



MEDICAL INSTITUTIONS

THINGS TO WATCH FOR

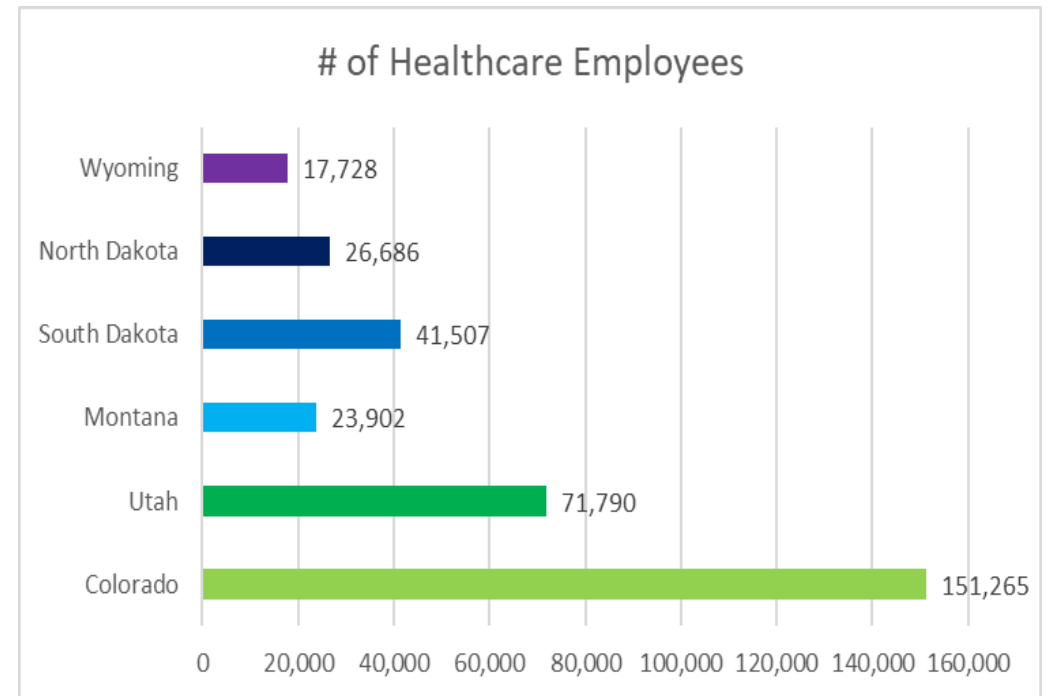
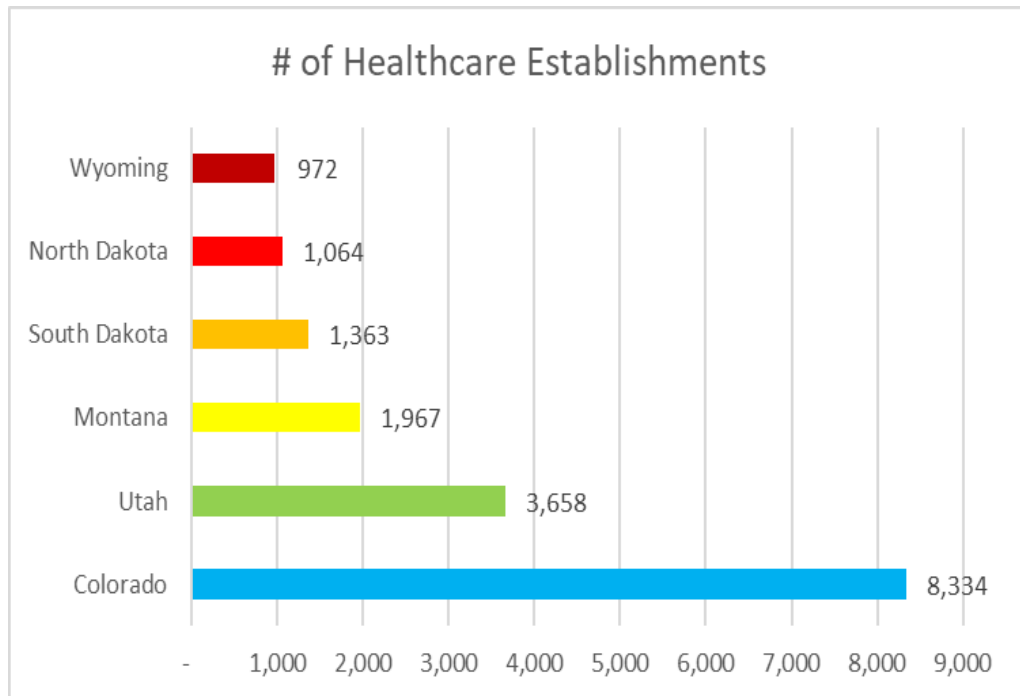


