Not to Flush: safe, secure, sustainable unused medicine take-back systems are needed

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A timely subject...

AP: Drugs found in drinking water

Hormonal chemicals may be imperiling fish

Even at the low levels detected, scientists worry about the possible effect on fish growth and reproduction.

BY WARREN CORNWALL AND KEITH ERWIN
Seattle Times staff reporters

As they swim deep beneath Seattle's Elliott Bay, male English sole carry something in their bodies that's not supposed to be there: a protein found only in female fish, first found in the 1990s, are thought to be a result of human hormone-mimicking chemicals flushed into the water from sewage-treatment plants, factories, storm-watersheds and runoff from roadways that had made their way into surface water systems in Hayden.

Prescription drug overdoses are up 56% since 1997.

OxyContin abuse in region soars

The illicit use of the painkiller, especially among teens, has driven up its street price, which has made pharmacies robbery targets.

the region say that methamphetamine's popularity is quickly being outpaced by the powerful prescription painkiller simply known as “Oxy.”

According to the Drug Enforcement Administration (DEA), prescription-drug
Pharmaceuticals

- Antibiotics
- Anti-inflammatories
- Beta-blockers
- Anti-depressants (SSRIs)
- Steroids
- Hormones, estrogen replacements, BC pills
- Chemotherapeutics
- Stimulants
- Etc.
Pharmaceuticals (cont’d)

• Wide range of biologically-active chemicals

• Three classes by sale/regulation:
  – Over The Counter
  – Prescription (or “Legend”)
  – Controlled Substances

• Some designate as hazardous waste
Pharmaceuticals (cont’d)

- **Controlled Substances** – regulated by the Federal Drug Enforcement Administration due to potential for abuse
  - **Schedule I** – illegal drugs (ex., heroin, LSD)
  - **Schedule II** – morphine, OxyContin, codeine, Demerol, Ritalin, amphetamines, fentanyl
  - **Schedule III** – Tylenol with codeine, Vicodin
  - **Schedule IV** – benzodiazepines, Valium, Darvon
  - **Schedule V** – codeine cough syrups
Some Pharmaceuticals are Endocrine Disrupting Chemicals

Some chemicals from the "families" above are potentially endocrine disrupters.
Drugs are in wastewater systems and the environment

- Ibuprofen, valium, prozac, antibiotics, steroids, hormones
- Found in 80% of U.S. streams tested by USGS
- Found in drinking water supplies in many U.S. cities
Drugs also present poisoning and abuse hazards

- Most homes have many medicines on the shelves
- Common source of childhood poisonings
- Common source of teenage and adult abuse
Drugs enter the environment through use and disposal

- Probably most result from use, passing through us un-metabolized, then going through wastewater treatment systems
- Unused/unwanted quantities could be huge, as much as 50% of many prescriptions (80% for antibiotics): we figure 30% overall
- Common/historical recommendation was to flush; “crush&flush” is still widely practiced method
Lots of medicines go unused…

• Overprescribing/Overpurchasing
• Patient doesn’t finish.
• Changes in medications.
• Medicines expire.
• Lots of medicines needed during serious illness, but patient recovers.
• Lots of medicines, including strong pain relievers, needed for end-of-life care.
Drug treatability?

- Pharmaceuticals = wide range of chemicals
- Many studies underway (EPA, WERF, USGS, ...)
- Conventional activated sludge and MBR show good, although mixed removals
- Longer solids retention time often leads to greater removals
  - Trade-off with energy and cost
- Biosolids issues?
Source Control Makes Sense

• Complex chemicals, not all “treatable”
• Wastewater treatment plants are conduits for pharmaceuticals getting into the environment (from both use + disposal)
• Reduce use
• Reduce waste
• Promote DO NOT FLUSH message
• Separately manage unused left-overs
Source control (cont’d)

• Nat’l Summit on Preventing Pharmaceutical Waste (PSI, Philadelphia, Oct., 2010):
  – Modify co-pay and dispensing fee structures
  – Limit initial prescription size for certain meds
  – Pro-rate co-pays
  – Reduce waste from drug samples
  – Increase use of electronic medical records
  – Limit direct-to-consumer advertising
  – Reduce total amounts sold and amounts wasted
Federal Guidelines:

- Do not flush prescription drugs down the toilet or drain unless the label or accompanying patient information specifically instructs you to do so. For information on drugs that should be flushed visit the FDA’s website.

