

Dental Office P2



WRPPN • 2005

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Today's Topics

Presentations

- Dental Office Types, Staffing, & Trends
- Chemicals Used
- CDA Outreach Programs
- Agency Programs

Discussion Groups

- Working w/ Local Dental Society
- Amalgam Issues
- X-Ray Issues
- Infection Control Issues

Dental Office Types & Trends



Teresa Pichay, CDA

- General Dentistry
- Other Practice Types
- Office Staff
- Industry Trends

Who's Who In A Dental Office

- General Dentist
- Endodontist
- Pediatric Dentist
- Oral & Maxillofacial Surgeon
- Prosthodontist
- Orthodontist
- Oral & Maxillofacial Radiologist
- Periodontist
- Public Health Dentist
- Oral Pathologist

- Dental Assistant
- Registered Dental Assistant/Certified Dental Assistant
- Registered Dental Hygienist
- Lab Tech
- Office Manager/Patient Coordinator
- Receptionist

Continuing Education

Sources

- Dental associations, local dental societies, ADA
- Study clubs
- Dental schools
- Community colleges
- Regional occupational programs

Subjects

- Clinical courses, e.g., pharmacology,
- Mandated courses or courses that instruct on legal requirements, e.g., infection control

Issues Impacting Dentistry

Access to Dental Care

- Licensure of internationally trained professionals
- Changing scope of practice
- Public funding

Third-Party Payer Issues

- Adequate reimbursement
- Market economics
- Quality assurance

Regulatory Compliance

- Cal/OSHA
- Waste management – medical & hazardous
- Radiation
- Wastewater

Pollution Prevention & Dentistry

- Proposed regulation
- Research
- Educational outreach
- Selective regulation

Dental Office Chemical Use



Tom Barron

- Radiography
- Work Surface Disinfection
- Instrument Cleaning
- Instrument Sterilizing

Chemicals Dentists Use • 1

- **Photography**
- Infection Control
- Hygiene Work
- Restoration Work
- Lab Work
- Pharmaceuticals
- Cleaning & Maint.
- Hydroquinone
- Silver
- Glutaraldehyde
- Potassium Hydroxide
- Potassium Sulfite
- Sodium Thiosulfate
- Acetic Acid

Chemicals Dentists Use • 2

- Photography
- **Infection Control**
- Hygiene Work
- Restoration Work
- Lab Work
- Pharmaceuticals
- Cleaning & Maint.

- **Sanitizers**
 - Ethyl Alcohol
 - Triclosan
- **Disinfectants**
 - Alcohols (Ethyl, Isopropyl)
 - Quat. Ammonium Chloride
 - Oxidizers (Bleach, H₂O₂)
 - Phenylphenol
- **Sterilizers**
 - Glutaraldehyde
 - Orthophthaldehyde (OPA)
 - Formaldehyde

Chemicals Dentists Use • 3

- Photography
- Infection Control
- **Hygiene Work**
- **Restoration Work**
- **Lab Work**
- **Pharmaceuticals**
- Cleaning & Maint.
- Amalgam (Hg, Ag, Cu)
- Glass Ionomer
- Resin Composite
- Gold
- Porcelain
- Tooth Whitener
- Adhesives
- Disinfectants
- Antibiotics

Chemicals Dentists Use • 4

- Photography
- Infection Control
- Hygiene Work
- Restoration Work
- Lab Work
- Pharmaceuticals
- **Cleaning & Maint.**

Typical Cleaners With:

- Detergents
- Surfactants
- pH Adjusters
- Builders
- Disinfectants

Concerns About :

- Endocrine Modifiers
- Low & High pH
- Bleach

Dental Radiography

- Two Kinds
 - IntraOral
 - Panoramic
- Exposures/Week
- Chemicals Used
- P2 Opportunities
 - Processing
 - Film vs Digital



Photo: US Navy

Developer Chemistry

Components-Chemical Name & Common Name	CAS Number	Range % (wt)
Water	7732-18-5	80-85
*Sodium Sulfite	7757-83-7	5-10
*Hydroquinone**	123-31-9	1-5
*Potassium Hydroxide	1310-58-3	1-5
p-Methylaminophenol sulfate	55-55-0	<1

