

# **Environmental Factors: Mercury and Fluoride Behavioral Factors: Sodas and Vaping**

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## At Issue:

- Mercury
- Fluoride
- Erosion
- Vaping

# Mercury

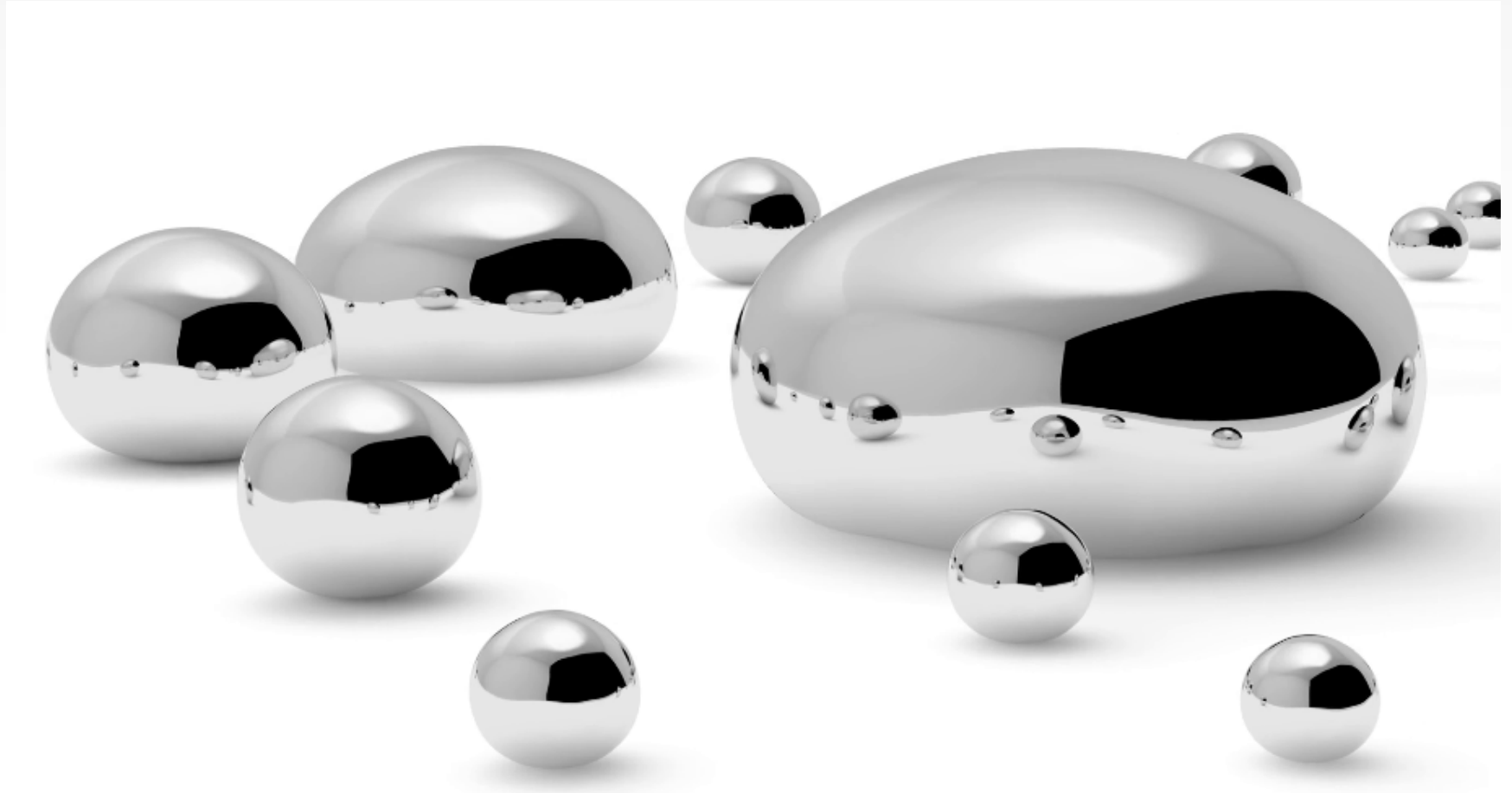


**Kentucky Public Health**  
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# Mercury!



# Mercury!



# Mercury

- Metal
  - Liquid at room temp
  - Uses
    - Home thermometers
    - Industrial meters
    - Dental Amalgam

# Mercury as a Poison?

- Methods of Intake
  - Ingestion
  - Respiration
  - Dermal Transference

# Mercury in Dental Fillings





# Mercury in Dental Fillings

- First Use as a Filling Material
  - 659 A.D.
  - China
- Most Popular and Effective Restorative Material
  - Low Cost
  - Pre-1970
    - 75% Fillings Were Amalgam
  - Post-1970
    - 50% of All Fillings are Amalgam

