

Proper Medication Disposal

www.MedicationDisposal.utah.gov



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Overview

- Pharmaceuticals and Personal Care Products (PPCPs) are ***pollutants***, we find them in low concentrations in our waterways. But their effect on the environment and human health is unknown, thus we are not regulating them.

Overview

- In addition to environmental concerns...there are HUGE social issues to consider:
 - Drug Sales Have Skyrocketed
 - Low compliance = high accumulations
 - Lots of unused drugs in people's homes
 - Most home poisonings involve pharmaceuticals
 - Pharms at Home Increase Drug Abuse
 - Leftovers are routinely flushed

Overview

Pharmaceuticals and Personal Care Products (PPCPs) as Pollutants



PPCPs refers to:

- Products used by individuals for personal health or cosmetic reasons
- Products used by agribusiness to enhance growth or health of livestock.



Pharmaceuticals and Personal Care Products as Pollutants



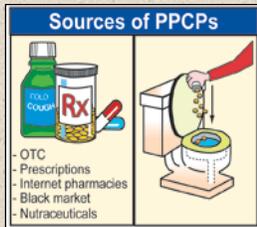
PPCPs comprise a diverse collection of thousands of chemical substances including:

- Prescription and over-the counter drugs
- Veterinary drugs
- Fragrances
- Cosmetics
- Sun-screen products
- Diagnostic agents
- Nutraceuticals (e.g., vitamins)



PPCPs Enter The Environment Through Use and Disposal

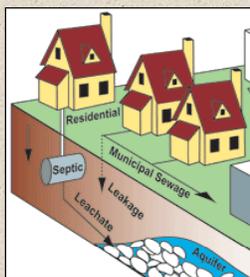
PPCPs have probably been present in the environment for as long as humans have been using them. Individuals add PPCPs to the environment through:



- Excretion
- Bathing
- Disposal of medications to sewers and trash.
- Unused/unwanted quantities as much as 50% of many prescriptions - 80% for antibiotics
- Common/historical recommendation was to flush; "crush & flush" is still widely practiced method



Pharmaceuticals and Personal Care Products as Pollutants



- The drugs that we take may be excreted in a biologically active form into wastewater and ultimately released into lakes and rivers.
- Advances in technology have improved our ability to detect and quantify these chemicals.
- Their effect on the environment is now recognized as an important area of research.



PPCPs Are Present in Our Nation's Waterbodies

National Stream Reconnaissance: U.S. Geological Survey (USGS), 1999-2000

- This study was the first national-scale examination of emerging contaminants in streams of the United States.
- Water samples were collected from a network of 139 streams across 30 states during 1999 and 2000.
- The sampling sites focused towards streams considered to be susceptible to contamination. Thus, the results of this study are **not** considered representative of all streams.



PPCPs Are Present in Our Nation's Waterbodies

RESULTS:



- One or more chemicals were detected in 80 percent of the streams sampled, and 82 of the 95 chemicals were detected at least once.
- Generally, these chemicals were found at very low concentrations (in most cases, less than 1 part per billion).
- Mixtures of the chemicals were common:
 - 75 percent of the streams had more than one
 - 50 percent had 7 or more
 - 34 percent had 10 or more.



PPCPs Are Present in Our Nation's Waterbodies

RESULTS:

- The most frequently detected chemicals (found in more than half of the streams) were:
 - Coprostanol (fecal steroid)
 - Cholesterol (plant and animal steroid)
 - N-N-diethyltoluamide (insect repellent)
 - Caffeine (stimulant)
 - Triclosan (antimicrobial disinfectant)
 - Tri (2-chloroethyl) phosphate (fire retardant)
 - 4-nonylphenol (nonionic detergent metabolite).
- Steroids, nonprescription drugs, and insect repellent were the chemical groups most frequently detected.
- Detergent metabolites, steroids, and plasticizers generally were measured at the highest concentrations.