TYPES OF MEDICAL INSTITUTIONS

- Hospitals
- Pharmacies
- Dental Offices
- Medical Offices
- Military Clinics
- Veterinarian Offices
- Nursing Homes & Resident Care
- Correctional Facilities

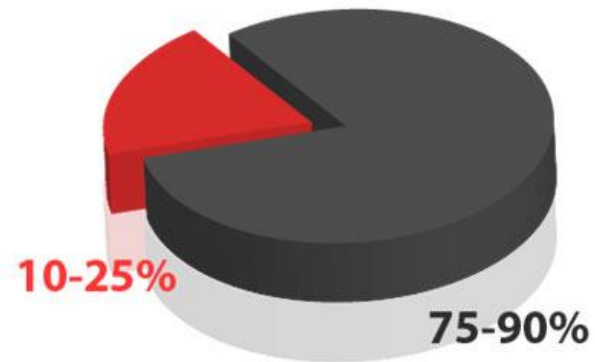


INSTITUTIONAL NUMBERS



US HOSPITALS

PRODUCE 5.9 MILLION TONS OF WASTE ANNUALLY
(THIS NUMBER DOES NOT INCLUDE OTHER TYPES OF MEDICAL FACILITIES)



MAY 2012

Influent Results

Influent Analytes	SVWRF Concentration/ Parts per trillion	CVWRF Concentration/ Parts per trillion	Provo Concentration/ Parts per trillion
Caffeine	52,000	18,400	36,800
Ibuprofen	22,200	14,800	30,000
Naproxen	9,890	No Data	10,700
Tramadol	782	462	804
Morphine	328	167	271
Cocaine	267	27.1	166
Oxycodone	171	115	176
Codeine	69.6	74.9	59.9
THC	<25	<25	<25

Effluent Results

Effluent Analytes	SVWRF Concentration/ Parts per trillion	CVWRF Concentration/ Parts per trillion	Provo Concentration/ Parts per trillion
Caffeine	23	<10	<10
Ibuprofen	<10	<10	<10
Naproxen	93.6	<10	<10
Tramadol	622	296	850
Morphine	160	<10	31.1
Cocaine	<10	<10	<10
Oxycodone	141	97.1	90
Codeine	86.7	27.9	43.7
THC	<25	<25	<25

JUNE 2012

Influent Results

Influent Analytes	SVWRF Concentration/ Parts per trillion	CVWRF Concentration/ Parts per trillion	Provo Concentration/ Parts per trillion
Caffeine	39,700	56,600	15,800
Ibuprofen	25,100	24,500	21,200
Naproxen	13,200	15,000	11,600
Tramadol	828	702	365
Morphine	465	446	212
Cocaine	154	455	20.5
Oxycodone	193	177	93.4
Codeine	159	114	76.8
THC	<25	<25	<25

Effluent results

Effluent Analytes	SVWRF Concentration/ Parts per trillion	CVWRF Concentration/ Parts per trillion	Provo Concentration/ Parts per trillion
Caffeine	<10	31.6	<10
Ibuprofen	<10	67.2	<10
Naproxen	50.1	342	14.7
Tramadol	870	642	218
Morphine	28.5	161	<10
Cocaine	<10	<10	<10
Oxycodone	83.3	116	61.6
Codeine	34.7	70.3	<10
THC	<25	<25	<25

BUT WHY?

