

Jeanette MacLean, DDS

 @drmaclean

**Pediatric Pearls  
for the GP**

JEANETTE MACLEAN, DDS,  
DABPD, FAPPD

 **YouTube**

 **Affiliated Children's Dental Specialists**  
7,22K subscribers

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**Jeanette MacLean, DDS**

Diplomate, American Board of Pediatric Dentistry  
Fellow, American Academy of Pediatric Dentistry  
Owner, Affiliated Children's Dental Specialists

BS Chemistry, Northern Arizona University 1999  
DDS University of Southern California 2003  
Pediatric Dentist, University of Nevada School of Medicine/Sunrise Children's Hospital 2005

Disclosures: Neither myself nor my family members have any owner interest or stock in any of the products mentioned in this presentation, nor do I receive sales commission.

I have received speaking honoraria in the past from: Elevate Oral Care, Oral Science, GC America, DMG America, NuSmile, DryShield, P&G

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**Greetings  
from  
Phoenix,  
Arizona**




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**dental town**  
 Dr. Jeanette MacLean  
 Tour the pediatric practice of Central New York's newest dentist  
 p. 56

**The New York Times**

Dr. MacLean said, "People assume that parents will reject it because of poor aesthetics." But "if it means preventing a child from having to be sedated or having their tooth drilled and filled, there are many parents who choose S.D.F.," she added.

After Dr. MacLean treated Knox, she gave him a sticker.  
COURTESY OF THE NEW YORK TIMES

**THE FULL-ARCH IMPLANT**  
 A Game-Changing Technique  
 Dr. Alan Long discusses a new approach to traditional dentures  
 p. 18

**WHY YOUR PORCELAIN BREAKS**  
 It's common sense regarding the reasons for dental restorations, but how do you address each of them?  
 p. 24

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**Challenges**

- Patient behavior
- Poor compliance
- Poor diet
- Poor home care
- Misinformation

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**We're All on the Same Team**

- ▶ Guardians
- ▶ Dental Professionals
- ▶ Healthcare Professionals
- ▶ Educators

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### Course Objectives:

- ▶ Pediatric dental screening
- ▶ Infant lap exam
- ▶ Behavior management techniques
- ▶ Caries risk assessment
- ▶ Anticipatory guidance and parent education
- ▶ Nutritional counseling
- ▶ Fluoride varnish application
- ▶ Dental sealant placement
- ▶ Silver diamine fluoride
- ▶ Atraumatic restorative treatment
- ▶ Red flags including abuse, neglect, airway, tethered oral tissue
- ▶ When to refer to a pediatric dentist, orthodontist, and/or other allied health professional

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## Pediatric Dental Screening

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### 1<sup>st</sup> Visit by the 1<sup>st</sup> Birthday

- ▶ Recommended by the AAPD
- ▶ Like a "well visit" for teeth
- ▶ Don't wait until there's a problem, or they will associate that negative experience with the dentist (waiting for trauma or a toothache)
- ▶ 1/3 of kids have decay by age 3, 50% by kindergarten
- ▶ Establish a Dental Home



The dental home is the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated, and family-centered way. The dental home should be established no later than 12 months of age to help children and their families institute a lifetime of good oral health. A dental home addresses anticipatory guidance and preventive, acute, and comprehensive oral health care and includes referral to dental specialists when appropriate.

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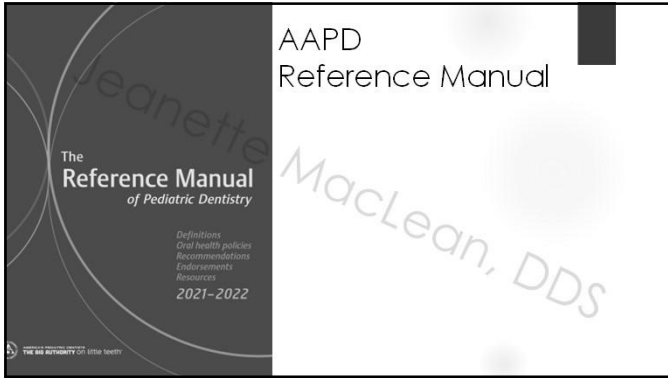
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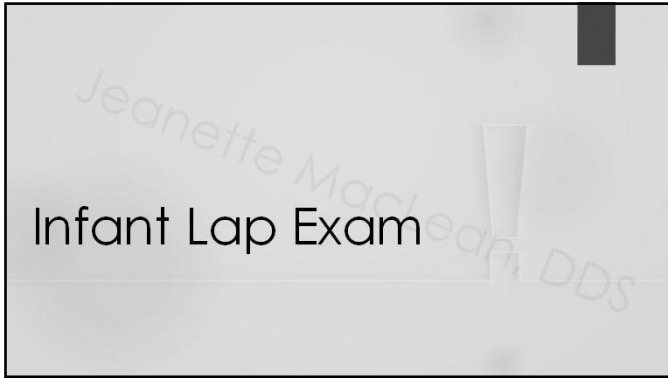
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**Specialized Care Co, Inc.**  
 Creating dental products that help you provide safe, comfortable care.

**Knee to Knee Lap Board**  
 SP-LAP-BD01.w

**Chair Cushion for Infants and Toddlers**  
 SPCC-inf01.w

**We have made progress on our supply issue for the upholstered products. We are starting to stock up, and have made it possible to order online again. However, we are not fully stocked on an item-by-item basis. There may be a delay in shipping. If your order is time-sensitive, please call us at 800-722- or email info@specializedcare.com.**

**Description**  
 An over-sized dental chair can feel insecure for patients under the age of two, and it can cause you to bend and hold in order to provide treatment. Our Stay N Place Chair Cushion for Infants creates a safe, cozy lift for the patient, presents a professional image for parents, and helps you maintain better posture.

**Description**  
 The chair cushion is like a bean bag, with soft foam inside. Air escapes through side vents as the child is placed upon it. This settles the cushion into the curves of the dental chair while securely nesting the baby.

- Wipe clean
- Plastic Cover
- Pillowcase cover




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- Child's legs around parent's waist
- Parent holds child's hands
- Assistant helps stabilize head

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### Infant Exam Checklist

- ▶ Note which teeth have erupted/are erupting
- ▶ Look for plaque, stain, visual decay, and/or signs or trauma
- ▶ Check soft tissue, gingiva, labial and lingual frenula
- ▶ Demonstrate how to use manual toothbrush
- ▶ Apply fluoride varnish



An infant exam is relatively fast and simple. The visit is more about prevention, education, and getting the child accustomed to the dental setting

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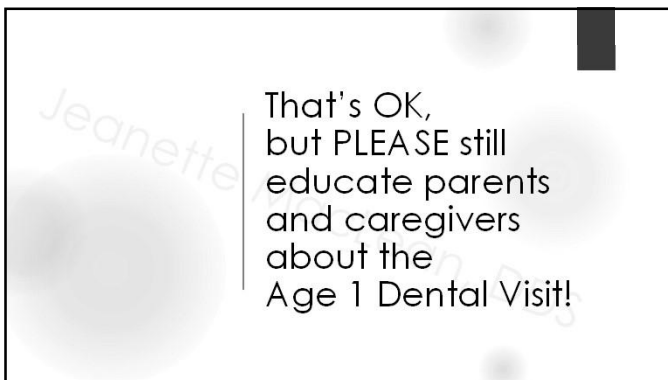
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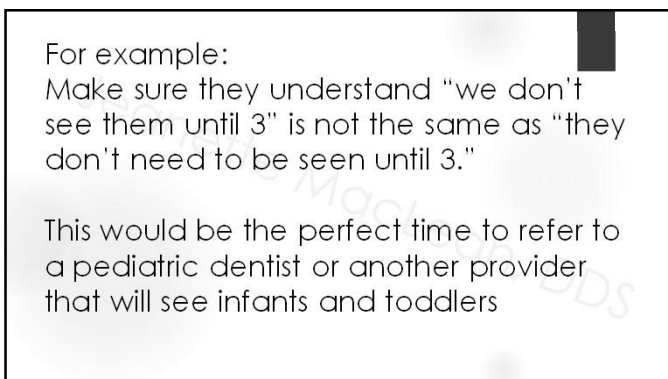
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# Behavior Management Techniques

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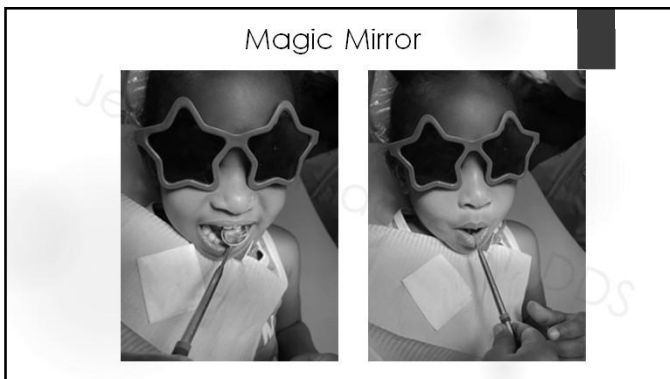
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Positive Reinforcement

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Dollar Store Shopping List

- ▶ Small hand mirrors
- ▶ Fun sunglasses
- ▶ Stickers
- ▶ Rubber Duckies
- ▶ 'Treasure'
- ▶ Kitchen timer



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Extra Credit:

▶ Dr. Eyal Simchi  
"The Magic Dentist,"  
Riverfront Pediatric Dentistry



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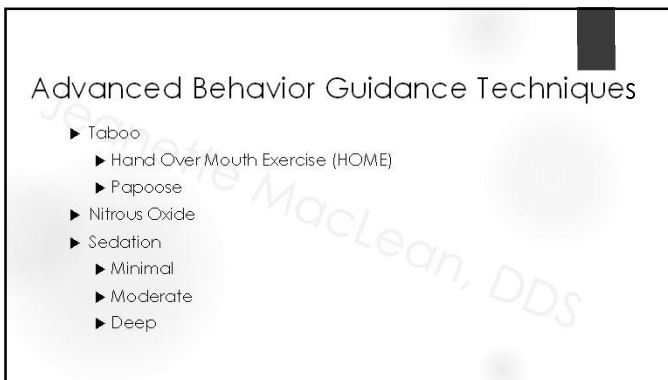
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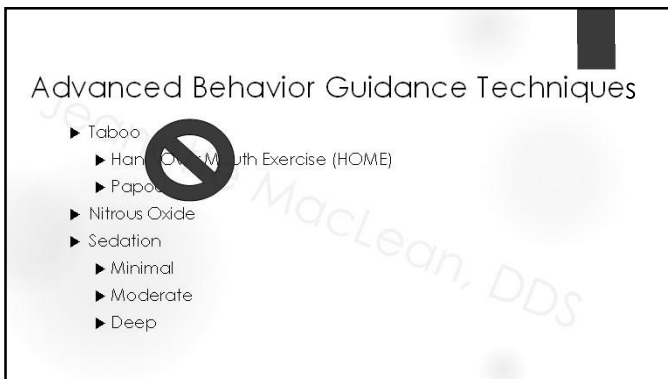
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**Parents  
in the  
Operator**

**Friend or Foe?**

by Jeanette MacLean, DDS

Dentaltown, Nov. 2015

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### Parental Presence

- ▶ Your opportunity to shine!
- ▶ Parent education
- ▶ Your house rules
- ▶ Practice Terminology
- ▶ "Silent Partner" (for operative)
- ▶ They see what really happens

**PRACTICE TERMINOLOGY**

Dear Parents:

In order to improve the chances of your child having a positive experience in our office, we are selective in our use of words. We try to avoid using words that may scare your child. We also strongly discourage you from sharing your negative thoughts about a dental experience you may have had. Never use dental care as a threat. Please suggest us by **NOT USING** negative words that are often used for dental care. These include:

<u>DONT USE</u>	<u>OUR EQUIVALENT</u>
needle or shot	sleepy juice
fill	whistle
fill in tooth	clean a tooth
pull or yank tooth	wiggle a tooth out
decay, cavity	sug or bug
examination	count teeth
tooth cleaning	tickle teeth
explorer	tooth counter
rubber dam	raincoat
gas	happy air, laughing gas

This will also help you understand your child's description of the filling experience. Our intention is not to "fool" the child - it is to create an experience that is positive. We appreciate your cooperation in helping us build a positive attitude for your child!

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**Caries Risk Assessment**

Jeanette MacLean, DDS

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### AAPD Reference Manual

Table 1. Caries-risk Assessment Form for 0-5 Years Old<sup>18</sup>

Factors	High risk	Moderate risk	Low risk
<b>Risk factors, social/hygienical</b>			
Mother/paternal caregiver has active dental caries	Yes		
Parent/caregiver has life-time of parents, low health literacy	Yes		
Child has frequent exposure (>3 times/day) between meal sugar containing snacks or beverages per day	Yes		
Child uses bottle or non-spill cup containing natural or added sugar frequently between meals and/or at bedtime	Yes		
Child is a recent immigrant		Yes	
Child has special health care needs		Yes	
<b>Protective factors</b>			
Child receives optimally fluoridated drinking water or fluoride supplements			Yes
Child has tooth brushed daily with fluoridated toothpaste			Yes
Child receives topical fluoride from health professional			Yes
Child has dental home/regular dental care			Yes
<b>Clinical findings</b>			
Child has non-carotined (incisors/white spot) caries or enamel defects	Yes		
Child has visible caries or filling or missing teeth due to caries	Yes		
Child has visible plaque on teeth	Yes		

Circle the number that apply to a specific patient helps the practitioner and parent understand the factors that contribute to or protect from caries. Risk assessment interpretation of low, moderate, or high is based on progression of factors for the individual. However, clinical judgment may justify the use of one factor (eg, frequent exposure to sugar-containing snacks or beverages) when that one decayed missing filled surface (DMFS) is determining overall risk.

