Mercury Dental Amalgam Collection and Recovery
U.S. Federal and State Models

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Purpose

• Summarize the issue of mercury use, releases, and environmental fate of waste dental amalgam

• Provide examples of how U.S. EPA and the Commonwealth of Massachusetts are addressing collection and recycling
Dental Amalgam Use in the U.S.

• Use of dental amalgam has declined in the past two decades, but accounts for ~30 percent of dental fillings in the U.S.

• EPA estimates ~160,000 dentists working in more than 120,000 dental offices use or remove amalgam

• Mercury can be released when mercury-containing fillings are placed or drilled out, as well as disposal of excess amalgam stocks

• Waste amalgam materials that are flushed into chair-side drains enter the solid waste stream
Mercury Amalgam Waste in the Environment

• Publicly Owned Treatment Works (POTWs)
  – At ~90 percent efficiency, some amalgam in wastewater reaches lakes, rivers, and streams

• Medical Waste Incinerators
  – Medical waste “red” bags incinerated at facilities not designed to handle mercury component of amalgam

• Landfills
  – If disposed in garbage, can reach landfills and potentially leach into groundwater

• Fertilizer
  – Sludges from POTWs may be applied to agricultural lands as fertilizer
Best Management Practices

  - Amalgam separators
  - Precapsulated alloys
  - Proper disposal and recycling of captured amalgam
  - Avoiding the use of oxidizing cleaning agents and heat disinfection for amalgam containing materials
• Office of Water
  – EPA's 2008 Final Effluent Guidelines Plan did not identify the dental sector for an effluent guidelines rulemaking

  – EPA is pursuing voluntary measures to increase installations and use of amalgam separators and best management practices
    • Stated in the December 2008 Memorandum of Understanding (MOU) on Reducing Dental Amalgam Discharges
    • The purpose of the MOU is to have dental offices install and properly maintain amalgam separators, and recycle the collected amalgam waste
• Office of Solid Waste and Emergency Response
  – EPA is developing strategies to enhance amalgam waste management in dental offices

  – When abbreviated, the specific actions spell “G.R.I.T.”
    • Gray bag it…
      – Discard excess amalgam wastes into a special waste “gray” bag
      – Never dispose of dental amalgam wastes in medical waste “red” bags or in office trash containers
    • Recycle it…
      – Select a responsible dental amalgam recycler who will manage waste amalgam safely to limit the amount of mercury which can go back into the environment
    • Install it…
      – Install an amalgam separator in the office to capture up to 95 percent of the mercury leaving a dental office through drains
    • Teach it…
      – Educate and train staff about the proper management of dental amalgam in the office
• Voluntary
  – State and local voluntary management programs are based on or derived from the 2007 ADA guidance

• Mandatory
  – The Clean Water Act allows states to pursue more stringent actions than are called for at the Federal level
  – Nine states, including Massachusetts, have chosen to implement mandatory amalgam separator programs
• Initial efforts in June 1998, pursuant to regional U.S.-
  Canadian Action Plan
  – Plan set phased percentage reduction goals for 2003, 2010, and
    Long-Term

• In 2001, initiated voluntary program
  – Outreach conducted through State Dental Association and other
    professional meetings
  – Achieved only modest increases in use of amalgam separators

• In 2004, announced that regulations requiring amalgam
  separators and other BMPs would be adopted in 2006
  – Phase II: Adoption of mandatory requirements (2006)
• Phase I – Early Compliance Program
  – Relied on self-certification via Internet filings, subject to penalties
  – Enforced via compliance audits
  – Incentives
    • Waived permit fees
    • Retroactively recognized previously installed systems
    • Offered better incentives for earlier participation
• Phase II – Mandatory Program
  – Applies to dental practices likely to generate wastewater containing amalgam mercury
    • Includes general dentists, pediatric dentists, endodontists, prosthodontists
    • Exempts oral surgeons, periodontists, orthodontists
  – Requires
    • Install amalgam separator for every dental chair where waste amalgam is generated
      – System must remove 95 percent of amalgam waste based on ISO 11143 protocol
    • Maintain and operate separators according to manufacturer specifications
    • Use only pH neutral cleaners with vacuum lines
    • Recycle all mercury-containing amalgam waste
    • Keep records to document that program requirements are met
• Results
  – More than 70 percent of dentists certified under the voluntary compliance program
  – Regulations mandating the use of amalgam separators adopted on schedule in 2006
  – Compliance audits indicate more than 95 percent of covered practices installed separators
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