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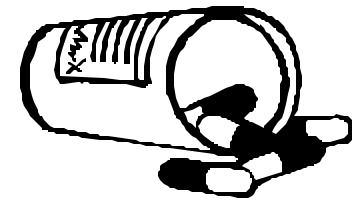


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A Remedy for Prescription Drug Disposal . . .



How do I dispose of unused prescription and over-the-counter drugs?

What environmental problems exist due to disposal of expired and unused medications?

The issue of proper pharmaceutical drug disposal is an emerging issue in the environmental arena. All medications applied externally or ingested (and their bioactive transformation products) have the potential to be excreted or washed into sewage systems and from there discharged to the aquatic or terrestrial environments. The risks posed to aquatic organisms by continual life-long exposure and to humans by long-term consumption of minute quantities in drinking water are essentially unknown. While the major concerns to-date

have been the promotion of pathogen resistance to antibiotics and disruption of endocrine systems by natural and synthetic sex steroids, effects due to the presence of many other pharmaceuticals and health care products in the environment, especially considering them collectively, have unknown consequences. The United States Geologic Survey has taken a lead in gathering sampling data to confirm the presence of pharmaceuticals in the environment (<http://toxics.usgs.gov/regional/emc.html>), and the United States Environmental Protection Agency has taken a lead in compiling information on potential environmental impacts (www.epa.gov/nerlesd1/chemistry/pharma/faq.htm#Insimpleterms).



So, what are the best disposal options?

One option is to dispose of unwanted medications at a Community household hazardous waste (HHW) collection program, if one is available. A list of local HHW programs can be found at www.deq.state.mi.us/documents/deq-essd-recycle-mihhwprograms.pdf. If no HHW collection program is available, then a household faces a medication disposal dilemma between flushing medicines down the toilet, versus placing the waste medicine in the trash. Both of these disposal routes have disadvantages. Placing substances in the household garbage can lead to inadvertent access by children and animals. While flushing the medicine down the toilet does prevent misuse of the substance, the practice can cause other problems. Specifically, when medicines are flushed down a toilet, they usually go to one of two places -- a septic tank or through a series of sanitary sewers into a wastewater treatment plant (WWTP). Medicines can harm the beneficial bacteria that are responsible for breaking down waste in the septic system or at a WWTP.

When medicines go to a WWTP, several other problems can result. Many medicines are not captured or are only partially captured during a WWTP treatment process so they can pass through a WWTP intact; municipal sewage treatment plants are not engineered for pharmaceutical removal. These substances are then released into a nearby lake, river or ground water with the treated wastewater. Some medications may contain heavy metals, such as mercury containing compounds. A list identifying pharmaceutical products that contain mercury can be found through our website at: www.deq.state.mi.us/documents/deq-ead-p2-mercury-mercusetree.pdf. Alternatives to mercury containing household products can be found at: www.deq.state.mi.us/documents/deq-ead-p2-mercury-consumer.doc. For the past several decades, mercury has received increasing attention as a serious pollutant of concern due to its toxic and bioaccumulative properties. In aquatic systems mercury is often converted by bacteria to methylmercury (an organic form of mercury) which can be magnified up the aquatic food

chain hundreds of thousands of times, posing a potential risk to humans and wildlife that consume fish. For all of these reasons, any and all disposal of drugs down a drain or toilet is strongly discouraged.

If your community does have a HHW collection program, the recommended option is to dispose of the medication in this manner. Make sure you safely and securely store the medication in a location not accessible to children.

Lacking this preferred option, placement in the trash or garbage with transport to a landfill is the most practical option. It is recognized that there is concern that this method could potentially allow inadvertent access of the drugs to children and/or animals during the disposal process. This access potential can be minimized by following a few simple steps.

- Keep the pharmaceuticals in their original container since the labels may contain safety information, the container is chemically compatible, and the caps are typically water tight and child-proof.
- Add a small amount of water to the solid drug or some absorbent material such as kitty litter, sawdust or flour to liquid drugs before recapping. These measures are intended to discourage any unintended use of the drug.
- Double enclose the contained drugs in a bag or any other waste container to prevent immediate identification of a drug container or prevent a glass drug container from breaking during the disposal process, e.g., when a plastic garbage bag tears, tipped trash can, etc.

For more information on this subject, review the web sites provided above or contact the Environmental Assistance Center at 800-662-9278 for direct access to Michigan Department of Environmental Quality programs.