Overall assessment of the child's dental caries risk: High  Moderate  Low

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### AAPD Reference Manual

Table 1. Caries-risk Assessment Form for 0-5 Years Old<sup>18</sup>

Factors	High risk	Moderate risk	Low risk
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Child has frequent exposure (>3 times/day) between meal sugar containing snacks or beverages per day	Yes		
Child uses bottle or non-spill cup containing natural or added sugar frequently between meals and/or at bedtime	Yes		
Child is a recent immigrant		Yes	
Child has special health care needs		Yes	
<b>Protective factors</b>			
Child receives optimally fluoridated drinking water or fluoride supplements			Yes
Child has tooth brushed daily with fluoridated toothpaste			Yes
Child receives topical fluoride from health professional			Yes
Child has dental home/regular dental care			Yes
<b>Clinical findings</b>			
Child has non-carotined (incisors/white spot) caries or enamel defects	Yes		
Child has visible caries or filling or missing teeth due to caries	Yes		
Child has visible plaque on teeth	Yes		

Overall assessment of the child's dental caries risk: High  Moderate  Low

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- ▶ Early Childhood Caries (ECC)
  - ▶ the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any primary tooth in a child under the age of six.
- ▶ Severe Early Childhood Caries (S-ECC)
  - ▶ Any sign of smooth-surface caries in a child <3
  - ▶ Ages 3 – 5 with one or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth
  - ▶ Decayed, missing, or filled score ≥ to four (age 3), ≥ to five (age 4), or ≥ to six (age 5)



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Anticipatory Guidance  
and Parent Education

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Caries Prevention

- ▶ Caregivers
  - ▶ Parents
  - ▶ Grandparents
  - ▶ Nanny
  - ▶ Childcare
- ▶ Patients
  - ▶ Age appropriate
- ▶ School
  - ▶ Preschool
  - ▶ Aftercare
  - ▶ Head Start



IT TAKES  
A  
*village*

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Open the conversation

- ▶ Do you have any questions or concerns?
- ▶ How is brushing and flossing going at home?
- ▶ How do they do for the pediatrician? Haircuts?
- ▶ Habits?

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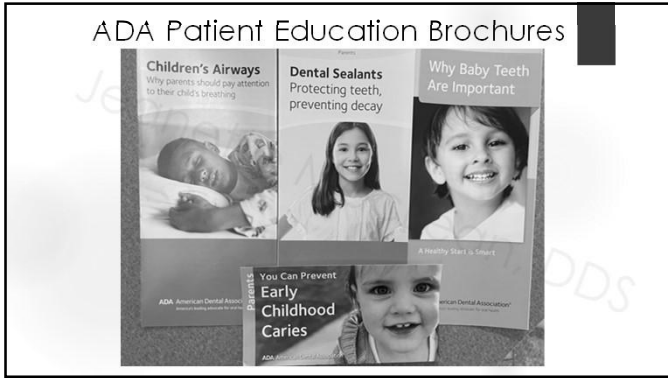
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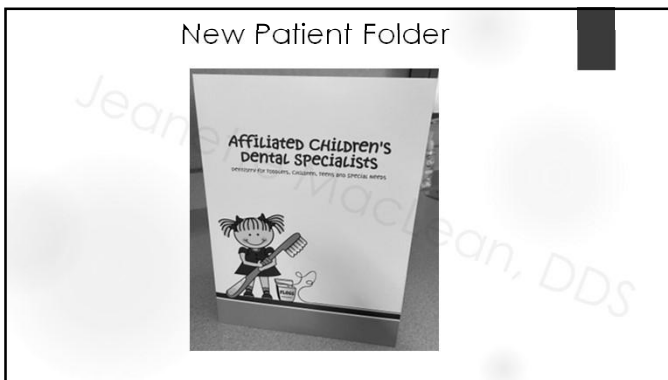
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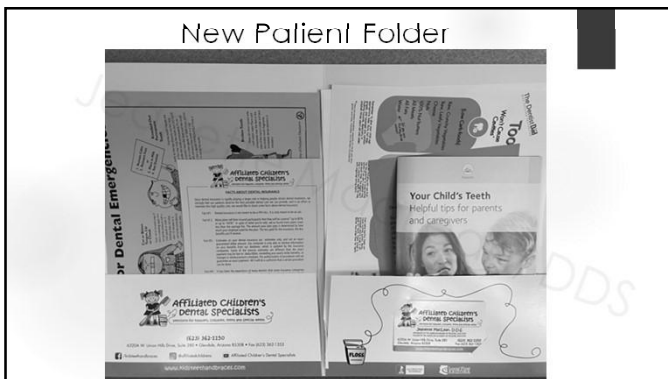
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### AAPD Reference Manual

**Table 3. Example of a Caries Management Pathways for 0-5 Years Old**

Risk Category	Diagnostics	Interventions			Restorative
		Fluoride	Dietary Counseling	Sealants	
Low risk	<ul style="list-style-type: none"> <li>Recall every six to 12 months</li> <li>Radiographs every 12 to 24 months</li> </ul>	<ul style="list-style-type: none"> <li>Drink optimally fluoridated water</li> <li>Twice daily brushing with fluoridated toothpaste</li> </ul>	Yes	Yes	Surveillance
Moderate risk	<ul style="list-style-type: none"> <li>Recall every six months</li> <li>Radiographs every six to 12 months</li> </ul>	<ul style="list-style-type: none"> <li>Drink optimally fluoridated water</li> <li>Twice daily brushing with fluoridated toothpaste</li> <li>Fluoride supplements</li> <li>Professional topical treatment every six months</li> </ul>	Yes	Yes	<ul style="list-style-type: none"> <li>Active surveillance of non-cavitated (white spot) caries lesions</li> <li>Restore of cavitated or enlarging caries lesions</li> </ul>
High risk	<ul style="list-style-type: none"> <li>Recall every three months</li> <li>Radiographs every six months</li> </ul>	<ul style="list-style-type: none"> <li>Drink optimally fluoridated water</li> <li>Twice daily brushing with fluoridated toothpaste</li> <li>Professional topical treatment every three months</li> <li>Silver diamine fluoride on cavitated lesions</li> </ul>	Yes	Yes	<ul style="list-style-type: none"> <li>Active surveillance of non-cavitated (white spot) caries lesions</li> <li>Restore of cavitated or enlarging caries lesions</li> </ul>

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First x-rays

- When primary molar contacts are closed
- Visible decay
- Trauma
- Pathology or abnormality
- PANO when in mixed dentition



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**Table 4. Example of a Caries Management Pathways for ≥6 Years Old**

Risk Category	Diagnostics	Interventions			Restorative
		Fluoride	Dietary Counseling	Sealants	
Low risk	<ul style="list-style-type: none"> <li>Recall every six to 12 months</li> <li>Radiographs every 12 to 24 months</li> </ul>	<ul style="list-style-type: none"> <li>Drink optimally fluoridated water</li> <li>Twice daily brushing with fluoridated toothpaste</li> </ul>	Yes	Yes	Surveillance
Moderate risk	<ul style="list-style-type: none"> <li>Recall every six months</li> <li>Radiographs every six to 12 months</li> </ul>	<ul style="list-style-type: none"> <li>Drink optimally fluoridated water</li> <li>Twice daily brushing with fluoridated toothpaste</li> <li>Fluoride supplements</li> <li>Professional topical treatment every six months</li> </ul>	Yes	Yes	<ul style="list-style-type: none"> <li>Active surveillance of non-cavitated (white spot) caries lesions</li> <li>Restore of cavitated or enlarging caries lesions</li> </ul>
High risk	<ul style="list-style-type: none"> <li>Recall every three months</li> <li>Radiographs every six months</li> </ul>	<ul style="list-style-type: none"> <li>Drink optimally fluoridated water</li> <li>Brushing with 0.5 percent fluoride gel/paste</li> <li>Professional topical treatment every three months</li> <li>Silver diamine fluoride on cavitated lesions</li> </ul>	Yes	Yes	<ul style="list-style-type: none"> <li>Active surveillance of non-cavitated (white spot) caries lesions</li> <li>Restore of cavitated or enlarging caries lesions</li> </ul>

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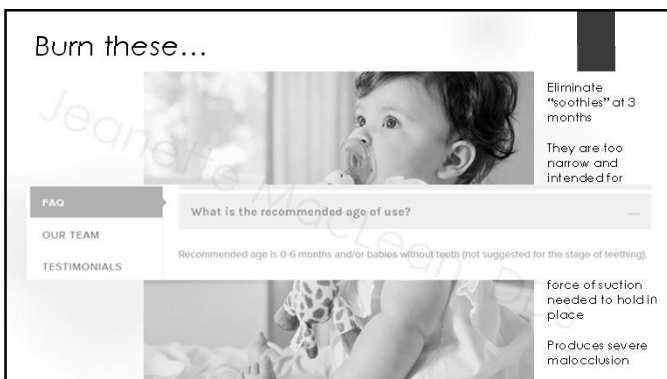
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**ATLANTA CHILDREN'S DENTAL SPECIALISTS**

## Trauma Handouts

### FRACTURED PERMANENT TOOTH

Your child has fractured a permanent tooth. Today's treatment is a preventive procedure to reduce tooth sensitivity and enhance the chance of the nerve's complete recovery.

The exposed dentin (inner layer of the tooth) is usually sensitive to cold and sweet things. As a result, we have placed an insulating base material to temporarily protect the tooth. It is a bonded resin material that should help keep your child comfortable.



If the tooth has no symptoms, a bonded filling can be placed into the tooth to replace the part that was broken away. The usual life expectancy of these bonded fillings is 7-8 years, but can vary from patient to patient depending upon several variables such as occlusion, hygiene, and overall treatment care. The bonded filling is intended to buy time until your child is old enough for a more permanent restoration, such as a porcelain veneer or a crown.

If any symptoms arise (particularly cold sensitivity and color change) be sure to call the office for follow-up, as the tooth may require root canal therapy. Traumatized teeth have a guarded prognosis with a wide range of possible outcomes. Treatment outcome may range from a best case scenario of minimal to no treatment needed, to a worst case scenario of abscess or extraction.

**DO NOT FEEL WORRY TO CALL THE OFFICE ABOUT YOUR CHILD**

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## Nutritional Counseling

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## Misinformation

"She never gets candy"

"We water down juice"

"We only eat organic"

"We don't eat junk food"

"We don't eat sugar"

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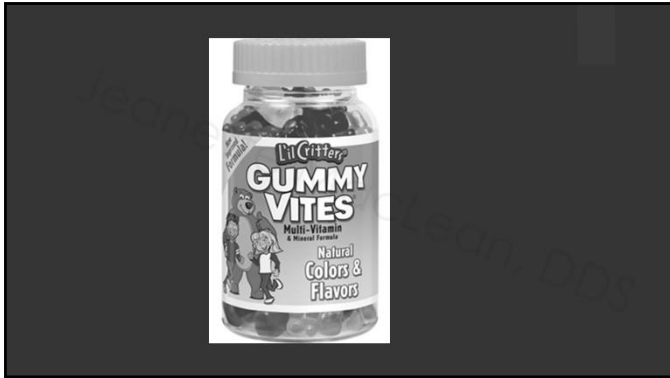
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Carbs + acid =



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Cavity Lighter Fuel!



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Dr. Roger Lucas "The Dentist Dad"

Tooth Snack Guide

**Won't Cause Cavities**  
[Low Carb foods]  
Raw, Crunchy Vegetables  
Raw, Leafy Vegetables  
Cheese  
Nuts  
100% Nut Butters  
All Meats  
Water  
Eggs

**Usually Won't Cause Cavities**  
Whole Milk  
Fresh Fruit  
Popcorn  
White grain bread  
Yogurt  
Ice Cream  
Dips & Sauces  
Oatmeal

**Causes Cavities Early**  
Candies  
Softs  
Juice  
Chocolate milk  
Cookies  
Dried fruit  
Fruit snacks/strips  
Dried flour cereals  
Fritters  
Crackers  
Chips & Salsas  
Sports Drinks

**Important Prevention Tips**

- Always try to have a glass of water after every meal or snack.
- Chew your food slowly and thoroughly.
- Chew gum (sugar-free) after eating.
- Only brush your teeth after eating.
- Only floss once a day, after brushing.
- Only have water after the night time brushing.
- Don't drink if this are trapping for additional minutes.
- Rinse or spit out after eating.
- Avoid acidic and sugary drinks.
- Don't drink or eat anything that is sticky.
- Don't eat anything that is high in sugar.
- Never have a bottle in bed with baby!

