Investigation and Education: A Medical School and Health Science Center’s Role in Addressing the Safe Disposal of Medication

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Investigation and Education

• Objectives:
  – To understand the scope of the drug diversion and disposal problems in the U.S.
  – To understand that there is a dearth of information on the environmental impact of various classes of prescription medication.
  – To understand how should medical and other health related schools identify the scope of the problem and to recommend solutions.
University of New England
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- College of Arts and Sciences
  - Marine Science
  - Center for Land-Sea Interaction
- Westbrook College of Health Professions
- College of Pharmacy
- College of Graduate Studies
  - Public Health program
- Proposed College of Dental Medicine
- College of Osteopathic Medicine
UNE’s Impact on Maine

• Current growth health sciences university.
  • New College of Pharmacy.
  • Planned College of Dental Medicine.
  • Economic impact to our state:
    • >$500,000,000/year.
• Educates more health care professionals than any institution in Maine or the world.
  • >900 graduates a year.
  • 10% of physicians; 15% of PCP; and >25% of rural doctors in Maine.
Scope of the Problem

• There’s a lot of ‘pills’ around...
  – Prescriptions filled per year: 3,679,671,222
  – Compliance:
    • As low as 20%-decreasing over time, and with multiple medications...
    • PhRMA estimate of 3% of all medications are not used.
    • Other studies reveal much higher numbers.
      – 82% of antibiotics
      – 50% of antidepressants
      – 50% of beta-blockers
      – 20% of pain meds
Scope of the Problem

• **Diversion of Controlled Substances is a crisis.**
  – >15 million controlled prescription drug abusers.
  – Exceeds all combined Schedule I drug abusers:
    • Cocaine = 6 million
    • Hallucinogens = 4 million
    • Inhalants = 2 million
    • Heroin = 300,000
Scope of the Problem

- Agricultural use medications.
  - Endocrine disruptors
    - Estrogens, testosterone
  - Industrial chemicals, pesticides, herbicides
- Antibiotics
- SSRIs
- Antidepressants
- Low levels of multiple substances

Environmental Impact
Scope of the Problem

• Environmental impact.
  – Disposal of Opioids
    • FDA recommendations to ‘flush’.
    • Passage of the Secure and Responsible Drug Disposal Act of 2010.
  • Opium Poppy cultivation has occurred for 5,000 years.
    – Alkaloids leached into the watershed.
Sources of Medications Entering Environment

1. Agricultural
2. Human waste
3. Disposal of unused meds
The Problem of Unused Medications

• Ever increasing number of prescriptions.
• Low compliance.
• ‘Stockpiles’ in homes.
• Abuse and poisoning is a crisis.
• Unused medications are often ‘flushed’.
• Increasing levels are seen in the environment.
• What is the safest means of disposal?
  – Incineration?
Possible Research Initiatives

• Identify medications that are unused
  – Class; # of pills; pt demographics; population demographics.

• Develop population based programs
  – Improved compliance (ie. Health care concierge, co-pay differential, pharmacist f/u of pt, etc.).

• Patient and provider education.

• More frequent and specific sewer assays.

• Identification of specific land-sea interactions.
Questions

• Define Scope?
  – Human disposal of unwanted meds
  – Human excretion
  – Agricultural and animal waste

• Impact?
  – Environmental
  – Abuse

• Solutions?
  – Cost
  – Is there a safe means of disposal?