- Hospitals are monitored by other agencies, however
 - FDA does not monitor drug disposal
- Hospitals are political quagmires
 - Financially Driven
- Hotline tips
 - Hospital tip
 - Pharmacy tip



WORLD HEALTH ORGANIZATION (8 CATEGORIES OF WASTE)

- **Infectious waste** – Waste that may transmit infection from virus, bacterial, parasites to human, i.e.: lab cultures, tissues, swabs, equipment and excreta
- **Sharps** – Sharp waste, such as needle, scalpels, knives, blades, etc.
- **Pathological** – Human tissue or fluids i.e. body parts, blood, other body fluids
- **Radioactive** – Unused liquid in radiotherapy or lab research, contaminated glassware, etc.
- **Chemical** – Expired lab reagents, film developer, disinfectant
- **Pharmaceuticals** – Expired and contaminated medicines
- **Pressurized containers** – Gas cylinders and gas cartridges
- **General waste (UMW)** – No risk to human health because no blood or any related bodily fluid, i.e.: office paper, wrapper, kitchen waste, general sweeping, etc.

MEDICAL WASTE

MEDICAL WASTE SEGREGATION CHART 2015

SHARPS Red Sharps Container	BIOHAZARD Red Container or Red Liner in Container	TRACE CHEMO Yellow Container
<ul style="list-style-type: none"> ✓ Needles ✓ Ampules ✓ Broken Glass ✓ Blades ✓ Razors ✓ Staples ✓ Trocars ✓ Guide Wires ✓ Other Sharps 	<ul style="list-style-type: none"> ✓ Infectious Waste ✓ Blood Products (albumin etc) ✓ Contaminated Personal Protective Equipment (PPE) ✓ IV Tubing ✓ Cultures, Stacks 	<ul style="list-style-type: none"> ✓ Empty vials, ampules ✓ Empty Syringes, Needles ✓ Empty IVs ✓ Gowns ✓ Gloves ✓ Tubing ✓ Aprons ✓ Wipes ✓ Packaging 
RCRA HAZARD Black Container	PHARMACEUTICAL Blue Container	RADIOACTIVE Shielded Containers with Radioactive Symbol
<ul style="list-style-type: none"> ✓ Hazardous meds (RCRA) ✓ Half/Partial doses (RCRA) ✓ Hazardous bulk meds ✓ P-listed drugs, packaging ✓ Bulk chemo ✓ Pathological Waste (Incineration Only) 	<ul style="list-style-type: none"> ✓ Pills ✓ Injectables ✓ Antibiotics 	<ul style="list-style-type: none"> ✓ Fluorine-18 (F-18), 110 minutes half-life. ✓ Technetium-99 (T-99m), 6 hours half-life. ✓ Iodine-131 (I-131), 8 days half-life. ✓ Strontium-89 (Sr-89), 52 days half-life. ✓ Iridium-192 (Ir-192), 74 days half-life. ✓ Cobalt-60 (Co-60), 53 years half-life. 

POTENTIAL IMPACTS

- Kitchen Waste (BOD, TSS, FOG)
- Fixer/Developer Waste (Ag, Hg)
- Pharmaceutical Waste (Acetaminophen, Estrogen, etc.)
- Radioactive Waste (Radionuclides)
- Disposable Wipes (cleaning, personal care, etc.)
- Amalgam Separator Waste (Ag, Hg)
- Communicable Diseases (Ebola, CDIF, Hepatitis, etc.)
 - Laundry Services, toilets
- Laboratory Services
 - Blood, stool, urine, and tissue samples



DENTAL OFFICES



DENTAL OFFICES



VETERINARY CLINICS

- Perform surgeries
- Gloves and wipes are used
- Prescribe and use medications
- Needs prescription drug disposal methods



