

Instructor Sheets

Dental Wastes Recycling and Disposal

Preventing Pollution by Putting Dental Wastes in Their Proper Place Part II

*A curriculum for use in Kansas dental schools
(For use with overheads or electronic visual aid provided as part of this
curriculum.)*

Slide 1 Title Slide

Dental Waste Recycling and Disposal (continued)

Slide 2 Introduction (engage)

In terms of human health and the environment, mercury is well known as the most problematic and harmful waste generated by the dental industry. However, other wastes generated by dental clinics also need to be handled with care. For example, waste silver wastes generated as part of the x-ray process are also regulated in some Kansas communities. As with mercury wastes, even in communities without specific regulations, BMPs or best management practices have been established for the handling of these wastes.

This section of the curriculum will address BMPs for the handling of silver-rich wastes, as well as lead foils and shield, certain cleaners, and the state regulations related to disposal of medical service wastes, often referred to as “red” bag wastes.

Slide 3 What Do You Think? (explore)

Ask students to break into groups of two to four and come up with answers to the following situation. Give the students five minutes to come up with answers, then ask each group to share its response.

Dr. Driller’s clinic processes x-rays for several clients each day. When the chemicals for the x-ray processor are changed, the old or waste chemicals are currently dumped down the drain.

1. The staff has heard that some of these chemicals should NOT go down the drain. Which ones are they?

(Answer: Waste fixer contains a large amount of silver which should be recovered through a process on or off site, prior to disposal down the drain. This next presentation will explain this further. Waste developer and rinse water can be disposed of down the drain, unless they have been mixed with the waste fixer.)

2. In part I of this dental waste disposal section, you learned that mercury-amalgam is a dental waste that should be recycled, keeping it out of the drain, trash, and red bag waste. List two other wastes that fall into this “special handling” category.

(Answer: Silver-rich wastes like waste fixer and old x-rays; lead foils, shields, and aprons; some regulated or toxic cleaners, like cleaners that contain chrome; and medical service wastes)

3. Are there any materials or technologies that can be substituted or instituted to prevent the generation of these potentially toxic wastes in the first place?

(Answer: Yes, non-mercury compounds such as composites are a suggested material substitution, and the use of digital technology to replace chemical film development is a technology change that more clinics are turning to. There are also some alternative x-ray processes that use specialized chemicals and do not generate silver wastes.)

Slide 4 Silver-Rich Wastes

(explain)

- ✓ What are they?
- ✓ Waste fixer (Waste fixer is the silver-rich waste generated during the x-ray development process. The waste developer and rinse water are not generally considered silver-rich like the waste fixer.)
- ✓ Old x-ray films
- ✓ What about alternatives that do not use silver?
- ✓ Digital technologies and silverless films such as diazo, vesicular, photopolymer, electrostatic, or selenium-based are viable options to avoid the generation of silver.

Slide 5 The Silver Problem

- ✓ Why be concerned?
- ✓ Silver is a non-renewable resource that should be conserved through reclamation processes.
- ✓ Silver can be harmful to aquatic life.
- ✓ Wastewater treatment plants cannot remove it.
- ✓ Recovered silver can be a source of income in some cases.
- ✓ Waste fixer usually contains enough silver, five milligrams per liter or more, to be classified as a hazardous waste. For this reason, the silver

from the waste fixer should be reclaimed either on or off site, unless the clinic has written permission from the local sewer authority to dump it down the drain. If quantities of 55 pounds or more of the waste fixer are generated at one time or accumulated, the clinic may be impacted by hazardous waste regulations. It is always best to avoid this added regulatory burden by managing your waste silver and other hazardous wastes before more than 55 pounds total are generated or accumulated on site.

Slide 6 Options for Handling Silver Wastes (elaborate/extend)

- ✓ Waste or waste fixer, two main BMPs
- ✓ One option, on-site management of waste silver solutions, involves the use of or purchase of a unit that recovers silver from the waste fixer at the clinic. Once the silver is removed from the solution, it can be flushed down the drain. The canister or unit that has absorbed the silver is then usually sent back to the vendor that sold or rents the recovery unit to the clinic. In some cases, the recovery unit produces a fairly pure silver metal, which can then be sold to a metals vendor. On-site units include electrolytic units and metallic replacement cartridges, chemical precipitation units, as well as others. The most economical unit to use will depend on the quantity of waste fixer generated and the concentration of silver in that solution.

Slide 7 Silver Waste Disposal (continued)

- ✓ The other option, off-site management of waste silver solutions, usually entails the clinic collecting the solution and hiring a contractor to pick the solution up. The contractor then recovers the silver off site. In some locations, like Wichita, the wastewater treatment plant has a program that allows preregistered clinics to bring their waste silver to the plant for silver recovery at no charge. Whether on- or off-site management of this waste is used, be sure to label the stored solutions as “hazardous waste” or “silver fixer for recycling,” depending on the final destination of the waste. If more than 55 pounds is generated at one time or accumulated on site, the clinic will have to comply with hazardous waste regulations. Most clinics are small enough to manage their potentially hazardous wastes in quantities of less than 55 pounds total, avoiding additional regulatory burden. If you store more than 55 pounds on site, contact the SBEAP, one of the agencies listed at the end of this presentation, for help complying with the regulations.
- ✓ Old films contain silver and also have a recycling value. See handout number one for a list of vendors that handle these wastes.
- ✓ Maintain waste recycling and disposal of dental wastes for a minimum of three years. Communities that have requirements beyond BMPs

require specific records and will provide the clinic with the paperwork needed upon registration with the program.