Source: Neo-Flo

Hydroquinone Hazards

Common Name: **HYDROQUINONE**

CAS Number: 123-31-9
DOT Number: UN 2662

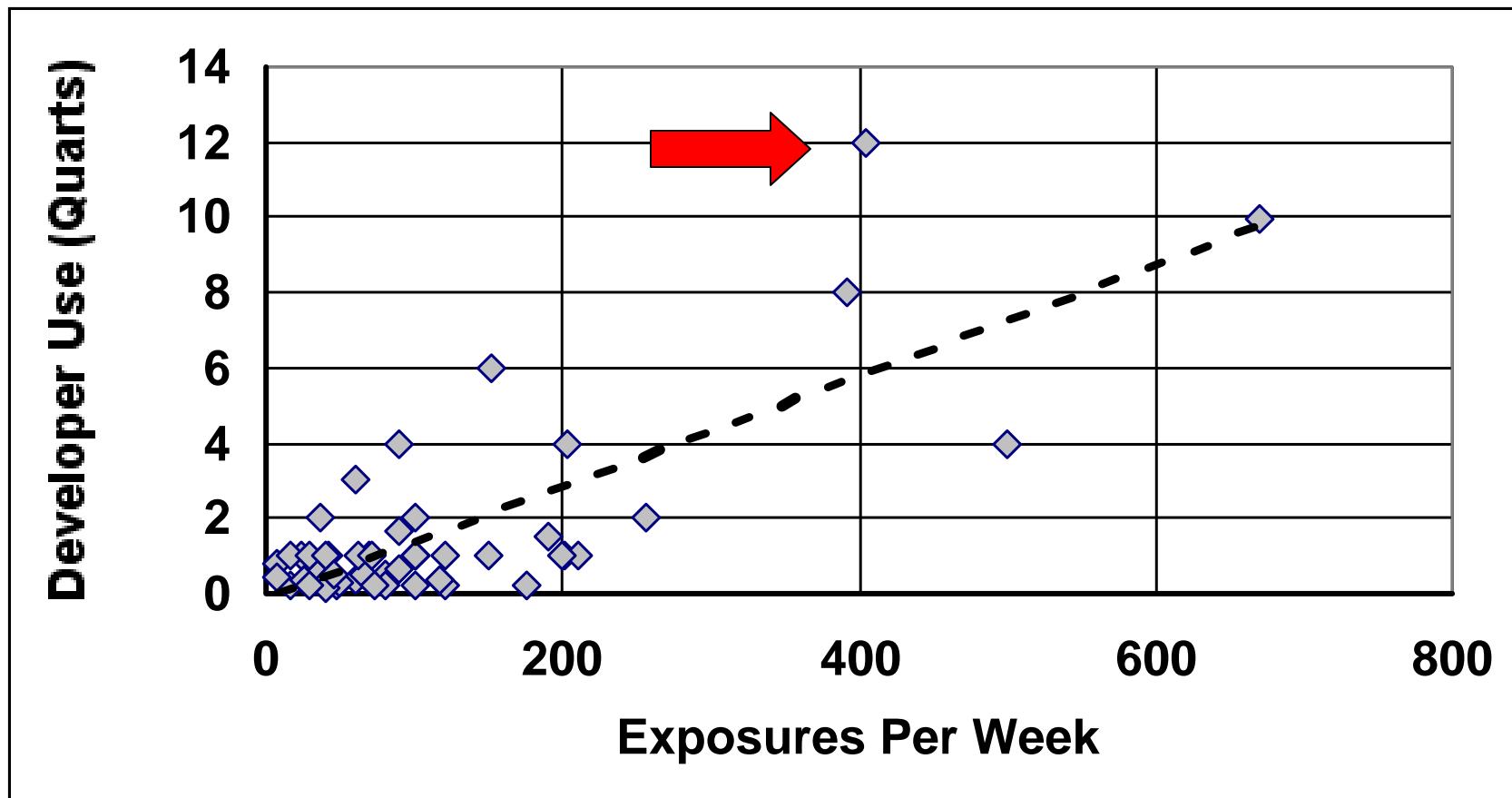
HAZARD SUMMARY



- * Hydroquinone can affect you when breathed in.
- * Hydroquinone can cause fatal poisoning when swallowed.
- * Hydroquinone may cause mutations. Handle with extreme caution.
- * Hydroquinone can irritate and may burn the eyes. Repeated exposure can cause a staining and discoloration of the eyes and eyelids and may cause clouding of the eyes (corneal opacities), affecting vision.
- * Contact can irritate the skin and cause a rash and changes in skin color.
- * Exposure can cause headache, nausea, vomiting, abdominal cramps, dizziness, and muscle twitching.
- * Hydroquinone may cause a skin allergy. If allergy develops, very low future exposure can cause itching and a skin rash.
- * Hydroquinone may affect the liver and kidneys.

Source: State of New Jersey

X-Ray Developer Use



Source: Barron (2005)

X-Ray P2 Opportunities

- Change to Digital
- Reduce Spoiled Exposures
- Reduce Chemical Use
 - Change By Need
 - Buy Pre-measured
 - Self-contained



