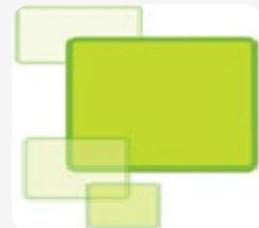




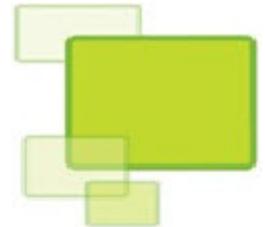
Curing Pharmaceutical Waste

Catherine Zimmer, MS, BSMT
Zimmer Environmental
Improvement, LLC



Overview

- › Update
- › Waste Issues
- › Pollution Prevention
- › Best Waste Practice
- › Case Studies
- › Conclusion

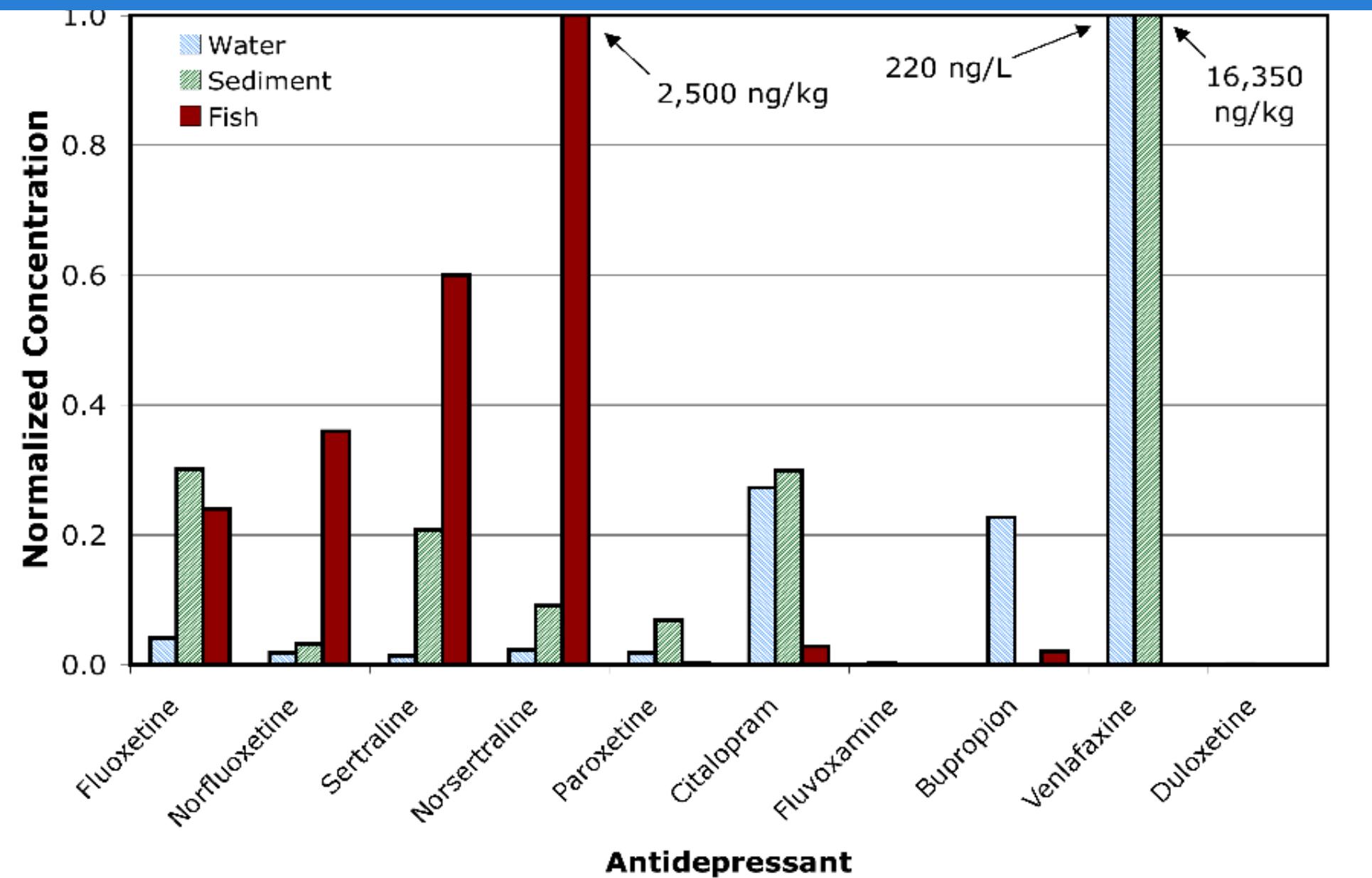


Background

- › Contaminants in surface waters & landfill leachate
- › Three primary sources
 - › Excretion
 - › Pharmaceutical manufacturer
 - › Healthcare waste
- › Impacts to aquatic life
- › Ecotoxicity data <1%



Antidepressant Pharmaceuticals in Two U.S. Effluent-Impacted Streams: Occurrence and Fate in Water and Sediment, and Selective Uptake in Fish Neural Tissue



Environmental assessment new pharmaceuticals

European Medicines Agency (EMA)

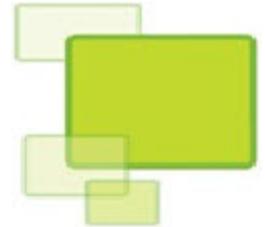
- At onset of development
- Long term risk assessment
- Phase I
 - Considers endocrine disrupting compounds
 - Predicted environmental concentration (PEC), (0.01 ug/L)
 - Predicted No effect concentration (PNEC)
 - Fate
 - Absorption
 - Bioaccumulation
 - Biodegradability
 - Biofilm toxicity
 - *Daphnia* toxicity
 - Excipients
- Phase II
 - More specific testing
 - Recommendations reduce environmental impact

Food & Drug Administration (FDA)

- Categorical exclusion
- Tier I: acute testing
- Tier II: chronic (if indicated)
- Tier III: lifecycle/fish reproduction
 - Recommended for estrogenic, androgenic or thyroid drugs (2016)
- PEC trigger is 10x greater (0.1 ug/L)
 - Less rx to Phase II
- Conflict of interest

Wastewater Treatment

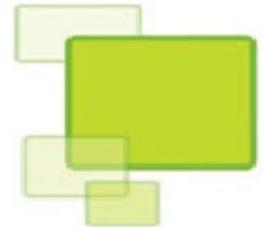
- Increased retention time
- Chlorination
 - chloramines
- Ozonation
 - creates bromate
- Activated carbon or reverse osmosis
 - waste disposal
- On site collection and treatment



