JEA Dental Amalgam BMP Program

Open Up, and Say…

Aaaa-malgam

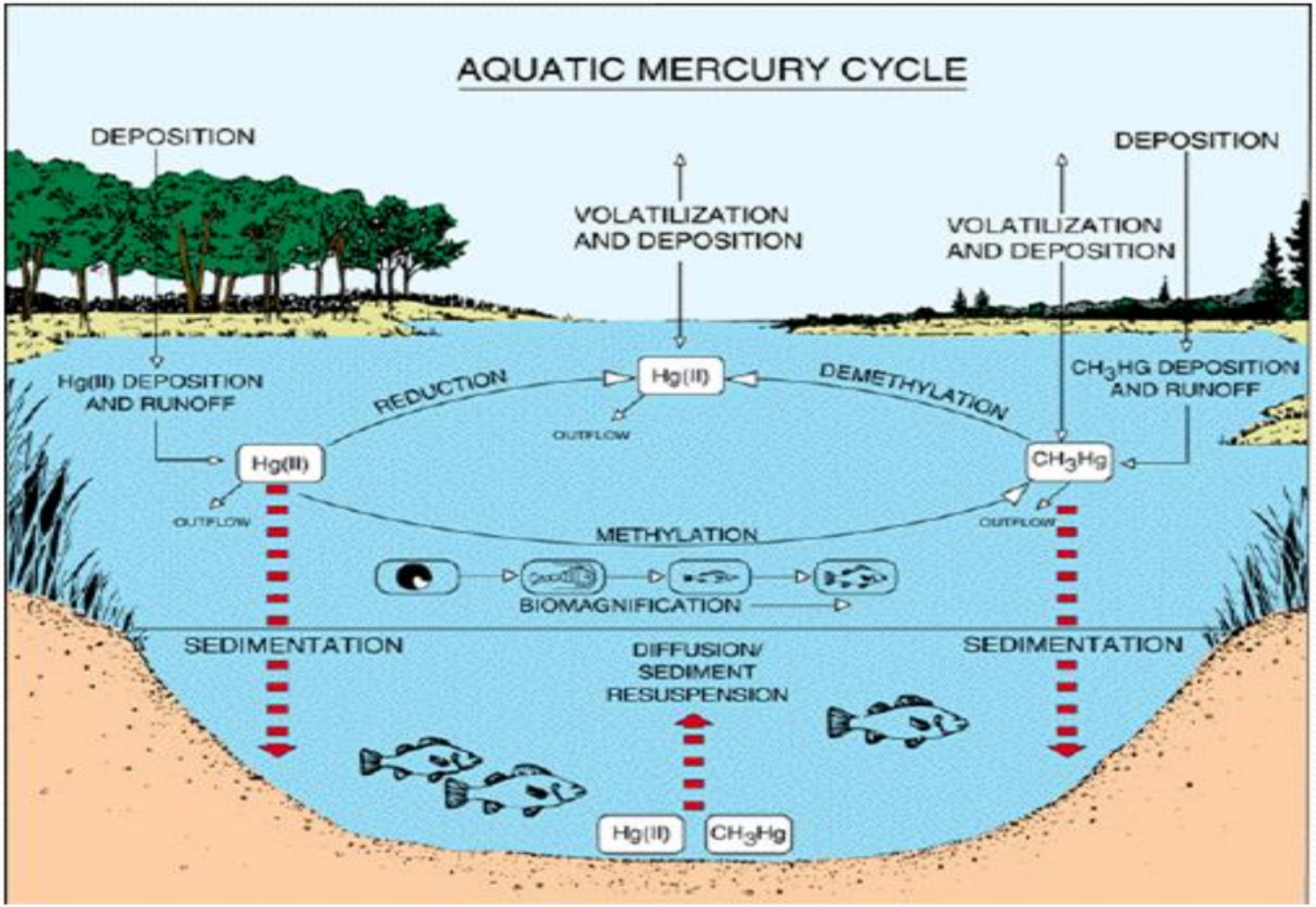
Dental Amalgam, that is…

Why Do We Care?

Because the EPA says so

Dental Amalgam is composed of

- 45% Mercury
- 55% (combined) Ag, Sn, Cu


AQUATIC MERCURY CYCLE
DEPOSITION
VOLATILIZATION AND DEPOSITION
DEPOSITION
VOLATILIZATION AND DEPOSITION
Hg(II) DEPOSITION AND RUNOFF
REDUCTION
Hg(II)
OUTFLOW
DEMETHYLATION
CH3HG DEPOSITION AND RUNOFF
Hg(II)
CH3Hg
OUTFLOW
OUTFLOW
METHYLATION
BIOMAGNIFICATION
SEDIMENTATION
DIFFUSION/ SEDIMENT RESUSPENSION
SEDIMENTATION
Hg(II)
CH3Hg

Project Charter:

•Mercury loadings to the WRFs have been increasing in recent years.

•Since Hg is primarily a pollutant of commercial/industrial origin, determine if adequate controls for Hg are in place by Industrial Pretreatment .

•Reduce mercury loadings from commercial/industrial facilities to WRF.