# Mercury in Dental Fillings: Less Now

- Why?
  - Reduced Decay Rates in Adults
  - Frequent Use of Crowns
  - Tooth Colored (Resin-based) Materials

# Mercury: People's Concerns: Nice, White Fillings



**Amalgam Fillings**



**Composite White Fillings**

# Mercury: People's Concerns

- Poison?
  - Removal is “Necessary”
  - They Look Better
  - White Fillings are “better” Fillings
- Allergy

# Mercury: People's Concerns

- Systemic Health
  - Neurological
    - No Evidence to Suggest Adverse Health Effects in General Population
      - Even in Children



# Mercury in Dental Fillings: Full Disclosure

- Anti-Mercury Advocates say Mercury fillings impact systemic and mental health systems

# Mercury: Dental Strong Points

- Amalgam
  - Low Cost
  - Durable
  - Non-irritating to the Pulp
- White Colored Filling Material
  - More expensive
  - Shorter Lifespan
    - “Washout”
    - Fractures and Abrasion
  - Irritating to the Pulp

# White Fillings: Dental Concerns





# Mercury: Dental Strong Points

- Exposure from Amalgam Fillings is Very Small
- Does Not Unnecessarily Pose a Health Hazard
  - Removal of Amalgam Fillings (who otherwise exhibit no adverse effects)
    - Not Recommended
    - Could Put the Person at Greater Risk



# Mercury in Dental Fillings

- Should We Worry?
- Let's Look at Other Sources of Mercury



# Mercury: Other Environmental Sources

- Air and Water Quality
- Fish

# Mercury: Air Quality





# Mercury: Other Environmental Sources

- Mercury Emissions in Air
  - Major Source
    - Coal Burning Plants

# Mercury: Fish Intake



# Mercury: Common Sense and Facts

- Fish Intake
  - Shark and Swordfish
  - Naturally High in Mercury
  - Contaminated Waters
- Water Quality Reports
- Watch for Public Information Bulletins

# Mercury: Common Sense and Facts

- The Science Says:
  - Amalgam Fillings are Safe and Preferable in Many Patients, Especially
    - High Risk for Decay
    - Low Dental IQ and Value
    - Medicaid Population
      - Public Investment



# Mercury: Final Slide

- Quote:
  - Everyone is exposed to mercury through air, drinking water, soil and food.
  - Studies have shown that the amount of mercury you are exposed to from your fillings is less than the amount that most people are exposed to in their daily environment or in the food they eat.

