“The Power of Prevention”

George J Martinez  National Prevention Specialist
PREVENTION:
THE ACT OR PRACTICE OF STOPPING SOMETHING BAD FROM HAPPENING

To protect the patient from future disease.
Understanding The Caries Process

No Cavity

- Adhesion
- Colonization
- De- & Re- mineralization
- White spot

Cavity

- Enamel lesion
- Dentin lesion
- Pulpal lesion

Time

Dr. Joel Berg
Professor, Dept of Pediatric Dentistry
University of Washington
“Dental Caries is a bacterially based, infectious, transmissible disease that progresses when acid produced by bacteria travels into the tooth and dissolves the carbonated hydroxyapatite mineral.

The Caries Balance: Contributing Factors and Early Detection
John D.B Feathersone, MS, PhD
CDA Journal vol 31 No 2

#1
Active caries
The Caries Balance

**Pathological Factors**
- Acid producing bacteria
- Frequent eating / drinking of fermentable carbohydrates
- Sub-normal saliva flow and function

**Protective Factors**
- Saliva flow with its components
- Fluoride, calcium and phosphate
- Antibacterial from extrinsic sources

If the *protective factors* prevail, the caries process is halted or reversed.”

John Featherstone, Community Dent Oral Epidem
The Caries Balance

Pathological Factors
• Acid producing bacteria
• Frequent eating / drinking of fermentable carbohydrates
• Sub-normal saliva flow and function

Protective Factors
• Saliva flow with its components
• Fluoride, calcium and phosphate
• Antibacterials from extrinsic sources

Demineralization
WSL
Caries

Health
Frequent snacks between meals represents a constant acid challenge for children of all ages.
### Erosion

**THE THRESHOLD FOR ENAMEL SOLUBILITY IS A 5.5 PH**

**SOURCE: MINNESOTA DENTAL ASSOCIATION**

<table>
<thead>
<tr>
<th>Product</th>
<th>pH &lt; 5.5 is BAD</th>
<th>Sugar (tsp) per 12 oz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Acid</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Pepsi</td>
<td>2.5</td>
<td>9.8</td>
</tr>
<tr>
<td>Coke Classic</td>
<td>2.6</td>
<td>9.3</td>
</tr>
<tr>
<td>Orange Minute Maid</td>
<td>2.8</td>
<td>11.2</td>
</tr>
<tr>
<td>Hawaiian Fruit Punch</td>
<td>2.8</td>
<td>10.2</td>
</tr>
<tr>
<td>Dr. Pepper</td>
<td>2.9</td>
<td>9.5</td>
</tr>
<tr>
<td>Gatorade</td>
<td>3.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Surge</td>
<td>3.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Mountain Dew</td>
<td>3.2</td>
<td>11.0</td>
</tr>
<tr>
<td>Red Bull</td>
<td>3.3</td>
<td>?</td>
</tr>
<tr>
<td>Diet Coke</td>
<td>3.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Diet Dr. Pepper</td>
<td>3.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Sprite</td>
<td>3.4</td>
<td>9.0</td>
</tr>
<tr>
<td>Diet 7-Up</td>
<td>3.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Orange Juice</td>
<td>4.1</td>
<td>?</td>
</tr>
<tr>
<td>Barq's Root Beer</td>
<td>4.6</td>
<td>10.7</td>
</tr>
<tr>
<td>Milk</td>
<td>6.5</td>
<td>?</td>
</tr>
<tr>
<td>Tap water</td>
<td>7.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Springwater</td>
<td>7.9</td>
<td>0.0</td>
</tr>
</tbody>
</table>
## Ph and ingredient comparison