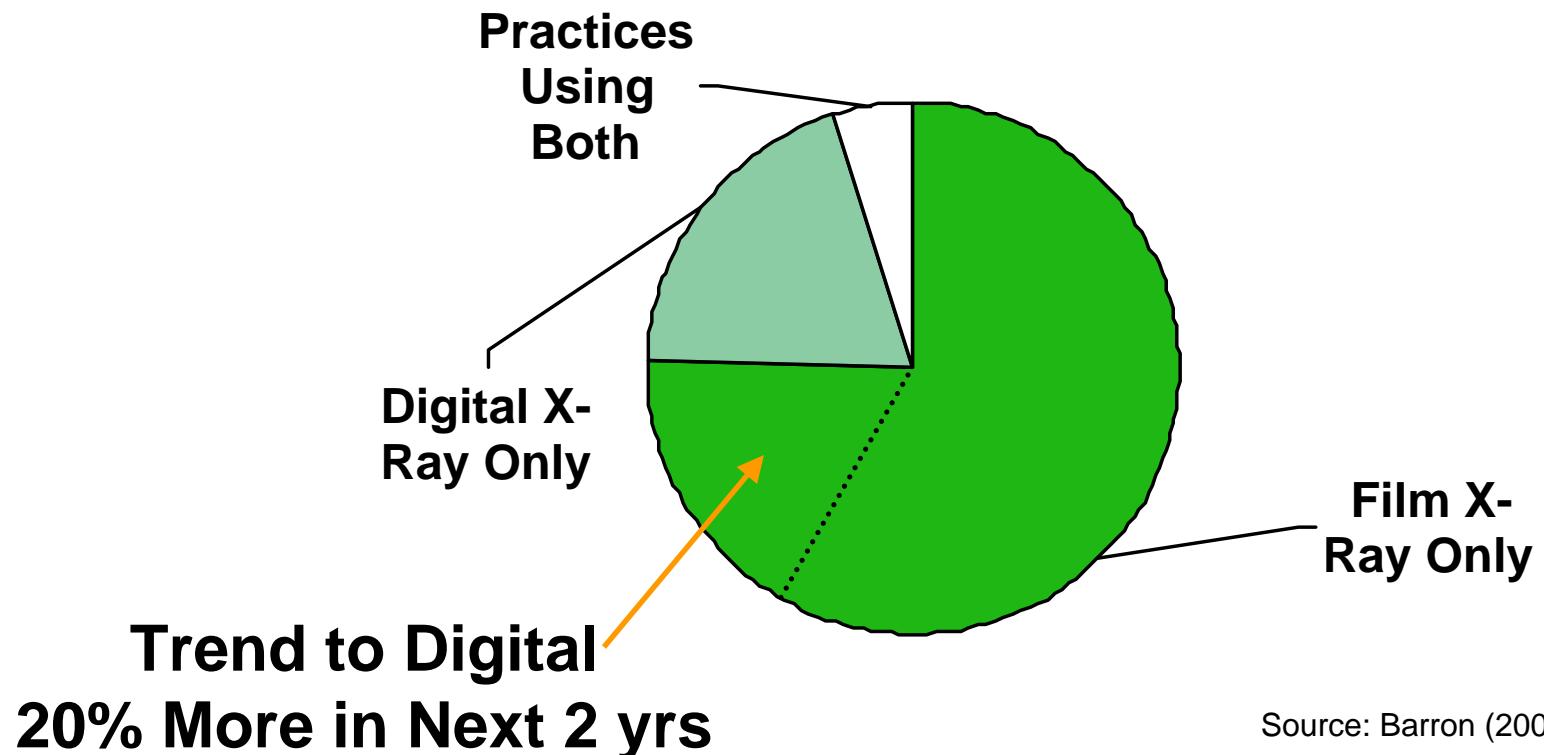
Photo: Dental-X

Film vs Digital X-Ray

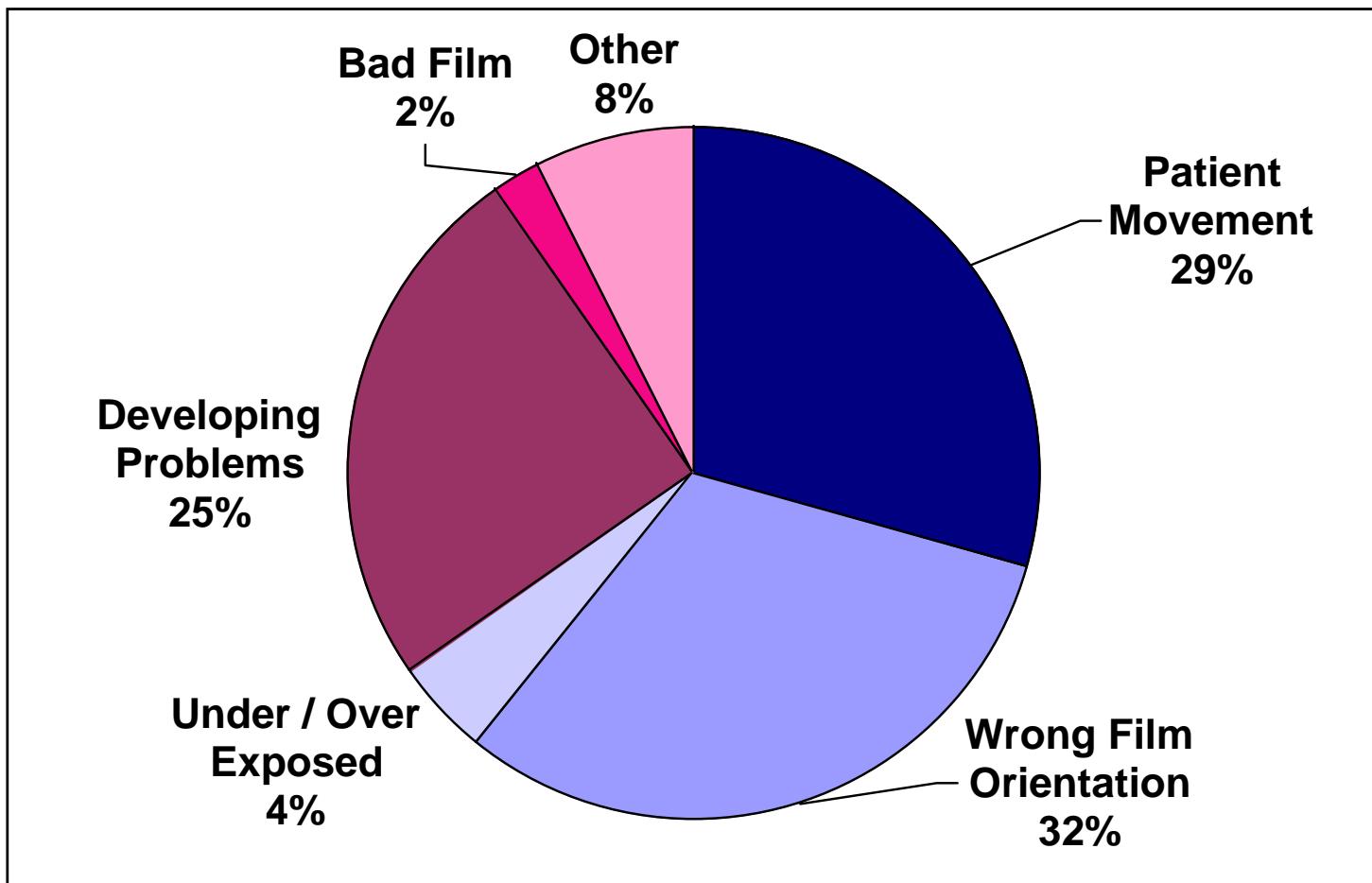
Film = 76% of Practices

Digital = 19%

Both = 5%



Spoiled X-Ray Exposures



Source: Barron (2005)

