AP IMPACT: Tons of drugs dumped into wastewater

By JEFF DONN, MARTHA MENDOZA and JUSTIN PRITCHARD – Sep 14, 2008

U.S. hospitals and long-term care facilities annually flush millions of pounds of unused pharmaceuticals down the drain, pumping contaminants into America's drinking water, according to an ongoing Associated Press investigation.

These discarded medications are expired, spoiled, over-prescribed or unneeded. Some are simply unused because patients refuse to take them, can't tolerate them or die with nearly full 90-day supplies of multiple prescriptions on their nightstands.

Few of the country's 5,700 hospitals and 45,000 long-term care homes keep data on the pharmaceutical waste they generate. Based on a small sample, though, the AP was able to project an annual national estimate of at least 250 million pounds of pharmaceuticals and contaminated packaging, with no way to separate out the drug volume.

One thing is clear: The massive amount of pharmaceuticals being flushed by the health services industry is aggravating an emerging problem documented by a series of AP investigative stories — the commonplace presence of minute concentrations of pharmaceuticals in the nation's drinking water supplies, affecting at least 46 million Americans.

Researchers are finding evidence that even extremely diluted concentrations of pharmaceutical residues harm fish, frogs and other aquatic species in the wild. Also, researchers report that human cells fail to grow normally in the laboratory when exposed to trace concentrations of certain drugs.

The original AP series in March prompted federal and local legislative hearings, brought about calls for mandatory testing and disclosure, and led officials in more than two dozen additional metropolitan areas to analyze their drinking water.

And while most pharmaceutical waste is unmetabolized medicine that is flushed into sewers and waterways through human excretion, the AP examined institutional drug disposal and its dangers because unused drugs add another substantial dimension to the problem.

"Obviously, we're flushing them — which is not ideal," acknowledges Mary Ludlow at White Oak Pharmacy, a Spartanburg, S.C., firm that serves 15 nursing homes and assisted-living residences in the Carolinas.

Such facilities, along with hospitals and hospices, pose distinct challenges because they handle large quantities of powerful and toxic drugs — often more powerful and more toxic than the medications people use at home. Tests of sewage from several hospitals in Paris and Oslo uncovered hormones, antibiotics, heart and skin medicines and pain relievers.

Hospital waste is particularly laden with both germs and antibiotics, says microbiologist Thomas Schwartz at Karlsruhe Research Center in Germany.

The mix is a scary one.

In tests of wastewater retrieved near other European hospitals and one in Davis County, Utah, scientists were able to link drug dumping to virulent antibiotic-resistant germs and genetic mutations that may promote cancers, according to scientific studies reviewed by the AP.

Researchers have focused on cell-poisoning anticancer drugs and fluoroquinolone class antibiotics, like anthrax fighter ciprofloxacin.

At the University of Rouen Medical Center in France, 31 of 38 wastewater samples showed the ability to mutate genes. A Swiss study of hospital wastewater suggested that fluoroquinolone antibiotics also can disfigure bacterial DNA, raising the question of whether such drug concoctions can heighten the risk of cancer in humans.

Pharmacist Boris Jolibois, one of the French researchers at Compiegne Medical Center, believes hospitals should act quickly, even before the effects are well understood. "Something should be done now," he said. "It's just common sense."

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Some contaminated packaging and drug waste are incinerated; more is sent to landfills. But it is believed that most unused pharmaceuticals from health care facilities are dumped down sinks or toilets, usually without violating state or federal regulations.

The Environmental Protection Agency told assembled water experts last year that it believes nursing homes and other long-term care facilities use sewer systems to dispose of most of their unused drugs. A water utility surveyed 45 long-term care facilities in 2006 and calculated that two-thirds of their unused drugs were scrapped this way, according to the National Association of Clean Water Agencies.

An internal EPA memo last year included pharmaceuticals on a list of "major pollutants of concern" at health care businesses. Still, few medical centers keep comprehensive records of drugs they cast down toilets or into landfills. When data are kept, drugs and tainted packaging are combined in the same totals.

In an attempt to quantify the problem, the AP examined records in Minnesota, where state regulators have pushed hospital administrators to keep closer track than elsewhere. Fourteen facilities were surveyed, in a range of settings from rural to urban. The AP projected those annual totals onto the national patient population for hospitals and adjusted for the relatively lower pharmaceutical use of Minnesotans. Since long-term care facilities generate more drug waste than hospitals, the AP conservatively doubled the number.

That calculation produced an estimate of at least 250 million pounds of annual drug waste from hospitals and long-term care centers, further complicated by the fact experts say drugs might account for only up to half of pharmaceutical waste, while the rest is packaging.

The AP estimate excludes many other sources of health industry drug waste, from doctors' to veterinary offices. Smaller medical offices typically dispose of expired samples and unwanted drugs like ordinary consumers — with little forethought.

Alan Davidner, president of Vestara of Irvine, Calif., which sells systems to manage drug waste, says his limited sampling suggests the health care industry's contribution could even be higher.

Plus, untold amounts of pills and tablets are being thrown away each year at federal and state correctional institutions.

At a state prison in Oak Park Heights, Minn., nurse Linda Peterson says the hospital unit serving inmates statewide has been throwing away up to 12,000 pills a year. She says some heart medicines and antibiotics are simply chucked into the trash. Tightly regulated narcotics susceptible to abuse go down the toilet.