### October issue of Dimensions of Dental Hygiene.

<table>
<thead>
<tr>
<th>Brand</th>
<th>Ph</th>
<th>Carbs per Per serving (g)</th>
<th>Caffein</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMP</td>
<td>2.7</td>
<td>30</td>
<td>75</td>
<td>130</td>
</tr>
<tr>
<td>Coca-Cola</td>
<td>2.5</td>
<td>27</td>
<td>34</td>
<td>97</td>
</tr>
<tr>
<td>Coffee</td>
<td>5.5</td>
<td>0</td>
<td>139</td>
<td>0</td>
</tr>
<tr>
<td>Full Throttle</td>
<td>1.45</td>
<td>14.5</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>Monster</td>
<td>2.7</td>
<td>27</td>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>Mtn Dew</td>
<td>3.2</td>
<td>46</td>
<td>36</td>
<td>110</td>
</tr>
<tr>
<td>Red Bull</td>
<td>3.3</td>
<td>28</td>
<td>80</td>
<td>110</td>
</tr>
<tr>
<td>Rock Star</td>
<td>1.5</td>
<td>15.5</td>
<td>80</td>
<td>140</td>
</tr>
</tbody>
</table>
#2
Frequent eating or drinking fermentable carbohydrates
Importance of Normal Saliva Flow

SALIVA PROPERTIES:

- DELIVERS FLUORIDE TO STRENGTHS THE ENAMEL.
- DELIVERS CALCIUM AND PHOSPHATES (REMINERALIZATION).
- ANTIBACTERIAL SUBSTANCES (MICROBES MULTIPLY 10 TIMES FASTER).
- BUFFERS THE PH.

CAUSES OF XEROSTOMIA: MARCH2008,60-65, RDHMAG.COM
CIANCIO S. (2004). MEDICATIONS’ IMPACT ON ORAL HEALTH. JADA,135,1440-1448

A normal saliva flow is about 3 to 4 pints a day
A restricted saliva flow means less protective effects
Xerostomia: The most underrated risk factor

- MEDICATIONS
  Antianxiety, Antidepressants, Antipsychotic, Antihistamines.
- Genetics
- Diseases
- Radiation to head and neck and chemotherapy can knock out salivary glands
Significant Six

1. Active decay (Peridex)
2. Frequent eating or drinking of fermentable carbohydrates
3. Subnormal saliva flow
4. Cancer treatment to head or neck (Severe High Risk)
5. Active orthodontic treatment
6. Exposed roots

No More Excuses Caries Management
Caries Management by Risk Assessment

Significant Six Protocol
Protocol for High Caries Risk

Enamel Saturation and Bacteria Control

• Fluoride Varnish
• Brush 5 times a day with OTC strength toothpaste
  or nightly with 5000 PPM of sodium fluoride (Clinpro 5000)
• Caries active - Rinse in the morning with Peridex daily for one week
• Xylitol
• Sealants

Periodic oral exam every 3 - 4 months
• Review compliance with medications and oral hygiene
• Fluoride varnish
“Dental caries is a bacterially based, transmissible, infectious, communicable disease. Because dental caries is a bacterially derived disease, it is necessary to deal with a high bacterial challenge because fluoride alone, in many instances, will not adequately deal with the challenge.”

Tooth Decay (Caries): occurs only when all three factors are present

Dental Caries

Plaque Bacteria

Tooth Surface

Fermentable Carbohydrates
Are you treating the symptoms and the causes?

If we mechanically repair cavities while ignoring the disease that caused them, did we cure this patients?
Using Topical Fluoride Agents for Caries Management and Prevention

**Determination of Caries Risk:** There are many systems to determine caries risk [see ADA*, AAPD**].

**Individual risk factors increasing risk for developing caries may include, but are not limited to:**

- Active caries in previous 12 months
- High titer of cariogenic bacteria
- Poor oral hygiene
- Drug/alcohol abuse
- Poor family dental health
- Cariogenic diet
- Genetic abnormality of teeth
- Many multi-surface restorations
- Chemo or H/N radiation therapy
- Eating disorders
- Active orthodontic treatment
- Irregular dental care
- Suboptimal fluoride exposure
- Developmental or acquired enamel defects
- Prolonged nursing (bottle or breast)
- Presence of exposed root surfaces
- Restoration overhangs and open margins
- Physical or mental disability with inability or unavailability of performing proper oral health care
- Xerostomia (medication, radiation, or disease-induced)