# Fluoride



# Fluoride!

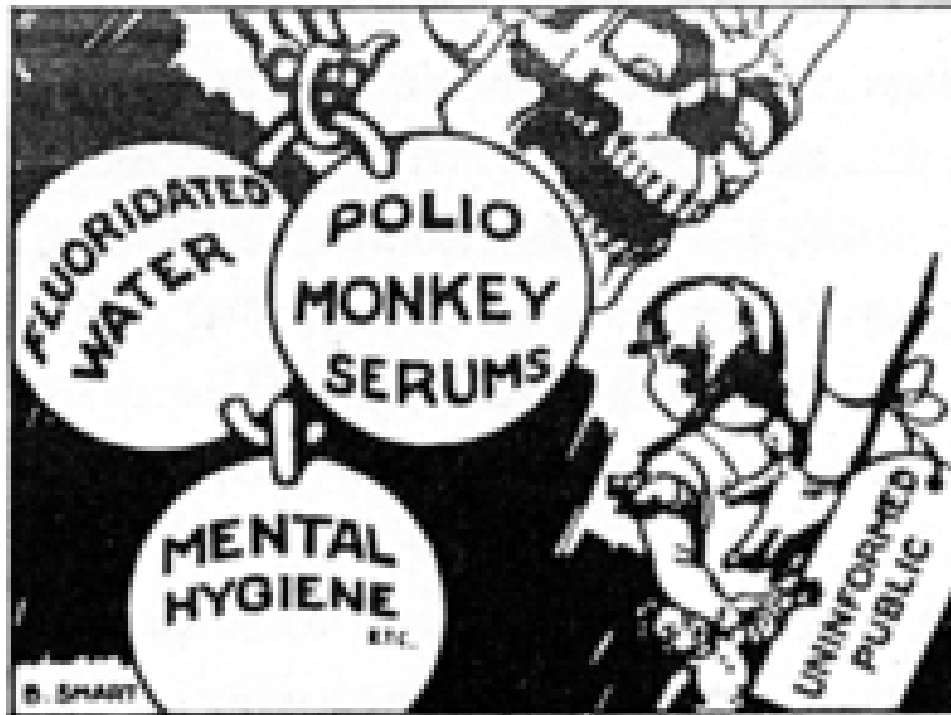


# Fluoride!

<p>9</p> <p><b>F</b></p> <p>Fluorine</p> <p>18.9984032</p> <p><math>1s^2 2s^2 2p^5</math></p> <p>17.4228</p>	<p>10</p> <p><b>Ne</b></p> <p>Neon</p> <p>20.1797</p> <p><math>1s^2 2s^2 2p^6</math></p> <p>21.5645</p>
<p>8</p> <p><b>O</b></p> <p>Oxygen</p> <p>15.9994</p> <p><math>1s^2 2s^2 2p^4</math></p>	<p>18</p> <p><b>Ar</b></p> <p>Argon</p> <p>39.948</p> <p><math>1s^2 2s^2 2p^6 3s^2 3p^4</math></p>

# Historical Opposition

At the Sign of **THE UNHOLY THREE**



Are you willing to **PUT IN PAWN** to the **UNHOLY THREE** all of the material, mental and spiritual resources of this **GREAT REPUBLIC**?



# Fluoride: What is it?

- Naturally Occurring Mineral
  - Number 9 on the Periodic Table
  - Very Small Ion When Dissolved
- Found with Limestone Veins
- Naturally Found in Ground Water Sources

# Fluoride: How Do We Get It?

- Community Water Systems
- Toothpaste
- Rinses
- Professional Topical Applications
- Supplements



## Fluoride:

- Today's Focus
- Community Water Fluoridation



# Fluoride in Community Water: History

- CDC Recommendations
  - 1962
    - 1.0 PPM
  - 2015
    - 0.7 PPM
  - 2018
    - Range of 0.6 PPM-1.2PPM

# Fluoride in Community Water: History

- Why the Change?
  - Toothpastes
  - Rinses
  - Professional Topical Application
  - Community Water is everywhere
    - Canned and Frozen Vegetables
    - Bottled Water
    - Soft Drinks

# Fluoride in Community Water: Full Disclosure:

- Causes Resistance of Domination
  - Submission
- “Narcotising” Certain Area of the Brain
- German and Russian Prisoner of War Camps
- Increases in:
  - AIDS, Alzheimer’s, Arthritis, Cancer (sounds like Hg)
  - Low IQ
  - Body Systems such as: GI, Kidney, Pineal Gland

# Fluoride in Community Water:

- Low and Safe Levels
- Beneficial at All Ages
  - Children Most Impacted
- Low Cost
  - About \$1.00 per person per year (U.S.)
  - About \$.25-\$.65 per person per year (KY)
- Fluoridation Costs for a Lifetime
  - Less Than the Cost of ONE Filling

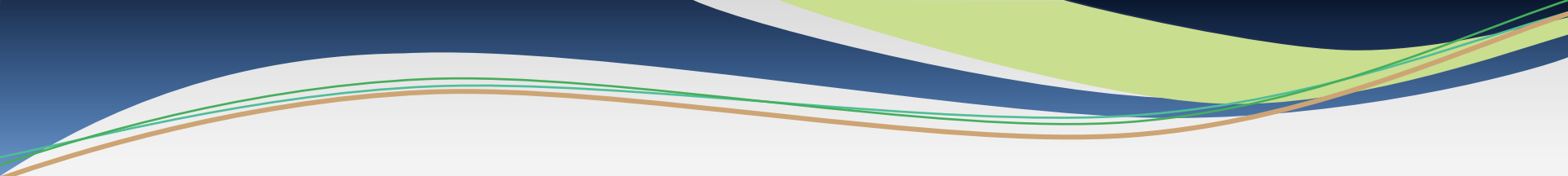
# Fluoride in Community Water: Dental Concerns

- Fluorosis
  - Cosmetic in Nature and Extent
  - Rare
  - Resistant to Decay



# Common Sense:

- The Science Says:
  - Fluoride is safe
  - Fluoridated Water IS Public Health
  - The Greater Good
  - Studies prove it over and over again
    - Good Science, that is.