Research First, Ask Questions Later

Determine Dental Office contribution of Hg to WRF

Calais *et al (1994) and* Drummond *et al (1995)*

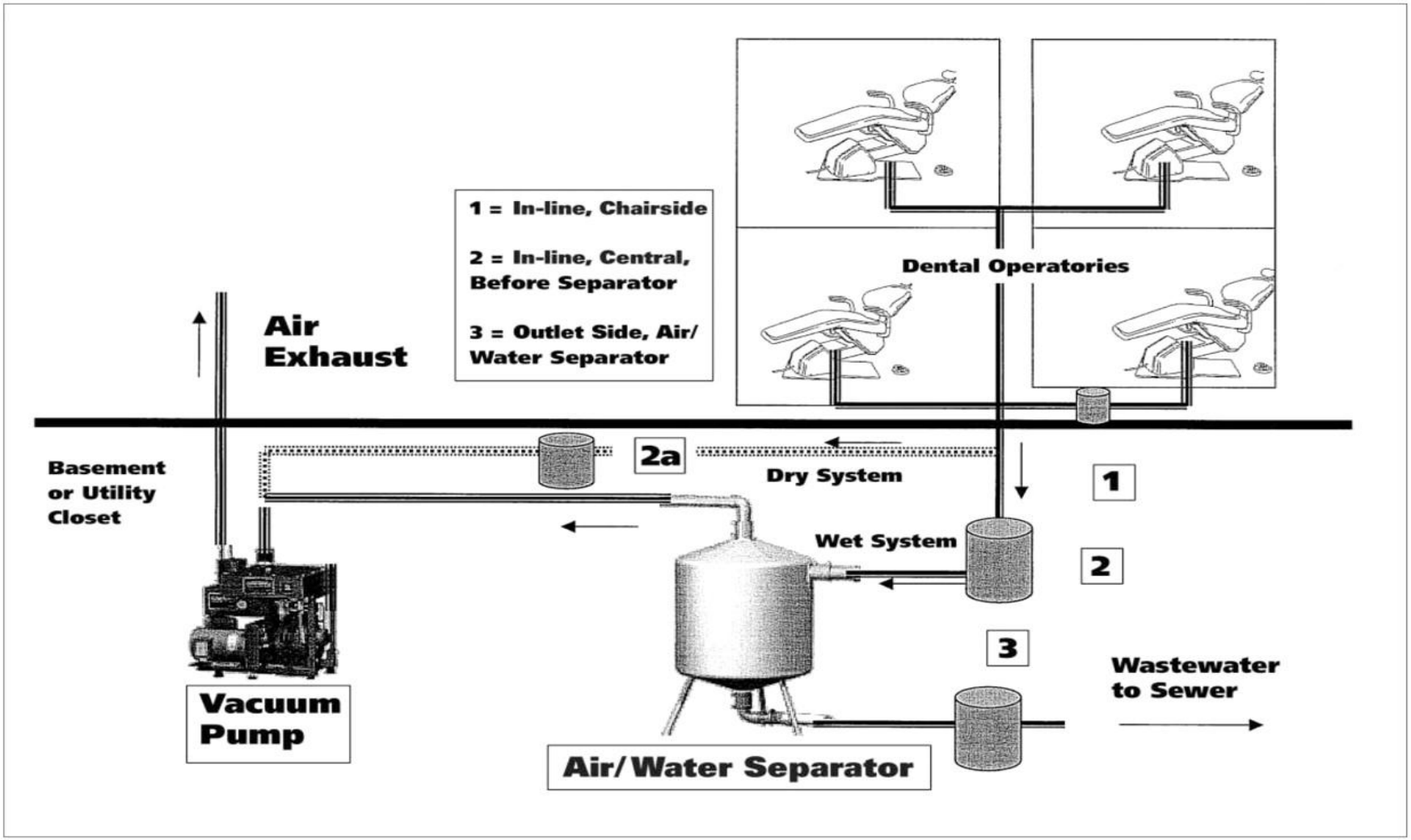
~ 1341 mg Hg generated per dental chair per day (240 days per year)

~ 60% of Hg retained by 0.7 mm chair side trap

~ 80% of Hg retained using a secondary vacuum filter (210 micron)

~ 99.9% of Hg may be removed using separator technologies

Now… Rinse


1 = In-line, Chairside
2 = In-line, Central, Before Separator
3 = Outlet Side, Air/ Water Separator
Dental Operatories
Air Exhaust
Basement or Utility Closet
2a
Dry System
1
Wet System
2
3
Wastewater to Sewer
Vacuum Pump
Air/Water Separator

This Won't hurt a Bit…

5 Simple Survey Questions for Dentists:

1. **Which of the following best describes your work with amalgam fillings?**
   - I **only PLACE** amalgam fillings (no removals)
   - I **only REMOVE** amalgam fillings (no placements)
   - I both **PLACE and REMOVE** amalgam fillings
   - **I DO NOT WORK** with amalgam fillings in any capacity *(end of survey)*

   1a. On average, approximately how many amalgam fillings do you *PLACE* each month? ___

