



Colorado Department  
of Public Health  
and Environment

# Waste Management for Health Care Facilities

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# Pharmaceuticals in the Environment



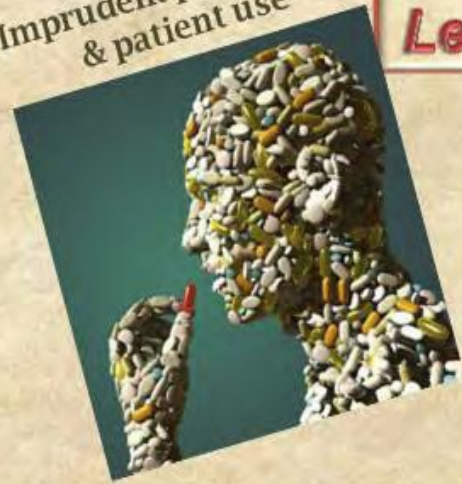
- USGS studies find pharmaceuticals in ground water and surface water across the US
- Pharmaceuticals found in leachate from Maine municipal waste landfill
- Health care facilities are one source of pharmaceuticals

# Drugs in Surface Water - 2008 Study

- 80 percent intersex fish downstream of a French pharmaceutical plant; 5% intersex fish detected upstream.
- Fewer fish downstream (177); 301 upstream.
- 6 species downstream; 8 species upstream.

Source: Sanchez, W, W Sremski, B Piccini, O Palluel, E Maillot-Maréchal, S Betoulle, A Jaffal, S Aït-Aïssa, F Brion, E Thybaud, N Hinfrey and JM Porcher. Adverse effects in wild fish living downstream from pharmaceutical manufacture discharges. [Environment International](http://dx.doi.org/10.1016/j.envint.2011.06.002) <http://dx.doi.org/10.1016/j.envint.2011.06.002>.

Imprudent prescribing  
& patient use



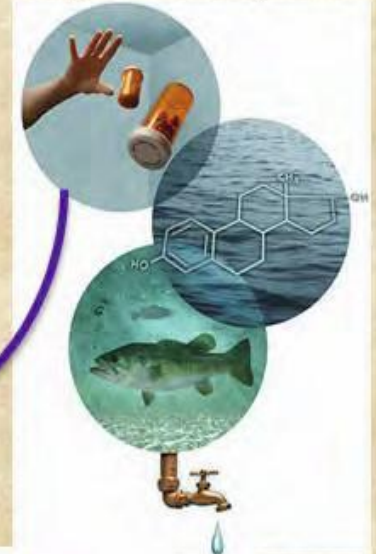
Leftover

Stockpiling &  
improper storage



Drugs

Imprudent disposal



Wasted healthcare  
resources



Poisonings



Residues recycled  
from environment

# RCRA and Health Care Facilities

- Hazardous waste and solid waste rules fully apply to health care facilities.
- Hazardous waste penalty maximum is \$25,000/day per violation.
- Proper disposal helps manage risk to hospital, employees, contractors, and environment.



# Some RCRA Hazardous pharmaceuticals...

Exceeds TCLP for Ag



**Coumadin**  
Coumadin (warfarin)

1 mg	
2 mg	
2.5 mg	
3 mg	
4 mg	
5 mg	
6 mg	
7.5 mg	
10 mg	

Warfarin Sodium is a blood thinner used to keep blood flowing smoothly and prevent the formation of blood clots.

Drug3K.com - Online Drug Encyclopedia

Exceeds TCLP for Hg



Exceeds TCLP for m-cresol



Acutely hazardous P listed wastes



Photo © 2008 Erowid.org

# Why pharmaceuticals may need to be disposed

- Expiration;
- Patient Refusal;
- Dispensing Errors;
- Change in Physicians' Orders;
- Over Prescribing;
- Patient Death.



# Key Requirements for all Hazardous Waste Generators

- Determine what wastes are RCRA hazardous wastes when disposed.
- Ensure proper disposal of RCRA hazardous wastes at an authorized RCRA facility.
- Other requirements apply.

# Disposal Scenarios



Landfill



Incinerator



Autoclave

- Tissue
- Pharmaceuticals
- Chemo (trace and bulk)
- Hazardous Waste (if RCRA incinerator)

- “Red bag” waste or sharps
- NO recognizable body parts
- NO Pharmaceuticals
- NO radioactive waste
- NO chemo waste

**Hospital Waste**

# Most Common Hazardous Waste Violation for Health Care Facilities



In most cases, the worst disposal option for waste meds\*...



\*May be necessary for controlled substances

# Food for thought...

- 5-10% of all drugs in a typical pharmacy are hazardous waste when disposed.
- Disposal of remaining drugs (including many hormones and antibiotics) is largely unregulated in Colorado.
- Controlled substances usually go down the drain.
- Incineration of ALL medication waste is recommended.

# CDPHE: Working with Front Range Hospitals

- CDPHE began stakeholder meetings & compliance assistance inspections at Front Range hospitals in 2008
- CDPHE began regular inspections at Front Range hospitals in 2009



# Current: Focus on Rural Hospitals

- Generator Assistance Program (GAP) inspections at rural hospitals in NE Colorado began in December 2010
- June 2, 2011: First health care waste management training session for rural hospitals
- Outreach in other corners of the state planned for 2011 and 2012



# 2012 and Beyond



- Long term care
- Retail pharmacies
- Veterinary healthcare
- Dental care