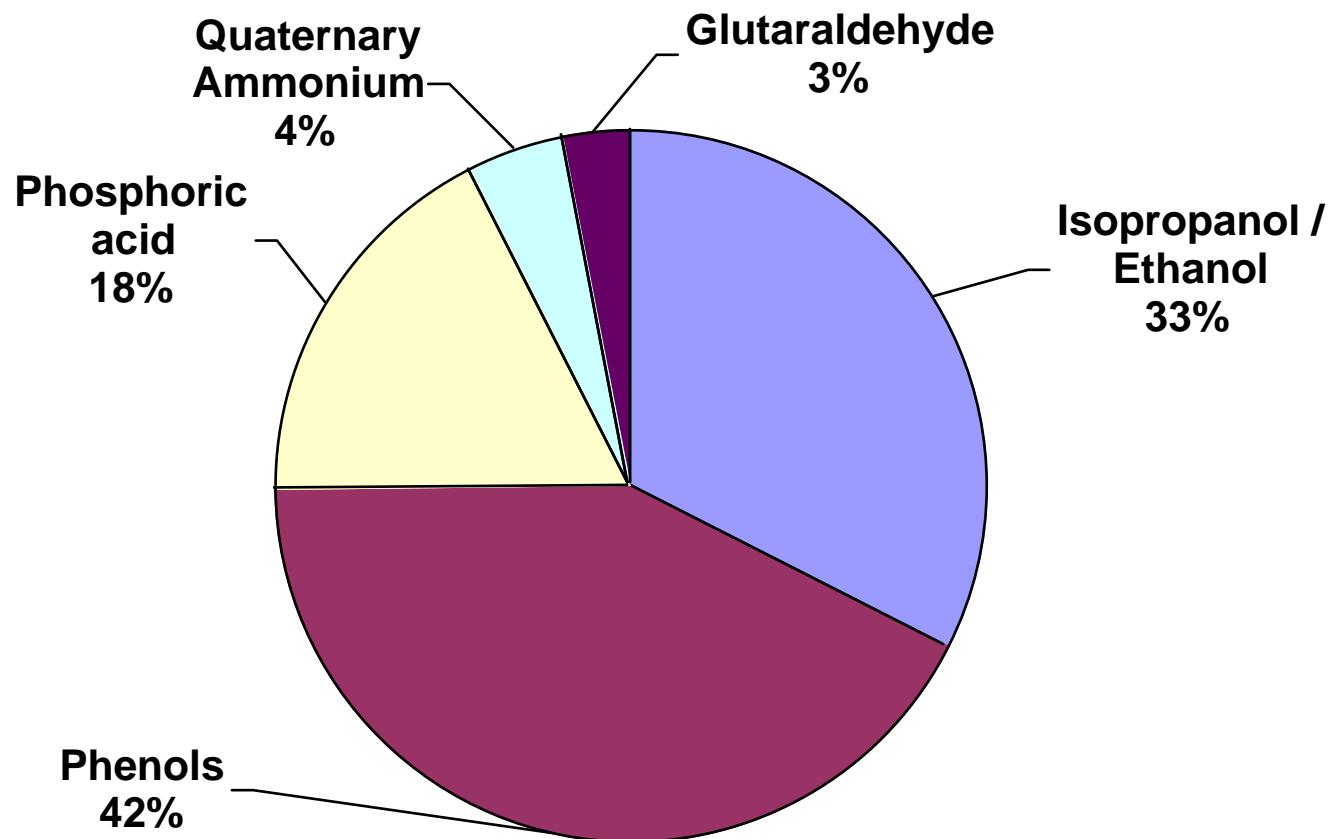
Infection Control

- Instruments
 - Cleaning
 - Sterilization
- Work Surfaces
 - Operatories
 - Other Work Areas
- Vacuum Systems
- Hand Sanitizers



Photo: US Navy

Work Surface Disinfection



Source: Barron (2005)