   1b. On average, approximately how many amalgam fillings do you *REMOVE* each month? ___

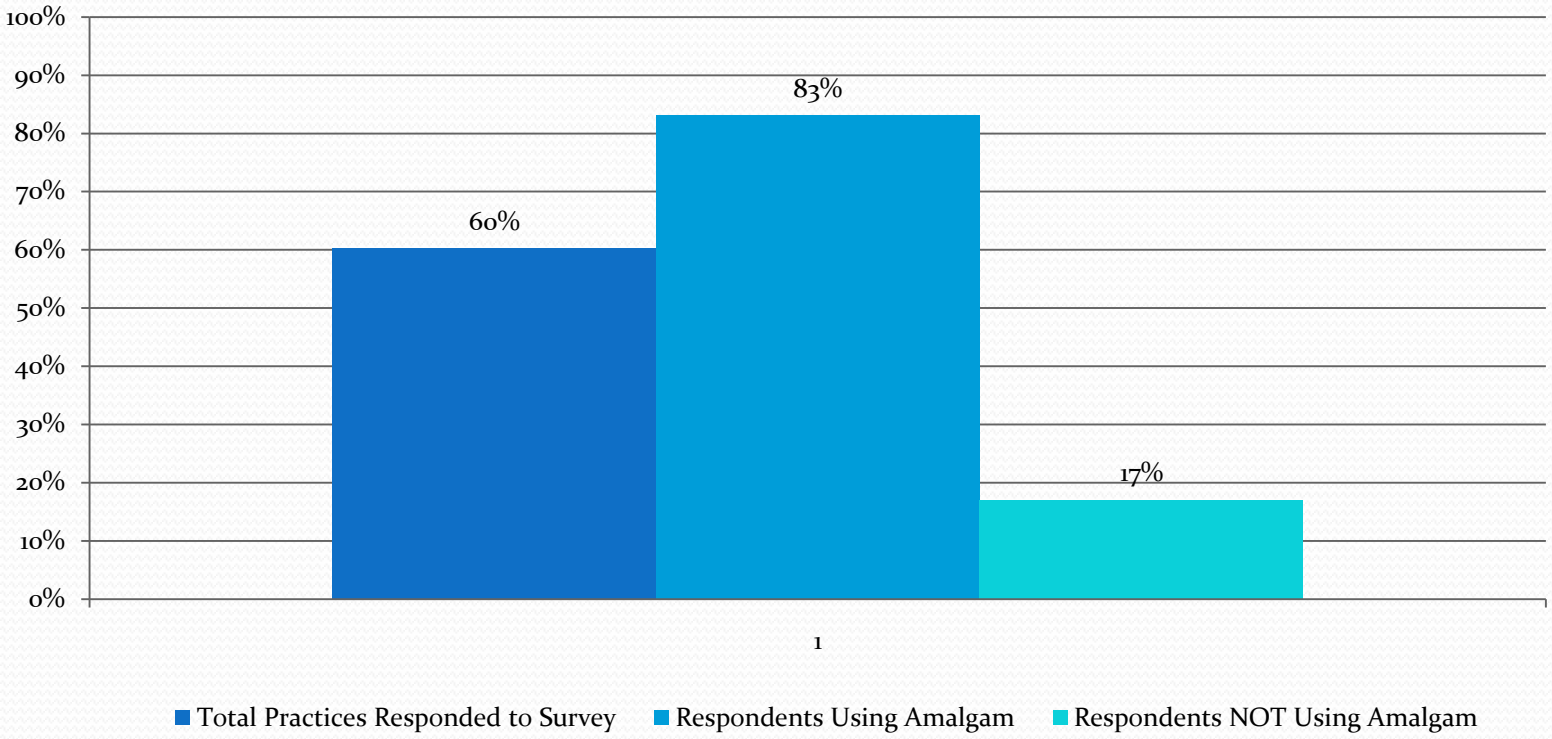
2. **How many operatories (dental chairs) in your practice? ___**

