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Testimony by Massachusetts Department of Public Health
Associate Commissioner and Director of the
Bureau of Environmental Health, Suzanne K. Condon, before the
Joint Committee on Public Health
Tuesday, May 13, 2008

Topic: Pharmaceuticals and Personal Care Products

Good morning and thank you for the opportunity to testify before the Joint Committee on Public Health on the emerging public health issues associated with pharmaceuticals and personal care products (PPCPs) in drinking water. This issue is receiving widespread attention from public health and environmental officials nationwide.

PPCPs have been investigated for their presence in the nation's surface water, wastewater, and drinking water over the past several years. In 2002, the U.S. Geological Service (USGS) conducted an investigation of PPCPs in streams throughout the country, reporting detections of PPCPs in concentrations generally in the parts per billion or parts per trillion range.

Two years later, USGS demonstrated that some of these PPCPs survived the water treatment process and were present in drinking water samples.

Later in this testimony, I will briefly touch on some of the interagency activities we have been involved with but I know that Commissioner Burt will go into greater detail on these initiatives in her testimony, so my remarks will be brief.

PPCPs originate primarily from people, through excretion in human waste after medications are consumed, through flushing down toilets for unused or expired medicines or other personal care products, or through washing down drains of products used on the skin. In addition, veterinary or other animal products are similar sources that enter the waste stream.

There are a wide variety of PPCPs that include prescription drugs (such as antibiotics or hormones), over-the-counter medicines, veterinary drugs, fragrances and cosmetics, nutrient chemicals, such as vitamins, sunscreen products, and others.

Some PPCPs are easily broken down and processed in the human body or degraded readily in the environment, but others do not easily degrade or break down and hence can enter the waste stream. These compounds tend to dissolve easily in water and for that reason can be detected in drinking water.

Research on the ecological effects of PPCPs have identified impacts such as alterations in the behavior of fish or feminization of male fish exposed to female hormones in the water.

However, so far, there have not been studies showing human health effects from exposure to the concentrations being detected for PPCPs in drinking water. Still, most public health and environmental experts would agree that more research is needed. Many pharmaceuticals and personal care products have endocrine disrupting properties, including those that are, or mimic the actions of, estrogens. Endocrine disrupting chemicals may mimic the effects of existing hormones, inhibit existing hormones or otherwise interfere with the action of hormonal systems. These compounds have been linked to human health effects such as adverse birth outcomes, effects on child development, breast cancer, and diabetes.

The most commonly cited uncertainties about PPCPs in drinking water and human health effects relate to possible effects of exposures to mixtures of many PPCPs at once, the potential long-term exposure to these compounds, and the potential concern for exposures to populations more vulnerable and for whom these products were never intended, such as the developing fetus.

A recent Journal of the American Medical Association (JAMA) article from earlier this month notes that there are some indications that exposure at the concentrations being detected in drinking water are likely to pose low risks to human health. This was based on the fact that PPCP concentrations in drinking water are far below therapeutic doses. In addition, unlike some industrial chemicals found in water, PPCPs are designed to be safe for humans and are unlikely to accumulate in tissues because most are rapidly eliminated from the body.

Currently, there are few population-based biomonitoring data available to determine what levels of PPCPs might be present in the human population. However, recent data from CDC National Health and Nutritional Examination Survey (NHANES) have shown detectable levels of several phthalates which are present in many consumer and personal care products, including some prescription medications. NHANES data are also available for compounds found in some PPCPs, such as benzophenone-3 (BP-3), which is used in sunscreen and many other consumer products. What the health implications are of contaminants at levels being measured in humans remains to be seen.

MDPH is a member of the Safe Drinking Water Act Advisory Committee, where in the spring of 2007 MassDEP staff introduced a project with UMass Amherst for sampling public water supplies for PPCPs. Commissioner Burt will be elaborating on this activity.

While national research on potential health effects from environmental concentrations of PPCPs in drinking water continues, there is universal agreement that efforts can and should be undertaken to reduce the contribution of PPCPs to our wastewater and drinking water.

To that end, MDPH worked in partnership with MassDEP and others as part of an interagency task force to review current consumer guidance and develop refinements as needed on the disposal of unused or expired pharmaceuticals.

The task force includes several DPH bureaus and programs, such as the DPH Bureau of Environmental Health, Environmental Toxicology Program, the DPH Bureau of Health Care Quality, Drug Control Program, MDPH Bureau of Substance Abuse Services, and Board of Registration in Pharmacy, as well as the MassDEP, the Massachusetts Water Resources Authority (MWRA), Regional Poison Control Centers, the U.S. Drug Enforcement Administration, and the U.S. Food and Drug Administration (office of Pharmaceutical Science).

The Department has worked with organizers of take-back and drop-off programs in Massachusetts as one option for household disposal. Another option widely encouraged is to dispose of such products through household trash, thereby preventing disposal through flushing and hence entering the wastewater stream.

However, there are some drawbacks to disposing of all pharmaceuticals in the trash. Some drugs have a high abuse potential. In other instances, disposing in household trash may increase the potential for young children to access and accidentally ingest dangerous amounts of the drug. For that reason, the most prudent guidance relates to disposal methods making such discarded medicines as unattractive as possible to the substance abuse community.

Some pharmaceutical containers have specific instructions on the FDA-approved label or accompanying instructions to dispose unused or expired product by flushing down the toilet. This is consistent with federal guidance issued in 2007 that suggests that certain pharmaceuticals should be flushed down the toilet, such as OxyContin tablets.

In addition, health care providers can prescribe only needed quantities to reduce the possibility of unused medicines that may end up in the waste stream.

Consistent with the pharmacy access bill, the Department is also currently working on the related issue of sharps in the waste stream. It is our hope that disposal options created statewide will enhance disposal options for unused medications in a more secure environment.

Finally, we are partnering with MassDEP on convening a summit to discuss PPCPs and steps that can be taken to reduce environmental and human health impacts of these compounds in Massachusetts. We look forward to continued collaboration with all of our partners as we move forward to address this emerging environmental public health issue.