"We flush it and flush it and flush it — until we can't see any more pills," she says.

She notes the presence of nursing homes, a hospital and another prison in the same area. "So what are all these facilities doing, if we're throwing away about 700 to 1,000 pills a month?"

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The EPA is considering whether to impose the first national standard for how much drug waste may be released into waterways by the medical services industry, but Ben Grumbles, the EPA's top water administrator, says a decision won't be made until next year, at the earliest.

So far, regulators have done little more than politely ask the medical care industry to stop pouring drugs into the wastewater system. "Treating the toilet as a trash can isn't a good option," says Grumbles.

Some think it's time to do more than ask. "It's strange that we have rules about the oil from your car; you're not allowed to simply flush it down the sewer," says U.S. Rep. Tim Murphy, R-Pa. "So why do we let these drugs, without any kind of regulation, continue to be flushed away in the water supply?"

Landfills are one alternative. At least they don't empty directly, and immediately, into waterways like some sewage.

Marjorie E. Powell, a lawyer for the Pharmaceutical Research and Manufacturers of America, says landfills are "more environmentally friendly," while EPA spokeswoman Roxanne Smith contends that landfilling of hazardous pharmaceutical waste "poses little threat to the public."

Still, Grumbles acknowledges that landfills, while safer, are not a permanent solution. That's because pharmaceuticals can eventually reach waterways from landfills through leaks or intentional releases of treated seepage known as leachate.

An agency staffer wrote in a memo last year: "EPA recognizes that residuals in the leachate could contaminate groundwater supplies and ultimately reach water treatment plants, but disposal into the trash is currently considered a BMP" — or best management practice.

Already, researchers have detected trace concentrations of drugs — including the pain reliever ibuprofen and seizure medicine carbamazepine — in seepage or groundwater near landfills.

Environmental professionals outside government are reaching a consensus that incinerators are the best disposal method.

"That's the best practice for today because we don't really know what the hell to do with the stuff," says industrial engineer Laura Brannen, an executive at Waste Management Healthcare Solutions, of Houston. She says burning destroys more drug waste than all other methods, though some contaminants may escape in smoke and ash.

On a recent day at Abbott Northwestern Hospital in Minneapolis, Mary Kuch was getting ready to squirt leftovers from a syringe of hydromorphone, a powerful morphine derivative, into a sink. When she started out in nursing 18 years ago, "I took it for granted, because I was a young nurse, and that's what other nurses did," she says. "But I did find it strange."

These days, only four gallons — drugs with high potential for abuse — go down the hospital's drains each year. Nearly all leftover medicine and contaminated packaging are instead tossed into black bins and rolled to a hospital storage room crammed with scores of 55-gallon drums.

There, waste-company employee Bryant Sears — dressed in a Teflon suit, rubber gloves and goggles — conducts a sorting operation. Pills, blister packs and liquid medicines collected in vials, along with syringes and IV bags, are separated out according to differing disposal standards and methods. Occasionally, he glances at a wall-sized placard with details on which drug goes where — hazardous waste in one barrel, nonhazardous in another. A roll of "hazardous waste" stickers hangs from a pole on the wall.

Sears points to some epinephrine, a heart drug, saying, "Now that it's past its expiration date, it's waste."

These leftovers and discards ultimately will be incinerated.

EPA's Smith says even municipal burners unapproved for hazardous waste "will destroy all but a minute fraction" of organic compounds — the kind found in pharmaceuticals.

But Stephen DiZio, a manager with the California Department of Toxic Substances Control, says not so fast. "I don't think we're encouraging incineration of anything. The public outcry would be so great."

The push for incineration hides an irony. Several decades ago, drug waste was routinely chucked into the trash and burned in hospital or city incinerators.

Then came a national campaign against air pollution. Most hospitals shut down their burners, and city incinerator managers became pickier about what they'd accept. With options restricted, hospitals began shipping more drug waste to landfills — and dumping more into toilets and sinks.

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A few choices are expanding. Some states have passed laws to make it easier to contribute unused drugs to charity pharmacies that supply low-income patients.

Also, a small share of unused drugs is shipped back to manufacturers for credit — and incineration, waste consultants say. But the drugs are supposed to be sent back in original packaging — sometimes impractical because the packaging is discarded or damaged.

Several long-term care residences want to deploy automatic drug-dispensing machines that suppliers would refill often to reduce waste.

While not yet practical, there are several experimental technologies, such as destroying trace drugs with an electrical arc, microwaves, or caustic chemicals.

Increasingly, some bureaucrats and health professionals are suggesting that drug makers help pay costs of managing drug waste. But the pharmaceutical industry says there's insufficient evidence of environmental harm to warrant the expense.

But impatience is mounting. Even the EPA has begun to take such suggestions seriously. Grumbles says drug makers "should do more for product stewardship and meds retrieval now." He says it would be unwise to wait for all the proof.

For now, many health facilities, especially small ones, are put off by the cost of proper handling. Drugs deemed hazardous by the EPA — about 5 percent of the market — might cost up to $2 a pound to incinerate in a certified hazardous waste incinerator, says Vestara's Davidner. A pound might cost 35 cents to burn in a regular trash incinerator.

Tom Clark, an executive at the American Society of Consultant Pharmacists, wonders: "When you can flush it down the toilet for free, why would you want to pay — unless there's some significant penalties?"

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