

GreenPharmEDU.org

GreenPharm: Integrated Pharmaceutical Waste Educational Program



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Reducing pharmaceutical waste involves every aspect of healthcare; from prescribers to environmental managers in hospitals. In an effort to reduce the quantities of pharmaceuticals entering the environment, Teleosis Institute and Touro University's Institute for Environmental Medicine is launching the GreenPharm: Integrated Pharmaceutical Waste Reduction Program. GreenPharm provides a comprehensive educational program for all stakeholders involved with prescribing medication, delivering pharmaceuticals to patients and consumers, and handling unused pharmaceuticals in healthcare settings.

Our overall goals are to:

- Reduce exposure to pharmaceuticals in water systems.
- Work with health professionals to set priorities for risk-reduction activities.
- Help the healthcare industry and local communities mitigate the major sources of pharmaceuticals in waste streams.
- Reach zero pharmaceutical waste in the environment.

With the improved safety of the public health as our agenda, we have identified six key stakeholder groups that we believe must be engaged in a coordinated effort to maximize proper disposal. They are:

- Family Practice Physicians, Pediatricians, Geriatrics, Psychiatrists, Hospitalists
- Nurses: Hospital, Hospice, Long-Term Care, Public Health
- Pharmacists: Hospital, Retail, and Consulting
- Dentists
- Veterinarians
- Hospital Environmental Staff

Project Outline

Timing: January 1st, 2010 – December 31, 2012

Activities: 20 Continuing Education Modules will be developed for 15 different primary prescribers in clinical settings. These modules will be rolled out approximately one per month over the next 2 years.

Implementation: Goals, Objectives and Timeline

To accomplish these major goals we will implement the following plans:

- Identify key leaders in the field of ecopharmacology.
- Develop curriculum that fosters stewardship based medical practices.
- Provide accessible online education that reaches large audiences of professionals easily and effectively.
- Engage in ongoing evaluation for effectiveness of programs and solutions.

As leaders in the delivery of healthcare, physicians are essential for reducing the impact of pharmaceuticals on the environment. Little or no educational opportunities, until our program, have been developed that directly influence clinician prescribing. The GreenPharm program will offer the most up-to-date data and research on the environmental impact of pharmaceuticals. The program will also provide resources and educational tools for reducing unwanted prescribing in clinical settings as well as provide prescription safety tools for patients.

The GreenPharm program provides all health care professionals with basic understanding of the following issues:

- The environmental burden of pharmaceutical
- The Medical Waste Act and the Controlled Substance Act: the role of the DEA
- GreenPharm: minimizing pharmaceutical waste in medical prescribing
- Medication safety: diversion, use and misuse
- Hazardous and regulated medical waste
- Unused pharmaceutical collection systems

GreenPharm is an online curriculum designed to educate clinicians on methods and reasons for reducing waste in medical prescribing. Through a series of convenient lessons developed by academic and noncommercial experts, clinicians will learn about the ecological footprint of pharmaceutical waste and the appropriate steps in clinical medicine to reduce over prescribing and the amount of unused medications. GreenPharm is designed to be easily integrated into any busy health professionals schedule and allows for lessons to be completed at ones own pace. Modules will be available online open to anyone at a minimal cost to the professionals for CME.

Steering Committee:

Forrest Batz, PharmD, Assistant Professor of Pharmacy Practice, University of Hawaii at Hilo College of Pharmacy

Karen Bowman, MN, RN, COHN-S Vice President – Washington State Association of Occupational and Environmental Health Nurses Environmental Health Specialist – Washington State Nurses Association

Dr. Joel Kreisberg, DC, MA, Executive Director, Teleosis Institute

Fred Mayer, R PH, MPH, President, Pharmacists Planning Service, Inc.

Maureen Phillips, BSN, RN, CSPI Drug Disposal Committee of the Nurses Work Group , Health Care Without Harm

Dr. Ilene Ruhoy, MD, PhD, Director of Institute for Environmental Medicine Touro University, Nevada.Dr.

Scheduled for 2010

Timing: June 1, 2010 – December 31, 2010

Activities: Five hours on-line continuing education modules will be developed and offered in the calendar year of 2010.