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pH awareness

Drink	pH
Water	7.0
White & Sugar Milk	7.0
Milk	6.8
Flavored Milk	6.7
Flat Mineral Water	6.3
Soda Water	5.5
Ancient Yogurt	5.1
Beer & Wine	4.0
Sparkling Mineral Water	3.8
Orange Juice	3.4
Apple Juice	3.4
Ginger Ale	3.1
Diet Cola	3.0
Banana	2.9
Sweet & Fatty	2.7
Powdered	2.7
Coca Cola & Pepsi	2.3
Vinegar	2.2
Lemon Juice	2.0
Strawberry Acid	2.0
Car Battery Acid	1.0
Swimming Pool Acid	0.0

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Talking to Kids

- ▶ Engage the kids in conversation
- ▶ Talk on their level
- ▶ Use age appropriate, child-friendly terms & stories
  - ▶ Preschool "sugar bugs"
  - ▶ Elementary/middle school "potty humor" "not flossing is like going #2 and not wiping"
  - ▶ High school - "brush your teeth in the morning to keep your friends, brush your teeth at night to keep your teeth!"
- ▶ Some kids listen to others more than their parents
- ▶ Kids are often visual learners
  - ▶ Mirror
  - ▶ Models
  - ▶ Handouts

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Prevention & Home Care

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Misinformation

- ▶ Fluoride concerns
- ▶ "He brushes all by himself"
- ▶ "We have a power brush"

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**Alex Jones owes \$1.5bn and declared bankruptcy. So how is Infowars still running?**

Jones is already making headlines again for platforming Ye's antisemitic rants. Legal experts explain what's going on

**The FDA has warned InfoWars founder Alex Jones to stop selling false coronavirus cures, including silver toothpaste**

**Alex Jones Raked in \$165 Million Over Three Years Selling Supplements and Prepper Gear**

Financial records obtained by Huff Post reveal the conspiracy theorist was cashing in big as he spread lies about the Sandy Hook massacre

© Alex Jones of Infowars owes \$1.5bn to families of victims of the Sandy Hook shooting. Photograph: Jim Bourg/Reuters

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### Patient autonomy

- ▶ Forced mass medication
- ▶ Systemic vs. Focal treatment
- ▶ Insurance coverage and cost
- ▶ Desire for "natural" ingredients




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### World Health Organization October 2021

- ▶ "Essential Medicines"
  - ▶ SDF
  - ▶ GIC
  - ▶ Fluoride Toothpaste




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### AAPD Policy on Use of Fluoride

- Topical fluoride refusal and resistance may be a growing problem and mirror trends seen with vaccination refusal in medicine
- Recognizes that drinking fluoridated water and brushing with fluoridated toothpaste twice daily are the most effective method in reducing dental caries prevalence in children.
- Encourages dental providers to talk to parents and caregivers about the benefits of fluoride and to proactively address fluoride hesitance through chairside and community education.




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## AAPD Best Practices: Fluoride Therapy

- ▶ When used appropriately, fluoride is both safe and effective in preventing and controlling dental caries.
- ▶ Although adverse health effects (e.g., decreased cognitive ability, endocrine disruption and cancer) have been ascribed to the use of fluoride over the years, the preponderance of evidence from large cohort studies and systematic reviews does not support an association of such health issues and consumption of fluoridated water.
- ▶ Regarding cognitive ability, a recent study of mothers' urinary fluoride levels and their child's intelligence quotient (IQ) levels suggested an association with exposure levels greater than those recommended in the U.S. for water fluoridation. However, a prospective study in New Zealand did not support an association between fluoridated water and IQ measurements, and a national sample in Sweden found no relationship between fluoride levels in water supplies and cognitive ability, non-cognitive ability, and education.



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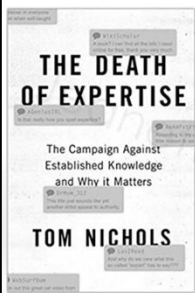
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## The Death of Expertise



- ▶ Technology and increasing levels of education have exposed people to more information than ever before. These societal gains, however, have also helped fuel a surge in narcissistic and misguided intellectual egalitarianism that has crippled informed debates on any number of issues.
- ▶ Today, everyone knows everything; with only a quick trip through WebMD or Wikipedia, average citizens believe themselves to be on an equal intellectual footing with doctors and diplomats. All voices, even the most ridiculous, demand to be taken with equal seriousness, and any claim to the contrary is dismissed as undemocratic elitism.
- ▶ Paradoxically, the increasingly democratic dissemination of information, rather than producing an educated public, has instead created an army of ill-informed and angry citizens who denounce intellectual achievement.

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## Dihydrogen Monoxide (DHMO)

- ▶ Used as an industrial solvent and coolant
- ▶ Can produce blistering vapors
- ▶ Fatal if inhaled
- ▶ Accelerates the corrosion and rusting of many metals
- ▶ Has been detected in city water lines
- ▶ Chemophobia - an aversion to chemicals or chemistry ranging from a reasonable concern over the potential adverse effects of synthetic chemicals, to an irrational fear due to misconceptions about their potential for harm. Consumer products with labels such as "natural" and "chemical-free" (the latter being impossible if taken literally, since all consumer products consist of chemical substances) appeal to chemophobic sentiments by offering consumers what appears to be a safer alternative
- ▶ Even water has a "toxic dose"



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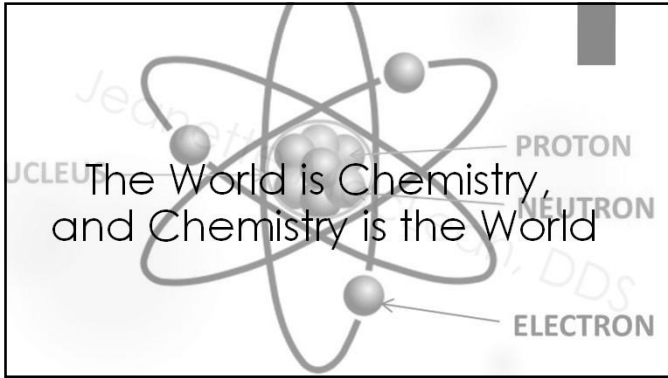
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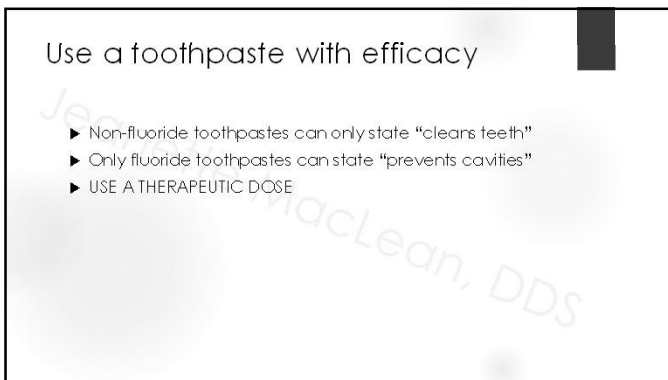
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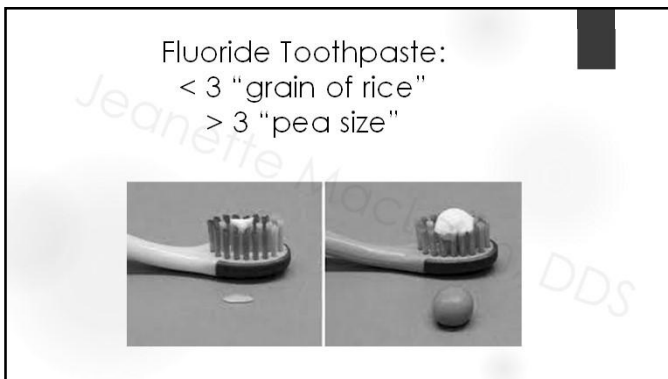
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### Other Options

- CPP-ACP
- Hydroxyapatite
- Nano silver
- Calcium



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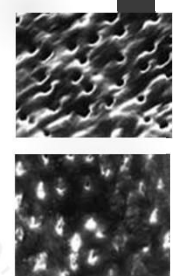
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### MI Paste and MI Paste Plus

- ▶ Benefits
  - ▶ Relief of sensitivity
    - ▶ CPP-ACP occludes dentinal tubules
  - ▶ Prevention
    - ▶ Remineralization
- ▶ Non-irritating for xerostomic patients
- ▶ Safe for lactose intolerant patients
- ▶ Contraindicated for patients with a casein (milk protein) allergy



SEM by Prof E. Reynolds



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### Correct size toothbrush



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"Powered toothbrushes were more effective than manual toothbrushes for plaque removal in children."

PEDIATRIC DENTISTRY | V 42 | NO 4 | JULY - AUG 2020



SYSTEMATIC REVIEW AND META-ANALYSIS

Plaque Removal by a Powered Toothbrush Versus a Manual Toothbrush in Children: A Systematic Review and Meta-Analysis

Est Dashiwaki, MSc, DMD • Sabina Staff, DMD • Brad Shay, PhD, DMD • Anahita Zivi, PhD, DMD, MPH

Abstract: Purpose: The purpose of this study was to determine the relative plaque reduction efficacy of powered versus manual toothbrushes in children. Methods: A systematic review and meta-analysis were conducted based on a literature search that included Medline, Embase, Cochrane Database of Systematic Reviews, Dentistry and Oral Science, and Berman Medical Library, Hebrew University. Studies were chosen that were randomized controlled trials and published between 1980 to 2019 in English that compared plaque reduction with manual and powered toothbrushes in children. The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach was used to assess the quality of evidence. Results: From a search of 1502 articles, nine articles were selected for meta-analysis. A statistically significant plaque reduction benefit for a powered toothbrush versus manual toothbrush (P=0.002) contained mean difference (MD) was 0.308 and the 95 percent confidence interval was 0.352 to 0.268 (random-effects model). Two tests revealed considerable heterogeneity (I-squared equals 96 percent; Cochran's Q, P<0.001). A low possibility of bias was indicated by Beggs-Macmillan and Egger tests (P=0.1 for both). Evidence quality was given a GRADE score of moderate. Conclusion: Powered toothbrushes were more effective than manual toothbrushes for plaque removal in children. (Pediatr Dent 2020;42(4):280-7) Received November 4, 2019 | Last Revision March 24, 2020 | Accepted March 24, 2020

KEYWORDS: META-ANALYSIS, POWERED TOOTHBRUSH, CHILDREN

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Position

Chicken pecking or 6 o'clock position

10 or 2 o'clock position with person sitting

Oral Health Instructions for Special Needs Patients in a...  
Elevate Oral Care  
253 subscribers

1:30:44

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Position

Chicken pecking or 6 o'clock position

10 or 2 o'clock position with person sitting

Oral Health Instructions for Special Needs Patients in a...  
Elevate Oral Care  
253 subscribers

1:30:44

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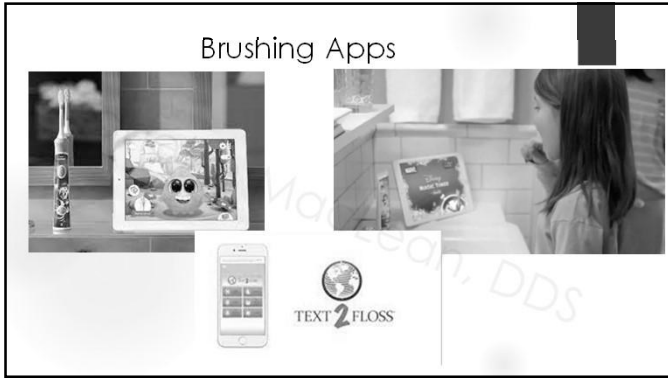
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Supervised brushing and flossing



**ADULT  
SUPERVISION IS  
RECOMMENDED**

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Would you let her put on your makeup??

- ▶ Toddlers and children are still developing their dexterity and fine motor skills



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Who's teeth are they?

- ▶ Do you want to spend your time and money at the dentist when you're older?
- ▶ Or would you rather spend it on other things?