<table>
<thead>
<tr>
<th>Recommended Topical Fluoride Agents</th>
<th>Fluoride Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPM Fluoride</td>
</tr>
<tr>
<td>Professionally-applied Agents:</td>
<td></td>
</tr>
<tr>
<td>2.26% fluoride varnish</td>
<td>22,600</td>
</tr>
<tr>
<td>Acidulated phosphate fluoride (APF) gel (with 0.1 M phosphoric acid)</td>
<td>12,300</td>
</tr>
<tr>
<td>Prescription-strength, Home-Use Agents:</td>
<td></td>
</tr>
<tr>
<td>Gel or paste with or without accluation (0.1M phosphoric acid)</td>
<td>5,000</td>
</tr>
<tr>
<td>Mouthrinse</td>
<td>900</td>
</tr>
</tbody>
</table>

The following were not reviewed, but are presented as a reference:

**Over-the-counter Strength:**
- Toothpaste with 1150 ppm (0.12%) fluoride or less [i.e., 0.25% sodium fluoride]
- Mouthrinse with 100 ppm (0.01%) or 225 ppm (0.02%) fluoride [i.e., 0.02/0.05% sodium fluoride]

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* [ADA.org/5157.aspx?currentTab=2](http://ADA.org/5157.aspx?currentTab=2)
Clinical Recommendations for Use of Professionally-Applied or Prescription-Strength, Home-Use Topical Fluoride Agents for Caries Prevention in Patients at Elevated Risk of Developing Caries

Strength of recommendations: Each recommendation is based on the best available evidence. The level of evidence available to support each recommendation may differ.

- **Strong**: Evidence strongly supports this intervention
- **In favor**: Evidence favors providing this intervention
- **Weak**: Evidence suggests implementing this intervention only after alternatives have been considered
- **Expert Opinion For**: Evidence is lacking; the level of certainty is low. Expert opinion guides this recommendation
- **Expert Opinion Against**: Evidence is lacking; the level of certainty is low. Expert opinion suggests not implementing this intervention
- **Against**: Evidence suggests not implementing this intervention or discontinuing ineffective procedures

<table>
<thead>
<tr>
<th>Age Group or Dentition Affected</th>
<th>Professionally-Applied Topical Fluoride Agent</th>
<th>Prescription-Strength, Home-Use Topical Fluoride Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Younger than 6 years</td>
<td>2.26% fluoride varnish at least every 3 to 6 months • In Favor</td>
<td>0.09% fluoride mouthrinse at least weekly • In Favor</td>
</tr>
<tr>
<td></td>
<td>2.26% fluoride varnish at least every 3 to 6 months • In Favor</td>
<td>0.09% fluoride mouthrinse at least weekly • In Favor</td>
</tr>
<tr>
<td></td>
<td>OR 1.23% fluoride (APF*) gel for 4 minutes at least every 3 to 6 months • In Favor</td>
<td>OR 0.5% fluoride gel or paste twice daily • Expert Opinion For</td>
</tr>
<tr>
<td>6-18 years</td>
<td>2.26% fluoride varnish at least every 3 to 6 months • In Favor</td>
<td>0.09% fluoride mouthrinse at least weekly • In Favor</td>
</tr>
<tr>
<td></td>
<td>OR 1.23% fluoride (APF*) gel for 4 minutes at least every 3 to 6 months • In Favor</td>
<td>OR 0.09% fluoride mouthrinse at least weekly • In Favor</td>
</tr>
<tr>
<td></td>
<td>OR 0.5% fluoride gel or paste twice daily • Expert Opinion For</td>
<td>OR 0.5% fluoride gel or paste twice daily • Expert Opinion For</td>
</tr>
<tr>
<td>Older than 18 years</td>
<td>2.26% fluoride varnish at least every 3 to 6 months • Expert Opinion For</td>
<td>0.09% fluoride mouthrinse daily • Expert Opinion For</td>
</tr>
<tr>
<td></td>
<td>OR 1.23% fluoride (APF*) gel for 4 minutes at least every 3 to 6 months • Expert Opinion For</td>
<td>OR 0.09% fluoride mouthrinse daily • Expert Opinion For</td>
</tr>
<tr>
<td></td>
<td>OR 0.5% fluoride gel or paste twice daily • Expert Opinion For</td>
<td>OR 0.5% fluoride gel or paste twice daily • Expert Opinion For</td>
</tr>
<tr>
<td>Adult Root Caries</td>
<td>2.26% fluoride varnish at least every 3 to 6 months • Expert Opinion For</td>
<td>0.09% fluoride mouthrinse daily • Expert Opinion For</td>
</tr>
<tr>
<td></td>
<td>OR 1.23% fluoride (APF*) gel for 4 minutes at least every 3 to 6 months • Expert Opinion For</td>
<td>OR 0.09% fluoride mouthrinse daily • Expert Opinion For</td>
</tr>
<tr>
<td></td>
<td>OR 0.5% fluoride gel or paste twice daily • Expert Opinion For</td>
<td>OR 0.5% fluoride gel or paste twice daily • Expert Opinion For</td>
</tr>
</tbody>
</table>