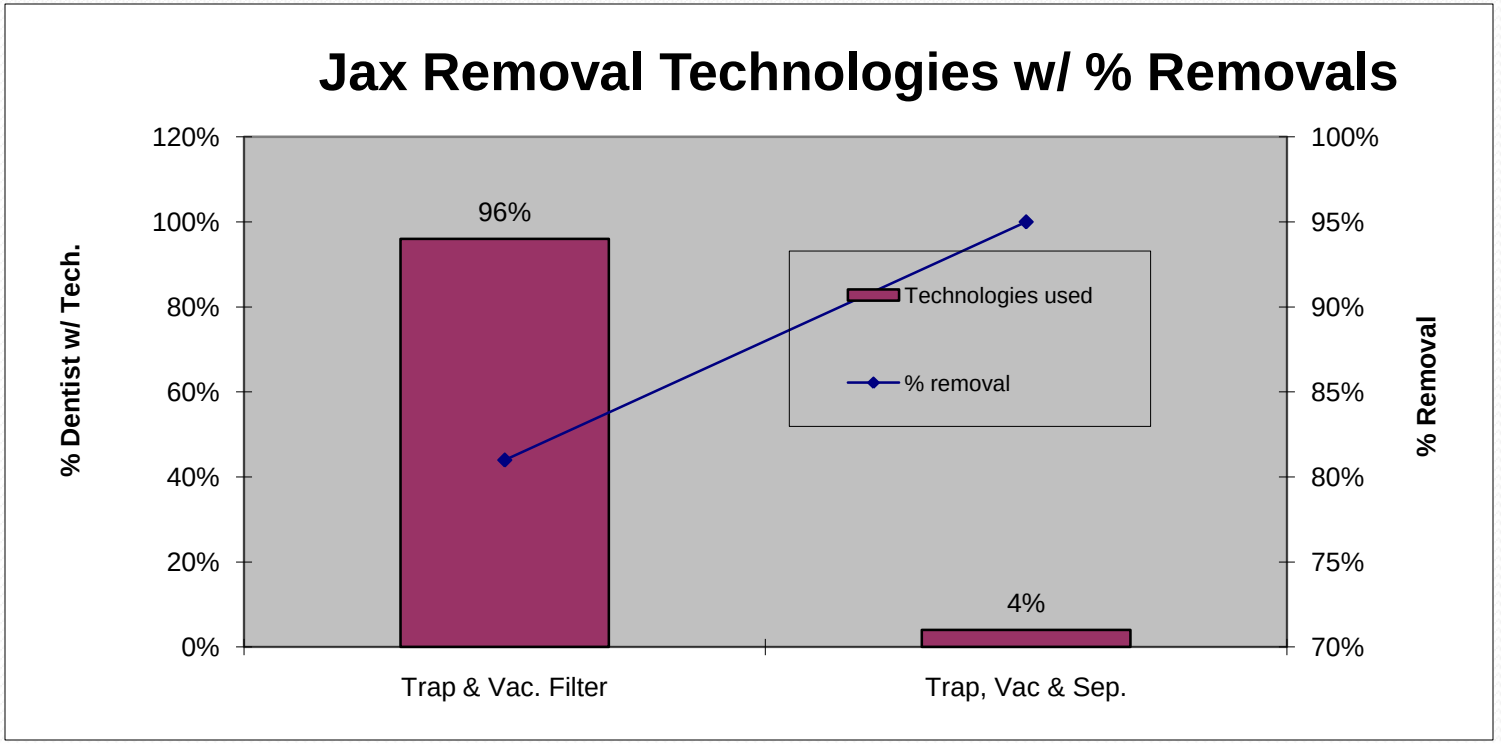
3. **Does your practice employ the use of:**
   - Chair-side traps
   - Secondary vacuum pump filters
   - Amalgam Separator
   - Other _____

4. **How do you dispose of amalgam particles recovered (chair-side trap, vacuum pump filters and separator)?**

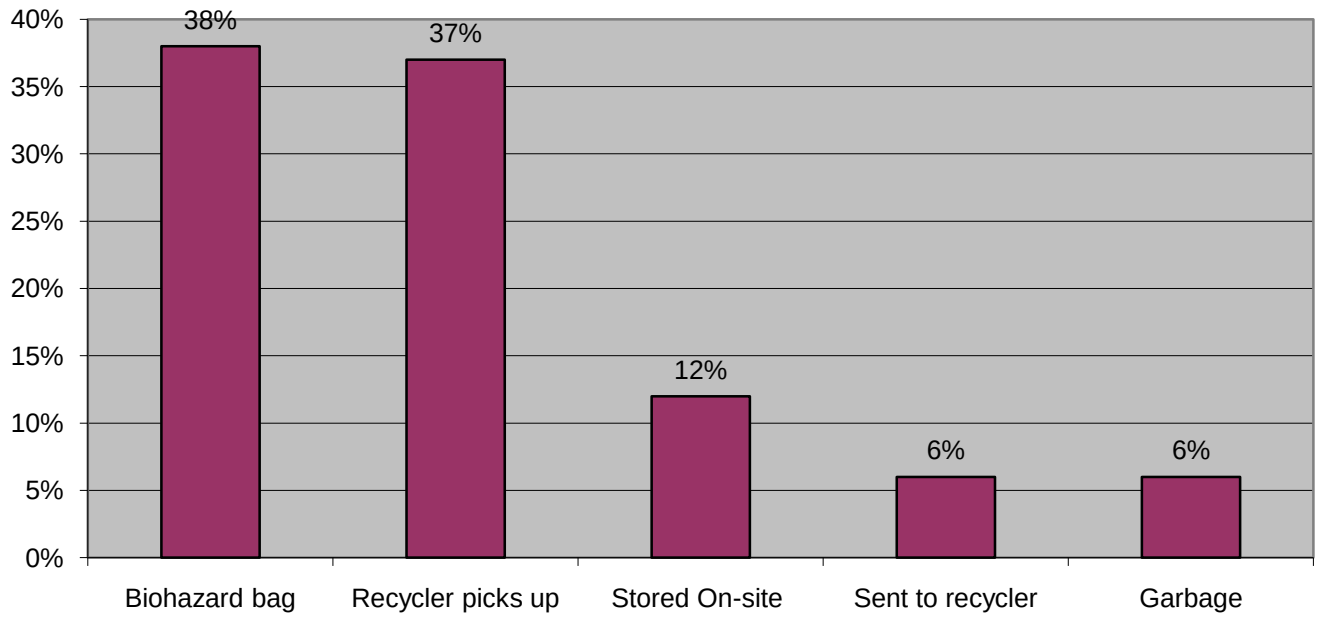
5. **How do you dispose the unused portion of amalgam capsules?**

