and tires, though residents often arrive with a wide array of hard-to-dispose-of materials. According to US Drug Enforcement Administration (USDEA) regulation, the destruction of all confiscated controlled substances must be under the control of and observed by law enforcement personnel. State regulatory authorities were also concerned

with proper handling and disposal of the substances collected, as some medications are technically classified as hazardous. In order to address all of these concerns, the County partnered with its own police force and Wheelabrator, Inc., which operates the County-based waste-to-energy plant. Drugs confiscated by County law enforcement were already being incinerated at this facility. The County simply expanded its agreement with Wheelabrator, Inc. to create a convenient, local incineration point for the medications collected at these events. County police were recruited to attend each event, oversee collection, and escort the collected materials to the incineration facility.

The County notified the public of this new program through a panel of media channels including: automated recorded calls, subscriber emails, newspaper ads and brochures distributed through local pharmacies.

**Table Summary of Westchester County Take Back the Meds Program**

	Montrose		Playland		Yorktown		Valhalla	
	3/28/2008	3/29/2008	4/4/2008	4/5/2008	5/9/2008	5/10/2008	6/6/2008	6/7/2008
Number of Households	17	45	37	83	21	75	51	121
Containers of Medicine	281	352	402	630	140	218	334	763
Total Gallons	70	94	106	141	–	–	–	–
Total Pounds	–	–	–	–	65	102	100	193
DEA Controlled	3.20%	4.55%	5.22%	8.10%	19.29%	26.15%	7.49%	7.34%
Rx	61.57%	44.03%	60.95%	59.05%	62.86%	49.54%	57.49%	66.06%
OTC	31.32%	45.17%	31.34%	31.11%	15.00%	24.31%	31.74%	24.64%
Vet Rx	1.42%	1.42%	1.49%	0.32%	0.00%	0.00%	0.30%	0.13%
Unknown	2.49%	4.83%	1.00%	1.43%	2.86%	0.00%	2.99%	1.83%

*Types of pharmaceuticals and amounts so far compiled by the Take Back the Meds Westchester County program*

Public Education	Industrial Pretreatment Programs
Research and Regulatory Assistance	Household Recycling Programs
Drug Take-Back Programs	Innovative Treatment Technologies

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Photo courtesy of Westchester County Communications Department

**Pharmacists and chemists accepting and cataloging drugs.**

At each event, County staff direct residents to the Take Back the Medications station at the HRD events, and assist them by taking the drugs which residents have been instructed to leave in the original packaging. Notably, the residents never have to leave their vehicles. Volunteer pharmacists from the Westchester/Rockland Society of Pharmacists, join with County chemists, to identify and list the medications accepted.

To date, the County has had four events and the results of the Take Back the Meds program can be seen in the *Table Summary*. At the events, the County collected about 1.5 to 2 pounds of drugs per household and each household brought in between six to eight containers on average. At the most recent event, during an eight hour day, residents were bringing in almost 100 containers of drugs an hour. Due in part to the success of the individual events, Westchester County is now investigating permanent HRD facilities and the possibility of including medication take back as part of their functions. As a result, residents would be allowed continuous access for unwanted drug disposal.

### Global Examples

Another method of collecting unused or waste medications is through stewardship programs. These programs have been successful on a short-term basis in this country, but on a continuous basis in other countries such as Australia and Canada. In Australia, about 5,000 pharmacies participate and the Commonwealth covers the annual cost of \$751,000 or \$1.47/lb, while the pharmaceutical wholesalers discount disposal costs. In British Columbia, the Residuals Management Group, which consists of brand owners, fund the annual cost of \$170,500 or about \$3.25/lb. The program has 856 pharmacies participate. These full stewardship programs allow continuous access at many locations for residents to dispose of unwanted medications.

### More Programs Needed

New more accurate testing methods have allowed the detection of drugs in the source water supply. Now that these drugs have been identified, methods are being looked into to reduce the amount that reaches the environment. The methods include more effective treatment processes, better drug metabolization, education for proper disposal, and take-back programs.

Take-back programs in this country to date have mostly been short term programs for days, weeks or several months. The full stewardship or continuous take-back programs may provide the most

successful alternative for the collection of unwanted medications in a country that continues to see the number of prescriptions and drugs grow.

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