MEDICAL OFFICES

- Pharmaceutical Waste
 - Medication Samples
- Sharps
- Gloves
- Wipes

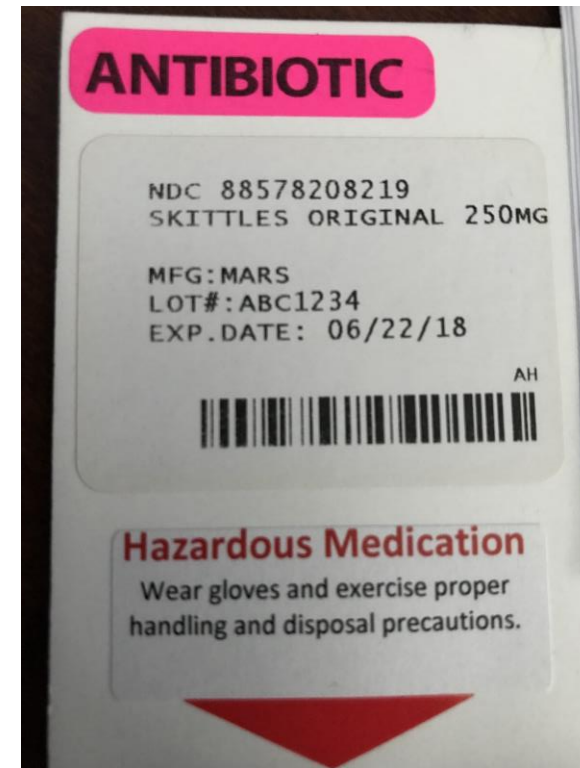


NURSING HOMES/RESIDENT CARE

- Pharmaceuticals
 - Must maintain a manifest of disposal
- IV Medications
- Gloves
- Adult Wipes
- FOG



MEDICATIONS



EPA DRUG WASTE RULE

- EPA is finalizing a drug waste rule hopefully by July
 - All pharmaceutical waste must be bagged
- FDA currently says it is okay to dispose of approximately 50 different medications down the drain
 - Including Fentanyl patches



MILITARY CLINICS

- **Federal Facility Responsibilities under the CWA include:**
 - Obtaining any applicable National Pollutant Discharge Elimination System (NPDES) permit and managing direct discharges in compliance with permit conditions
 - Managing discharges to a Publicly-Owned Treatment Works (POTW) in accordance with established Federal, State, and local pretreatment standards
 - Developing, implementing, and maintaining storm water pollution prevention plans and obtaining necessary permits
 - Establishing and maintaining records, reports, monitoring equipment, and other information the EPA Administrator may require pursuant to Section 308, as well as allowing access to EPA to copy records, inspect monitoring equipment and sample effluent sources



CORRECTIONS FACILITIES

- Medical Clinics
- Dental Clinics
- Kitchens
- Etc.



PROBLEM INDICATORS

- Wipes/gloves downstream of medical facilities
- Large grease deposits downstream
- Radioactivity in your sludge
- Heavy metals increase at the headworks or in your sludge
 - Hg, Ag, etc.
- Test for pharmaceuticals in your waste stream
 - Costly
 - Need a baseline



TAKE-AWAY

- Curt McCormick of CWACS
 - Specific Prohibitions
 - Bulk, expired, outdated, or concentrated prescription or non-prescription drugs
- Watch for problem indicators at the plant
- Know your regulations
- Know that all Federal, State, and Local facilities fall under your oversight

QUESTIONS



**I DON'T LIKE MAKING PLANS
FOR THE DAY BECAUSE THEN
THE WORD "PREMEDITATED"
GETS THROWN AROUND
IN THE COURTROOM.**

© REBEL CIRCUS

CONTACT INFORMATION

Spencer Parkinson
SVWRF Pretreatment Director
sparkinson@svwater.com
(801) 495-5452