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# Fluoride Varnish Application

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## 2.5% FluoriMax Varnish

- ▶ Enamel maxes fluoride absorption at 2.5%  
(Carey, U of CO, IADR)
- ▶ "Consequently it can be stated at a reasonable level of certainty that if a difference in the efficacy of the two varnishes exists, it is probably minute. Lowering the fluoride concentration of Duraphat is worth considering at least when used in children."  
(Seppa et al 1994)



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For patients with fixed orthodontic appliances and high caries risk, we strongly recommend:

- ▶ Rx 5000ppm fluoride toothpaste
- ▶ 3 month recall
- ▶ Powerbrush



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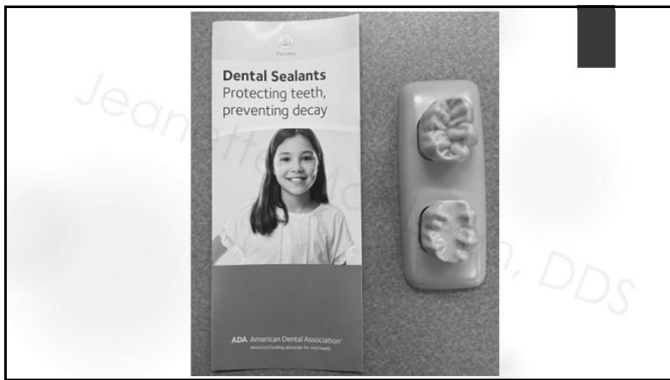
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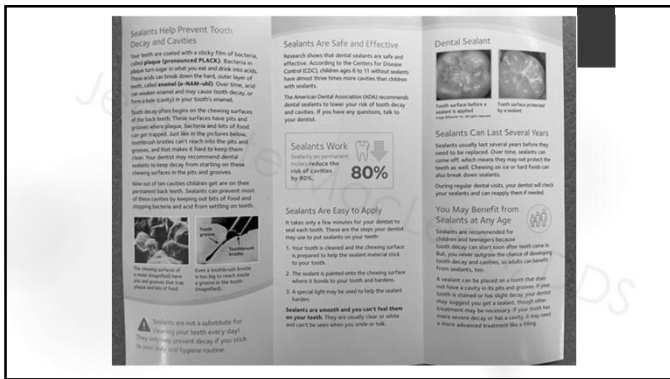
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### Past challenges with resin sealants;

- ▶ Difficult to achieve ideal isolation
- ▶ Time consuming
- ▶ Young and/or phobic patients cannot tolerate procedure
- ▶ Etch syringe looks like a "shot"
- ▶ Etch burns
- ▶ Can't seal partially erupted molars with resin
- ▶ Chipping and leaking over long term
- ▶ Decalcification and/or decay present

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### Deep Thoughts...



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### What defines sealant SUCCESS ?

- ▶ Is it RETENTION of the sealant material ?  
(common study metric/dentist mentality)
- ▶ Or is it PREVENTION of caries ?



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**LOW VISCOSITY GLASS IONOMER CEMENT**

- ▶ SIMPLICITY OF APPLICATION
- ▶ HYDROPHILIC
- ▶ BIOCOMPATIBLE
- ▶ RELEASES/RECHARGES W/ FLUORIDE
- ▶ WELL TOLERATED BY WIDE RANGE OF PATIENTS
- ▶ CAN BE USED ON PARTIALLY ERUPTED MOLARS
- ▶ FLOWS INTO PITS AND FISSURES
- ▶ GIC SEALANT WEAR/LOSS IS NOT ASSOCIATED WITH CARIES

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Class ionomer cements as fissure sealing materials: yes or no?  
 A systematic review and meta-analysis  
 Alirezaei JADA 2018

► "There was no difference between the percentage of caries development with use of GICs as fissure sealing material compared with that for the conventional RBSs"

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► "These findings indicate that the caries prevention effect of GIC-based sealants is not associated with retention."

Alirezaei et al. JADA 2018

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► "Mickenautsch and Yengopal indicated that the risk of loss of complete retention of sealant materials was associated with the risk of developing caries occurrence for RBSs but not for GIC-based sealants. The explanation of this result was that small particles remained in the bottoms of fissures that acted as a fluoride reservoir and that the slow release of fluoride enhanced nearby enamel remineralization."

Alirezai et al. JADA 2018

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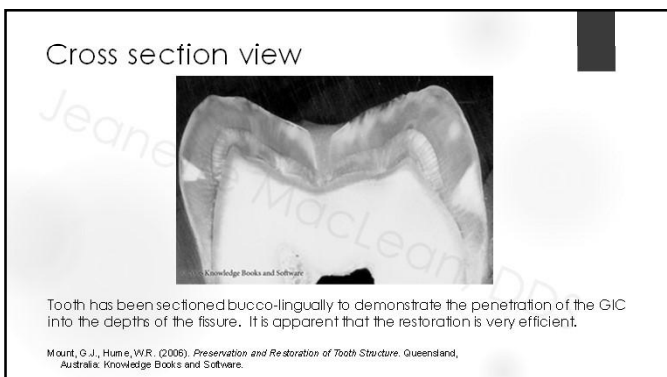
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Alirezaei et al. JADA 2018

- ▶ "Use of a surface conditioner (polyacrylic acid) with the glass ionomer sealant increased the chance of a chelation reaction between the calcium of the enamel and polyacrylic acid in the glass ionomer matrix that established a more stable bonding surface"



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- ▶ "It seems that GIC-based sealants, with their lower technique sensitivity, good adherence, and fluoride-releasing properties, have an additive effect of being a sealant and fluoride provider for the prevention of occlusal caries. Therefore, GIC-based sealants may be a good alternative to RBSs specifically in community procedures when there is limited equipment, no chairside assistant for the dentist or dental hygienist, and a considerable number of children at high risk of developing caries."

Alirezaei et al. JADA 2018

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Longitudinal caries prevalence in a comprehensive, multicomponent, school-based prevention program

Starr et al JADA 2021

- ▶ 6-year prospective open cohort study in 33 US public elementary schools, providing care to 6,927 children in communities with and without water fluoridation. After dental examinations, dental hygienists provided twice-yearly prophylaxis, glass ionomer sealants, glass ionomer interim therapeutic restorations, fluoride varnish, toothbrushes, fluoride toothpaste, oral hygiene instruction, and referral to community dentists as needed.
- ▶ The prevalence of untreated caries decreased by more than 50%
- ▶ Fuji IX



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### Triage Pink

- ▶ Command set w/ curing light (absorbs heat)
- ▶ Visual/color indicator
- ▶ Great for partially erupted molars
- ▶ Interim restorations
- ▶ Toothbrush abrasion
- ▶ Exposed roots



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### Partially Erupted Molars

**Preventing Caries in Partially Erupted Molars**


*Clinical research indicates a superior alternative to resin restorations*

**Inside**

**Preventing Caries in Partially Erupted Molars**

Clinical research indicates a superior alternative to resin restorations

**P**artially erupted molars are often associated with a poor occlusal contact and a poor occlusal band can actually contribute to the development of caries rather than preventing it. A study conducted by researchers at the University of Michigan School of Dentistry found that partially erupted molars are more susceptible to caries than are fully erupted molars. The study found that partially erupted molars have a higher incidence of caries than do fully erupted molars. The researchers concluded that partially erupted molars are more susceptible to caries because they do not have a good occlusal contact and a poor occlusal band can actually contribute to the development of caries rather than preventing it. The researchers also found that partially erupted molars have a higher incidence of caries than do fully erupted molars. The researchers concluded that partially erupted molars are more susceptible to caries because they do not have a good occlusal contact and a poor occlusal band can actually contribute to the development of caries rather than preventing it.



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On a cooperative patient you can do all 4 first permanent molars with one capsule of Triage in under 5 minutes

- ▶ Teeth are protected!
- ▶ Parents are happy because you can do them right at the checkup
- ▶ Kids are happy because it's fast, easy, and painless
- ▶ Saves chair time and supplies
- ▶ Increases production

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On a cooperative patient you can do all in one minute

- ▶ Tee
- ▶ Par
- ▶ Kid
- ▶ Sav
- ▶ Inc

EVERYONE WINS!

4529725

ISNIM

DDS

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### Explanation to patients (parents)

- ▶ GIC sealant is more than a physical barrier to the grooves. Unlike resin, which is just gluing something to a surface and has no other redeeming qualities, the GIC sealant is like medicine for the tooth. It delivers fluoride to help the enamel mature and be more acid resistant and less likely to decay.
- ▶ In time they may see the white (or pink) sealant wear, but it's leaving behind stronger, more acid resistant enamel.

MEDICINE FOR TEETH

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### GIC-dentin Chemical Fusion

Ionic constituents from both the GIC and the underlying dentin

A resin impression SEM technique for examining the glass-ionomer cement chemical fusion zone. Millicich G. Journal of Microscopy, Vol 217, P11 January 2005, pp. 44-46

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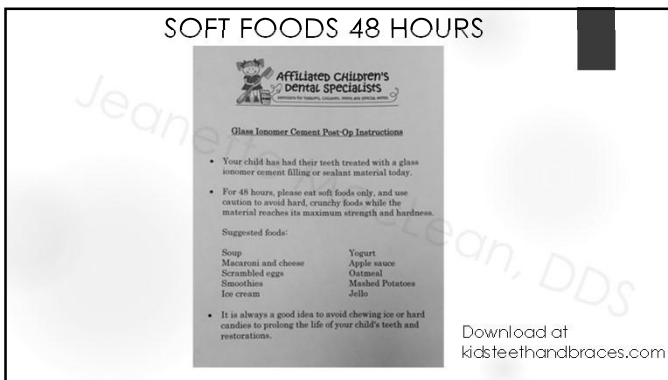
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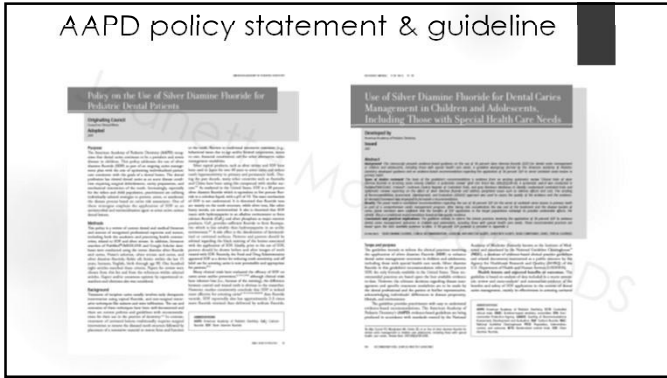
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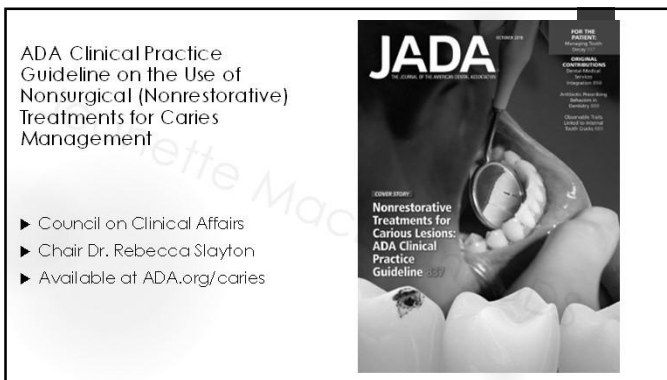
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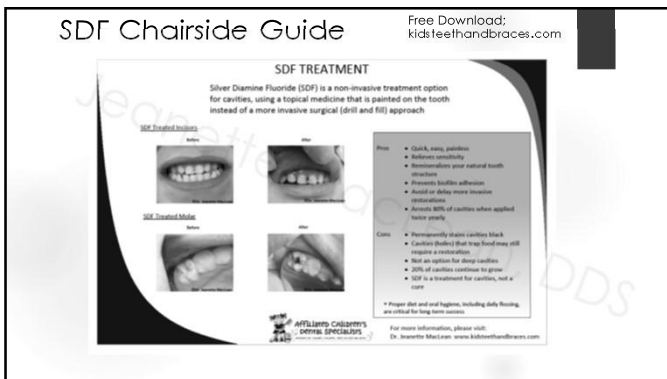
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Jeanette MacLean, DDS

**>> Background**

By knowing the lesions in primary teeth that progress quickly and the ones that progress more slowly, it was possible to stagger the treatments into more comfortable segments. In this way some lesions were able to be left for a period of time or not treated at all.

**>> Learning from nature. The salivary-access factor:**

It has long been known that open carious lesions in primary teeth progress less rapidly than the more closed ones. Open carious lesions are more accessible to the action of saliva with its remineralizing potential.

Therefore when assessing the likelihood of a lesion progressing quickly or slowly, apart from its position in the arch, its degree of 'openness' was taken into consideration.

A more enclosed lesion as shown above is conducive to faster caries progression than a more open one.

When in contact with the lesion a spread of up to a greater extent of water and therefore a greater probability of caries arrest.

Dr. Craig's book is available at [www.dentcloudok.com.au](http://www.dentcloudok.com.au)

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**Relative risk (and rate of caries progression).**

- = Low
- = Medium
- = High

Left: Illustration of low to high-risk sites in the primary dentition. The high risk sites are arrowed.