Survey Results

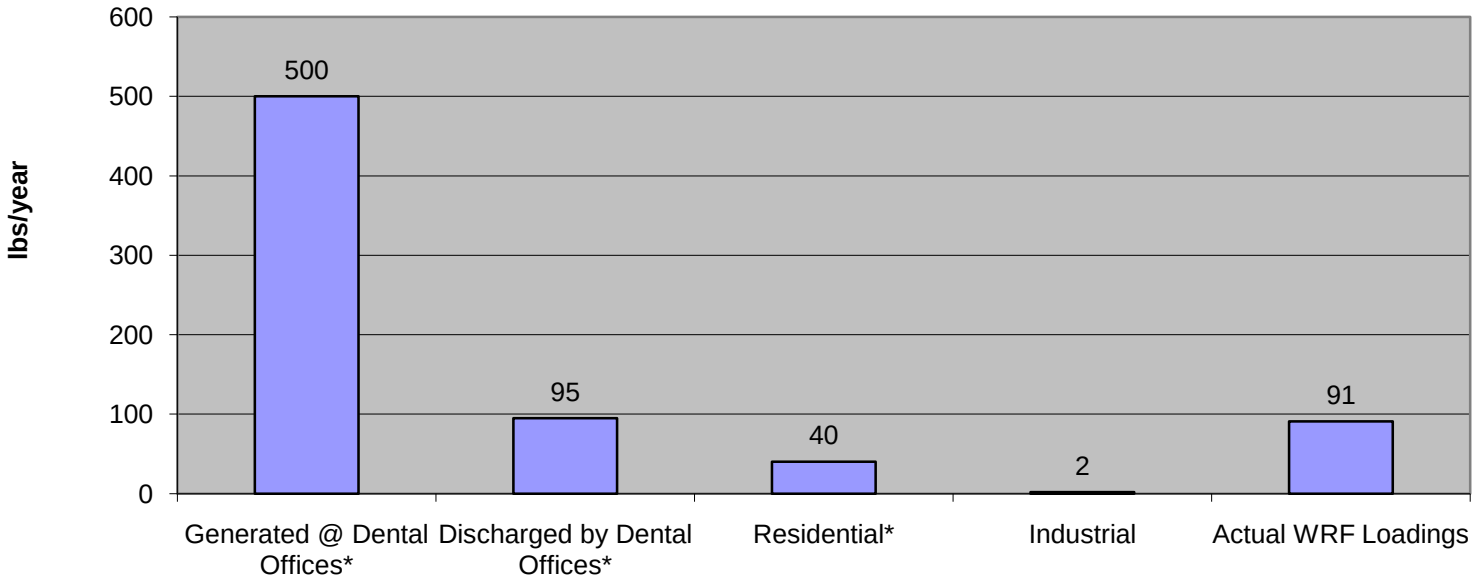



Jax Removal Technologies w/ % Removals
% Dentist w/ Tech.
% Removal
120%
100%
80%
60%
40%
20%
0%
100%
95%
90%
85%
80%
75%
70%
96%
4%
Technologies used
% removal
Trap & Vac. Filter
Trap, Vac & Sep.

Jax Dentists
Amalgam Disposal Practices



Jax Wastewater Sources of Hg



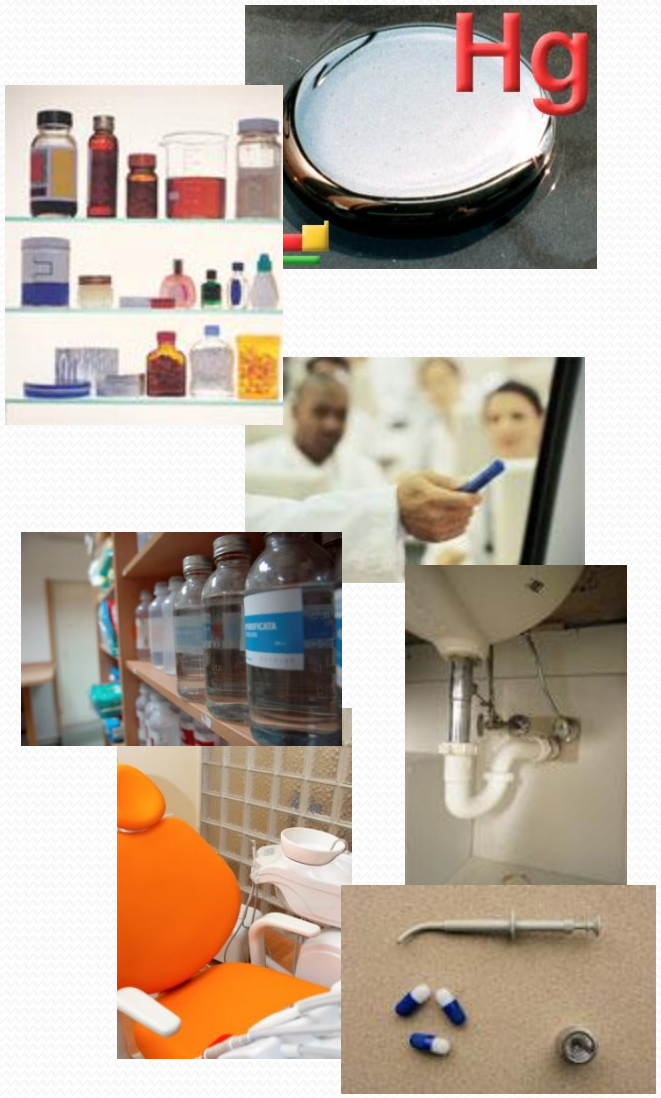
* Estimated from survey results & literature search