Glutaraldehyde Hazards

Common Name: **GLUTARALDEHYDE**

CAS Number: 111-30-8

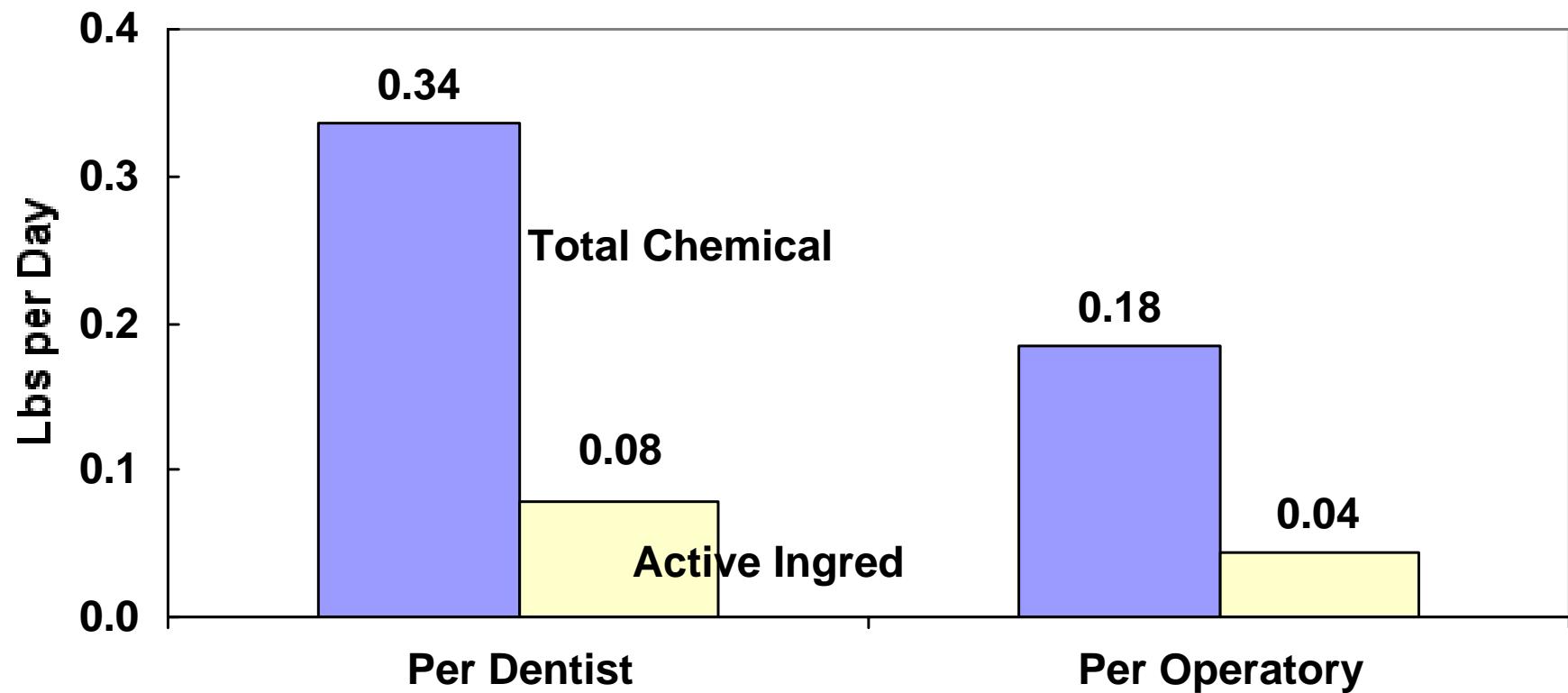
DOT Number: None

HAZARD SUMMARY

- * **Glutaraldehyde** can affect you when breathed in and by passing through your skin.
- * Contact with the liquid and vapor can severely irritate the eyes. At higher concentrations **Glutaraldehyde** can irritate and burn the skin.
- * Breathing **Glutaraldehyde** can irritate the nose and throat causing coughing and wheezing.
- * **Glutaraldehyde** can cause headache and nausea.
- * **Glutaraldehyde** may cause a skin allergy. If allergy develops, very low future exposure can cause itching and a skin rash.
- * **Glutaraldehyde** may cause an asthma-like allergy. Future exposure can cause asthma attacks with shortness of breath, wheezing, cough, and/or chest tightness.

Source: State of New Jersey

Surface Disinfectant Use



More Info: Dental P2 Website

Disinfection - P2 Measures

- Minimize Contamination
- Evaluate Active Ingredients
- Buy Pre-Measured Units
- Review Mixing
- Review Tools, Techniques, & Timing

CDA Outreach Programs

BEST MANAGEMENT PRACTICES

AMALGAM WASTE



- Follow recycler or hauler instructions. Many for dislodging of waste and separation of contact and non-contact amalgam.
- Separate excess contact dental amalgam that is retrieved during placement with glass and place in an appropriate container.
- Use chainside traps to capture dental amalgam.
- Change, or clean, chainside traps frequently. Flush the vacuum system before changing the chainside trap.
- Change vacuum pump filters and screens at least monthly or as directed by the manufacturer.
- Check the pump under your sink for the presence of any amalgam-containing waste.
- Eliminate all use of bulk elemental mercury and use only precipitated dental amalgam for amalgam restorations.
- Limit the amount of amalgam triturated to the closest amount needed for the restoration. Keep a variety of amalgam capsule sizes on hand to ensure that almost all triturated amalgam is used.
- Train staff who handle or may handle mercury-containing material in its proper use and disposal.
- Consider the use of amalgam removal technologies, such as sedimentation systems or amalgam separators, if you practice in an area where mercury in wastewater discharges is a serious concern.

Properly Control Treatment Works (PCTW) may also be a waste zone BMPs availability.