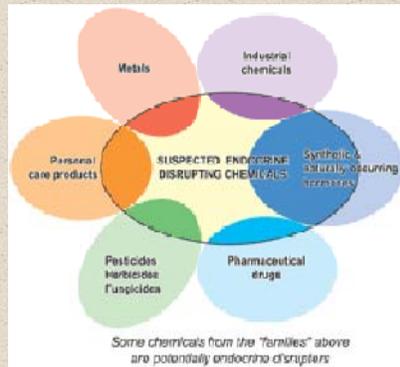
PPCPs Are Present in Our Nation's Waterbodies

Human and environmental effects:

- Knowledge of the potential human and environmental health effects of these 95 chemicals is highly varied.
- Drinking-water standards or other human or ecological health criteria have been established for 14.
- Measured concentrations rarely exceeded any of the standards or criteria. Thirty-three are known or suspected to be hormonally active. 46 are pharmaceutically active.
- Little is known about the potential health effects to humans or aquatic organisms exposed to the low levels of most of these chemicals or the mixtures commonly found in this study.



Some Pharmaceuticals are Endocrine Disrupting Chemicals*



A group of chemicals, known as endocrine disruptor chemicals (EDCs), has been identified as having the potential to cause adverse health effects in humans and wildlife.

Among this group DDT, PCBs, endosulfan, methoxychlor, diethylphthalate, diethylhexylphthalate, and bisphenol A may occur in drinking water.



PPCPs May Cause Ecological Harm*

Further research:

- Antibiotics, hormones, SSRIs are receiving the most attention.

- Boulder Creek, CO, study: 50:50 female:male ratio upstream, 90:10 downstream; ethynylestradiol measurably higher downstream.



- Male fish are producing eggs in the Potomac River. Bioassays of SSRIs are showing some sub-lethal effects at environmentally relevant levels.

- 2006 Italian study found that a mixture of common drugs at very low (ng/L-environmentally-relevant) concentrations inhibited the growth of human embryonic cells



More Issues To Consider

Too Many Pharmaceuticals Go Unused*

- PhRMA uses an estimate of 3% of all meds go unused
 - Recent British survey showed:
 - 82% of antibiotics go unused
 - 50% of antidepressants
 - 50% of beta-blockers
 - 20% of pain meds
 - Compliance/adherence rates for some medications are under 20%
 - Patient compliance goes down as # of medications goes up: “polypharmacy”
 - Medicare Part D now requires 30-day supply billings, regardless of need and without ability to refund unused expenses (or to return unused product)



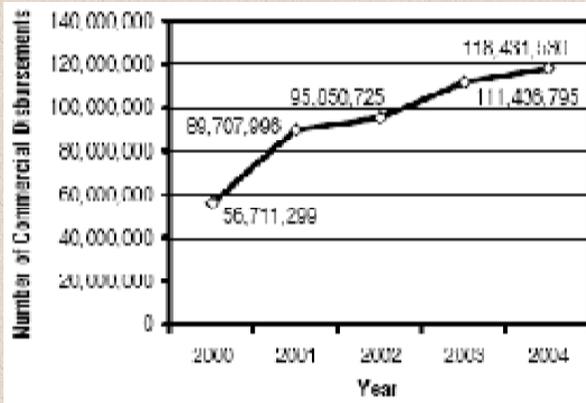
Too Many Pharmaceuticals Go Unused*

- “Rampant non-compliance” and poor adherence to medication regimens, coupled with medication errors, present a significant health care issue, especially for the elderly
- Accumulations of unused meds have become a national burden, both in health care cost and in potential for diversion and abuse
- Hospice nurses, nursing homes and medical examiners are faced with large accumulations of medicines, including potent controlled substances, when patients die
- “Catch 22” for handling the leftovers – no easy, safe, legal or environmentally acceptable answers



Drug Sales Have Skyrocketed*

U.S. sales have more than doubled in last 5 yrs
(Ref: National Drug Intelligence Center, 2005, via Ilene Ruhoy, 2006)



Drug Sales Have Skyrocketed*

- Between 1992 and 2002:
 - U.S. population grew 13%
 - # non-controlled prescriptions increased 57%
 - # controlled drug prescriptions increased 154%(ref: CASA, via Irene Ruhoy, 2006)
- This increased use and availability is one key to the current concerns over what to do with the left-overs.