Other Regulatory Documents Reviewed

- **American Dental Assoc. (ADA)**
- **Virginia Dental Assoc. (VDA)**
- **Oregon Dental Assoc. (ODA)**
- **Wisconsin Dental Assoc. (WDA)**
- **Idaho Dental Assoc. (IDA)**
- **Florida, State DEP**
- **Connecticut, State DEP**
- **San Francisco, CA**
- **Boulder, CO**
- **Santa Monica, CA**
- **Narragansett Bay, RI**
- **And many, many more…**

8 Areas of Focus

- **Elemental Mercury**
- **Amalgam Capsules**
- **Non-contact Amalgam**
- **Contact Amalgam**
- **Storage**
- **Chair side traps / Collection**
- **Training**
- **Plumbing**



23 Topics

- Discontinue use of elemental mercury - recycle it
- NEVER discard elemental mercury in trash, sewer, sharps or "red bag" waste
- Use amalgam substitutes in cases where clinically and ethically appropriate
- Post information for patients about amalgam filling alternatives
- Use precapsulated alloy to eliminate elemental mercury spill Stock a variety of amalgam capsule sizes and use appropriate one for each procedure (P2)
- Empty amalgam capsule should be placed in labeled "non contact amalgam" container to be recycled
- NEVER put amalgam (contact or non-contact) in the sharps, "red bag", trash, or down the drain
- Do not mix waste streams (contact and non-contact waste amalgam) according to recycler's requirements
- Amalgam recovered from chair side traps, secondary filters, etc. should be stored as "Contact- amalgam" and recycled
- NEVER put extracted teeth with amalgam restorations in the red biohazard bag - Disinfect and place with contact amalgam for recycling
- NEVER disinfect contact amalgam using an autoclave or chlorine containing or oxidizing disinfectants / detergents (bleach), or line cleaners containing enzymes, phenols, or quaternary ammonium compounds
- STORE any amalgam waste DRY in an airtight container. If amalgam is stored under radiographic fixer or any other liquid, NEVER discharge that liquid to the sewer - it must be disposed of as hazardous waste
- Keep records of amalgam recycling
- Use chair side traps and regularly change filters (use proper PPE)
- Ensure that all vacuum pumps are equipped with a secondary filter
- NEVER rinse out or clean chair side traps or filters - treat as amalgam waste - recycle If chair is strictly dedicated to hygiene, the filter may be disposed with all other general contact material
- Encourage amalgam separators (ISO 11143 compliant)
- If a dry turbine separator is used, have a licensed amalgam recycler pump out and clean the separator tank at least every 6 months or according to manufacturer recommendations
- Maintain records of separator and trap inspections, cleaning and maintenance in a bound logbook
- Train staff in proper mercury / amalgam spill cleanup procedures
- NEVER clean up a spill with a vacuum cleaner
- Remove sink traps and inspect for sludge buildup - collect sludge and store in a separate waste container - install new traps and elbows or replace old ones after cleaning with an appropriate line cleaner
- Designate all sinks as "Sanitary Use Only - No Chemical or Amalgam Disposal" to eliminate the cleaning of amalgam contaminated instruments in the sink unless sink is connected to an approved amalgam separator.

Get the Big Boys On Board First

ADA

FDA
FLORIDA DENTAL ASSOCIATION

NEDDA
NorthEast District Dental Association
a component of the Florida Dental Association

Institute a Best Management Practices Program

Make Them Think Its Their Own Idea

- Background of the hazards of mercury in the environment
- Describe the how mercury enters the environment
- Introduce Pollution Prevention
- Describe how a Best Management Practices Program Works

BMP Structure

7 BMP requirement areas

- Describe dangers in each area that can contribute to additional mercury release into the environment
- Clearly state the requirement with minimal wording
- List items that are not required, but recommended if the facility desires to go to the “Next Level” of environmental compliance responsibility

You only ~~Floss~~ Filter the Amalgam that you want to Keep

Key BMP Provision: Filtration

- Require at minimum 210 micron secondary filters to retain 80% of mercury in amalgam
- Suggest that facilities consider installing a mercury separator, but these are not required at this time