MANDATORY PER CALIFORNIA CODE OF REGULATIONS TITLE 22

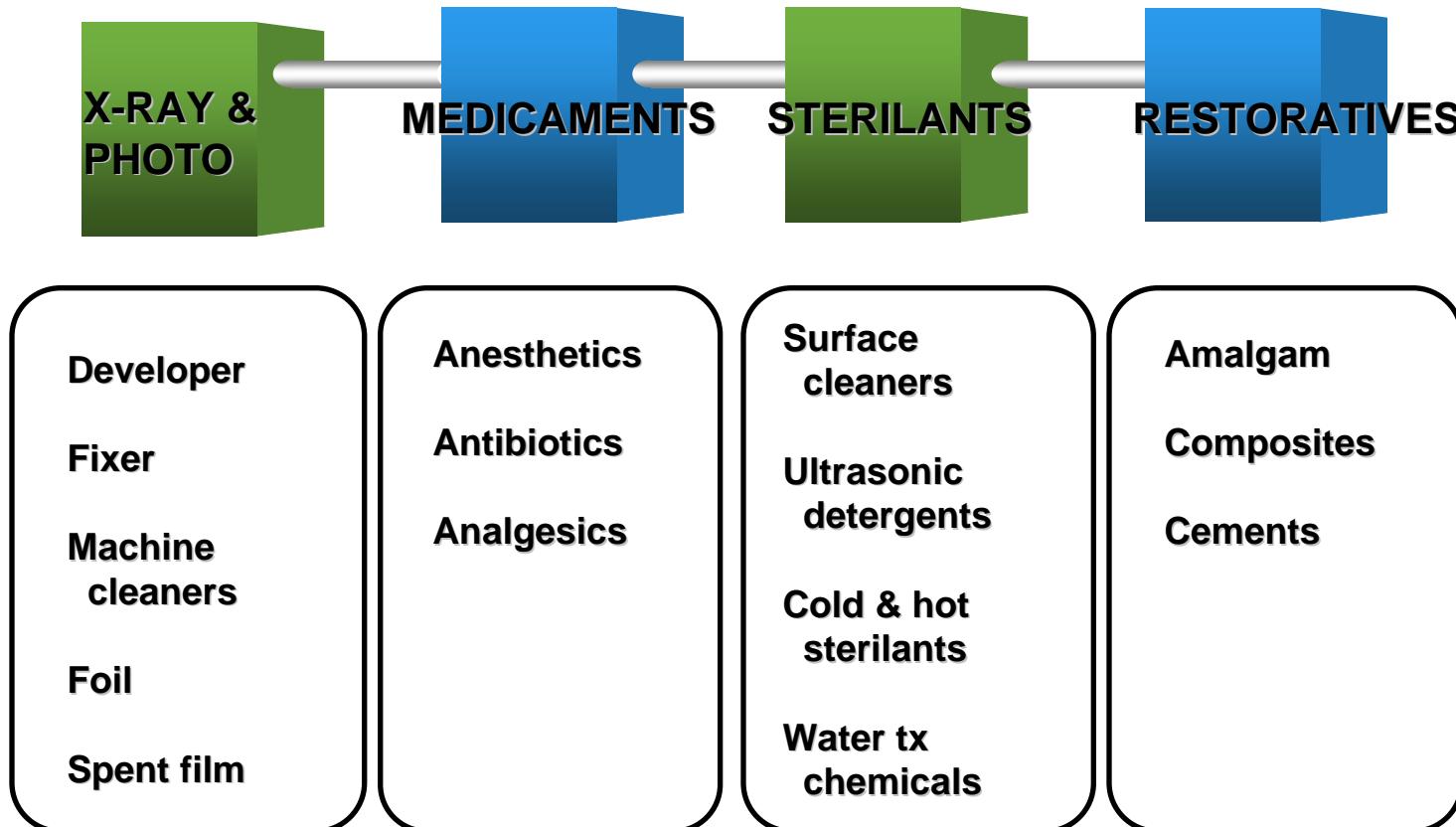
- Do not rinse amalgam-containing traps, filters, or containers in the sink.
- Do not place amalgam, elemental mercury, broken or reusable amalgam capsules, extracted teeth with amalgam, or amalgam-containing traps and filters with medical waste or regular solid waste.
- Recycle, or manage as hazardous waste, amalgam, elemental mercury, broken or reusable amalgam capsules, extracted teeth with amalgam, amalgam-containing waste from traps and filters.
- Keep amalgam waste in an airtight container.

THE CALIFORNIA DENTAL ASSOCIATION
CDA Member Contact Center: (866) 232-6362

Rosanne Harding, CDA

- Operatory Wastes
- Other Wastes
- Outreach Steps
- The P2 Universe
- Waste Option Tables
- CDA Outreach To Date