Incineration



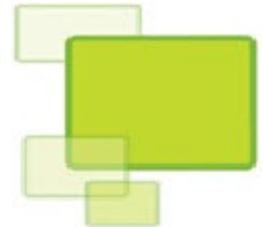
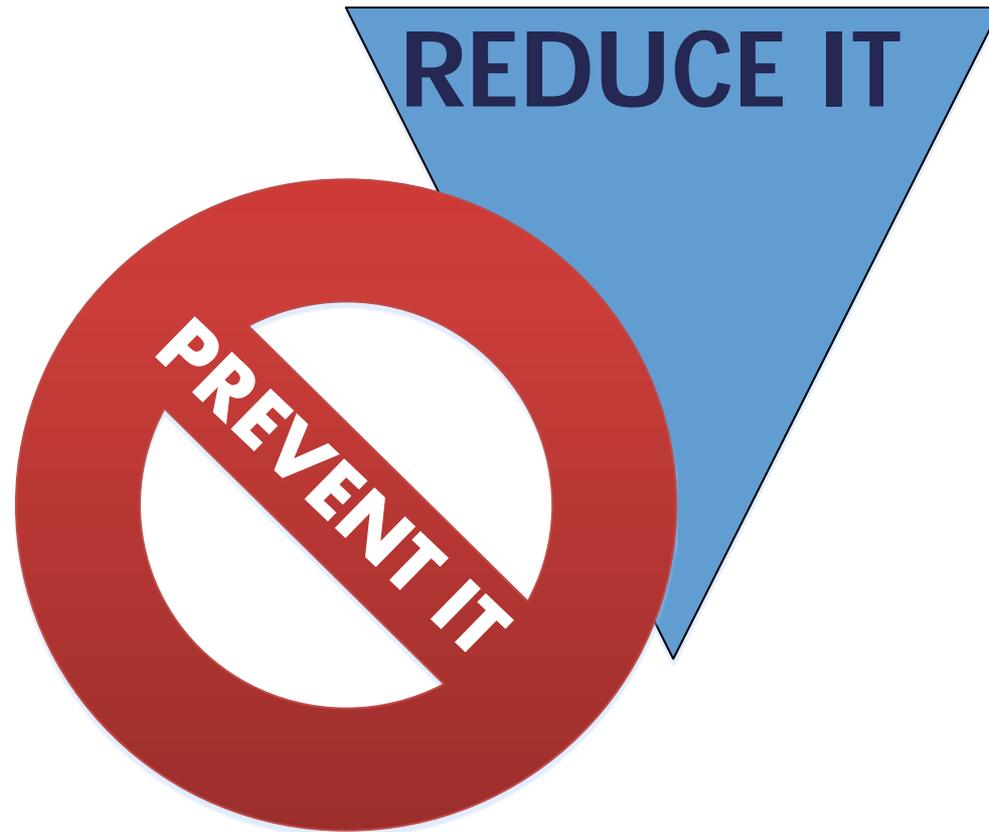
DEA PERSONNEL UNLOAD BOXES OF
PRESCRIPTION DRUGS INTO A
FRONT-END LOADER PRIOR TO
INCINERATION,
KENNE DALE, TEXAS. 9/25/10



Waste management costs money!



