Drugs in Our Drinking Water?

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Antibiotics, analgesics (pain killers), lipid regulators and antidepressants are commonly found inside of home medicine cabinets. Until recently, few would think to examine the presence of these drugs in our drinking water. Yet, these pharmaceuticals and personal care products (PPCPs) are among a variety of organic chemicals that the U.S. Environmental Protection Agency now refers to as “contaminants of emerging concern” (CECs). While CECs are not necessarily new pollutants, their presence in the environment and significance are only now being evaluated. The occurrence of PPCPs in sewage treatment plant run off, surface waters, seawaters, ground water, and some drinking waters has lead to an increasing concern about the impact of these chemicals on the aquatic environment.

In fact, the aforementioned drugs were evaluated in two bays on the gulf coast of Florida, namely, Apalachicola Bay and Tampa Bay. The compounds selected were chosen based on a national survey of the number of prescriptions, persistence in the environment, the possibility of environmental impact, and the availability of analytical standards for testing. Scientists detected two chemicals out of the 40 analyzed. Sulfamethoxazole (SMZ), a common drug used in animals and humans, exists in both bays; however, it appears to be more concentrated and dispersed throughout Apalachicola Bay (detected at 3 of 5 sample sites) than Tampa Bay (detected at one site). Carbamazepine (CBZ), an anticonvulsant and mood-stabilizing drug, was also detected in Tampa Bay.

Based on these results, CBZ or SMZ do not appear to threaten the ecological health of Apalachicola Bay or Tampa Bay; however, the occurrence and threat from these chemicals and the ecological and economical ramifications in the future, particularly in Apalachicola Bay, cannot be ruled out. This is because it is a highly productive fishing area generating $70-80 million dollar per year. If the concentrations of PPCPs in Apalachicola Bay continue to increase, the productivity of the bay would be adversely impacted. In addition, the potential for detrimental public health impacts caused by the consumption of seafood harvested from the area will rise.
Furthermore, the majority of the waters in the Apalachicola Bay estuary are Class II waters, meaning they are used for shellfish propagation or harvesting. Reclassification of these waters could result in the termination of the fishing industry in the bay, which will adversely affect Florida’s economy.

**Ways to Help Stop Water Contamination**

Municipal sewage, both treated and untreated, is the most common route for drugs used by humans to enter the environment. There are several simple ways to reduce our personal contribution to the emerging concern of PPCPs in the environment. For instance, using personal care products made of natural ingredients rather than synthetic materials. Also, living a healthier lifestyle will, in turn, reduce our dependence on drugs and consequently reduce the quantities of PPCPs entering our water bodies. Nonetheless, lifestyle changes take a major commitment and much devotion. An equally important habit that anyone can adapt is to properly dispose expired and/or unused medications, thereby reducing the amounts of the compounds in our water supply.

*Zakiya Hoyett, Ph.D. is a recent graduate of Florida A&M University who worked as research assistant to School of the Environment Interim Dean Michael Abazinge, Ph.D. on this project. Join Hoyett on Feb. 28 at 6 p.m. for a live Twitter chat for expert advice on ways to prevent water contamination from pharmaceuticals. Follow @FAMU_LivingWell. Visit www.famu.edu/livingwell101.*