Operatory Waste Streams



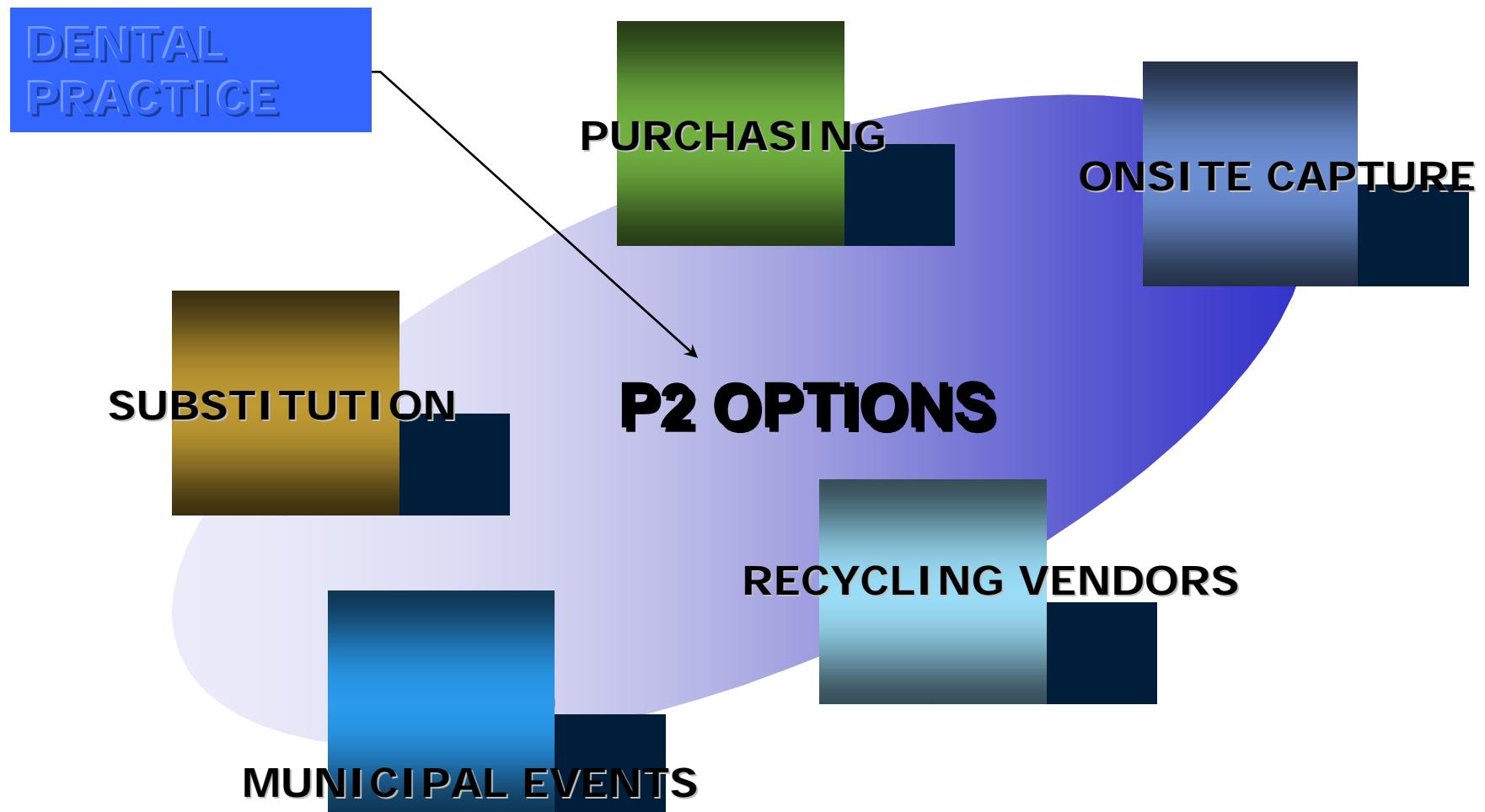
Other Waste Streams

- **Electronic wastes** (*computer components, etc*)
- **Outdated equipment** (*e.g. - xray machines being replaced with digital equipment*)
- **Outdated furniture**
- **Construction debris from remodel projects**
- **Office paper, cardboard**
- **Medical wastes**

Outreach Steps

- 1. RESEARCH LOCAL RESOURCES**
- 2. DEVELOP PRESENTATION WITH LOCAL DATA**
- 3. MEET WITH LOCAL DENTAL SOCIETY**
- 4. PROVIDE OVERVIEW OF ALL WASTE STREAMS AND OPTIONS**

Expanding The P2 Universe



Waste Option Table 1

Waste Material	Disposal option	P2 Option	Notes
Amalgam	Haz Waste	Mail-back or pick-up	
Lead Foil	Haz Waste	Mail-back or pick-up	
Resins/ cements	Solid waste	None	
Fixer	Haz Waste	Pick- up by recycler or onsite recovery	
Developer	Wastewater or haz waste	None	Depends on formula
Cold Sterilant	Wastewater or haz waste	None	Depends on ingredients

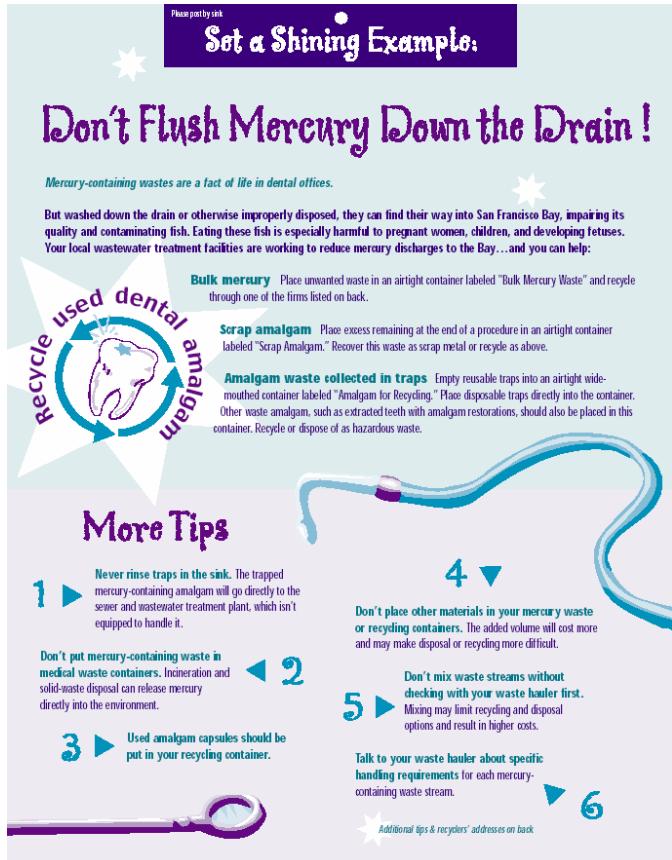
Waste Options Table 2

Waste Material	Disposal option	P2 Option	Notes	
Equipment	Haz Waste or solid waste	Metal recycler or donate to others (clinics, Mexico)	Many metal recyclers will take xray equipment if lead removed & segregated	
Electronics	Haz Waste	Community events, donate or local vendors		
Outdated furniture/fixtures	Solid waste	Metal or plastic recycler	Depends on materials	
Office paper/cardboard	Solid Waste	Local recycler or community prgm		
Construction waste	Solid waste	Local recycler or community prgm	Disposal option depends on formula	

CDA Outreach To Date

- Presentations have been given to over 8 Dental societies over the past year
 - Presentations are about 1.5 hours long
 - Attendance varied from 25 to 100 attendees at each event
 - Outreach is available to all dental societies in California
 - In some cities, the public works departments have offered similar outreach programs
 - More presentations are scheduled for next year

Agency Outreach Programs



Sushma Dhulipala, SFE

- Amalgam Management
- Other Wastes
- Green Business
- SF Workshops
 - For Dental Offices
 - For Agency Staff

Agency Outreach

- Partnerships
- Amalgam Separators
 - Approved Listing
 - Amalgam Separator Vendor Fair
 - Rebate Program
- Outreach Tools
 - Dental workshops
 - Inspector Cross training
 - Fact sheets
- Lessons Learned



Partnerships: POTWs, Dental Societies

SFPUC – BERM
(Regulation)