	Required Actions	Why?	What Must I do to Comply?	What Should I Do Next?
Disposal	**NEVER discard the following in any sink drain, trash, sharps, or biohazard "red bag" waste**: • Elemental mercury • Opened amalgam capsules • Scrap amalgam in any form (contact or non-contact)	Mercury can be released to the environment if put into the sewer system. Solid waste disposal in the regular trash is land filled and is a groundwater contamination hazard. Sharps and biohazard waste are often incinerated and can release mercury vapor into the air	You **MUST** contact a licensed mercury waste hauler or recycler to dispose of all mercury containing / contaminated materials.	It is **RECOMMENDED** that you: • Discontinue the use of elemental mercury • Use amalgam substitutes in cases where clinically and ethically appropriate • Use precapsulated alloys and stock a variety of capsule sizes to reduce waste • Designate all sinks as "Sanitary Use Only - No Chemical or Amalgam Disposal" to eliminate the cleaning of amalgam contaminated instruments in the sink unless the sink is connected to an approved amalgam separator.
Equipment	**ALWAYS** ensure that chair side traps are used and that all vacuum pumps are equipped with a secondary filter	Multiple levels of amalgam retention devices, when properly installed and maintained, can be a very cost effective means to remove up to 80% of your amalgam waste from entering the sewer system	You **MUST** install chair side traps **AND** secondary vacuum system filters.	It is **RECOMMENDED** that you additionally install an amalgam separator (ISO 11143 compliant) that can remove up to 99% of your amalgam waste from entering the sewer system
Maintenance	**ALWAYS** regularly service chair side traps and filters but **NEVER** rinse out or discard amalgam recovered from them in any sink drain, trash, sharps, or biohazard "red bag" waste	Regularly maintained chair side traps and filters will best retain amalgam particles while maximizing system flow efficiency. See proper disposal above.	You **MUST** maintain the filter system according to the manufacturer's recommendations. Trap, filter and separator waste must be disposed of by a licensed mercury waste hauler or recycler.	It is **RECOMMENDED** that you use disposable traps and filters to reduce the labor of cleaning while minimizing potential spill and exposure hazards.
Storage	**NEVER** discharge radiographic fixer or any other liquid, to the sewer that is used to store or disinfect amalgam	Liquids that are used to store or disinfect amalgam waste is considered to be mercury contaminated solutions	You **MUST** dispose of all liquids used to store or disinfect amalgam as mercury containing hazardous waste	It is **RECOMMENDED** that you store any amalgam waste DRY in a labeled, airtight container. Follow all of your licensed mercury disposal / recycler company's amalgam segregation (contact / non-contact) and disinfection requirements. Add an appropriate amount of a proper disinfectant ONLY if required by your hauler and ONLY when the container is full and ready to be removed from the site.
Dissolution Issues	**NEVER** disinfect contact amalgam using an autoclave or heat. **NEVER** use plumbing line cleaners containing: • Oxidizing disinfectants • Detergents containing chlorine (bleach) • Cleaners containing enzymes, phenols, or quaternary ammonium compounds.	The use of an autoclave may volatize the mercury and release it into the air that you breathe. Strong oxidizers and other listed chemicals may dissolve amalgam releasing mercury into solution creating an additional hazardous waste.	You **MUST** eliminate the use of disinfecting and cleaning methods and materials that either volatilize or dissolve amalgam	It is **RECOMMENDED** that you use only a mild disinfectant and line cleaners that have a minimal dissolving effect on the solid amalgam particles.
Training	**ALWAYS** train your staff in proper mercury / amalgam handling and spill cleanup procedures	Proper knowledge and handling of amalgam waste is vital to prevention of accidental exposure and release into the environment	You **MUST** educate all staff members that may have the potential to handle or use mercury containing materials of these JEA Amalgam Best Management Practices (BMP's)	It is **RECOMMENDED** that you additionally train all personnel that may come into contact with amalgam to review the OSHA proper mercury safe handling / disposal procedures
Records	**ALWAYS** Keep records	Retention of your records is necessary to demonstrate compliance with these BMP's	You **MUST** retain the following records for a minimum of 3 years • All amalgam disposal / recycling manifests • Trap, filter, and separator maintenance • Employee training of these BMP's	

Write your BMP and they will com-ply…

The Carrot and the Stick Method

With a BMP program, **Dental Offices** can:

- ***Avoid*** requirements to obtain a discharge permit
- ***Avoid*** performing routine sampling of wastewater discharge for mercury
- ***Avoid*** requirement to demonstrate compliance with JEA's mercury discharge limit of 0.006 ppm
- ***Avoid*** the costs and administrative burden associated with traditional permit based regulatory programs.

