ADEQ Arizona Department of Environmental Quality

RESOURCE SUMMARY

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Pollution Prevention (P2) for Dental Offices

Dental offices handle a variety of toxic substances and produce a range of hazardous, universal and solid waste. Dentists in the US discharge approximately 5.1 tons of mercury each year to the publicly owned treatment works (POTW).[1] To help prevent such pollution, try the following best management practices.

Dental Amalgam and Mercury

Dental amalgam is a mixture of liquid mercury and a powdered alloy containing silver, tin and copper.[2] The amount of amalgam and mercury used by dentists that enters the POTW can be reduced using best management practices and techniques.

Things a dental office can do:

Consider alternatives — Dental amalgam fillings should be substituted, when appropriate, with composite resin, glass ionomer, porcelain or gold alloys.[3] Phase out any mercury-containing equipment, such as thermometers and pressure monitors by switching to mercury-free alternatives, such as digital thermometers and aneroid or electronic pressure monitors.[4] Use line cleaners that minimize the dissolution of amalgam and avoid chlorine-containing cleaners.[5]

Avoid mercury and metals waste — Consider using pre-capsulated alloys and stock a variety of capsule sizes to reduce waste. Use amalgam separators to capture amalgam before it is discharged from the dental office.[4] Ensure that the cartridges are replaced at the recommended maintenance schedule. Use best management practices such as chair-side traps and vacuum pump filters that can capture mercury and metals for recycling.[4]

Do not dispose of mercury-containing waste with biohazardous waste. Instead, look for a metal recycler that will accept used amalgam capsules and teeth that contain amalgam. Review all applicable regulations and check with state agencies and your recycler for storage and disposal requirements.[4]

Measure amalgam accurately so that you only use what is needed for the procedure to avoid excess amalgam mix. Clean and replace sink traps regularly to ensure that mercury does not accumulate in them.

Consult the American Dental Association's Amalgam Separators and Waste Best Management and the EPA's Mercury in Dental Amalgam for more information.[4 6]

Best P2 Practices for Dental Offices

Waste management — Establish a dental waste management system and educate employees and cleaners on how to handle the different types of hazardous wastes in the office. Elements of good waste management include:

- Protecting lead aprons with a durable sleeve to maximize their use.
- Checking with recyclers to see if lead foils and aprons or shields can be recycled.
- Managing the inventory of any pharmaceuticals to minimize the risk of expired material or spills.
- Contacting suppliers about pharmaceutical take-back programs and, if possible, returning unused or expired material instead of disposing of it as hazardous waste.[7]

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Minimize X-rays — Instead of traditional X-rays that result in fixer that generates silver waste, consider using digital photography to capture images of the teeth.[8] If using silver-containing X-ray fixer, consider installing a silver recovery unit or sending used fixer off-site for metals reclamation.

Assess materials currently in use — Eliminate the need for toxic cold sterilizers (e.g., glutaraldehyde) by selecting instruments that can be heat sterilized and reused.[9] Investigate the use of ultrasonic cleaning devices to reduce chemical use. Evaluate the active ingredients in the bath solution and consider less toxic or enzyme-based cleaners. Consider using an autoclave (steam-based) or using a dry heat oven versus chemiclave for sterilization if the instrument allows.

Consider digitized charts, billing and e-mail notifications and texts for appointment reminders. Use a dry vacuum system and turn off faucets and water lines when not in use.

Reduce harmful chemicals — Use Bisphenol A (BPA) free adhesives and sealants. If using chemicals for sterilization, research less toxic alternatives. Use the least amount of chemical to achieve the required result and follow manufacturer directions when mixing. Also consider green disinfectants and cleaners with fewer toxic chemicals for equipment lines and general sanitation. See EPA's Safer Choice program website for more information.[10]

References

[1] EPA. Dental Effluent Guidelines.
[2] US Food and Drug Administration. About Dental Amalgam Fillings.
[3] International Academy of Oral Medicine and Toxicology. Alternatives to Mercury Amalgam Fillings.
[4] Healthcare Environmental Resource Center. Mercury in Healthcare Facilities.
[5] American Dental Association. Oral Health Topics: Amalgam Separators and Waste Best Management.
[6] EPA. Mercury in Dental Amalgam.
[7] Healthcare Environmental Resource Center. Managing Specific Wastes—Pharmaceutical Wastes.
[8] US National Library of Medicine National Institutes of Health, Dental Office Waste—Public Health and Ecological Risk.
[9] Appropriate Use of "Cold Sterile" Solutions for Dentistry.
[10] EPA. Safer Choice Program.

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