- To dispose of prescription drugs not labeled to be flushed, you may be able to take advantage of community drug take-back programs or other programs, such as household hazardous waste collection events, that collect drugs at a central location for proper disposal. Call your city or county government’s household trash and recycling service and ask if a drug take-back program is available in your community.

- If a drug take-back or collection program is not available:

  1. Take your prescription drugs out of their original containers.

  2. Mix drugs with an undesirable substance, such as cat litter or used coffee grounds.

  3. Put the mixture into a disposable container with a lid, such as an empty margarine tub, or into a sealable bag.

  4. Conceal or remove any personal information, including Rx number, on the empty containers by covering it with black permanent marker or duct tape, or by scratching it off.

  5. Place the sealed container with the mixture, and the empty drug containers, in the trash.
Federal footnote...

1 Consumers are advised to check their local laws and ordinances to make sure medicines can legally be disposed of with their household trash.
MEDICINES RECOMMENDED FOR DISPOSAL BY FLUSHING

This list from FDA tells you what expired, unwanted, or unused medicines you should flush down the sink or toilet to help prevent danger to people and pets in the home. Flushing these medicines will get rid of them right away and help keep your family and pets safe.

FDA continually evaluates medicines for safety risks and will update the list as needed.

<table>
<thead>
<tr>
<th>Medicine</th>
<th>Active Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actiq, oral transmucosal lozenge *</td>
<td>Fentanyl Citrate</td>
</tr>
<tr>
<td>Avinza, capsules (extended release)</td>
<td>Morphine Sulfate</td>
</tr>
<tr>
<td>Daytrana, transdermal patch system</td>
<td>Methylphenidate</td>
</tr>
<tr>
<td>Demerol, tablets *</td>
<td>Meperidine Hydrochloride</td>
</tr>
<tr>
<td>Demerol, oral solution *</td>
<td>Meperidine Hydrochloride</td>
</tr>
<tr>
<td>Demerol, oral solution *</td>
<td>Diazepam</td>
</tr>
<tr>
<td>Diastat/Diastat AcuDial, rectal gel</td>
<td>Hydromorphone Hydrochloride</td>
</tr>
<tr>
<td>Dilaudid, tablets *</td>
<td>Hydromorphone Hydrochloride</td>
</tr>
<tr>
<td>Dilaudid, oral liquid *</td>
<td>Methadone Hydrochloride</td>
</tr>
<tr>
<td>Dolophine Hydrochloride, tablets *</td>
<td>Fentanyl</td>
</tr>
<tr>
<td>Duragesic, patch (extended release) *</td>
<td>Morphine Sulfate; Naltrexone Hydrochloride</td>
</tr>
<tr>
<td>Embeda, capsules (extended release)</td>
<td>Hydromorphone Hydrochloride</td>
</tr>
<tr>
<td>Exalgo, tablets (extended release)</td>
<td>Fentanyl Citrate</td>
</tr>
<tr>
<td>Fentora, tablets (buccal)</td>
<td>Morphine Sulfate</td>
</tr>
<tr>
<td>Kadian, capsules (extended release)</td>
<td>Methadone Hydrochloride</td>
</tr>
<tr>
<td>Methadone Hydrochloride, oral solution *</td>
<td>Methadone Hydrochloride</td>
</tr>
<tr>
<td>Medicine</td>
<td>Active Component</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Methadose, tablets</td>
<td>Methadone Hydrochloride</td>
</tr>
<tr>
<td>Morphine Sulfate, tablets (immediate release)</td>
<td>Morphine Sulfate</td>
</tr>
<tr>
<td>Morphine Sulfate, oral solution</td>
<td>Morphine Sulfate</td>
</tr>
<tr>
<td>MS Contin, tablets (extended release)</td>
<td>Morphine Sulfate</td>
</tr>
<tr>
<td>Onsolis, soluble film (buccal)</td>
<td>Fentanyl Citrate</td>
</tr>
<tr>
<td>Opana, tablets (immediate release)</td>
<td>Oxymorphone Hydrochloride</td>
</tr>
<tr>
<td>Opana ER, tablets (extended release)</td>
<td>Oxymorphone Hydrochloride</td>
</tr>
<tr>
<td>Oramorph SR, tablets (sustained release)</td>
<td>Morphine Sulfate</td>
</tr>
<tr>
<td>Oxycontin, tablets (extended release)</td>
<td>Oxycodone Hydrochloride</td>
</tr>
<tr>
<td>Percocet, tablets</td>
<td>Acetaminophen; Oxycodone Hydrochloride</td>
</tr>
<tr>
<td>Percodan, tablets</td>
<td>Aspirin; Oxycodone Hydrochloride</td>
</tr>
<tr>
<td>Xyrem, oral solution</td>
<td>Sodium Oxybate</td>
</tr>
</tbody>
</table>

*These medicines have generic versions available or are only available in generic formulations.