The Carrot and the Stick Method

With a BMP program, **The Control Authority** can:

- ***Avoid*** permitting 200+ dental facilities
- ***Avoid*** performing routine sampling of wastewater discharge for mercury
- ***Avoid*** the costs and administrative burden associated with traditional permit based regulatory programs
- Be able to run an effective program with 1 employee 15 % of allotted time

One Page Periodic Compliance Statement

JEA Dental Amalgam Recycling/Disposal Semi-Annual Certification Statement
Return this completed form within 14 days by mail or fax along with any accompanying documentation

Compliance period: Year _____ (check One): Jan. 1 – Jun. 30 _____ Jul. 1, 2009 – Dec. 31 _____
Dental Facility Name_____
Address _____
City_____ State _____ Zip_____
Mailing Address (if different) _____
Phone # _____ Fax # _____
Email

Check One

____ I certify that during the current compliance period this facility has disposed or recycled amalgam and/or mercury in accordance with the *JEA Best Management Practices for Mercury Waste Management in Dental Offices.* [**Documentation confirming disposal from the licensed mercury recycling/handler must be enclosed with this statement**].

-Or-

____ I certify that during the current compliance period this facility has not disposed or recycled amalgam and/or mercury, but it has been stored on-site in accordance with the *JEA Best Management Practices for Mercury Waste Management in Dental Offices.*

-Or-

____ I certify that during the current compliance period this facility has not handled amalgam and/or mercury, and does not have any amalgam and/or mercury on-site.

-And-

I certify that to the best of my knowledge this facility has abided by the *JEA Best Management Practices for Mercury Waste Management in Dental Offices* during the current compliance period and the above information is true and accurate to the best of my knowledge.

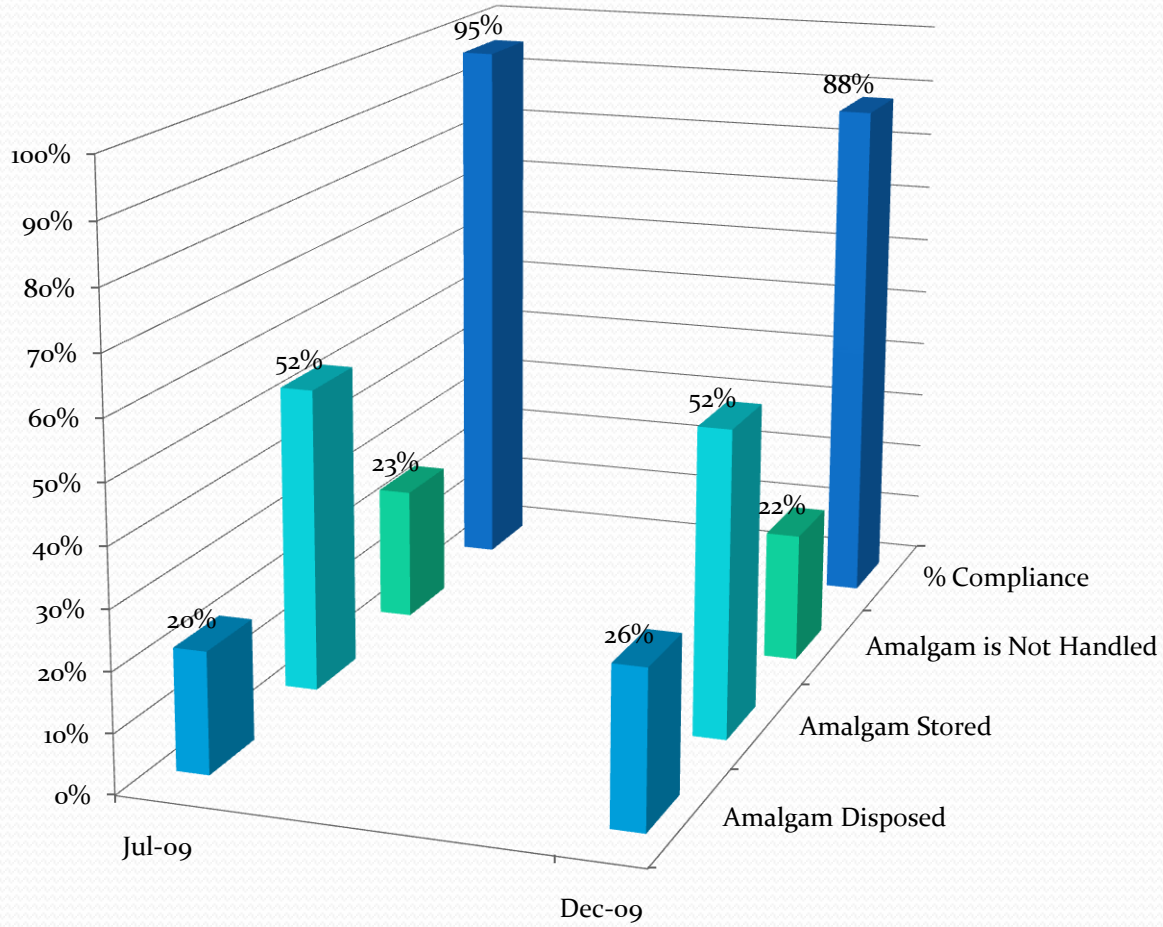
_____
Name of Authorized Representative (type or print)

_____
Title

_____
Signature

_____
Date

Periodic Compliance Results



Why Do We Care?

Gratuitous slide of unused photos