Most Poisonings Involve Pharmaceuticals

Of all calls to U.S. poison control centers in 2004:

- 2,438,644 total exposures reported
- 1,389,156 (57%) were pharmaceutical exposures
- 581,488 (42%) of the pharm exposures were to children under 6 years of age



Poisonings

- Unintentional injuries were 5th leading cause of death overall in the U.S. and the leading cause for those under age 45. (Does not include suicides or homicides) Of all unintentional injuries that resulted in death, poisonings accounted for 16.4%
- Of all poisonings, 93.4% were drug-related



Unintentional Deaths

- In 2007, more Utahns died from unintentional prescription pain medication overdoses than in motor vehicle crashes, making it the number one cause of injury death in Utah.



Unintentional Deaths

A study of deaths between 1999 and 2004 shows that 47 percent of those deaths due to non-illicit drug overdoses had an active prescription for the opioid drug that was determined to be their cause of death.

- Seventy five percent had a valid prescription for that drug in the past year (365 days).
- Only 15 percent of deaths had no record of a prescription being filled for the opioid found in their system at the time of death.
- The average age of deaths, which had a valid prescription at time of death, is 41 years old, with the largest age grouping 35-54.
- For deaths where no active prescription was found, the average age is 39.6, with the largest age group at 35-44.



Pharms at Home Increase Drug Abuse*

Between 1992 and 2003:

- U.S. population grew 14%
- # of teens (12 to 17 yrs of age) who abused controlled prescription drugs jumped 212%
- # of adults (18 and older) abusing such drugs climbed 81%
- # of all Americans who abuse controlled prescription drugs nearly doubled, from 7.8 million to 15.1 million



Pharms at Home Increase Drug Abuse

- The # (15.1 million) of controlled prescription drug abusers exceeds the combined # of Schedule I (illegal) drug abusers:
 - Cocaine = 5.9 million
 - Hallucinogens = 4.0 million
 - Inhalants = 2.1 million
 - Heroin = 0.3 million



Pharms at Home Increase Drug Abuse

- “Pharming” is latest craze among teens ‘*Generation Rx*’
- One in five teens says he or she has been offered prescription drugs to get high
- In 2003, 15% of all American teens abused or were addicted to controlled drugs



Summary of the Problem*

- Lots of unused drugs in people’s homes
- Low compliance = high accumulations
- Poisoning and abuse concerns
- Leftovers are routinely flushed
- Pharms are showing up in the environment
- No safe, legal, environmentally-acceptable options



Resource Conservation and Recovery Act (RCRA)

- The Resource Conservation and Recovery Act (RCRA) is a federal law controlling the management and disposal of solid and hazardous wastes produced by a wide variety of industries and sources.
- The RCRA program regulates the management and disposal of hazardous pharmaceutical wastes produced by pharmaceutical manufacturers and the health care industry.
- Under RCRA, a waste is a hazardous waste if it is specifically listed by the EPA or if it exhibits one or more of the following four characteristics: ignitability, corrosivity, reactivity and toxicity.
- **RCRA does not regulate any household waste, which includes medications/pharmaceutical waste generated in a household.**



CONTROLLED SUBSTANCE ACT*

<http://www.deadiversion.usdoj.gov/schedules/schedules.htm>

- Schedule I – illegal drugs (ex., heroin, LSD)
- Schedule II – morphine, OxyContin, codeine, Demerol, Ritalin, amphetamines
- Schedule III – Tylenol with codeine, Vicodin
- Schedule IV – benzodiazepines, Valium, Darvon
- Schedule V – codeine cough syrups



What Should I do with my Unused Medications?

DO NOT FLUSH! DO NOT POUR!



What Should I do with my Unused Medications?

DO NOT FLUSH! DO NOT POUR!

DISPOSAL GUIDELINES:

- First, check with your police department to see if they have a drug collection program. Both the Salt Lake City Police Department and the Salt Lake County Sherriff's Office each have established a proper disposal program, go to: www.MedicationDisposal.utah.gov for locations

What Should I do with my Unused Medications?

DO NOT FLUSH! DO NOT POUR!

DISPOSAL GUIDELINES:

- Second, check to see if your community household hazardous waste program collects medications (they must have law enforcement officials present). We try to list sites at www.MedicationDisposal.utah.gov

What Should I do with my Unused Medications?

DO NOT FLUSH! DO NOT POUR!

DISPOSAL GUIDELINES:

- Lastly, if no collection options exist, follow these steps:
 - Remove all personal identification from prescription bottles;
 - Mix all unused drugs with coffee grounds, kitty litter, or another undesirable substance, and/or
 - Place this mixture in a sealed container before disposing in the trash, on the day of pick-up.