Additional Information:
- 0.1% fluoride varnish, 1.23% fluoride (APF*) foam, or prophylaxis pastes are not recommended for preventing coronal caries in all age groups (• Expert Opinion Against or • Against). See JADA publication for recommendation strength by age group. The full report, which includes more details, is available at ebd.ada.org.
- No prescription-strength or professionally-applied topical fluoride agents except 2.26% fluoride varnish are recommended for children younger than 6 years (• Expert Opinion Against or • Against), but practitioners may consider the use of these other agents on the basis of their assessment of individual patient factors that alter the benefit-to-harm relationship.
- Prophylaxis before 1.23% fluoride (APF*) gel application is not necessary for coronal caries prevention in all age groups (• Expert Opinion Against or • Against). See JADA publication for recommendation strength by age group. No recommendation can be made for prophylaxis prior to application of other topical fluoride agents. The full report, which includes more details, is available at ebd.ada.org.

*APF: Acidulated phosphate fluoride

Patients at low risk of developing caries may not need additional topical fluorides other than over-the-counter fluoridated toothpaste and fluoridated water.

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1 Weyant RJ, Tracy SL, Anselmo T, Beltran-Aguilar ED, et al. Topical Fluoride for Caries Prevention: Executive Summary of the Updated Clinical Recommendations and Supporting Systematic Review. JADA 2013;144(11):1279-1291. © 2013 American Dental Association. All rights reserved. Any other use, copying, or distribution, whether in printed or electronic format, is strictly prohibited without the prior written consent of the ADA.
Products and Medicaments

3M™ ESPE™ Preventive Care

[Image of various dental products and medicaments]
Fluoride

**FDA indicated to prevent dental caries**

Reduces tooth solubility
- A strong electro negative ion
  
  \[ \text{Ca} + \text{PO}_4 \quad = \quad \text{hydroxyapatite} \]
  
  \[ \text{Ca} + \text{PO}_4 + \text{fl} \quad = \quad \text{fluorapatite (up to 30,000 PPM fluoride)} \]

Enhances remineralization

Interferes with bacterial metabolism reducing acid production

*Clinically proven that reverses white spots*

First added to drinking water in 1940s (USA and Canada)

Types of fluorides
- Sodium (hard tissue)
- Stannous (hard and soft tissue)
- Acidulated phosphate (hard tissue)
Higher concentrations are recommended for patients with High Caries Risk.
Varnish
Vanish
5% Sodium Fluoride White Varnish

Functionalized Tri-Calcium Phosphate fTCP

- Teeth must be wet
- Invisible on teeth
- Migrates
- Tenacious on teeth
- Contains xylitol
Tri-Calcium Phosphate (TCP) – What is it?