Waste = Pollution



BEST WASTE PRACTICE

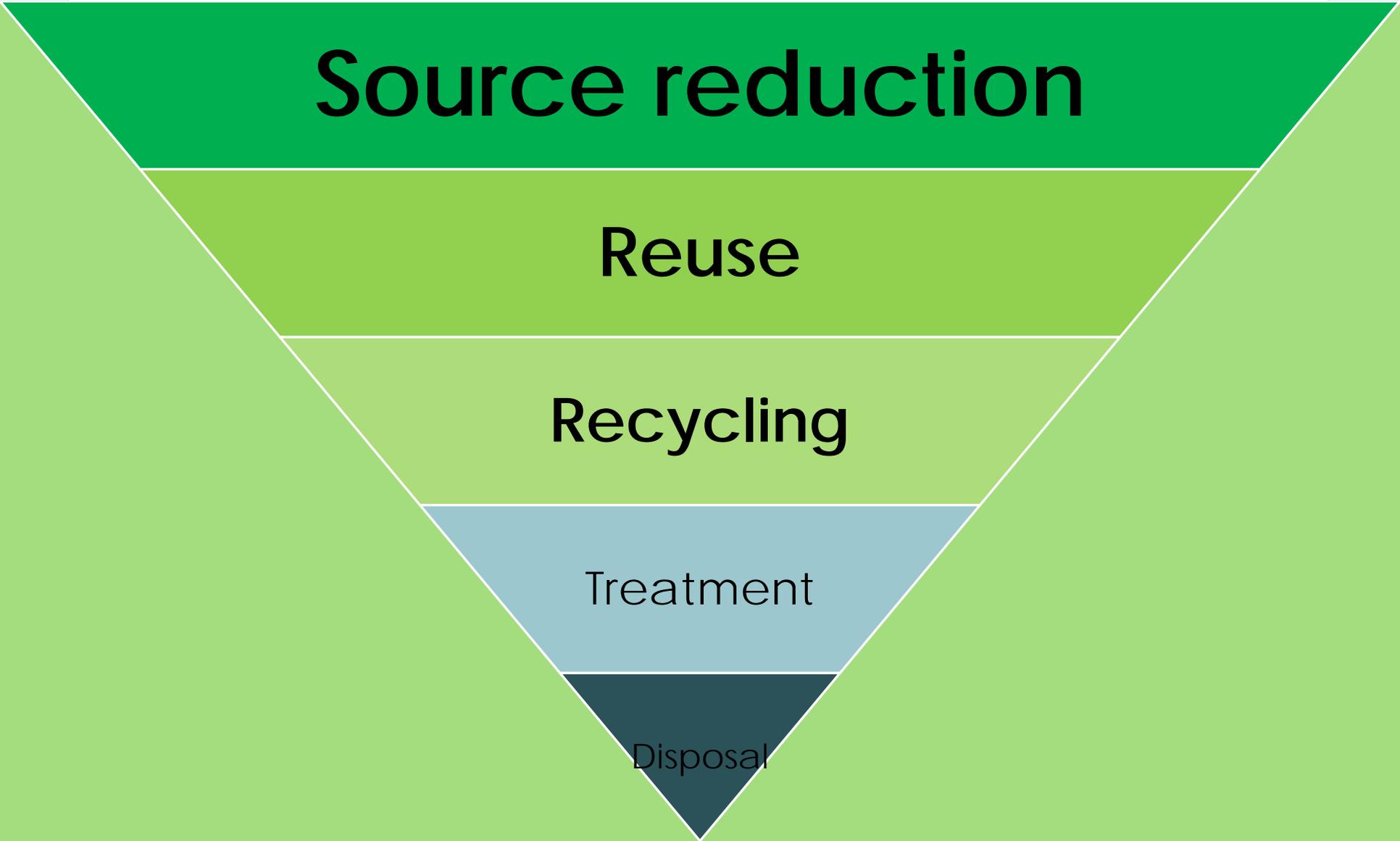
Source reduction

Reuse

Recycling

Treatment

Disposal



WHY WASTE?

PHYSICIAN/PATIENT RELATED

CHANGE ORDERS
ALLERGY/SIDE
EFFECT

OVERPRESCRIBING

FACILITY RELATED

INVENTORY
MANAGEMENT
DOSAGE FORM

ACCIDENTS
TECHNIQUE
PACKAGING
FAILURE

REGULATIONS

CONTROLLED
SUBSTANCE ACT

FOOD DRUG
ADMINISTRATION
SHELF LIFE

4 BWP Projects

Facility
related

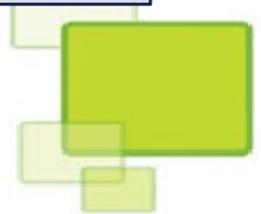
Large
Hospital

Small
Hospital

Physician
related

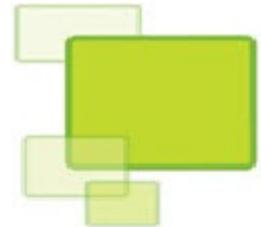
Clinic
System

Long term
care
facility



Facility-related

- Investigation
 - Reverse distribution manifests
 - Sample waste
 - Return receipts
- Findings
 - Inventory management
 - Automated dispensing
 - Sample control



Reverse distribution

- Process
 - Sorting fees
 - Disposal extra
 - Nine to thirty percent of credit
- Seven percent inventory
 - Industry average = 2%
- Potential Savings
 - \$80,000 Hennepin County Medical Center
 - \$35,000 Tri-County Hospital

