

**Northern New England Poison Center  
Medication Disposal Summary Report**  
Latest update (1/17/2008)

**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.<sup>1</sup> Limiting access to medicines is a key prevention strategy ("clean out the medicine cabinet").<sup>2</sup>

Pharmaceuticals and other personal care products (PPCP) have been found in our water supply.<sup>3</sup> The sources are most likely excrement, flushed products and ground water contamination from land-fills.<sup>4, 5, 6, 7</sup> 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.<sup>8</sup>

There is controversy about how to properly dispose of medicines (Table 1 & 2).<sup>9</sup> There are three common methods utilized throughout the United States for medication disposal: flushing, throwing away and collecting.<sup>5,10,11</sup> All of these options have strengths and weaknesses. Legislation related to medication reuse and disposal varies by state. The goal of any disposal method needs to keep these in mind:

- Prevent acute poisoning;
- Prevent abuse;
- Ensure patient safety;
- 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.<sup>12</sup>

## 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.<sup>13</sup>

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.<sup>1</sup> Several reports confirm this alarming trend of pharmaceutical abuse and misuse.<sup>14,15,16,17,18</sup>

## 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.<sup>3-7</sup> 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.<sup>8</sup>

Medications' effects on the aquatic environment:

- Ability to resist degradation in the aquatic environment;
- Accumulation in adipose tissue of aquatic organisms;
- Potential to poison aquatic organisms.<sup>19</sup>

It is important to remember, "Not everything that counts can be counted and not everything that can be counted counts." – *Albert Einstein*<sup>20</sup>

## 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 away and collecting 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).<sup>5, 9-11,21,22</sup>

**Table 1. Comparison of Medication Disposal Recommendations**

| <b>Strength</b>   | <b>Take-back incineration programs</b> | <b>Pharmacy take-back programs</b> | <b>Hazardous waste management</b> | <b>Throwing away medicines in the garbage</b> | <b>Flushing medicine down the sink or toilet</b> |
|---|--|------------------------------------|-----------------------------------|---|--|
| Prevents children and pets from unintentional poisonings  | √                                      | √                                  | √                                 |   | √  |
| Prevents drug users access to medicines   | √                                      | √                                  | √                                 |   | √  |
| Low impact on the environment   | √                                      |                                    |                                   |   |  |
| Relatively inexpensive for the participants and communities   |  |                                    |                                   | √   | √  |
| Population in support   | √                                      | √                                  | √                                 |   |  |
| Convenient  |  |                                    |                                   | √   | √  |
| <b>Weakness</b>   | <b>Take-back incineration programs</b> | <b>Pharmacy take-back programs</b> | <b>Hazardous waste management</b> | <b>Throwing away medicines in the garbage</b> | <b>Flushing medicine down the sink or toilet</b> |
| 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 could lead to poisonings or drug diversion) | √                                      |                                    | √                                 |   |  |
| Inconsistent disposal practices among pharmacies  |  | √ <sup>**</sup>                    |                                   |   |  |
| 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  |  | √ <sup>**</sup>                    | √ <sup>**</sup>                   | √ <sup>**</sup>                               | √  |
| Not allowed to accept controlled substances   | √ <sup>^</sup>                         | √ <sup>^</sup>                     | √                                 |   |  |

<sup>\*\*</sup> This may lead to an increase in the water supply, depending on how material is discarded.

<sup>^</sup> Depends on state laws and regulations.