List revised: March 2010
Released by the White House Office of National Drug Control Policy on April 20, 2011...
“…a comprehensive plan to address prescription drug abuse must include proper disposal of unused, unneeded, or expired medications. Providing individuals with a secure and convenient way to dispose of medications will help prevent diversion and abuse, and help to reduce the introduction of drugs into the environment.

“In order to protect human health and the environment, it is vital that collected prescription drugs be appropriately disposed of in an environmentally safe manner. ...an important environmental safety message in the fight against improper medication disposal is to recommend against flushing prescription drugs with the few exceptions noted by the Food and Drug Administration (FDA).”
The report recommends:
• Additional DEA-sponsored take-back events until the medication-disposal rule is finalized;
• A “robust public education initiative” on safe medicine return;
• “Engagement” with PhRMA and others to support medication disposal programs.
Models/pilot projects

- One-day collection events
- Household hazardous waste services
- Drop-off at police or sheriff offices
- Mail-back
- Drop-off/take-back at pharmacies
Controlled Substance barrier

- Only the end-user or law enforcement can legally possess a CS drug once dispensed
- Take-back programs thus must involve police or sheriffs
- “Safe and Secure Drug Disposal Act of 2010” enacted
- DEA is currently drafting rules
• Pharmacy take-back demonstration + law enforcement and other options
• Operating for more than 4 years at 39 pharmacies state-wide
• All voluntary, locally-funded (not sustainable)
• More than 100,000 pounds of medicines collected, with little advertising
Washington State (cont’d)
DEA Take-Back Events

- September, 2010: 121 tons
- April, 2011: 188 tons
- Stop-gap measure until ongoing programs are in place
Best approach: Product Stewardship
Product Stewardship

• It’s about long-term sustainability, zero waste, materials management, “ownership.”

• Full life-cycle responsibility.

• Those with the greatest ability to influence the life-cycle impacts of a product have the greatest responsibility.
Upstream Design - Source Control

• One objective of product stewardship is to encourage manufacturers to redesign products with fewer toxics, to reduce waste, and to encourage complete recycling or destruction.

• End-of-life take-back is part of a product stewardship system for anything not compostable or able to be fully treated in wastewater systems.
Product Stewardship Elsewhere

Many Products
- Pharmaceuticals
- Paint
- Pesticides
- Batteries
- Thermostats
- Tires
- Mercury Switches in Cars
- Vehicles
- Electronics
- Cell phones
- Beverage Containers
- Packaging
- . . . . and more

Many Places
- BC
- And all across Canada
- European Union
- Japan
- Taiwan
- South Korea
- Australia
- . . . .and more
PSI Pharmaceutical Initiative

• National dialogue (with NACWA support)
• National website: www.takebacknetwork.com/
• Change federal law and regulations
• Support state efforts to enact P.S. laws
• Promote extended producer responsibility as the right solution to this problem.
Recent Pharmaceutical Take-Back Legislation

- “study bills” in CA, VT, RI
- other take-back legislation in a dozen states
Why support medicine take-back?

“This is about saving even just one life... if we can dispose of cans and bottles and oil from our car properly, why can’t we dispose of something the size of a dime that can kill you?”

Bernard Strain, whose teenage son Timothy died last year after accidentally taking prescription methadone pills that had been sitting in a medicine cabinet.

_New York Times, September 24, 2010_
In closing...

• Pharmaceuticals are a complex, “emerging” issue important to WQ professionals
• Large quantities of drugs go unused, and offer potential for flushing
• Source control is a key tool
• Residential take-back programs for unused/waste medicines are an important part of source control efforts
In closing... (cont’d)

• Take-back should have a measurable effect
• We need to counter PhRMA’s message that all medicines can be effectively treated at WTPs
• If WTPs are required to take out more pharmaceuticals, it will cost $billion$
• NACWA and water quality experts need to speak up and show strong support for source control solutions such as take-back
In closing... (cont’d)

• The cost will fall on local tax- or rate-payers unless a better model is chosen
• We should work together to push for a product stewardship solution
For more information

- **Nationally:**
  www.takebacknetwork.com/

- **Washington State:**
  www.takebackyourmeds.com

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