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### Case Selection

CLINICAL | -

**The use of silver diamine fluoride (SDF) in dental practice**

Nisar Seli, Mark Robertson, Jeanette MacLean, Katherine Black, Sarah Gosau, Robyn Miller, Clement Seiffo and Nicola Innes\*

**Key points**

Seiffo et al. British Dental Journal 2020; 228(2): 75-81

Uses of SDF	
Level	Description
Tooth	Asymptomatic cavitated dentine carious lesions in primary teeth
	Lesions that are, or can be made, cleanable
	Non-restorable dentinal lesions
Tooth	Several carious lesions that may not all be treated in one visit
	Root surface carious lesions (primary and permanent teeth)
	Non-carious cervical lesions giving sensitivity
Person	Molar incisor hypoplasia/ectodysplasia to reduce sensitivity
	Pre-cooperative children, children and adults whose behavioural/medical conditions limit invasive restorative treatment and where there is a need to 'buy time' to avoid or delay treatment with sedation or general anaesthesia
Tooth	Patients with high caries risk with medical or psychological conditions that limit other treatment approaches eg patient with dental phobia, medical conditions or disabilities
	Patients who already have a high standard of brushing or are likely to be responsive to measures to change behaviour to carry out frequent, high quality toothbrushing or other methods to clean carious lesions
Tooth	Clinical signs or symptoms of irreversible pulpitis, or dental abscess/fistula
	Radiographic signs of pulpal involvement, or peri-radicular pathology
Tooth	Infection or pain from pulp or food packing (unless shape of tooth can be changed to become cleanable)
	Ongoing active lesions that are not arresting (irreversibly detectable over time)
Person	Not able or willing to brush and unlikely to. Patients (or parents) unable or unwilling to take responsibility
	Potassium iodide is contra-indicated in pregnant or breastfeeding women, patients undergoing thyroid gland therapy or on thyroid medication or patients with known allergy to potassium or iodine.
Person	Patients with ulceration, mucositis, stomatitis.
	Patients with allergy to silver, fluoride or ammonia

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### Depth of Lesion

- ▶ The use of SDF in deep lesions is NOT a contraindication
- ▶ Irreversible pulpitis IS a contraindication

### Misconception

components of SDF and/or the pH may irritate the pulp

- A histologic study found silver components had reached the pulp, and hypothesized that the silver component may act on the pulp via direct inactivation/destruction of bacteria in carious dentine and mechanical sealing of carious and sound dentinal tubules when followed by atraumatic placement of a glass ionomer cement restoration
- pH 10 SDF products are equivalent to direct pulp capping materials, such as calcium hydroxide (pH 10) and MTA (pH 10.2, after mixing, pH 12.5, 3 hours after setting)

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### Silver Fluoride + Deep Lesions

Griffith, M. CDA Jan. 2021

- ▶ Treating Deep Caries in 277 Adult Teeth with Silver Fluoride
- ▶ Used silver nitrate + fluoride varnish and SDF
- ▶ "Silver fluoride demonstrated the capacity to protect the pulp in this series of 277 teeth with very deep decay, with only 13 teeth requiring endodontia. It was successful in managing peripulpal caries with minimal recourse to endodontia and with asymptomatic clinical outcomes."



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### Silver Fluoride + Deep Lesions

Griffith, M. CDA Jan. 2021

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Basic Protocol

1. Patient/Clinic protection; safety/sunglasses, plastic lined bib, bracket cover
2. Vaseline over perioral area



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Basic Protocol

3. "Toothbrush clean" (\*\* SUBSTITUTE A MICROBRUSH VS. PROPHY BRUSH \*\*)



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Basic Protocol

4. Isolate with Dri-Aides and cotton rolls



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**Basic Protocol**

5. DRY DRY DRY!!! (\*\* SUBSTITUTE COMPRESSED AIR WITH DRY GAUZE \*\*)

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**Basic Protocol**

6. Apply SDF with a microbrush for 1 - 3 minute

- ▶ Use a plastic, disposable dappen dish
- ▶ Use caution to only get it on the desired tooth/teeth
- ▶ Saturate the surface of the lesion and allow to absorb via capillary action

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**Basic Protocol**

- ▶ DO NOT RINSE
- ▶ DO NOT BLOW COMPRESSED AIR while the SDF absorbs
- ▶ DO NOT LIGHT CURE
- ▶ Simply allow to absorb via capillary action, ideally for at least 1, up to 3 minutes
- ▶ If needed, blot excess after 1-3 minutes
- ▶ Remove cotton isolation
- ▶ FINISHED!

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Jeanette MacLean, DDS

### Updated package insert

<p><b>Dosage and Administration:</b></p> <ol style="list-style-type: none"> <li>1. Isolate the affected area of the tooth with cotton rolls or protect the gingival tissue of the affected tooth with petroleum jelly. Alternatively, a rubber dam can be used to isolate the area.</li> <li>2. Clean and dry the affected tooth surface.</li> <li>3. For up to 5 treated sites per patient, dispense 1-2 drops of solution into a disposable stainless steel applicator. Apply material directly to the tooth surface with an applicator.</li> <li>4. Air-dry.</li> </ol> <p><b>How Supplied:</b> Single 10 mL syringe containing 5 mL of product. Not sterile.</p> <p><b>Storage:</b> Do not freeze or expose to extreme heat. Keep in an air-tight container in a dark place.</p> <p><b>Caution:</b> Federal law restricts this device to sale by or on the order of a dentist or physician.</p> <p><b>Distributed by:</b> Elevite Oral Care, LLC West Palm Beach, FL 33411 877-686-8113 © 2017 Elevite Oral Care ELE489-0317</p>	<p><b>Dosage and Administration:</b></p> <ol style="list-style-type: none"> <li>1. Isolate the affected area of the tooth with cotton rolls or protect the gingival tissue of the affected tooth with petroleum jelly. Alternatively, a rubber dam can be used to isolate the area.</li> <li>2. Clean and dry the affected tooth surface.</li> <li>3. For up to 5 treated sites per patient, dispense 1-2 drops of solution into a disposable stainless steel applicator. Apply material directly to the tooth surface with an applicator.</li> <li>4. Allow to air dry, do not rinse.</li> </ol> <p><b>How Supplied:</b> Single 10 mL syringe containing 5 mL of product. Not sterile.</p> <p><b>Storage:</b> Do not freeze or expose to extreme heat. Keep in an air-tight container in a dark place.</p> <p><b>Caution:</b> Federal law restricts this device to sale by or on the order of a dentist or physician.</p> <p><b>Distributed by:</b> Elevite Oral Care, LLC West Palm Beach, FL 33411 877-686-8113 © 2018 Elevite Oral Care ELE489-0318</p>
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### Basic Protocol

7. Cover with fluoride varnish (OPTIONAL)



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### FV is NOT necessary for the proven efficacy of SDF alone

- ▶ No clinical trial (yet) compares SDF with or without FV
  - ▶ We don't know if it's good or bad (after 5 years of routine use, I'd say it's not bad, I'd argue it's good)
- ▶ Why do some practitioners like to use it?
  - ▶ Masks poor taste, improves the patient experience
    - ▶ I've had patients cry that they didn't "want the spicy medicine" that their other dentist used
  - ▶ Keeps it where you place it, help prevents unwanted stain on other surfaces
- ▶ Where have we seen FV used?
  - ▶ Graham Craig's Bourke Study (BMC Oral Health. 2013; 13: 73 doi: 10.1186/1472-6831-13-73)
  - ▶ Silver Nitrate + FV Steve Duffin CDA Journal 2012, Frank Mendoza IHS Warm Springs Protocol
  - ▶ Hammersmith, DePalo proximal SDF + FV (JOC PD 2020 Vol. 44, No. 2, pp. 79-83 doi.org/10.17796/1053-4625-44.2.2)

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**SDF + FV**

- ▶ 38% SDF + 5% fluoride varnish
- ▶ Applied at baseline and reapplied at 4 months
- ▶ Reassessed at 8 months
- ▶ 96.2 % arrest after 2<sup>nd</sup> application
- ▶ Compare to biannual, no FV Zhi 91%, Fung 75.7%



**The Effectiveness of Silver Diamine Fluoride and Fluoride Varnish in Arresting Caries in Young Children and Associated Oral Health-Related Quality of Life**

**Abstract**

**Objective:** Assess the effectiveness of silver diamine fluoride (SDF) and fluoride varnish (FV) in arresting caries and improving oral health-related quality of life (OHRQoL) in young children.

**Methods:** Children aged 2 to 5 years with untreated carious lesions were randomized to receive SDF or FV treatment. OHRQoL was assessed at baseline and 4 and 8 months post-treatment. Caries were reassessed at 8 months.

**Results:** The SDF group showed significantly higher caries arrest rates compared to the FV group at 8 months. OHRQoL scores improved significantly in the SDF group compared to the FV group.

**Conclusion:** SDF is an effective option for the management of caries in young children and is associated with improved OHRQoL compared to FV.

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**Basic application tutorial**



Video link available at [Kidsteethandbraces.com](http://Kidsteethandbraces.com)



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- 3 year shelf life
- Replace when discolors
- Dispense just before using
- Immediately recap
- Store in box or dark place

LAUNCHING GEL VERSION



**NEW TINTED FORMULA**

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### SDF + KI

Turton, B. Clinical and Experimental Dental Research Nov. 2020

- ▶ The use of KI is associated with poorer caries control
- ▶ those teeth which had KI placed had around twice the odds of becoming pulpally involved
- ▶ The use of KI reduced the staining, however, it also reduced the chances of caries arrest. A higher proportion of lesions progressed to involve the pulp over a 12-month period in those teeth where KI was used



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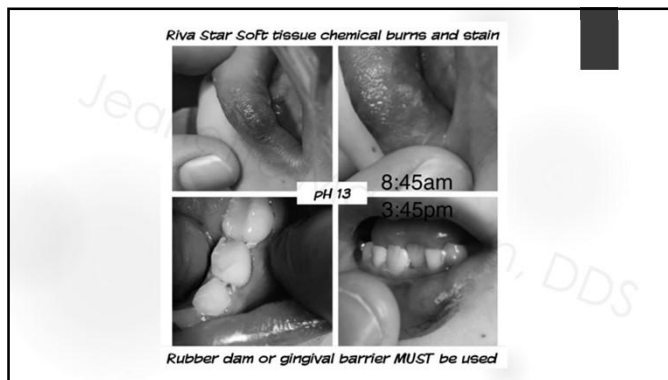
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### SDF CODES

- ▶ 1354 = CARIES ARREST
  - ▶ Interim caries arresting medicament application
- ▶ 1355 = PRIMARY PREVENTION
  - ▶ Caries preventive medicament application per tooth
  - ▶ This is an ADDITIONAL code
  - ▶ It does NOT replace 1354
  - ▶ Coverage and limitations:
- ▶ Both per tooth

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SDF as a "sealant?"

Jeanette MacLean, DDS

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SDF as a "sealant?"



Jeanette MacLean, DDS

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**AAPD E-NEWS**

**AAPD Releases New Guidance on the Use of CDT 2021 Code D1355**

With the release of the CDT-2021 dental coding manual on January 1, 2021, the CDT code **D1355 – caries preventive medicament application, per tooth**—was approved. A recent analysis by experts from the AAPD’s Councils on Clinical and Scientific Affairs, and Committee on Dental Benefit Programs concluded that, although Silver Diamine Fluoride (SDF) has proven efficacy as a **secondary** preventive agent (i.e., arrest of carious lesions) in numerous clinical studies, evidence of its efficacy as a **primary preventive** agent on children is insufficient at present. Therefore, without solid scientific evidence, the AAPD does not support the use of the code D1355 for use of SDF as a primary preventive agent in children. Accordingly, the AAPD recommends D1354 as the appropriate code for SDF when used as a caries arresting agent on cavitated carious lesions in primary teeth.

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**If SDF is to be used to treat tooth decay, and not as a preventive measure, why is there a new SDF insurance code (D1355) for caries prevention?**

The CDT-2021 Dental Coding Manual contains the approved code D1355 (caries preventive medicament application, per tooth) effective Jan. 1, 2021. SDF is included in this code, along with a number of preventive medicaments. SDF has proven effectiveness as a secondary preventive agent (stopping the progress of existing tooth decay) in numerous clinical studies. However, the evidence of its efficacy as a primary preventive agent (applied to teeth without decay) is insufficient. Therefore, without solid scientific evidence, the AAPD does not support the use of the code D1355 for use of SDF as a primary preventive agent in children. Accordingly, the AAPD recommends D1354 as the appropriate code for SDF for the arrest of progression of small cavities.

May 2021

## SILVER

DIAMINE FLUORIDE

**Policy and Fact Summary**

Silver Diamine Fluoride (SDF) has been shown to help stop cavities from getting worse and is a reliable additional tool to manage tooth decay. Its effective use requires a professional diagnosis of cavities, a plan of care specific to the treatment of an individual patient, and monitoring by a dentist.

**What is Silver Diamine Fluoride (SDF)?**  
SDF is a liquid applied to cavities. The active ingredients are silver, fluoride, and stannous fluoride. According to the CDT-2021 dental coding manual, the AAPD recommends that SDF may be used to arrest the progression of small cavities and to manage existing tooth decay. SDF is painted on the area affected by the cavity and is reapplied after 2-4 weeks. The silver fluoride paint after several days.

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Controlling caries in exposed root surfaces with silver diamine fluoride: A systematic review with meta-analysis

► "Yearly 38% SDF applications to exposed root surfaces of older adults are a simple, inexpensive, and effective way of preventing caries initiation and progression."  
 ►Oliveira JADA August 2018



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Free Download: [kidsfeethandbraces.com](http://kidsfeethandbraces.com)

**SDF + Floss Treatment**  
 Silver Diamine Fluoride (SDF) is a natural antimicrobial and remineralizing non-invasive treatment option for interproximal lesions (decay between the teeth)

**SDF Application to Interproximal Surfaces with System Floss**



**Pros**

- Quick, easy, and painless
- Non-invasive
- Remineralizes your natural tooth structure
- Prevents biofilm adhesion
- Arrests 80% of lesions when applied twice yearly
- Avoid or delay more invasive restorations

**Cons**

- Permanently stains decay black
- 20% of lesions fail to arrest with SDF treatment alone
- Not an option for deep cavities
- Lesions between molars are the most likely to grow and may require a restoration

\* Proper diet and oral hygiene, including daily flossing, are critical for long term success

For more information, please visit:  
 Dr. Jeanette MacLean [www.kidsfeethandbraces.com](http://www.kidsfeethandbraces.com)

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Interproximal tutorials online



Dr. Jeanette MacLean [kidsfeethandbraces.com](http://kidsfeethandbraces.com)

SuperFloss technique w/ blue Advantage Arrest

**YouTube**

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### Is floss necessary ?

