



Pharmaceuticals and Senate Bill 1757

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What are Pharmaceuticals?

- Prescription medications
- Over-the-counter drugs
- Veterinary medications
- Examples:
 - Antibiotics
 - Anti-inflammatory (ibuprofen)
 - Anti-depressants
 - Anti-diabetics
 - Stimulants (caffeine)
 - Reproductive and thyroid hormones



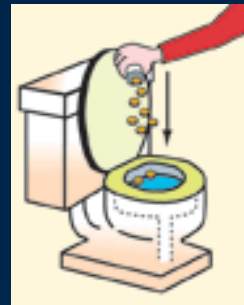
Sources of Pharmaceuticals in Wastewater

Medicines consumed & not completely absorbed

Excretion, sweat & vomit



Unused/expired medication flushed



Disposal of wastes from health-care industry



Pharmaceuticals enter wastewater stream (WWTP or septic systems)



Fate in Wastewater Stream



- WWTPs never designed to remove these chemicals
- Pharmaceuticals can move through WWTP into surface waters
- Septic systems leak and transfer water & contaminants to groundwater
- → These become our future drinking water supplies

Occurrence in Source Water



- Studies confirmed pharmaceuticals (& other emerging contaminants) do occur in US waterbodies (at low concentrations)
- USGS National Stream Reconnaissance (1999/2000):
 - 139 streams tested for 'emerging contaminants'; 30 States
 - 80% streams had detectable amounts of 1 or more of the chemicals
 - 50% streams contained 7 or more of the chemicals
- USGS Source-Water Reconnaissance (2001):
 - 25 GW & 49 SW sources of PDW supply in 25 States & Puerto Rico
 - At least 1 emerging contaminant was detected in 96% of samples



Environmental/Health Impacts

- Ecological impacts have been observed
 - Feminization of fish; may impact species survival.
 - Note that aquatic life are continuously exposed (higher risk)
- Concerns of antibiotic-resistance
- No evidence of adverse health effects to humans

Pharmaceutical Removal/Reduction from Drinking Water Sources



TWO APPROACHES

TREATMENT APPROACH

Remove the pharmaceuticals AFTER they've entered the wastewater system

Requires improved WW treatment technologies

PREVENTION APPROACH

Prevent/reduce the amount entering to wastewater system

- Disposal programs
- Take-back programs

Intent of TX Senate Bill 1757



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- Disposal programs
- Take-back programs
- Education

Senate Bill 1757 Project



- TCEQ shall study and make recommendations regarding the methods to be used by **consumers**, health care **providers**, and **others** for disposing of unused pharmaceuticals so that they do not enter a wastewater system.
- Passed in May 2009
- Report due to legislature December 1, 2010

Intent of TX SB-1757



Medicines consumed & not completely absorbed

↓

Excretion, sweat & vomit



~~Unused/expired medication flushed~~



~~Disposal of non-hazardous hospital wastes (also by pharmacies, physicians etc.)~~



FEWER Pharmaceuticals enter Wastewater System

Senate Bill 1757 Project



- Specifically, TCEQ shall consider:
 - (1) the methods currently used in Texas (by consumers, health care providers, and others);
 - (2) alternative methods used, including methods used in other states; and
 - (3) the effects on public health and the environment of the various methods used for that purpose.

SB 1757 Study Team Approach



- Identify current State and Federal **rules and regulations** involved
 - DEA (Controlled Substances Act)
 - RCRA (Federal Hazardous Waste regs)
 - Texas Administrative Code
 - Texas Health and Safety Code
- Identify **stakeholders** in TX
 - Who disposes of pharmaceuticals?
 - Who regulates/controls disposal practices?
 - Who may be impacted by changes to the practices/regs?
 - Develop Advisory Group & understand issues faced
- Identify **how pharmaceuticals are currently** disposed of in TX
 - Health-Care Providers vs. Consumers
 - What are the benefits of current methods? What should remain?
 - What needs to change? (Current constraints/concerns (non-compliance?))
 - Identify and fill knowledge gaps (possible survey)

SB 1757 Study Team Approach



- Identify **best approaches** used in other areas
 - **Consumers** - Some options to investigate:
 - Mail-back programs
 - Collection events
 - Drop-boxes
 - Education (posters, brochures, labeling)
 - **Health-Care Providers** - Some options to investigate:
 - Guidance documents for each type of provider
 - Better sorting practices and stock management
 - Disposal requirements in permits
 - Rule additions
 - **Study Team must consider:**
 - Compliance with regulations (State, Federal, Local)
 - Effectiveness and efficiency in meeting goals
 - Impact on amount of pharmaceuticals entering wastewater
 - Impact on public health
 - Community desires
 - Resources required
 - Partnerships required



SB 1757 Study Team Approach



- Determine **how best approaches could work in TX**
 - Identify programs, tools, resources etc. that would be required
 - How will possible changes impact current regulations?
 - How would changes impact permitting of facilities?
 - What would be required from stakeholders?
 - Consider long-term program feasibility
 - Identify metrics for success
 - Estimate the impact of proposed approach on TX public health and the environment

TCEQ Study Team Contacts



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