

Medication Disposal Summary Report

Latest update (12/3/2007)

Purpose

The purpose of this report is to:

- Summarize research related to, and the controversy surrounding, medication disposal.
- Document rationale for the Northern New England Poison Center's (NNEPC) Medication Disposal Recommendation.

Executive Summary

Medication-related overdoses have increased significantly in recent years.¹ Limiting access to medicines is a key prevention strategy ("clean out the medicine cabinet").²

Pharmaceuticals and other personal care products (PPCP) have been found in our water supply.³ The sources are most likely excrement, flushed products and ground water contamination from land-fills.^{4, 5, 6, 7} The presence of PPCP in the environment has not been proven to negatively affect humans. However, the health effects from long-term exposure to these compounds are not clear.⁸

There is controversy about how to properly dispose of medicines (Table 1 & 2).⁹ There are three common methods utilized throughout the United States for medication disposal: flushing, throwing it away and take back programs for incineration.^{5, 10, 11, 12} All of these options have strengths and weaknesses. Legislation related to medication reuse and disposal varies by state.²⁴ The goal of any disposal method needs to prevent acute poisoning, for reasons of patient safety, and limit environmental impact and water supply contamination.

Ultimately, any disposal recommendation needs to be practical, cost effective and safe. The NNEPC is taking an active role in developing disposal recommendations for the general public and health care and public health professionals.

Call to Action

In 2006 the American Medical Association (AMA) passed a resolution asking the United States Environmental Protection Agency (EPA) to lead the nation in addressing this issue. The AMA requested that the EPA:

1. Continue aggressive research to understand the public health impact of PPCP's on the drinking water supply, environment and human health.
2. Lead and engage stakeholders from other federal agencies, the pharmaceutical industry, hospitals and other health care institutions, health professional organizations representing physicians, pharmacists, and nurses and the public for the proper disposal of PPCP to prevent drinking water contamination and environmental impact.¹³

Medicine-Related Poisonings

Childhood poisonings - In 2005, in the United States, more than a half-million calls were made to poison centers about medication-related poisonings among children 5 years of age and younger.¹⁴

Medication overdoses - In 2004, poisoning became the second leading cause of death from unintentional injury in the United States. According to the Centers for Disease Control and Prevention, nearly all poisoning deaths in the United States are attributed to drugs, and most drug poisonings result from the abuse of prescription or illegal drugs.¹ Several reports confirm this alarming trend of pharmaceutical abuse and misuse.^{15,16,17,18,19}

Pharmaceuticals and Personal Care Products (PPCP) in the Water Supply

Medicines are not entirely absorbed by our bodies, and are excreted and passed into wastewater and surface water. According to the Environmental Protection Agency, studies have shown that pharmaceuticals are present in our nation's waterbodies.³⁻⁷ Research suggests that certain drugs may cause harm to the environment. To date, scientists have not found evidence of adverse human health effects from PPCP's in the environment.⁸

Medications' effects on the environment and human health are related to their:

- Ability to resist degradation in the aquatic environment;
- Accumulation in adipose tissue of aquatic organisms;
- Potential to poison aquatic organisms.²⁰

It is important to remember, "Not everything that counts can be counted and not everything that can be counted counts." – *Albert Einstein*²¹

Medication Disposal Recommendations

There is no undisputed recommendation for disposing of medicines (Table 1 & 2). There are three common methods utilized throughout the United States for medication disposal: flushing, throwing it away and take back programs for incineration. Community-based studies show that most people dispose of unwanted medicines in their garbage or by flushing them down their toilets or sinks, but would be willing and interested in properly disposing of their unused or expired medicines by returning them to a convenient location (such as a pharmacy).^{5, 9-12, 22, 24}