Proper Disposal Pilot

Currently in Utah, there are two types of formal residential collection options for unused medications:

- At law enforcement agencies, or
- At household hazardous waste collection events (which must have law enforcement present).



FUNDING

Grants are available to Law Enforcement Agencies to Establish a “Drug Collection for Proper Disposal” Program

- The Department of Environmental Quality is offering law enforcement agencies a one-time grant, up to \$1,000, to establish a “Drug Collection for Proper Disposal” program. This funding can be used to pay for: collection boxes, signage, evidence handling, incineration, advertising or associated expenses.

FUNDING

Requirements to secure this funding include:

- Establishment of a “Drug Collection for Proper Disposal” policy which uses evidence handling protocols with final destruction of the collected drugs through incineration at an approved hazardous waste disposal facility;
- DEA letter of approval
- Placement of clearly marked, secured and locked collection bins in an accessible areas which are monitored by the agency;

FUNDING

Requirements to secure this funding include:

- Residents will not be required to provide personal information or pay for disposal service;
- Reporting to DEQ of the pounds of medications collected;
- Advertising of the program through normal communications with the public.

LOCATIONS

- **DAVIS COUNTY**
LAYTON CITY
- **SALT LAKE COUNTY**
SALT LAKE CITY
 - Both Police Stations
 - 1040 West 700 South
 - 315 East 200 South

LOCATIONS

- **SALT LAKE COUNTY SHERIFF'S OFFICE**
 - COTTONWOOD HEIGHTS
 - HERRIMAN
 - HOLLADAY
 - KEARNS
 - MAGNA
 - MILLCREEK

LOCATIONS

- **SUMMIT COUNTY**
 - Park City Police Department
 - Summit County Sheriff's Office

- **TOOELE COUNTY**
 - TOOELE
 - STANSBURY PARK
 - WENDOVER
 - GRANTSVILLE

LOCATIONS

- **UINTAH COUNTY**
 - VERNAL

- **UTAH COUNTY**
 - SALEM CITY

 - SANTAQUIN/GENOLA

 - UTAH COUNTY SHERIFF'S OFFICE – TWO LOCATIONS
 - EVIDENCE BUILDING

 - EAGLE MOUNTAIN SUBSTATION

LOCATIONS

WASHINGTON COUNTY

– HURRICANE

- **Other inquires but no grant applications:**

- Woods Cross City
- Logan City
- Emery County Sheriff's Office
- Sandy City
- Heber City
- Wasatch County Sheriff's Office
- Salina City
- Mapleton City

Where Can I Properly Dispose of My Medications?

The Salt Lake City Public Utilities and Police Departments and the Salt Lake County Sheriff's Office established proper disposal programs for their residents by installing locked, mounted steel collection bins in the lobbies of their stations. Each agency then collects and burn the drugs. Bring your unused prescription and over-the-counter medications to the following locations:

Police Station
1040 West 700 South, Salt Lake City
M-F: 8 a.m. - 7 p.m.

Police Station
315 East 200 South, Salt Lake City
M-F: 7 a.m. - 7 p.m.

Herriman Sheriff Substation
13272 South 5600 West, Herriman
M-F: 8 a.m. - 5 p.m.

Cottonwood Heights Sheriff Substation
7480 South 2700 East, Cottonwood Heights
M-F: 8 a.m. - 5 p.m.

Holladay Sheriff Substation
4570 South 2300 East, Holladay
M-F: 8 a.m. - 5 p.m.



Funding

The Utah Department of Environmental Quality is offering law enforcement agencies a one-time pollution prevention grant, up to \$1,000, to establish a "Drug Collection for Proper Disposal" program.

This funding can be used to pay for: collection boxes, signage, evidence handling, incineration, advertising or associated expenses.

To find out more about this program and how to apply, please visit:

www.MedicationDisposal.utah.gov/funding.htm

Facts About Prescription Drug Disposal

* Unused medications improperly disposed of can harm you and your environment.

* Drugs can be scavenged and illegally sold.

* Children and animals could be poisoned if they find and swallow drugs.

* When drugs are flushed, they are not removed by the sewage treatment facilities and septic tank systems and can enter the soil, surface water and groundwater.