Slide 8 Communities that Regulate Silver Dischargers

- ✓ As of July 2001, the cities of Wichita and Kansas City, Kan., regulate the wastewater discharges of silver-rich wastes, like fixer. Dental clinics in these areas must register with these programs, perform some type of silver recovery, and complete required monitoring reports. Because regulations may change and are city-specific, contact the city's sewer authority to determine the exact requirements. Contact information is listed on last slide.
- ✓ Other regions around Kansas encourage dental waste BMPs.
- ✓ Nationally, more than 30 other regions also regulate silver discharges.
- ✓ If a clinic does dispose of this waste through the drain without reclaiming it, written permission from the sewer authority is recommended. Waste silver solutions should never be disposed of through an individual septic system.
- ✓ Waste developer and rinse water can normally be flushed down the drain unless it has been mixed with the waste fixer. Developer and rinse water normally do not contain high or regulated levels of silver.

Slide 9 Medical Service Wastes

In Kansas, the term "medical service waste," is the official name given to a waste stream often referred to by one of the other terms listed below:

- ✓ red bag wastes
- ✓ biohazards
- ✓ infectious wastes

Ask students to refer to handout number four, *Medical Service Waste Technical Guidance Document*, a KDHE document.

Medical service waste is defined as "those solid waste materials which are potentially capable of causing disease or injury, and which are generated in connection with human or animal care through inpatient and outpatient services."

Slide 10 Medical Service Waste Disposal Options

- ✓ Treated or sterilized medical waste can be sent to the permitted sanitary landfill.
- ✓ Untreated medical waste needs to be "red bagged," labeled "biohazard," and can only be sent to the landfill with special authorization. Call the landfill or 785-296-1600 for more information on disposal authorization.

- ✓ It can be disposed through a licensed medical waste disposal company; check the yellow pages.
- ✓ It can be incinerated at a permitted medical service waste incinerator.

Slide 11 Other Dental Wastes

Pass out and review the Dental Waste Disposal and Recycling Checklist, fact sheet.

- ✓ lead foils, shields, and aprons
- ✓ chrome and other regulated cleaners
- ✓ common disinfectants and chemiclave chemicals

Slide 12 Lead Foils, Shields, and Aprons

- ✓ These items contain lead, which is harmful to human health and the environment.
- ✓ Foils, shields, and aprons are normally collected and sent to a licensed reclaimer or recycler. These items are recyclable. If not recycled, in some cases they will need to be tested and disposed of as a hazardous waste. Contact the SBEAP for information about testing.

Slide 13 Chrome Cleaners

- ✓ Many cleaners for x-ray development systems contain chromium. Chromium is a toxic substance, which often needs to be handled as a hazardous waste.
- ✓ Whenever possible, use less toxic or non-toxic cleaners that do not have to be disposed of as a hazardous waste.
- ✓ Other old and odd types of chemicals, like formaldehydes or acetone solutions, may also need to be evaluated and disposed of as a hazardous waste.
- ✓ Businesses can always call the Small Business Environmental Assistance Program at 1-800-578-8898 for help with disposal questions.

Slide 14 Common Disinfectants and Chemiclave Chemicals

- ✓ It is always best to check with the wastewater treatment facility that accepts your wastes, but generally wastes generated as a result of disinfection and chemiclave processes can be safely and legally disposed of down the drain.
- ✓ Rural clinics that utilize an on-site sewage system should contact the Kansas Small Business Environmental Assistance Program for help with disposal of their wastes. Generally, no process wastes from the clinic should be disposed of through an on-site septic system.

Slide 15 **Dental Wastes Regulations**

- ✓ Medical service wastes are regulated throughout Kansas (review medical service waste handout number 4).
- ✓ Mercury and silver wastes are regulated in select communities, namely Wichita and Kansas City as of 2001.
- ✓ Utilize BMPs for all waste streams.
- ✓ Label your wastes, “mercury for recycling.”
- ✓ Keep documentation related to waste disposal for at least three years. This is required in regulated communities, but recommended in all regions.

Slide 16 **Where You Can Get Help**

- ✓ Anywhere in Kansas, contact K-State’s Small Business Environmental Assistance Program at 800-578-8898 or www.sbeap.org.
- ✓ In Wichita, contact Wichita Water and Sewer at 316-303-8775; in Kansas City, Kan., call 913-371-4240.
- ✓ Call the local dental association at 800-578-1002.
- ✓ Contact the American Dental Association at www.ada.org.

Slide 17 **A Time for Review** (evaluate)

Ask students to review what they have just learned by asking the following questions:

1. What is the most problematic dental waste in terms of public health and environment?

(Answer: Mercury-amalgam)

2. What wastes generated at the dental clinic are considered silver-rich?

(Answer: Waste fixer and old film. Developer or other x-ray wastes are not usually silver-rich unless they have been mixed with the waste fixer.)

3. What is the definition of medical service waste?

(Answer: Medical service waste is defined as “those solid waste materials which are potentially capable of causing disease or injury, and which are generated in connection with human or animal care through inpatient and outpatient services.”)

4. Other than mercury-amalgam, waste silver, and medical service wastes, what other dental wastes should be recycled or handled carefully?

(Answer: Lead foil, shields, and aprons can be recycled; cleaners that contain chromium may need to be disposed of as hazardous wastes; and other questionable disinfectants or chemiclave chemicals should be evaluated for proper or recommended disposal.)

5. If you need confidential, non-regulatory assistance determining what to do with your wastes, whom can you contact?

(Answer: Anywhere in Kansas, contact the Small Business Environmental Assistance Program at 800-578-8898 or www.sbeap.org.)