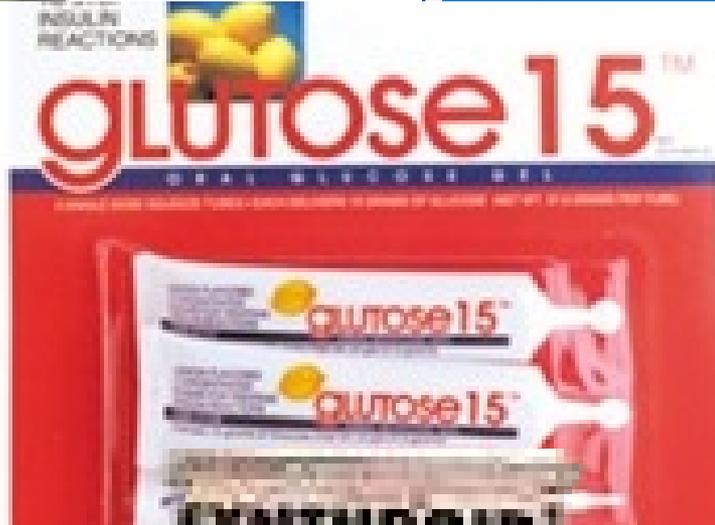


PROTECT FROM LIGHT

Glass
ABBOJECT[®]
Unit of Use Syringe

18-Gauge, 3 1/2"
(Intracardiac)

Rx only



Top TEN



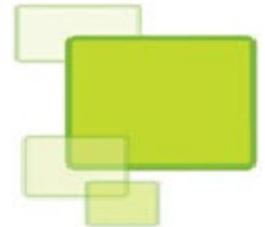
the lidocaine making of voices and noises of MUNG KUNG

the lidocaine
making of voices and noises of
MUNG KUNG

FORMAT 4:3	VIDEO AND AUDIO OF MUNG KUNG
VIDEO (PAL)	EXCLUSIVE
AUDIO (DOLBY DIGITAL)	BACKGROUND MUSIC BY MUNG
TEXT: ENGLISH	© The Lidocaine
	PAL 2

Crash Boxes

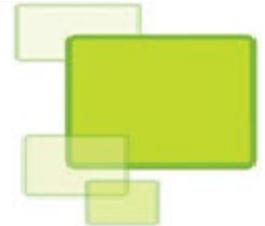
- Stock less
 - 14 to 6
- Savings
 - Inventory \$3400
 - Labor \$250



Purchasing/Inventory Management

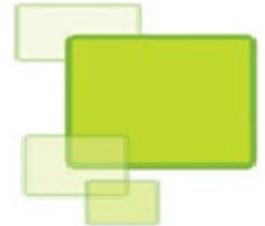
Automated distribution systems

- Par use reports
- Reorder list
- Expiration dates
- Redistribution
- Labeling
- Price comparison