Table 1. Comparison of Medication Disposal Recommendations

Strength	Take-back incineration programs	Pharmacy take-back programs	Hazardous waste management	Throwing away medicines in the garbage	Flushing medicine down the sink or toilet
Prevents children and pets from unintentional poisonings	√	√	√		√
Prevents drug users access to medicines	√	√	√		√
Low impact on the environment	√				
Inexpensive for the participants and communities		√	√	√	√
Population in support	√	√	√		
Convenient				√	√
Potential for delayed or decreased environmental impact		√**		√	
Weakness	Take-back incineration programs	Pharmacy take-back programs	Hazardous waste management	Throwing away medicines in the garbage	Flushing medicine down the sink or toilet
Costly	√				
Inconvenient for participants	√	√	√		
Not available in all communities	√	√	√		
Where available, it is infrequent and may lead to hoarding (e.g., storing of medicines for once a year disposal)	√		√		
Inconsistent disposal practices among pharmacies		√			
Potential risk of unintentional poisonings of children and pets				√	
Potential risk of access to medicines for drug users				√	
Increases the amount of medication in our water supply and environment.					√
Not allowed to accept controlled substances			√		

** Depends on how the pharmacy disposes of medication

Table 2. Various Agency Recommendations²³

Federal Agency	Medication Disposal Recommendation	Website
American Pharmacists Association	<p>Crush solid medications or dissolve them in water (this applies for liquid medications as well) and mix with kitty litter or sawdust (or any material that absorbs the dissolved medication and makes it less appealing for pets or children to eat), then place in a sealed plastic bag BEFORE tossing in the trash.</p> <p>Remove and destroy ALL identifying personal information (prescription label) from the medication container.</p> <p>Check for approved state and local collection programs or with area hazardous waste facilities. In certain states, you may be able to take your unused medications to your community pharmacy.</p>	<p>http://www.pharmacist.com/AM/Template.cfm?Section=Public_Health2&Template=/CM/HTMLDisplay.cfm&ContentID=11650</p>
US Fish and Wildlife Services		
Environmental Protection Agency	<p>Take unused, unneeded, or expired prescription drugs out of their original containers</p> <p>Mix the prescription drugs with an undesirable substance, like used coffee grounds or kitty litter, and put them in impermeable, non-descript containers, such as empty cans or sealable bags, further ensuring that the drugs are not diverted or accidentally ingested by children or pets</p> <p>Throw these containers in the trash</p> <p>Flush prescription drugs down the toilet only if the accompanying patient information specifically instructs it is safe to do so</p> <p>Return unused, unneeded, or expired prescription drugs to pharmaceutical take-back locations that allow the public to bring unused drugs to a central location for safe disposal</p>	<p>http://whitehouse.gov/policy/news/press07/022007.html</p>
Department of Health and Human Services		
American Medical Association		
Office of National Drug Control Policy		
Substance Abuse and Mental Health Services Administration	<ul style="list-style-type: none"> • Mix unused drugs with coffee grounds, kitty litter, or another undesirable substance and place in a sealed container before disposing in the trash. • Prescription drugs should not be flushed down the toilet unless specifically instructed to do so. • Where community prescription drug take-back programs exist, they are a good way to dispose of unused pharmaceuticals. 	<p>http://www.samhsa.gov/rxsafety/SAMHSA3tagged.pdf</p>
Food and Drug Administration	<p>Throw away expired medicines at a home hazardous waste disposal site or in a garbage can away from small children and pets.</p>	<p>http://www.fda.gov/medsinmyhome/MIH_as_they_grow.htm</p>
Centers for Disease Control	<p>Return to the pharmacy</p>	<p>http://www2a.cdc.gov/podcasts/media/pdf/EID%20Podcast%2010-18-06%20Antimicrobials%20Transcript.pdf</p>
American Association of Poison Control Centers	<p>Under review</p>	<p>www.aapcc.org</p>

Continue Table 2.