**“All substances are poisons;  
there is none which is not a poison.  
The right dose differentiates  
a poison from a remedy.”**

Paracelsus, 16<sup>th</sup> Century  
Alchemist and Physician



# **Soda Consumption Enamel Erosion**

Not going to take a lot of time here







# Causes

- Sodas
  - Even diet sodas
  - Energy Drinks
- Fruit Drinks
- Commercially bottled Iced teas

# Enamel Erosion

- Is NOT decay
- Is a different process
  - Absent a microbe
  - “Clean” surfaces of erosion



# Enamel Erosion

Cause

Increased acidity in the oral cavity

Plain and simple



# Scary Stats

- 77% of High School Seniors had a soda in the last 7 days (of the survey completion)
- 35% had at least one a day
- 28% had at least two a day
- 16% had at least three a day
- Kentucky consumes over one billion cans of soda a year

# The Obligatory Nasty Pictures



# The Obligatory Nasty Pictures



# The Obligatory Nasty Pictures



# Symptoms

- Tooth Pain
- Discoloration
- Transparency
- Cracks and Chips
- Need for repair
  - Habit must be curbed
- (GERD and bulimia)



# Treatment

- Difficult to restore
- Habit remains
- Full crowns

# Vaping: Impacts on Oral Health



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# Vaping Processes

- Propylene glycol
  - Big component
  - Breakdown
    - Acetic acid
    - Lactic acid
    - Propionaldehyde
- PG is very hygroscopic
  - produces dessication

# Vaping Results (orally)

- Xerostomia
- Caries
- Periodontal disease

# Vaping Processes

- Vegetable Glycerin
  - Another component of E Liquid
  - Colorless, odorless, viscous (key) and sweet
  - Alone doesn't cause a decay (MS doesn't feed on it) but it the viscousness helps MS stick better
  - But, paired with flavors, it makes the bacteria there anyway four times stickier than usual

# Vaping Results

- Paired with flavors, 27% decrease in enamel hardness compared to unflavored
- More decay on top of the propylene glycol impact
  - in the pits and fissures more than the smooth surfaces

# Vaping Processes

- Nicotine (when present)
  - Detrimental to soft tissue (gums)
  - Vasoconstrictor
  - Impedes local immune cell function



# Vaping Results

- Higher chance of gum disease and tooth loss



# Vaping Processes

- Lithium Batteries
  - Over heating
  - Exploding

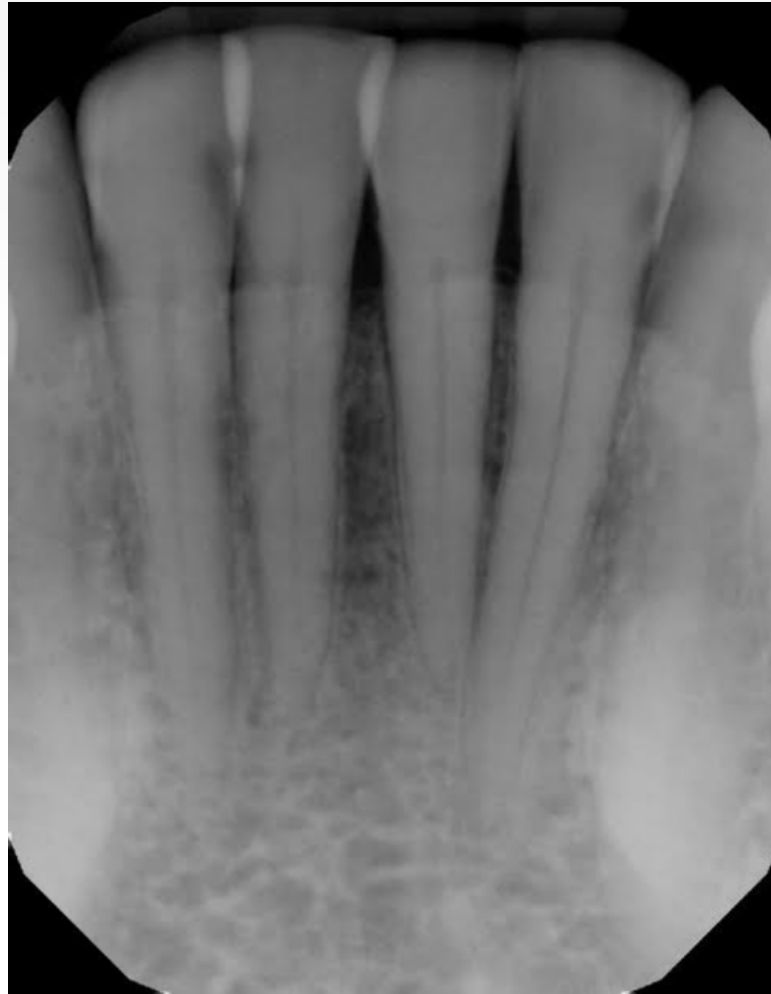
# Vaping Results

- Soft Tissue Trauma
  - Difficult to repair
- Hard Tissue Trauma
  - Fracture Teeth
  - Tooth Loss

# The Obligatory Nasty Pictures



# The Obligatory Nasty Pictures



# The Obligatory Nasty Pictures





**Now that you are grossed out--**

**Questions?**

# Mercury and Fluoride Erosion and Vaping

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