Caries Management Course Module: Water Fluoridation

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50 year Anniversary of Water Fluoridation

• ~1962 US Public Health Service made a recommendation that community water fluoridation (CWF) would have a significant impact on dental health
• Water Fluoridation Statistics

50 year Anniversary of Water Fluoridation

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• Recommended 0.7-1.2 ppm of Fluoride in the water
50 year Anniversary of Water Fluoridation

• ~1962 US Public Health Service made a recommendation that community water fluoridation (CWF) would have a significant impact on dental health
• **Recommended 0.7-1.2 ppm of Fluoride in the water**
• **1950s: Warmer Climates have Higher water consumption**

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The old way of thinking

Based on evidence:
At the time, warmer climates had higher water consumption and needed lower overall fluoride in the water.

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Re-thinking

• Recent Studies of water consumption suggest there may be no need for recommending different water fluoridation based on mean maximum temperature

• Reference Link: Heller et al Journal of Public Health 1999

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The New way of thinking

0.7 ppm across the country. Reduce Fluorosis Risk
But what is different now?

- Climate controlled housing (AC)
- Fluoride is more ubiquitous in 2014:
- Especially in processed foods!
- Different than 1962
- Fluoride Toothpaste and mouthwashes
- Supplements

More Sources of Fluoride

<table>
<thead>
<tr>
<th>Years Born</th>
<th>Very Mild to Severe Fluorosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-1980</td>
<td>~ 22.8%</td>
</tr>
<tr>
<td>1981-1996</td>
<td>~32%</td>
</tr>
</tbody>
</table>

Posterior Teeth are more effected than Anterior Teeth
Reference Link: CDC Surveillance Survey

The new way of thinking

- US Department of Health and Human Services has *proposed* a new universal ~0.7 ppm water fluoridation.
- Balance the risk of decay with risk of fluorosis, especially for children under 8 years of age.

EPA

- EPA (which is in charge of excess range) may rule on lowering the allowable maximum amount.
- Current:
  - Maximum for adverse health is 4 ppm
  - 2ndary maximum for esthetics is 2 ppm
Addressing Parental Concerns

Adjusting (lowering) the F-level because now:

- We promote *earlier* visits to the Dentist
- We assess risk for decay *earlier*
- To determine *early* use of F-Toothpaste/Supplements
- We have more *effective* Dental Fluoride Applications (varnish)

Caretaker Concerns

- For urban minority preschoolers
  - 40% drank bottled water exclusively
- For caretakers
  - Less than 50% were aware of fluoride in their drinking water

Reference Link: Drinking Preference Among Minorities

We strive to reduce minor esthetic concerns (white blotching)

The authors of this publication cited that immigrants may associate tap water with illness:

Reference Link: Water Use

It is important to keep a cultural competency when addressing water fluoridation
Fluoride

- Reduces enamel solubility
- Promotes remineralization of enamel, and may arrest or reverse early caries
- Higher levels inhibits the growth of cariogenic organisms, thus decreasing acid production
- Concentrated in dental plaque
- Primarily topical even when given systemically

Fluoride: more is not always better

- Too Much Fluoride can affect the development of permanent teeth (fluorosis)

Additional Concerns

- Risk of Dental Fluorosis can be an issue with 2-3 year olds.
  - Reference Link: Critical Periods in Fluorosis
- But there are issues with infants ingesting formula reconstituted with fluoridated water
  - Reference Link: Reconstituted Formula
CDC warning with Infant Formula

- CDC reports Risk of Mild Fluorosis for exclusive bottle use 0-12 months.
- Infant Formula-Reconstituted with F tap water

CDC Recommendation

- CDC recommends using 'some of the time' distilled, de-ionized, or purified water (bottle water) for reconstitution.
- No clear evidence for tap/bottled ratio

Brita® Filters (Charcoal Filters)

- DOES NOT REMOVE FLUORIDE
- It Mainly removes Chlorine Compounds used to keep water supplies safe but causes aftertaste.
- It removes organics (e.g. bacteria) and particles through absorption.

Fluoride in Bottled Water?

Bottlers are actually not required to list if fluoride is in their bottled water.

- 65 bottled water brands, only 5% listed fluoride content on their labels and 80% contained a suboptimal level of fluoride.
- A large degree of variability often exists between differing batches of the same brand of water.

Reference Link: Fluoride in Bottled Water
Reference Link: Accuracy of Fluoride in Water
Purchase Water for Mixing Baby Formula

- Non-Fluoride for Mixing Baby Formula
- Fluoride for Older Child (0.7 ppm)

Supplements

6.7% of prescribing dentists routinely test fluoride levels in a patient's drinking water.

Reference Link: Dentists and Fluoride Supplements

Talking with Parents: Your Child and Tap Water with Fluoride

Reference Links:
- Your child is more likely to not have ANY cavities
- At least 2-3 teeth are SAVED from cavities by tap water with fluoride, and if your child does get cavities, the decay is less severe.
- There is a lifetime benefit.

ADA Guide for High Risk Children

- Below is the ADA current recommendation for high risk children in non-fluoridated communities when the current drinking water is a certain concentrations. 1 ppm = 1 mg/liter.

<table>
<thead>
<tr>
<th>Age</th>
<th>&lt;0.3 ppm F</th>
<th>0.3-0.6 ppm F</th>
<th>&gt;0.6 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth-6 months</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>6 months-3 years</td>
<td>0.25 mg/day</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>3 years-6 years</td>
<td>0.25 mg/day</td>
<td>0.5 mg/day</td>
<td>None</td>
</tr>
<tr>
<td>6-16 years</td>
<td>1.0 mg/day</td>
<td>0.5 mg/day</td>
<td>None</td>
</tr>
</tbody>
</table>
Supplements

• It is unclear if the ADA will make any future changes to fluoride supplements.
• Is it to achieve optimal fluoridation or address caries risk?
• ADA does not recommend supplements to low risk children

Conclusion

• Dentists need to address a patient’s fluoride exposure in their drinking water.
• Integrate water fluoridation exposure in a caries management plan