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Urban

runoff in the L.A. River | Photo: KCET Departures

Prescription Drugs are Polluting Our Waters

(<http://www.kcet.org/socal/departures/lariver/confluence/river-notes/prescription-drugs-are-polluting-our-waters.html>)

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Microbeads **might be small**, but it's still mostly noticeable in the water. Unfortunately not everything detrimental to the environment and its ecosystem can be so easily seen. The drugs that we so often turn to when alleviating our ills and those of our animals are also degrading the environment for the rest of the population. A 2002 study by the U.S. Geological Survey found that **80 percent of streams** in the U.S. had traces of prescription drugs.

In a report done by environment and sustainable development consultancy **Bio Intelligence Service** for Executive Agency for Health and Consumers (EAHC), set up by the European Commission **in 2006**, notes that the United States is the largest consumer of human medicinal products. This year, approximately \$275.9 billion in prescription drugs will be prescribed according to the **Centers for Medicare and Medicaid**. That number is predicted to increase to \$379.9 billion by 2020. At most, a third of those prescriptions **won't be used** because patients don't complete their medication, stop medication, or reduce their dosage without informing their pharmacy -- all scenarios that produce excess pills in the pantry.

These drugs find their way into our waters through various means. Patients can excrete active substances simply by answering nature's call while taking prescription medicine. As much as 90% of a dosage is excreted with still-active ingredients through a patient's urine.

Even when not ingested, prescription medicines can be flushed down the toilet to be treated ineffectually by waste water treatment systems that are not equipped to handle these active substances. "People are often using toilets as trash cans, but whatever they flush doesn't just go away," said Heidi Sanborn, Executive Director of California Product Stewardship Council (**CPSC**). "The treatment plants we have now were mostly built in the '30s and '40s. They were meant to weed out normal bodily excretions, before all these intense chemicals were even manufactured. The cost to remove it from the water system would be astronomical and sometimes we don't even have the technology to do it."

At other times, these drugs can be introduced to our water system by **urban runoff** that rushes down city streets and into our drainage systems out in the oceans. This graphic from the EPA shows you just in how many ways pharmaceuticals can **get into our waters**.

As you can tell, once manufactured, drugs become a widespread problem for those not needing to be treated. Worse, there are **little or no monitoring systems** in place to quantify just how much of an effect this is having on the whole biological system.

"All of these drugs out there on the market are going to be discharged into the environment and we don't know what the effects are, because there's no requirement to do an assessment on the front end," Nick Schroeck, executive director of the Great Lakes Environmental Law Center in Detroit, **said to the New Republic**.

What is evident is that active substance levels are enough to cause noted **changes in the biology of animals**, especially in fish. Fish lesions, increased deaths in fish, and even ambiguously sexed fauna have been noted in the Great Lakes region.

A soon-to-be released study referenced by the New Republic also reveals that more than half of samples taken from 50 large wastewater treatment plants nationwide tested positive for at least 25 of the drugs

that were monitored. These include medications like oxycodone, high-blood pressure medications, and over-the-counter drugs like Tylenol and ibuprofen. The most prevalent were medications for high blood pressure. This is just a small sampling; there are about 2,500 distinct active ingredients in the United States, which can be formulated to thousands of commercial drugs, according to Christian G. Daughton, a scientist at the Environmental Protection Agency. His work deals heavily on the interactions between drugs and the environment.

The problem is not a new one. As early as 2006, **drugs were found** in Los Angeles' water system. The response has been the same as it is now.

"The Department of Water and Power treats and sends drinking water through the distribution system (the "tap") and conducts this process under stringent requirements. The DWP conducts chemical tests of the water going into the distribution system every few minutes," says Donna Toy Chen, Assistant Division Manager of the Watershed Protection Division, Bureau of Sanitation (BoS). This year, the agency has started to monitor concentration levels of various chemicals as part of the Los Angeles Sanitation Environmental Monitoring Division, but there is still little data to begin examination. In short, the agency needs more information and it's doing the best it can.



Sewage in the L.A. River | Photo: **Charles Wagner/Flickr/Creative Commons**

These end-of-the-cycle solutions, however, are just one of the ways communities can lessen the presence

of drugs in the water system. It is not even the most effective. Constantly having to upgrade water treatment plants to monitor and clean our water of these newfangled drugs would most likely prove to be costly and resource-intensive. Like all problems, it is best solved earlier in the process.

A better solution would be to decrease the amount of drugs that find themselves in the water in the first place. The California Product Stewardship Council (**CPSC**) is working with politicians to help approve legislation that would hold manufacturers responsible for the collection of unused prescription drugs similar to what is in place in other countries. The Sierra Club, the oldest and largest environmental organization in the U.S., is only one of many organizations that supports manufacturer take-back for unwanted medicines.

In Canada, manufacturers help pay for safe disposal of expired medications. In 2013, more than 90 percent of pharmacies were also drop-off locations for medications. These drugs were then collected and disposed of properly with funding from the Canada Health Product Stewardship Association (HPSA), made up of 135 pharmaceutical companies and corporations.

CPSC wants to adopt the same model here with **SB-1014** introduced by Senator Hannah-Beth Jackson and co-authored by Senator Mark Leno. The legislation garnered a large amount of support, but unfortunately not enough to get it passed. It will be re-introduced again by next year.

In Alameda County however, CPSC's efforts yielded good results. The county was first in the nation to require drug manufacturers to pay disposal costs for consumers' unused medications. The county won a federal appeals court appeal by the pharmaceutical industry at the end of September.

CPSC is not waiting around until something passes and sticks, however; it is also working with local authorities to set up collection stations at sheriff's offices. Ideally, Sanborn says these collection stations would be at pharmacies where consumers actually go to purchase their medications, but the organization has received no cooperation from large chains. "We repeatedly asked and called corporations like Walgreens and Rite Aid. We're getting no response at all," said Sanborn.

Currently, the Drug Enforcement Agency sponsors take-back events twice a year. At times, local governments also hold collections or have permanent locations to drop off medications. In Los Angeles, BoS has set up **Safe Centers** where people can return their unused and outdated medication. Some sheriff stations may also host these collection stations.

More often, however, prescription drugs aren't returned because it's inconvenient. They simply sit and wait in medicine cabinets, easy targets for friends and family who are secretly harboring drug addictions. Some patients do opt to follow the outdated FDA advice to flush medicines down the toilet, but that's not ideal. Once drugs are flushed down the water, they can leach into the ground and seep into the groundwater. If a home's water is connected to the city's wastewater treatment plant, these drugs can even

pass through the treatment system and enter river and lakes.

As of today, that outmoded advice can still be seen on its **website** in direct opposition to **EPA's counsel**.

Rather than collecting medicines when they're already prescribed, an even better approach called Eco-Directed Sustainable Prescribing (EDSB) **is suggested** by EPA researcher Christian Daughton. EDSB is a two-pronged approach. First, it counsels to decrease dosage or usage of prescription drugs by curbing overprescribing or minimizing the misuse of antibiotics. Second, Daughton suggests that doctors should also preferentially prescribe medications that are more completely absorbed in the body.

So, what is one to do, when faced with a water system that may or may not be relied on? At first glance, it seems consumers can do very little. We can introduce complex filtration systems, which may or may not be effective. We can start drinking bottled water, which most likely also comes from the same **tap water source**. Or, we can actively do something about the issue. In this case, it is better to reduce, reduce, and reduce prescription drugs at all stages rather than reduce, re-use, and recycle.

*Return unused medicines to **these Safe Centers**. Learn more **here**.*