**Table 2. Various Agency Recommendations**

| 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>   | <a href="http://www.pharmacist.com/AM/Template.cfm?Section=Public_Health2&amp;Template=/CM/HTMLDisplay.cfm&amp;ContentID=11650">http://www.pharmacist.com/AM/Template.cfm?Section=Public_Health2&amp;Template=/CM/HTMLDisplay.cfm&amp;ContentID=11650</a> |
| US Fish and Wildlife Services                             |   |   |
| Environmental Protection Agency                           | <ul style="list-style-type: none"> <li>▪ Take unused, unneeded, or expired prescription drugs out of their original containers and throw them in the trash.</li> <li>▪ Mix prescription drugs with an undesirable substance, such as used coffee grounds or kitty litter, and putting them in impermeable, non-descript containers, such as empty cans or sealable bags, will further ensure the drugs are not diverted.</li> <li>▪ Flush prescription drugs down the toilet <i>only</i> if the label or accompanying patient information specifically instructs doing so.</li> <li>▪ Take advantage of community pharmaceutical take-back programs that allow the public to bring unused drugs to a central location for proper disposal. Some communities have pharmaceutical take-back programs or community solid-waste programs that allow the public to bring unused drugs to a central location for proper disposal. Where these exist, they are a good way to dispose of unused pharmaceuticals.</li> </ul> | <a href="http://whitehouse.gov/policy/drugact/factsheet/proper_disposal.html">http://whitehouse.gov/policy/drugact/factsheet/proper_disposal.html</a>   |
| 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"> <li>• Mix unused drugs with coffee grounds, kitty litter, or another undesirable substance and place in a sealed container before disposing in the trash.</li> <li>• Prescription drugs should not be flushed down the toilet unless specifically instructed to do so.</li> <li>• Where community prescription drug take-back programs exist, they are a good way to dispose of unused pharmaceuticals.</li> </ul>   | <a href="http://www.samhsa.gov/rx/safety/SAM_HSA3tagged.pdf">http://www.samhsa.gov/rx/safety/SAM_HSA3tagged.pdf</a>   |
| Food and Drug Administration                              | Throw away expired medicines at a home hazardous waste disposal site or in a garbage can away from small children and pets.   | <a href="http://www.fda.gov/medsinmyhome/MIMH_as_they_grow.htm">http://www.fda.gov/medsinmyhome/MIMH_as_they_grow.htm</a>   |
| Centers for Disease Control                               | Return to the pharmacy  | <a href="http://www2a.cdc.gov/podcasts/media/pdf/EID%20Podcast%2010-18-06%20Antimicrobials%20Transcript.pdf">http://www2a.cdc.gov/podcasts/media/pdf/EID%20Podcast%2010-18-06%20Antimicrobials%20Transcript.pdf</a>                                       |

|  |              |  |
|--|--------------|--|
| American Association<br>of Poison Control<br>Centers | Under review | <a href="http://www.aapcc.org">www.aapcc.org</a> |
|--|--------------|--|

**Continue Table 2.**

| State Agency  | Medication Disposal Recommendation   | Website   |
|---|--|---|
| Maine Department of<br>Environmental Services               | A. Voluntary Turn-In Events<br>B. Mail-In Program<br>C. Product Stewardship<br>D. Legislation to Consider Redistribution   | <a href="http://www.umaine.edu/mainecenteronaging/documents/globalperspectives.pdf">http://www.umaine.edu/mainecenteronaging/documents/globalperspectives.pdf</a> |
| Maine Department of Health<br>and Human Services            |  |   |
| Maine Pharmacy Association                                  | Under review   | <a href="http://www.mparx.com">www.mparx.com</a>  |
| New Hampshire Department<br>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.</p> <p>Dispose of the waste in household trash.</p> <p>Keep products in their original containers. Pharmaceutical container caps are typically watertight and child proof.</p> <p>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> | <a href="http://www.des.state.nh.us/factsheets/sw/sw-33.htm">http://www.des.state.nh.us/factsheets/sw/sw-33.htm</a>   |
| New Hampshire Department<br>of Health and Human<br>Services | 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.  | <a href="http://whitehouse.drugpolicy.gov/news/press07/022007.html">http://whitehouse.drugpolicy.gov/news/press07/022007.html</a>                                 |
| New Hampshire Pharmacy<br>Association                       |  |   |
| Vermont Department of<br>Health                             | <ul style="list-style-type: none"> <li>• Take unused, unneeded or expired prescription and over-the-counter drugs out of their original containers.</li> <li>• Mix the prescription drugs with an undesirable substance (for example, used kitty litter, coffee grounds, bacon fat, soil), place the mixture into a</li> </ul>   | <a href="http://healthvermont.gov/adap/ada.p.aspx">http://healthvermont.gov/adap/ada.p.aspx</a>   |