Polacek et al Pediatr Dent 2021;43(6):475-80

- ▶ 76.4% arrest on incipient approximal caries in permanent molars & premolars
  - ▶ But not as successful as our study on primary molars (84% arrest)
- ▶ Not sure their exact protocol
- ▶ "Lesions where SDF was applied with Superfloss progressed more per month, on average, versus microbrush application."
- ▶ BOTH microbrush & Superfloss was the most successful at arrest, but they only examined 4 teeth treated this way



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### Interproximal SDF Research with Ohio State University



84.0% showed radiographic evidence of non-progression at 12-month

Silver Diamine Fluoride and Fluoride Varnish May Halt Interproximal Caries Progression in the Primary Dentition.

Hammersmith KJ, DePalo JR, Casamassimo PS, MacLean JK, and Peng J Journal of Clinical Pediatric Dentistry; 2020, Vol.44, No. 2, pp.79-83.



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### Studies on Topical Application of Ag(NH<sub>3</sub>)<sub>2</sub>F for the Control of Interproximal Caries in Human Primary Molars

Tsutsumi, Osaka University, 1981

Clinical trial of 58 children with contralateral interproximal lesions treated with SDF applied with unwaxed floss followed for 18 months

- Significantly reduced incidence of new interproximal caries vs. control
- Significantly reduced progress of enamel caries on interproximal surfaces vs. control
- Summary: multiple topical applications of SDF on interproximal surfaces in primary molars should be effective for interproximal caries development



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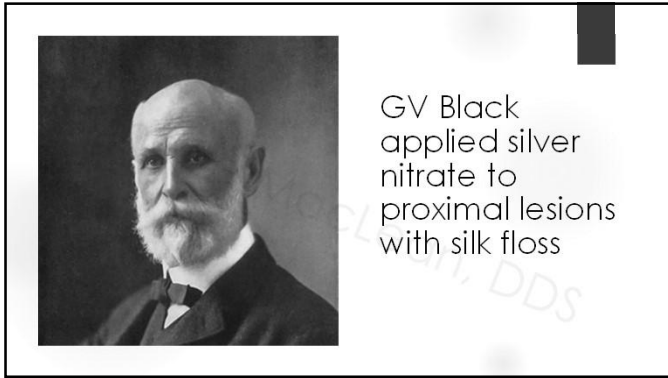
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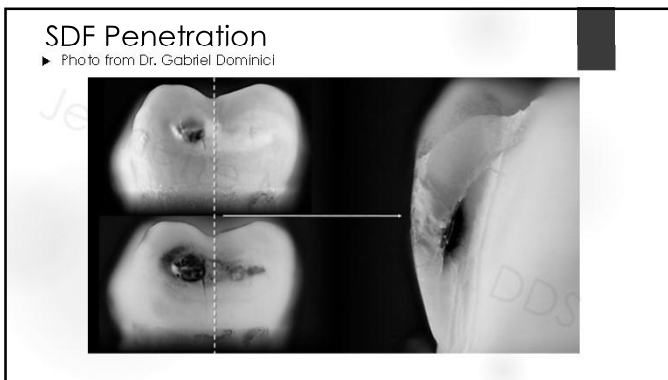
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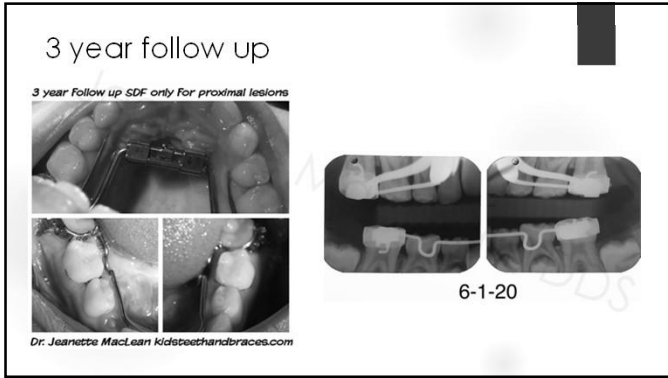
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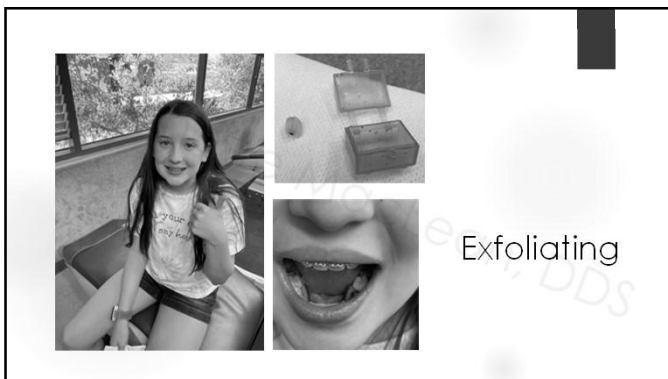
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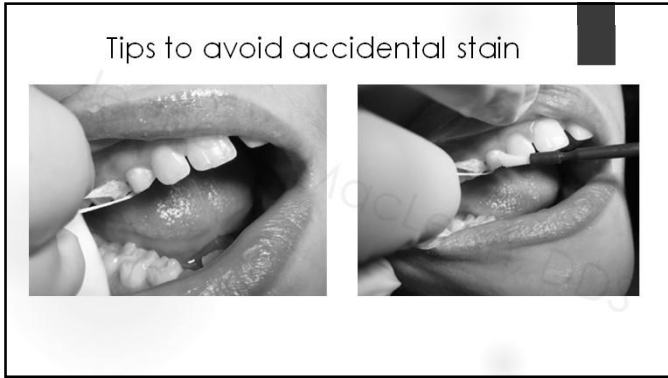
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### Follow up assessment



- ▶ Clinical assessment
  - ▶ SDF arrested caries should have a matte black "charcoal briquette" appearance
  - ▶ Should feel firm to a perio probe or dycal instrument
  - ▶ Do not try piercing it with a sharp explorer
- ▶ Radiographic assessment
  - ▶ Watch for stability of lesion size
  - ▶ Secondary dentin formation
- ▶ Patient assessment
  - ▶ Asymptomatic
  - ▶ Decreased sensitivity

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### Frequency of application

- ▶ Reapplication frequency varies depending on the clinical trial
  - ▶ Do not reapply more than once a week
  - ▶ Biannual application is most effective (91% arrest, Zhi et al 2012)
  - ▶ Average 80% arrest
- ▶ Reassess and reapply in 3-6 months depending on the size and location of the lesion as well as the patient's risk level
  - ▶ My approach - Re-evaluate and reapply to cavitations or lesions into dentin in 2-4 weeks, incipient lesions in 6 months
- ▶ Once a restoration is placed or the lesion is shiny and hard/smooth, stable and/or asymptomatic, it is not necessary to keep reapplying the SDF

\*\*\* It is important to communicate that this is a treatment, not a cure, and proper diet, hygiene, and daily fluoride use will play a critical role in the success of this treatment. Further, if the tooth is non-cleansable and broken down, a restoration is favorable when possible

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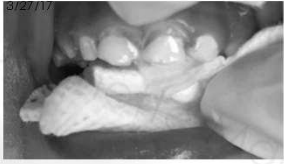
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3 year follow up, SDF only



- 2<sup>nd</sup> opinion = "IV sedation only or risk sepsis"
- Both parents are physicians
- Research and find NYT SDF article
- FIT drinking Pediasure, frequent eating
- Diet and hygiene improve
- SDF applied 4 times; 3/17, 4/17, 10/17, 5/18
- Patient has been seen q6mo, FV applied, no additional cosmetic treatment desired, teeth remain asymptomatic
- Lesions are shiny, hard and arrested

Dr. Jeanette MacLean kidsandteethandbraces.com

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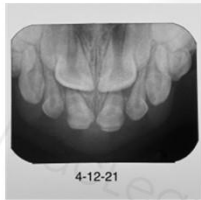
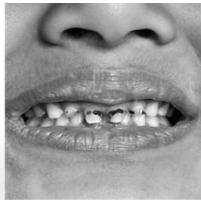
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4 year follow up, SDF only

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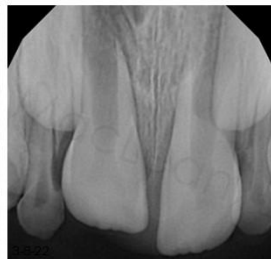
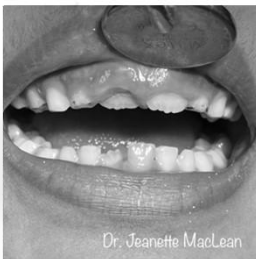
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5 year follow up, SDF only



Dr. Jeanette MacLean

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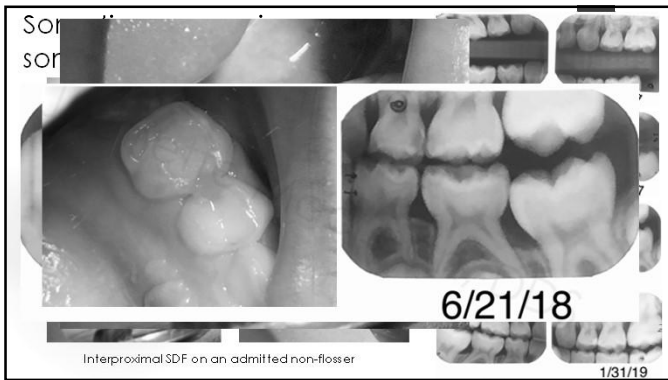
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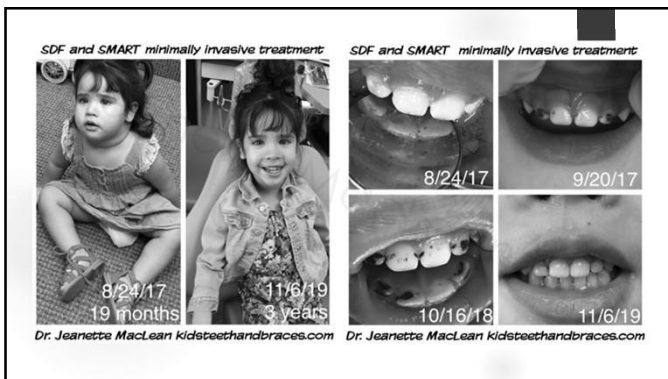
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SDF is Not a Cure-all



Extracted primary molar treated with SDF only for 2 years

Jeanette MacLean, DDS

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SDF Pitfalls

- ▶ Poor case selection
- ▶ Inadequate isolation and drying
- ▶ Rinsing
- ▶ Light curing
- ▶ Not covering with varnish
- ▶ Patient/parent is not on board with behavior modification
- ▶ "Cure all" or "one and done" mentality
- ▶ Lack of understanding of caries etiology
- ▶ Delayed placement of a sealed restoration (SMART, Hall) in cavitated lesions that are not easily cleansed or open to saliva



Jeanette MacLean, DDS

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SDF Pitfalls

- ▶ Poor case selection
- ▶ Inadequate isolation and drying
- ▶ Rinsing
- ▶ Light curing
- ▶ Not covering with varnish
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Jeanette MacLean, DDS

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### World Health Organization

The Global Promotion of ART

ART was introduced on World Health Day, April 7, 1994, as part of the Year of Oral Health

"The majority of the world's population still suffers from untreated dental decay. The main reason for this is the continued dependency on traditional approaches to oral health care."

"An innovative approach that brings safe and effective care for dental decay to communities without the need for expensive dental equipment is Atraumatic Restorative Treatment (ART). With this approach dental decay is removed solely with hand instruments and the cavity is filled with an adhesive, tooth coloured material which released fluoride."

Atraumatic Restorative Treatment (ART) for Tooth Decay

A Global Initiative 1998-2000

ART

Atraumatic Restorative Treatment

World Health Organization

50th Anniversary 1948-1998

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### The Art and Science of Minimal Intervention Dentistry and Atraumatic Restorative Treatment

By Dr. Jo Frencken

Leading expert on ART and caries

1977 leaves the Netherlands to live and work in Malawi for 3 years, addressing a gap in oral health between the Western world and Africa

WHO ART project manager

"ART combines modern cariology, a biomimetic dental material and patient-centered care." Giving it a place in "the (modern) dental practice and in outreach situations."