- Mineral used in bone-related implant procedures
- Source of calcium and phosphate
- *Similar in structure to natural teeth*
- Resistant to acid
- Strong like enamel

Ease of solubility at pH 7.0*

ACP > TTCP > α-TCP > DCPD ~ OCP > β–TCP > HAP

ACP vs TCP
Prescription Strength Fluoride

3M™ ESPE™ Preventive Care
Clinpro™ 5000
Functionalized Tri-Calcium Phosphate fTCP

• Innovative formula containing fTCP
• Greater fluoride uptake than other 5000 ppm dentifrices
• Hardens teeth better than other 5000 ppm dentifrices
• RDA score of 60-gentle on root surfaces
• 4 oz package (6 month supply)
• One step patient use

Prevention of WSL and decay is better than trying to get rid of them once they exist
Just For Kids / Omni Gel

.4% stannous fluoride (970 ppm)

Home care: Brush nightly

For children with active decay or prevention
“Dental caries is a bacterially based, transmissible, infectious, communicable disease. Because dental caries is a bacterially derived disease, it is necessary to deal with a **high bacterial challenge because fluoride alone, in many instances, will not adequately deal with the challenge.**”
INDICATIONS
• Seals enamel pits and fissures to aid in the prevention of caries

FEATURES
• Convenient direct delivery syringe for easy application
• Contains and releases fluoride
• Color change technology to visualize placement
• Low viscosity to flow easily into pits and fissures
• Self occluding
• No etching no rinsing when used with Scotchbond Universal adhesive
Scotchbond Universal
Selective etch adhesive

- New technology. New chemistry
- Uncompromising results in total etch & self etch
- Reliable bond strength. Virtually no sensitivity
- Vitrebond= performs on moist or dry dentin

Easy to use
- After prophy scrub Scotchbond Universal for 20 seconds
- Air dry for 5
- Apply Clinpro Sealant
- Light cure Sealant and bonding together for 10 seconds
Many indications

DIRECT INDICATIONS:

• Bonding of pit and fissure sealants without etching
• All direct classes of fillings with composite or compomer
• Sealing of cavities prior to cementation of amalgam restorations
• Root surface desensitization
• Protective varnish/sealant for glass ionomer fillings
• Repair of composite or compomer fillings
INDIRECT INDICATIONS:

- Cementation of veneers when combined with relyx™ veneer cement

- Bonding of dual-cure and chemical-cure cements, core build-up materials and composites when used with Scotchbond™ Universal DCA dual cure activator

- Bonding of core build-ups made of composite or core build-up materials

- Intraoral repair of existing composite, porcelain fused to metal, and all ceramic restorations without extra primer

- Sealing of cavities and preparations of tooth stumps prior to temporary cementation of indirect restorations

- Cementation of indirect restorations of composite, ceramic and metal when combined with Relyx™ adhesive resin cement
Vanish™ XT—What It Is:

- Light-cured glass ionomer material
- Site specific for *exposed dentin* and *at-risk enamel surfaces*
- Penetrates and *seals dentinal tubules* to immediately relieve sensitivity and to *protect site from demineralization*
- Extended durability for 6 months or longer
- Extended release of fluoride, calcium and phosphate
Vanish XT Extended Contact

All the major benefits of glass ionomer materials

PROTECTIVE COATING FOR AT-RISK SURFACES

- Surfaces susceptible to acid erosion
- Non-cavitated lesions (white spots)
- Partially erupted molars
- Around orthodontic brackets.
- Recharged daily brushing with Clinpro 5000 with calcium and phosphate.
- Fluoride recharge effect lasts several hours (up to 4 hours).
Application Technique: Orthodontics

Prevent Demineralization on Enamel Surfaces
THANK YOU!

GJMARTINEZ2@MMM.COM