- Permit Design
- Database of SF dentists
- Issuing Permits
- Inspections
- Monitoring Mercury reductions

SFE
(Education)

- Rebate Program
- Clearing House of information
 - Fact sheets
 - Approved Separator listing
- Outreach -
 - Amalgam Separator Vendor expo
 - Dental workshops
 - Inspector Cross training



San Francisco's Permit System

- ❖ **OPTION 1** – Install amalgam separator + Implement Amalgam BMPs
- ❖ **OPTION 2** - Monitor wastewater discharge for mercury content + Implement Amalgam BMPs
- ❖ **Exemptions??**

<http://pollutionprevention.sfwater.org>

San Francisco Dental Mercury Reduction Program



Dental practices that place or remove amalgam fillings (which can contain from 40% to 50% mercury) are a controllable source of mercury impacting the City's sewer systems. Consequently, as of January 1, 2004, dental offices that are connected to the City and County of San Francisco's sanitary sewer system are required to reduce their discharge of dental amalgam wastes to the lowest practicable level. Dental offices must file an application for a wastewater discharge permit with the City. This permit requires offices to implement mercury reduction Best Management Practices (BMPs) and to choose between installing an approved amalgam separator device or monitoring their wastewater discharges.

[Overview](#)

[Meetings & Events](#)

[Permit Application](#)

[Mandatory BMPs](#)

[Amalgam Separator Info](#)

[Wastewater Monitoring](#)

Amalgam Separators: Approved Listing & Vendor Fair

- **Approved Separator Listing**
 - ISO certification
 - 95 % efficiency
- **Vendor Fair**
 - ~300 attendees
 - 9 manufacturers represented



Amalgam Separators: Rebates

- ✓ Early-bird Rebates
(\$200 each to 100 dentists)
- ✓ Community Service Rebates
(\$400 each to 25 dentists)



Outreach: Beyond Mercury

- **Hazardous Wastes**

- Photo processing wastes
- Chemical sterilants
- Line cleaners



- **Universal Wastes**

- Amalgam wastes
- Hg lamps
- Computers etc.

- **Medical Wastes**

- Sharps
- Biohazardous
- Pharmaceuticals



Outreach: Tools & Timelines

- **Materials**

- Hazardous waste factsheet
- Universal waste factsheet
- Medical waste factsheet

- **Workshops**

- 6 workshops
- ~ 10% of dental offices

- **Inspector Training**

- **Websites**

- **Onsite Consultations**



07/03	Program Launch
10/03	Vendor Fair
10/03 – 12/03	Early-bird rebates
1/04 – 6/04	6 Workshops
1/04 – 6/04	Community Service rebates

Web Resources

Address <http://www.sfenvironment.com/aboutus/toxics/dentistry/dentistry.htm>

Google Search New! 40 blocked ABC Check Look for Map AutoFill

Home | Articles & Press Releases | Directories | Events & Meetings | What's New | About Us | Fact Sheets | Green Links

 **SF Environment**

 ENVIRONMENTALLY RESPONSIBLE DENTISTRY SAN FRANCISCO

Environmentally Responsible Dentistry Program

Many people do not realize that dental offices use and generate potentially hazardous substances. In dental practices, the most common hazardous substance is amalgam, a material used in "silver" fillings that contains 40-50 percent mercury by weight. Mercury is a toxic pollutant that accumulates in the body and is well known to cause harm to human health and the environment.

Other hazardous substances associated with dental offices include lead and silver from x-ray processing and compounds used to chemically sterilize equipment. These substances can NEVER be placed in the trash or poured down the drain.

Hazardous wastes mistakenly thrown in the trash contaminate air if the waste is incinerated, or land and ground water if sent to landfill. Wastewater containing mercury and other regulated substances may end up in the Bay where it accumulates in the tissues of fish, making them unsafe for human consumption, and devastates aquatic systems. Mercury is of particular concern in San Francisco Bay where the California Department of Health Services has issued fish consumption warnings due to the high mercury levels.

In an effort to reduce the amount of mercury entering the Bay, the City and County of San Francisco's Public Utilities Commission (SFPUC) and Department of the Environment (SF Environment) have worked with the San Francisco Dental Society to design a program to

Lessons Learned

- **Provide Incentives**
- **Cross train**



Measure success

Handholding

Outreach Outreach Outreach

Develop Strategies → Voluntary vs. Mandatory

Start with Partnerships → POTWs, Public Health & Dental Societies

Discussion Groups

Working w/
Local Dental
Society

X-Ray
Issues

Amalgam
Issues

Infection
Control
Issues

Wrap - Up



- Discussion Results
- What We Covered
- Open Issues
- Finding More Info
- Acknowledgements

More Info

Dental P2 - Where To Get More Info

American Dental Association

<http://www.ada.org/>

State Dental Associations

<http://www.azda.org/>
<http://www.cda.org>
<http://www.hawaiidentalassociation.net/>
<http://www.nvda.org/>

EPA Region IX - Dental P2 Project

<http://www.westp2net.org/dental/index.cfm>

SF Environment

<http://www.sfenvironment.com/aboutus/toxics/dentistry/resources.htm>

SF Water

http://sfwater.org/main.cfm/MC_ID/4/MSC_ID/85

City of Palo Alto

<http://www.city.palo-alto.ca.us/cleanbay/dental.html>

City of San Francisco - P2 Workshop Series

http://sfwater.org/detail.cfm/C_ID/1844/MC_ID/4/MSC_ID/85/MTO_ID/159

Seattle / King County

<http://dnr.metrokc.gov/wlr/indwaste/>

State of Washington

<http://www.ecy.wa.gov/dentalbmps/>

Union Sanitary District

http://www.unionsanitary.com/environmentalprograms/commercial/mer_red_prog.htm