



Pharmaceuticals in Our Waters: A Key Concern

Over the past decade, refined scientific methods have revealed the existence of a low-level stew of contaminants in many waters. This is not surprising given what we consume and then send toward our wastewater treatment plants and septic systems. Pharmaceuticals reach our waters from a variety of sources, including drug manufacturing plants, households and institutions flushing unused and expired medications,

and each of us excreting drugs that pass through our own bodies unchanged.

When the first confirmed reports of these chemicals were issued – I remember many who brushed off concerns because the concentrations were very low and the adage used was, “the solution to pollution is dilution.” Still, as the new scientific studies came in, we learned of situations where male fish were being “feminized” in a number of studied waters – with a possible culprit being estrogen. One recent study found that a pristine Canadian lake, purposely dosed with 5 parts per trillion estrogen, lost all male members of the studied minnow species.

Discussions with toxicologists revealed perhaps the key concern. While poisons often do not operate at a very low level, hormones do. Hormones are often effective in our systems at parts per trillion and

tenths of a part per trillion. Many of the identified chemicals we now see in our waters fall into a category known as endocrine disrupters – chemicals that can act as, or similar to, hormones.

Removing these chemicals from sewage is very difficult. While wastewater treatment plants are capable of removing some of the pharmaceuticals in the waste stream, they are not designed to remove these compounds. Many of these compounds pass right through wastewater treatment systems – even those with the highest current levels of controls. Very expensive systems, such as activated carbon or reverse osmosis, may only partially reduce the levels of these compounds.

It is important to keep in mind that although estrogenic chemicals downstream of a sewage treatment plant are suspected of causing effects in aquatic life, detecting effects on humans may be difficult. In general, concentrations of pharmaceuticals found in sources of drinking water were many times lower than therapeutic doses and well below levels associated with human health effects. Although a recent study showed the presence of pharmaceuticals in finished drinking water, the concentrations were less than or similar to concentrations in the source water and not considered a health risk.

Plainly, a great deal of study needs to be undertaken before any conclusions are reached. I personally lean toward the “precautionary” school of policy – that chemicals tend to be guilty until proven innocent, and active steps should be taken to remove chemicals from the environment whenever reasonable and feasible.

Some of those initial steps involve pollution prevention – efforts to limit the initial introduction of pharmaceuticals into the water. As discussed in this edition of *Clearwaters*, there are steps that can be taken right now, such as the recently announced “Don’t Flush” program to reduce the levels of these chemicals in our waters.

–James Tierney, Assistant Commissioner for Water Resources
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It Is Clean Enough

I swear I am turning into my mother. I grew up in a frugal family culture that, if elbow grease would do the job why spend money to do it the “new and improved” way? Unfortunately, as the country became the beneficiary of an aggressive Industrial Revolution, spending money on a chemical to do the job instead of using physical effort became easier, and many are now asking if that is truly an improvement. We all know the reason why we keep little kids out

from under the kitchen sink. That’s where the *poisons* are. Why do we clean with these poisons? There are many easy ways to clean the house with simple ingredients, many of which are even edible. Moreover, there is no reason to make a kitchen or bathroom as clean as an operating room. Unless there is a legitimate medical reason, no one has to use antibacterial anything all the time. Our homes can be clean enough without using products that rightfully should only be disposed of during town hazardous material days.

By having to stretch a nickel, we used materials found around the house to clean, not specialty chemicals. Vinegar and salt were great

for cleaning copper. If the house air was stale, we opened a window. When the drain was slow, a kettle of boiling water helped it along. Stinky drains and toilets were cured with baking soda and vinegar. Hot soapy water cleaned every cutting board and the onion smell was removed with lemons and salt. Pots were soaked in hot water and then scrubbed with a baking soda paste. Dirty windows were wiped clean with vinegar and water. Silver was cleaned with toothpaste and an old soft toothbrush or a dish pan filled with hot water, baking soda and a piece of aluminum foil.

With a grocery list of vinegar, baking soda, washing soda, hydrogen peroxide, toothpaste, salt, vegetable and plant oils, lemon juice, borax, cream of tartar, ammonia and Castile soap, anyone can clean just about anything without being exposed to chlorine, petroleum detergents, artificial sanitizers, volatile organic compounds, and chemicals with ingredients I can’t even spell. By making the choice to use only these innocuous items, the rinse water won’t contain the residue of the artificial chemical cleaners and that keeps the chemicals out of the water system.

If Lister and Pasteur swabbed my kitchen or bathroom, they would find some critters there. My house is not a hospital. However, it is free of visible dirt and relatively clean. I haven’t gone to the extent of making my own soap, but I am looking at a lot of labels, making specific choices as to what my household is exposed to, and the impacts to various waste streams. I am even reading ‘Hints from Heloise’ and wondering how I turned into my mother.

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