State Agency	Medication Disposal Recommendation	Website
Maine Department of Environmental Services	Voluntary Turn-In	http://www.umaine.edu/mainecenteronaging/documents/globalperspectives.pdf
Maine Department of Health and Human Services		
Maine Pharmacy Association	???	???
New Hampshire Department of Environmental Services	<p>Contact your local household hazardous waste coordinator prior to a collection event to determine if your municipality will accept the waste. Most collection events will accept mercury-added or other personal care products, but not pharmaceutical waste. Dispose of the waste in household trash.</p> <p>Keep products in their original containers. Pharmaceutical container caps are typically watertight and child proof. Add a small amount of water to a solid drug or some absorbent material such as kitty litter, sawdust or flour, to liquid drugs before recapping to discourage any unintended use of the drug.</p> <p>Double seal the container in another container or heavy bag to prevent easy identification of the drug container</p>	http://www.des.state.nh.us/factsheets/sw/sw-33.htm
New Hampshire Department of Health and Human Services	<p>Crush solid medications or dissolve them in water (this applies for liquid medications as well) and mix with kitty litter or sawdust (or any material that absorbs the dissolved medication and makes it less appealing for pets or children to eat), then place in a sealed plastic bag BEFORE tossing in the trash.</p> <p>Remove and destroy ALL identifying personal information (prescription label) from the medication container.</p>	http://whitehouse.drugpolicy.gov/news/press07/022007.html
New Hampshire Pharmacy Association		
Vermont Department of Environmental Services	???	???
Vermont Department of Health and Human Services	???	???
Vermont Pharmacy Association	???	???

Appendix

- A. A "Call to Action" for the Government to Address the Complex Pharmaceutical Disposal Issue
- B. List of Organizations and Agencies with Programs or Statements Regarding Disposal of Unused and Expired Medicines.
- C. List of Hazardous Waste Collection Sites by State

References

- ¹ <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5605a1.htm>
- ² http://www.drugfree.org/Portal/DrugIssue/Research/Teens_2005/Generation_Rx_Study_Confirms_Abuse_of_Prescription
- ³ <http://www.epa.gov/ppcp/>
- ⁴ http://www.nesc.wvu.edu/nsfc/pdf/pipline/PL_wi07.pdf
- ⁵ Kuspis DA, Krenzelo EP. What happens to expired medications? A survey of community medication disposal. *Vet Hum Toxicol.* 1996 Feb;38(1):48-9.
- ⁶ <http://www.epa.gov/ppcp/pdf/drawing.pdf>
- ⁷ <http://www.epa.gov/ppcp/faq.html#sources>
- ⁸ <http://www.epa.gov/ppcp/faq.html#Insimpleterms>
- ⁹ <http://www.epa.gov/ppcp/faq.html#how>
- ¹⁰ <http://lists.dep.state.fl.us/pipermail/pharmwaste/2006-October/000665.html>
- ¹¹ <http://www.mainebenzo.org/documents/pharmacistslettervol23.pdf>
- ¹² Appendix A
- ¹³ <http://www.mainebenzo.org/documents/Sept.2006EPAletteronPPCPs.doc>
- ¹⁴ Table 22. <http://www.aapcc.org/Annual%20Reports/05report/2005%20Publihed.pdf>
- ¹⁵ <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/methadone1999-04/methadone1999-04.htm>
- ¹⁶ <http://nmhealth.org/pdf/Drug%20Overdose%20Death%20in%20New%20Mexico%202006.pdf>
- ¹⁷ http://www.utexas.edu/research/cswr/gcattc/documents/PrescriptionTrends_Web.pdf
- ¹⁸ http://www.fda.gov/fdac/features/2001/501_drug.html
- ¹⁹ http://www.drugfree.org/Portal/DrugIssue/Research/Teens_2005/Generation_Rx_Study_Confirms_Abuse_of_Prescription
- ²⁰ Community Medical Foundation for Patient Safety PowerPoint Presentation August 11, 2006, 12pm. Environmental Hazard and Pharmaceuticals: Some Insights of the Hazards. Presented by Ye Sun.
- ²¹ <http://jpetrie.myweb.uga.edu/einstein.html>
- ²² Abahussain EA, Ball DE, Matowe WC. Practice and opinion towards disposal of unused medication in Kuwait. *Med Princ Pract.* 2006;15(5):352-7.
- ²³ Appendix B
- ²⁴ <http://www.ncsl.org/programs/health/drugbill07.htm>