* Research studies have shown that exposure to drugs found in waterways is having a serious, negative impact on fish and other aquatic life.

Proper Disposal of Prescription

and

Over-the-Counter Drugs in Utah



For More Information:

No Drugs Down the Toilet or Sink

If you're like most people, you have gathered a collection of prescription drugs and other medicines that are no longer needed.



Once it was common practice to flush these medications down the toilet or sink.

We now know that some of these substances are bad for our environment. The drugs are not removed by sewage treatment plants or septic tanks and may enter surface and ground waters, or soils.



Disposal Guidelines for Utah

DO NOT FLUSH! DO NOT POUR!

Prescription, or over-the-counter medications, should not be flushed down the toilet or sink. Follow these guidelines to dispose of these products properly:

- * First, check with your police department to see if they have a drug collection program;
- * Second, check to see if your community has a household hazardous waste program that collects medications; and
- * Lastly, if no collection options exist, follow these steps:
 - Remove all labels from prescription bottles;
 - Mix unused drugs with coffee grounds, kitty litter, or another undesirable substance, and then;
 - Place this mixture in a sealed container and put in your trash on the day of pick-up.

Learn More About ...

If you would like more information about medication disposal, you may want to visit some of these links:

The United States Geological Survey (USGS) has gathered sampling data that confirms the presence of medications in the water and soil.
<http://toxics.usgs.gov/regional/emc.html>

The Partnership for a Drug-Free America informs parents, young adults and teens of the very real risks of misusing medicine, "Prescription Medication Abuse: A Growing Problem."
www.drugfree.org/Parent/Resources/Prescription_Medicine_Misuse

Why Should I Take the Time To Do This?

Properly disposing of unwanted medications may be inconvenient, but there are some very important reasons to do this in a safe and responsible manner.

It's your environment – Please don't flush!

Drugs that are flushed down the toilet cannot be removed by the sewage treatment plant or septic system processes. These substances are released into waterways which can lead to contamination of surface and ground water. Septic tank systems may release the pharmaceuticals into the soil, from which they may reach the ground water.

Abuse is widespread!

Abuse of prescription drugs, particularly painkillers, has increased among teenagers and young adults due to the ease of obtaining drugs. Sixty percent of the persons who abuse painkillers indicated that they received the drugs free from friends or relatives.

You can make a difference!

Children, pets or scavenging animals could find the medication and swallow it. Drugs could be scavenged and illegally sold.



Take action to minimize the threat of accidental poisoning or drug abuse.

Let's take steps now to avoid harm to future generations and the environment.

Your participation is appreciated!

PROPER DISPOSAL OF PHARMACEUTICALS WORK GROUP

- Salt Lake City Public Utilities:** Florence Reynolds, Water Quality and Treatment Administrator
- Salt Lake City Police Department:** Jim Hill, Manager Police - Crime Lab/Ruthanne Ogletree, Evidence
- Board of Pharmacy:** Roger B. Fitzpatrick, Chairperson
- DOPL:** Noel Taxin, Manager
- DEA:** Lynette Wingert, Investigator
- Salt Lake Valley Health Department:** Dorothy Adams, Manager
Household Hazardous Waste Disposal
- Utah Department of Health:** Iona M. Thraen, Patient Safety Director
Health Systems Improvement
- Utah Poison Control Center /University of Utah College of Pharmacy**
Barbara Insley Crouch, PharmD, MSPH
Director, Utah Poison Control Center
- Utah Department of Environmental Quality:** Leah Ann Lamb, Assistant Director
Utah Division of Water Quality



PROPER DISPOSAL OF PHARMACEUTICALS WORK GROUP

Web Site

Proper Medication Disposal:

- www.medicationsdisposal.utah.gov/

Other resources:

Product Stewardship Institute:

- www.productstewardship.us/displaycommon.cfm?an=1&subarticlenbr=181

Teleosis Institute: Green Health Pharmacy Program:

- www.teleosis.org/gpp-program.php



Sources of Information Contained in this Presentation

References:

Pharmaceuticals and Personal Care Products as Pollutants (PPCPs), EPA Web Site: <http://www.epa.gov/ppcp/>

* Information in slides with an * was used with permission from Dave Galvin with the Local Hazardous Waste Management Program in King County, Washington and was taken from a presentation he gave to the Product Stewardship Institute.