Stephen Hancock Publishing  
shancocks@aol.com

The art and science of Minimal Intervention Dentistry and Atraumatic Restorative Treatment

Jo E. Frencken

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The material of choice for ART is a self-curing, glass ionomer cement (GIC)

- ▶ Biocompatibility – mimics dentin
- ▶ Ease of use - hydrophilic
- ▶ Antimicrobial effect
- ▶ Fluoride uptake and release
- ▶ Superior marginal seal – via ion exchange and chemical bonding

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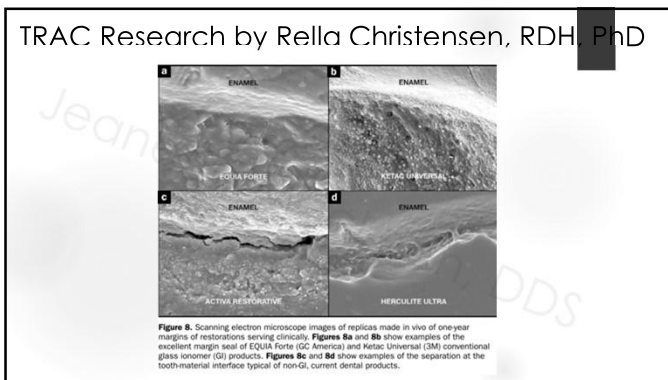
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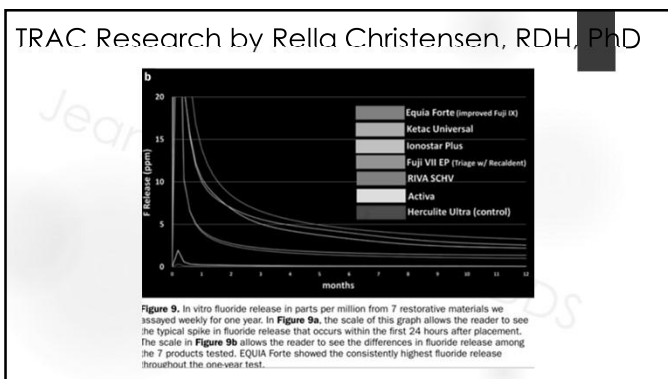
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### High Viscosity Glass Ionomer and Glass Hybrid Restoratives

- ▶ Fuji EQUIA Forte and Ketac Universal
- ▶ Amalgam replacement in Europe
- ▶ This is NOT an "interim" material
- ▶ Bulk-fill

In my day, glass ionomer cement would wash out!

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Class II Fuji EQUIA Forte 2 year post op

Class II Fuji EQUIA Forte 1 year post op

Dr. Juanette MacLain Kulisbeth@braces.com

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Sabrina Meets tetherball

Immediately post-op

4 months

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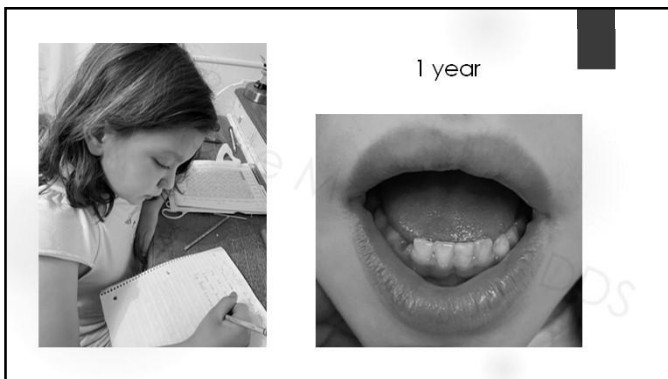
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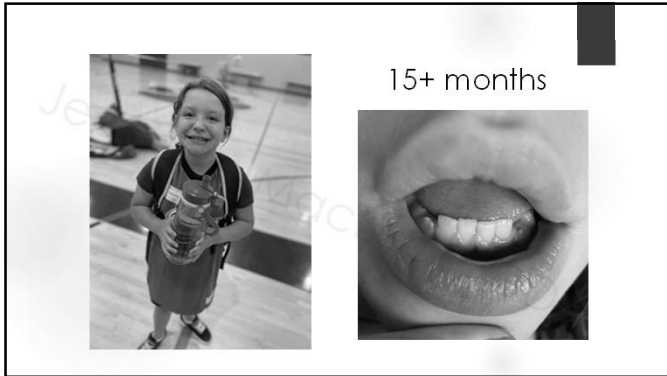
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### Controversy over terminology "Interim" vs. "Atraumatic"

- ▶ "Interim" implies temporary
  - ▶ All restorations have a finite longevity
- ▶ "Atraumatic"
  - ▶ Placing a restoration in an atraumatic way does not equate "temporary"

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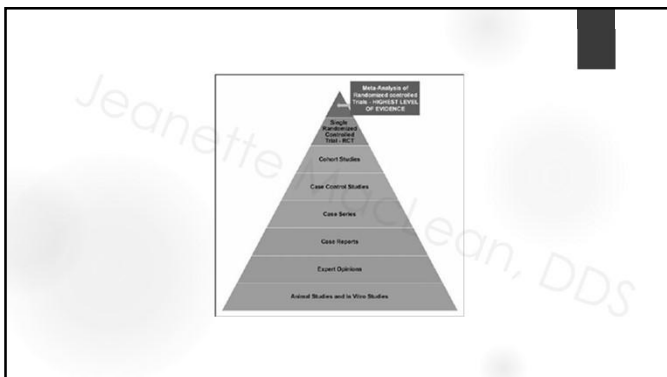
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Tooth Preparation for ART will vary on a case by case scenario, depending on the patient, the lesion, and the clinical situation, and may involve removal of tooth structure ranging from:

- ▶ All
- ▶ Some
- ▶ or None

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None...?



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"When you are considering whether to remove carious tissue in your pediatric patients, evidence-based research suggests that you should make your clinical decision based on hardness and not on a tooth's discoloration."

DR. MARGHERITA FONTANA, ADA ATLANTA 2017

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### The International Caries Consensus Collaboration (ICCC)

- ▶ 21 global experts in cariology convene in Belgium, 2015
  - ▶ Frecken, Innes, Fontana...
- ▶ To address "A gap between research findings and clinical practice. The reasons for this are complex, but contributing factors are inconsistencies in clinical guidelines, dental education, national health care policies, and remuneration systems."
- ▶ Findings and consensus publications featured in the 2016 special issue of *Advances in Dental Research*



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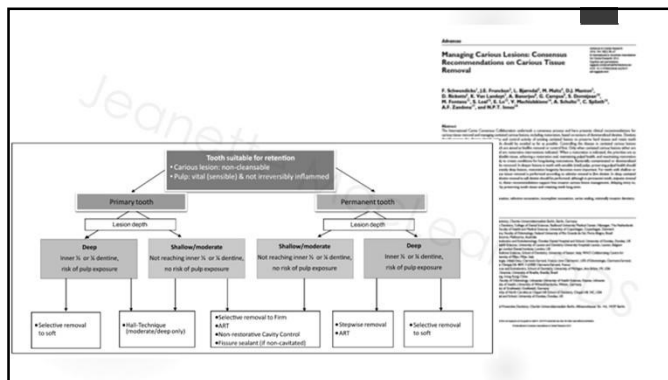
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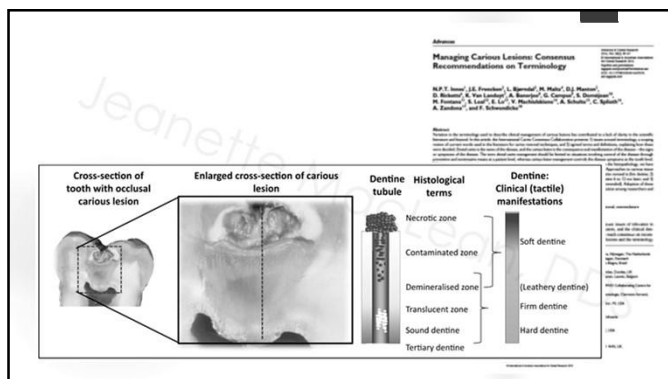
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Many US trained dentists are still "Bondodontists"

Complete caries removal

Extension for prevention

Drilling based on color vs. hardness

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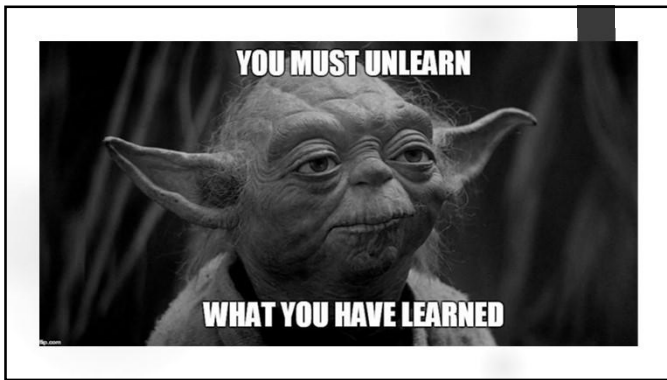
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Contemporary Concepts in Carious Tissue Removal: A Review

"Modern concepts for managing caries and its symptoms (i.e., carious lesions) aim to avoid invasive treatments whenever possible and instead attempt to control the activity of the biofilm and the lesions."

WILEY

Contemporary concepts in carious tissue removal: A review

Falk Schmalz, D.D.S., M.S.D., D.D.S., Ph.D., M.P.H.

**Abstract**

There is a general consensus of the three main pillars of modern caries management: (1) prevention, (2) non-invasive treatment, and (3) minimally invasive treatment. The aim of this review is to provide an overview of the contemporary concepts in carious tissue removal, focusing on the three pillars mentioned above. The review starts with a brief overview of the caries process and the role of the biofilm. It then discusses the different treatment options available, from prevention to non-invasive treatment and finally to minimally invasive treatment. The review concludes with a summary of the key points and a call to action for dentists to adopt a more holistic approach to caries management.

**1. INTRODUCTION**

Contemporary concepts in carious tissue removal: A review

Falk Schmalz, D.D.S., M.S.D., D.D.S., Ph.D., M.P.H.

**Abstract**

There is a general consensus of the three main pillars of modern caries management: (1) prevention, (2) non-invasive treatment, and (3) minimally invasive treatment. The aim of this review is to provide an overview of the contemporary concepts in carious tissue removal, focusing on the three pillars mentioned above. The review starts with a brief overview of the caries process and the role of the biofilm. It then discusses the different treatment options available, from prevention to non-invasive treatment and finally to minimally invasive treatment. The review concludes with a summary of the key points and a call to action for dentists to adopt a more holistic approach to caries management.

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### Glass Ionomer Options

- ▶ Fillings with High Viscosity GIC/ GLASS HYBRID RESTORATIVES
  - ▶ EQUIA Forte (HT high translucency)
  - ▶ Primary Bulkfill Class I, V, Strip Crowns, V, Permanent I,II, III, V (HT)
- ▶ Sealants with Low Viscosity GIC
  - ▶ Fuji Triage
  - (Fuji IX HVGIC also a great option)
- ▶ Fillings with Resin Modified Glass Ionomer (RMGI) – a good option for situations in which you want to light cure for speed and/or a resin-like appearance, while still providing fluoride release.
  - ▶ Fuji II LC
  - ▶ Primary Class II, III (tip – use Fuji coat like bond to finess/seal)
- ▶ Crowns
  - ▶ Fuji CEM2




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### Cavity Conditioner “PAA” = Polyacrylic Acid

- ▶ PAA and phosphoric acid etch for resin composite are NOT the same thing!
- ▶ PAA should be used whenever possible for SMART and GIC restorations
- ▶ Improves chelation and chemical bond
- ▶ A bonding agent is NOT necessary
- ▶ GC Cavity Conditioner =
  - ▶ 20% Polyacrylic Acid: removes the smear layer to enhance the bond of GIC to enamel and dentin
  - ▶ 3% Aluminum Chloride Hexahydrate seals dentinal tubules to reduce sensitivity




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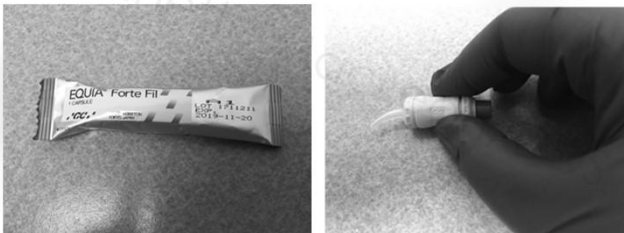
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### Basic GIC Capsule Mixing Steps