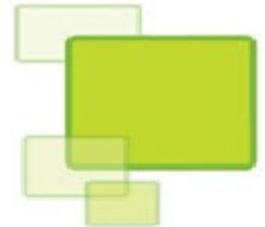
Self sorting waste

- Awareness
- Costs avoided
- Waste management



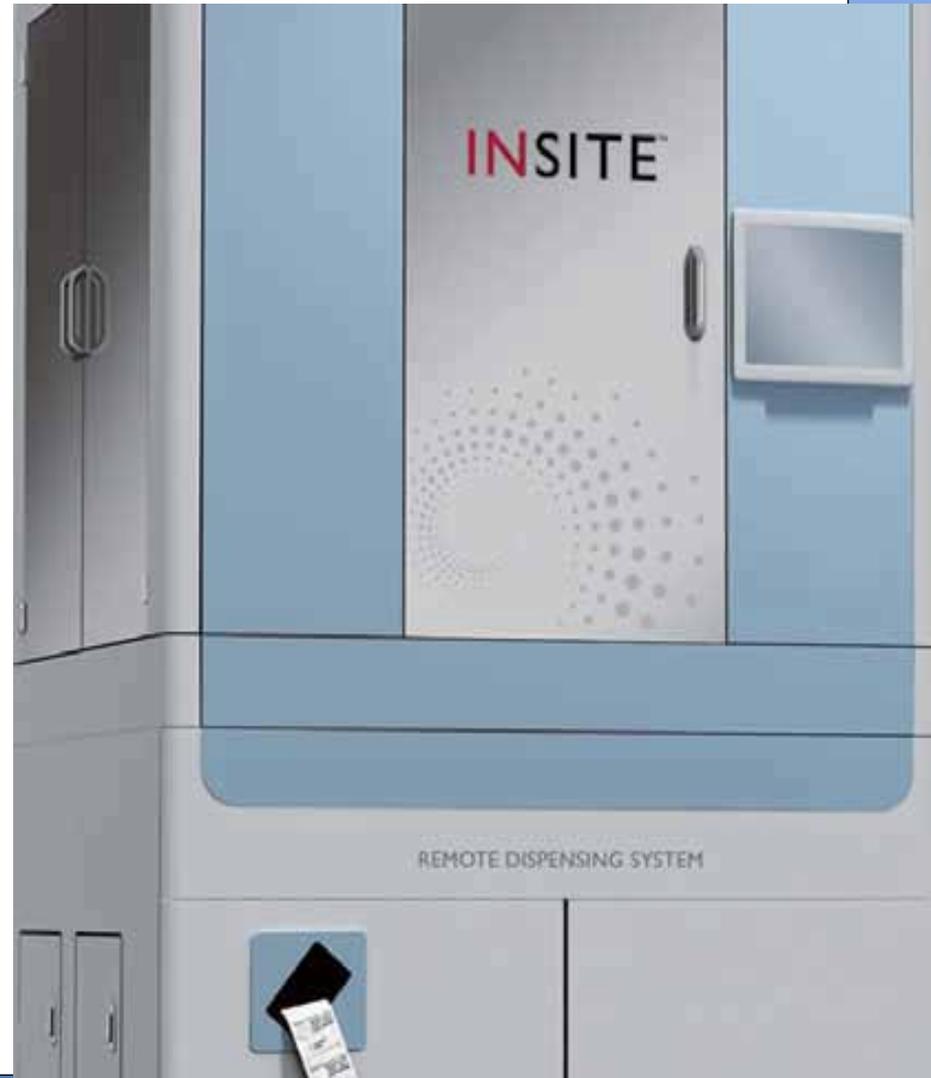
Samples

- › Concerns
 - Security
 - Short dated
 - Waste
- › Recommendations
 - Policy
 - Sample log
 - Top Ten
 - Voucher



Waste reduction in long term care

- Short fills
- Automated dispensing systems



Savings & waste reduced

Facility related

Large hospital-
inventory

510 lbs

\$80K

Small hospital –
inventory/ crash
cart/self sort

\$30K

Physician related

Clinic system-
sample
policy/voucher

\$6K, 22 lbs

Retail value ~\$20K

Long term care
facility

ADS

\$18K

More best waste practice

Eliminate antimicrobial soaps

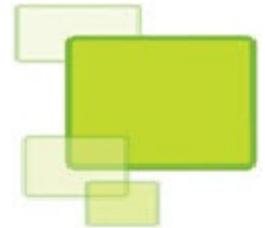
Ophthalmic procedures

Minimize BSS size

Use 3 cc syringe epi/lido for topical anesthetic

Prefilled syringes at prescribed dose

PVC-free IV bags



More pharmaceutical BWP

- › Minimize drug use
 - Health
 - Alternative therapies
 - Patient records
 - Animal production
- › Policy
 - Positive outcomes
 - Trial doses
 - Prescribe least ecotoxic
 - *Environmentally Classified Pharmaceuticals, Stockholm, SE*
- › Manufacturing
 - Shelf life
 - Specificity



RESOURCES

- Case studies, compliance /BWP assistance
- Zimmer Environmental Improvement LLC
 - Catherine Zimmer
 - ZENLLC@usfamily.net
 - T: 651.645.7509
- Membership organization
 - Practice Greenhealth
 - www.practicegreenhealth.org



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<http://toxics.usgs.gov/regional/emc/index.html>