Module 1 Environmental Burden of Pharmaceutical Waste
(1.5 hours CME/CNE/CE)

Module 2 Minimizing Waste in Clinical Prescribing
(Physicians 1 hour CME)

Module 3 Minimizing Pharmaceutical Waste in Medicine
(Nurses 1 hour CNE)

Module 4 Regulations and Disposal: Policy, Risk and Compliance
(Pharmacists 1 hour CE)

Module 5 Understanding pharmaceutical take-back programs (1 hr)
(1 hour CME/CNE/CE)

Statement of Needs/Problems to be Addressed

The steady increase in the use of pharmaceuticals (OTC/Rx) is creating an ever-increasing level of pollutants in drinking water, groundwater, and solid waste disposal sites. As a result, public health is currently at-risk and the potential for increased risk is inevitable as population continues to grow.

In 2000, the U.S. EPA Office of Research and Development's Strategy Plan named the risk of pharmaceuticals and personal care products (PPCPs), as one of the top five emerging issues for protecting human and ecological health. In August of 2008, the EPA initiated a request for hospitals, long-term care facilities, hospices, and veterinary hospitals to identify: how much unused pharmaceuticals are being disposed of, best management practices, and amounts being disposed directly into waterways and solid waste facilities.

Pharmaceutical pollution prevention or "Green Pharmacy Programs" emerged as a fast growing environmental stewardship initiative in 2008. National and regional stakeholders have convened in an effort to develop and implement pollution prevention measures as well as create source reduction initiatives. For example, the city of Philadelphia, in partnership with EPA Region 3, has developed similar coalitions to address this issue on a local level.

The risks associated with pharmaceuticals in drinking water, ground water and solid waste disposal are predominately ecological. The evidence continues to emerge on significant morphological and behavioral effects on aquatic organisms and animals associated with aquatic environments. Initial research has not determined the significance of environmental pharmaceutical wastes on human health (<http://www.epa.gov/ppcp/>). However, since pharmaceutical consumption in the U.S. is growing between 4-6% annually, we can only extrapolate that concentrations in fixed sources of water and land will continue to increase.

Pharmaceuticals enter the sewer systems primarily through: (1) the excretion of partially metabolized pharmaceuticals by humans and animals and (2) the disposal of unused or expired medications down the drain or toilet. Furthermore, pharmaceuticals are simply thrown in the trash along with other solid wastes and have the potential for leaching into ground water sources.

In 2002, USGS and the San Francisco Estuary Institute revealed that 80% of the waterways sampled in the U.S. contain small concentrations of common pharmaceuticals such as acetaminophen (24%), the hormone estradiol (16%), Diltiazem—a blood pressure medication (13%), Codeine (11%), and antibiotics (10%). In 2008, the Associated Press study confirmed that pharmaceuticals were also found in drinking water affecting at least 41 million Americans.

In 2005, the SF Bay Area Pollution Prevention Group estimated that every household in the Bay Area has roughly 2.37 pounds of unused or expired medications. Based on current population census, the potential amount of total waste is 16,827,000 pounds in the nine county San Francisco Bay Area. Costs for proper disposal are estimated at \$3 per pound, which equals \$50,000,000 in potential expense. This number only includes household pharmaceuticals, and does not include the quantity, composition or rate of disposal of pharmaceuticals in the other sectors involved with the dispensing and disposal of

medications (hospitals, long-term care, hospice, veterinarian facilities, primary care physicians, clinics and pharmacies).

Current solutions to this escalating problem are piecemeal at best and inter-stakeholder coordination is practically non-existent. Thus, only a small portion of the overall problem is being addressed while overall public health continues to be compromised in the areas of drinking water, local surface water, ground water, and solid waste disposal.

About Teleosis Institute

The Teleosis Institute is devoted to developing effective, sustainable healthcare services provided by professionals who serve as environmental health stewards.

Starting in 2007, Teleosis designed and successfully developed the Green Pharmacy Program, which to date has collected over 5,000 lbs of unused pharmaceuticals throughout the San Francisco Bay Area. Not only did this program involve setting up 15 permanent take-back sites throughout the Bay Area, Teleosis began actively participating in the states investigation of take-back programs and designs, which was initiated by the SB 966 bill that required the California Integrated Waste Management Board to recommend a module program throughout the state. Our involvement has given the Teleosis staff the opportunity to work with many different stakeholders throughout the region and state.

Teleosis continues to be actively involved with educating medical communities through conferences and continuing educational seminars at hospitals, and public health conferences including the 2009 International Symposium on Pharmaceuticals in the Home Environment, the Western Sustainability and Pollution Prevention Conference and the Idaho Public Health Association Annual Conference.

