Waste Pharmaceuticals: The Road Forward

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Maine Department of Environmental Protection

Improving Patient Safety through Informed Medication Prescribing & Disposal Practices October 31, 2007
Welcome to Maine

• 6,000 lakes and ponds

• 45,000 miles of rivers and streams

• 3500 miles of coastline; more than any other state in the continental U.S.
Welcome to Maine

• Home to approximately 20% of the nation’s intact brook trout populations and the primary steward of 97 percent of the wild brook trout inhabiting large lakes in the eastern US.
Maine has great water

- 95% of Maine waters meet their CWA designated uses.
- 98% of our rivers and streams are well above CWA Act minimum standards.
Maine Studies

- Since 2000 Maine studies have focused on Effect-based Cumulative Effects Assessment (CEA) of endocrine disruption in fish.
C.E.A. Studies

• Reproduction in fish: A sensitive indicator of endocrine disruption in aquatic ecosystems.

• If we do find impacts, then other studies will be needed to determine the cause.
C.E.A. Studies continued

• Measuring physiological and metabolic parameters (relative gonad size, egg size and number, circulating sex steroids, the female egg yolk protein vitellogenin in males, and gonadal development and intersex) in fish above and below pulp and paper mills and POTWs on our major rivers.
C.E.A. Studies continued

- In addition, age, growth, relative liver size, detoxification enzymes, and stress hormones in fish are studied. The pattern of responses can identify metabolic disruption due to endocrine disruptors.
C.E.A. Studies continued

- Evidence of endocrine disruption in some streams/rivers. Not sure of PPCP role.
C.E.A. Studies continued

- Impacts found in discharges to the Androscoggin, Kennebec or Penobscot seem to be due to other factors. More lab data is pending -- final word not written.
C.E.A. Studies continued

- Found intersex in 10% of the fish from the Penobscot below Millinockett and Lincoln, but reviewing the significance. Recent reports in the Potomac R and tributaries found a higher rate, >25%.
Maine Studies continued

• In 2005 Me DEP also worked jointly with EPA NE to analyze directly for PPCP’s in surface water.

• Found PPCPs in 18 of 19 samples, with majority of sites having 3 or more PPCPs.

• Have also found anti-seizure medication, DEET, caffeine and hormones in well samples. All wells were near septic systems.
Conclusions

• Maine sampling is extremely limited but shows that Maine’s waters are no different than other states — waste PPCPs are present and of concern.

What’s the path forward?
The Path Forward

• Maine first in US to pass legislation authorizing a mail-in program. Pilot planning is underway with funding from EPA and the Maine legislature.

• Maine DEP is working with communities on one-day collection events.

• Maine DEP monitoring other collection models in other states, including in-pharmacy collections.

• Maine DEP researching pharmaceutical company funded product stewardship collection programs in Europe and Canada.
The Path Forward
We should all be in this together!

• Expand dialogue to all parties, including pharmaceutical companies, insurance companies, law enforcement, environmental and health professionals.

• Continue to expand national research on potential environmental impacts.
The Path Forward

• Fully develop collection models: mail-in; one day collections; at pharmacy.

• Solve regulatory barriers to collection presented by the Controlled Substances Act.

• Develop sustainable permanent collection programs to avoid elicit use & uncontrolled environmental releases.
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