|                              |   |  |
|------------------------------|---|--|
|                              | sealable plastic bag or container, and place it into the trash. <ul style="list-style-type: none"> <li>• When discarding a transdermal patch, fold the patch into itself and then place it in the undesirable mixture.</li> </ul> |  |
| Vermont Pharmacy Association | Under review  | <a href="http://www.vtpharmacists.org">www.vtpharmacists.org</a> |

## References

- <sup>1</sup> <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5605a1.htm>
- <sup>2</sup> [http://www.drugfree.org/Portal/DrugIssue/Research/Teens\\_2005/Generation\\_Rx\\_Study\\_Confirms\\_Abuse\\_of\\_Prescription](http://www.drugfree.org/Portal/DrugIssue/Research/Teens_2005/Generation_Rx_Study_Confirms_Abuse_of_Prescription)
- <sup>3</sup> <http://www.epa.gov/ppcp/>
- <sup>4</sup> [http://www.nesc.wvu.edu/nsfc/pdf/pipline/PL\\_wi07.pdf](http://www.nesc.wvu.edu/nsfc/pdf/pipline/PL_wi07.pdf)
- <sup>5</sup> Kuspis DA, Krenzelok EP. What happens to expired medications? A survey of community medication disposal. *Vet Hum Toxicol.* 1996 Feb;38(1):48-9.
- <sup>6</sup> <http://www.epa.gov/ppcp/pdf/drawing.pdf>
- <sup>7</sup> <http://www.epa.gov/ppcp/faq.html#sources>
- <sup>8</sup> <http://www.epa.gov/ppcp/faq.html#Insimpleterms>
- <sup>9</sup> <http://www.epa.gov/ppcp/faq.html#how>
- <sup>10</sup> <http://lists.dep.state.fl.us/pipermail/pharmwaste/2006-October/000665.html>
- <sup>11</sup> <http://www.mainebenzo.org/documents/pharmacistslettervol23.pdf>
- <sup>12</sup> <http://www.mainebenzo.org/documents/Sept.2006EPAletteronPPCPs.doc>
- <sup>13</sup> Table 22B. <http://www.aapcc.org/Annual%20Reports/06Report/2006%20Annual%20Report%20Final.pdf>
- <sup>14</sup> <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/methadone1999-04/methadone1999-04.htm>
- <sup>15</sup> <http://nmhealth.org/pdf/Drug%20Overdose%20Death%20in%20New%20Mexico%202006.pdf>
- <sup>16</sup> [http://www.utexas.edu/research/cswr/gcattc/documents/PrescriptionTrends\\_Web.pdf](http://www.utexas.edu/research/cswr/gcattc/documents/PrescriptionTrends_Web.pdf)
- <sup>17</sup> [http://www.fda.gov/fdac/features/2001/501\\_drug.html](http://www.fda.gov/fdac/features/2001/501_drug.html)
- <sup>18</sup> [http://www.drugfree.org/Portal/DrugIssue/Research/Teens\\_2005/Generation\\_Rx\\_Study\\_Confirms\\_Abuse\\_of\\_Prescription](http://www.drugfree.org/Portal/DrugIssue/Research/Teens_2005/Generation_Rx_Study_Confirms_Abuse_of_Prescription)
- <sup>19</sup> 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.
- <sup>20</sup> <http://jpetrie.myweb.uga.edu/einstein.html>
- <sup>21</sup> Abahussain EA, Ball DE, Matowe WC. Practice and opinion towards disposal of unused medication in Kuwait. *Med Pric Prac.* 2006;15(5):352-7.
- <sup>22</sup> <http://www.ncsl.org/programs/health/drugbill07.htm>

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