1. Remove from wrapper immediately before use
2. Tap capsule on its side to loosen the glass particles




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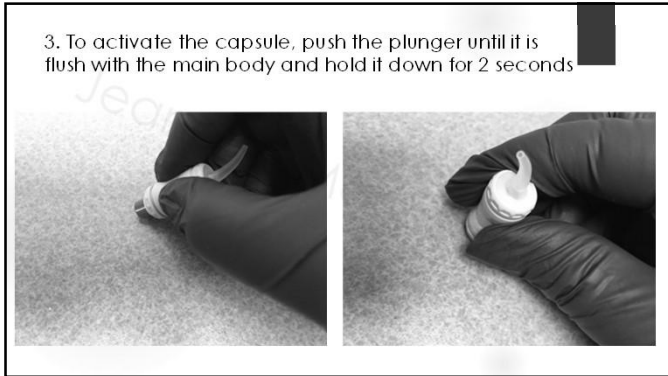
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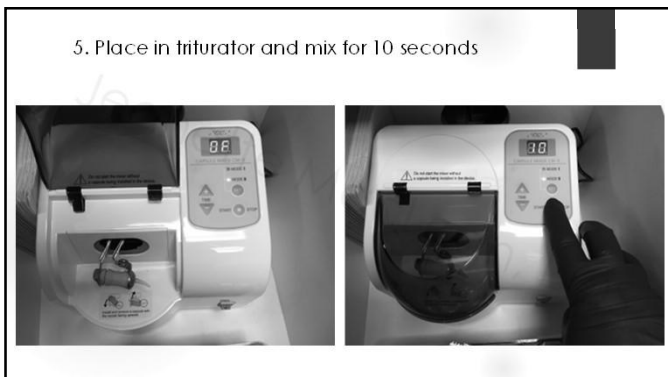
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5. Set a timer for 2 minutes, 30 seconds  
(\*\* 3.5 minutes with matrix or crown form \*\*)



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### Basic Aesthetic SMART

- ▶ SDF applied at exam
- ▶ Patient returns in 2-4 weeks for re-eval
- ▶ Lesion is matte black and ideally has sound margins
  - ▶ Remove soft dentin with hand instruments or slow speed round bur if needed or tolerated, this is optional but it can improve long term retention and performance of the restoration



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The art and science of  
Minimal Intervention Dentistry and  
Atraumatic Restorative Treatment  
Jo E. Frecken

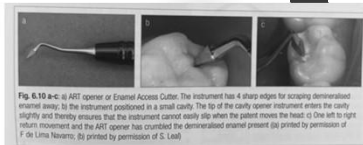
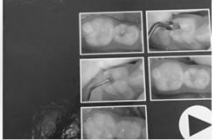


Fig. 6.10 a-c: (a) ART opener or Enamel Access Cutter. The instrument has 4 sharp edges for accuracy demonstrated (enamel away). (b) The instrument positioned in a small cavity. The tip of the cavity opener instrument enters the cavity slightly and thereby ensures that the instrument cannot easily slip when the patient moves the head. (c) One left to right rotation movement and the ART opener has contoured the demineralized enamel present (a) (revised by permission of F. de Lima Navarro. (b) printed by permission of S. Leach)

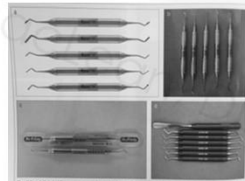


Fig. 6.9 (a) For ART treatment (reprinted by S. Leach, Handbook of Minimal Intervention Dentistry, Chicago, IL, 2011) (b) For ART treatment (reprinted by S. Leach, Handbook of Minimal Intervention Dentistry, Chicago, IL, 2011) (c) For ART treatment (reprinted by S. Leach, Handbook of Minimal Intervention Dentistry, Chicago, IL, 2011)

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Turn suction isolation systems  
WAY down  
or OFF

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- Activate and titrate your HVGIC according to the manufacturers specifications
  - In this example I am using Fuji EQUIA Forte
- Set a timer for 2 ½ minutes
- Apply the material to the cavity using the applicator gun (some use their finger, though I feel I have more control with the applicator)

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- Working time is SHORT
  - Get into place within approx. 45 seconds (varies depending humidity, package insert specifies 1 minute 15 seconds working time), then leave it alone until the full 2 ½ minutes are up (or longer)
- Options to press it into place; condenser, damp q-tip, finger, or microbrush/instrument dipped in coat
- Remove excess (I like a Hollanback)
- Over manipulating this material beyond the point of it being doughy (i.e. when it starts to get crumbly) will disrupt the glass matrix and the material will fail




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**Affiliated Children's  
Dental Specialists**

**Glass Ionomer Cement Post-Op Instructions**

- Your child has had their teeth treated with a glass ionomer cement filling or sealant material today.
- For 48 hours, please eat soft foods only, and use caution to avoid hard, crunchy foods while the material reaches its maximum strength and hardness.

**Suggested foods:**

Soup	Yogurt
Macaroni and cheese	Apple sauce
Scrambled eggs	Oatmeal
Smoothies	Mashed Potatoes
Ice cream	Jello

- It is always a good idea to avoid chewing ice or hard candies to prolong the life of your child's teeth and restorations.

Download at  
[kidsteethandbraces.com](http://kidsteethandbraces.com)

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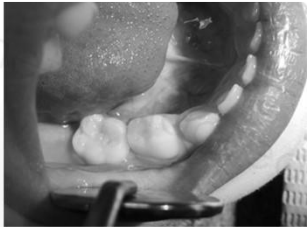
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6 month follow-up



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12 month follow-up



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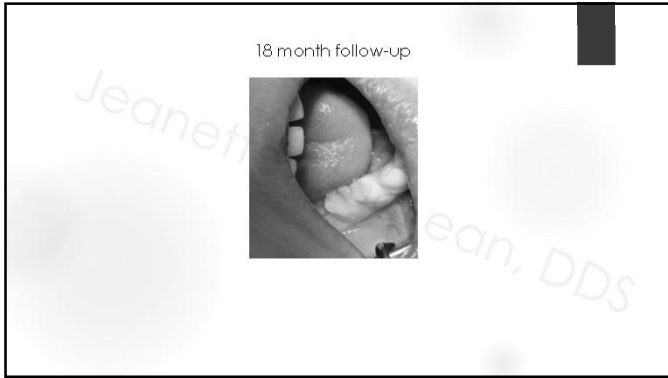
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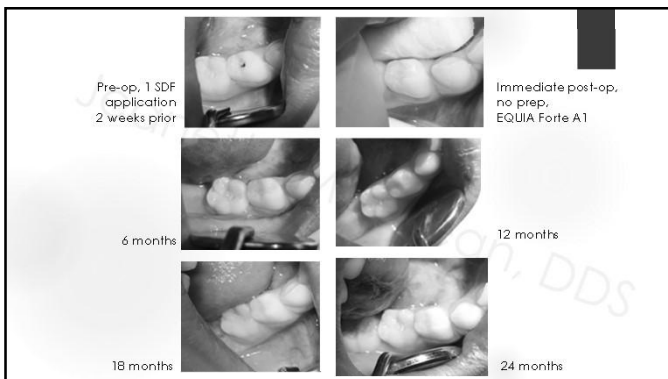
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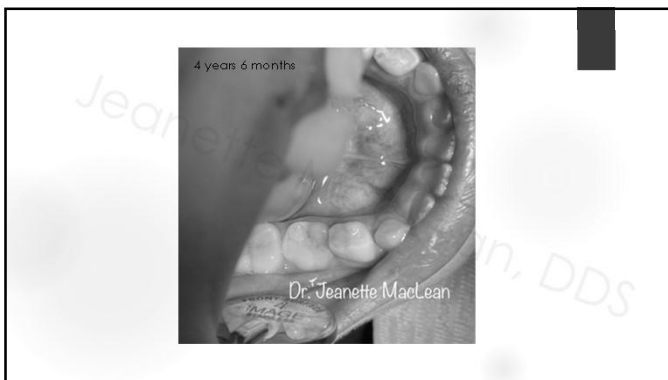
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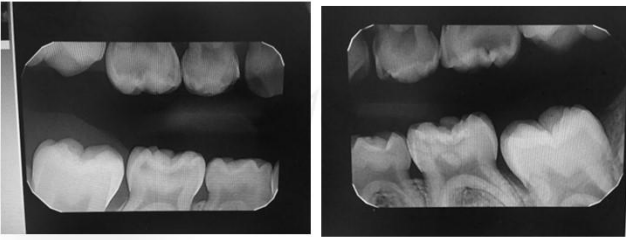
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5/1/18 x-rays from previous provider



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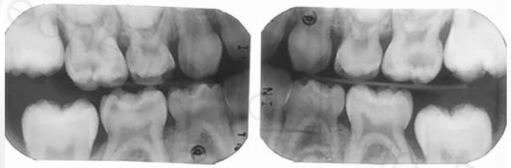
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5/17/18

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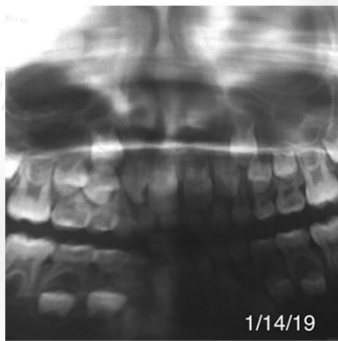
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1/14/19

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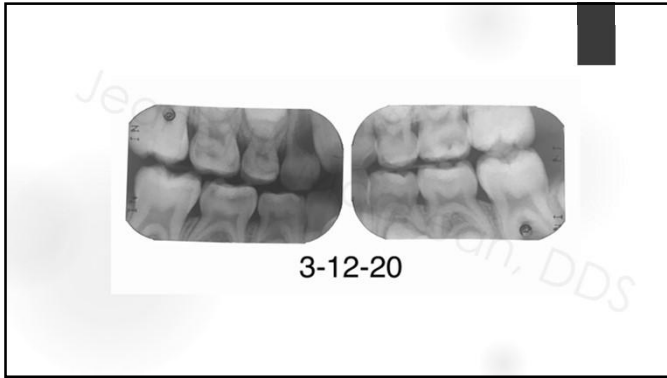
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3 year follow up

Jeanette MacLean Budd  
July 26

\*\*\*3 YEAR FOLLOW UP\*\*\*

Updated BWs and clinical photos. Patient will be 9 on Saturday. She chipped #1, which is very loose & about to exfoliate so I applied SDF & will let it fall out since it wasn't bothering her, and the mesial of #2 so I added EQUIA since it was bothering her tongue, but otherwise asymptomatic. I had recommended to add GIC to these 2 teeth last September because there was some wear and tear, but she had just been diagnosed with Type 1 diabetes, so time slipped away. She definitely could have been an 8-pack, with Hall crowns, but given how well she's done, and the esthetics concerns, we mutually agreed to keep it simple with a little more GIC on #1. Nice case to show how far you can get with ART/SMART & sealing carious lesions. Interesting fact, she said she notices she does most of her chewing on the right side.

14 month follow up on SMARTs for all 8 primary molars. Front teeth were caries free. This was a second opinion for GA and pulp/SSC on a 5 (now 6) year old, (GA was the only option given at previous pedo office). Teeth were asymptomatic and clinically had lots of sound enamel, though parents were warned we may need to do Hall crowns if the EQUIA Forte didn't hold up. Still asymptomatic and in good shape more than a year later. We will continue to monitor for sealed margins, radiographic stability of the lesions, and secondary dentin formation.

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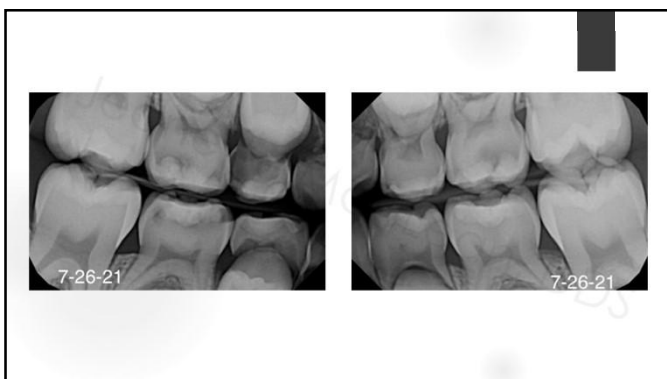
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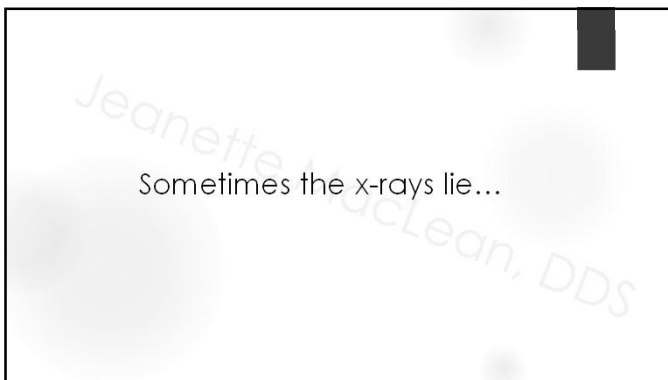
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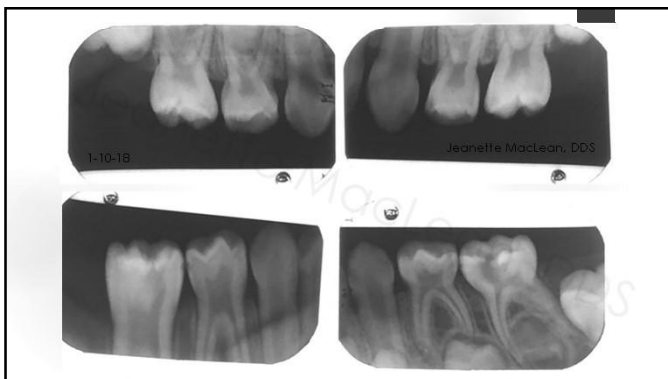
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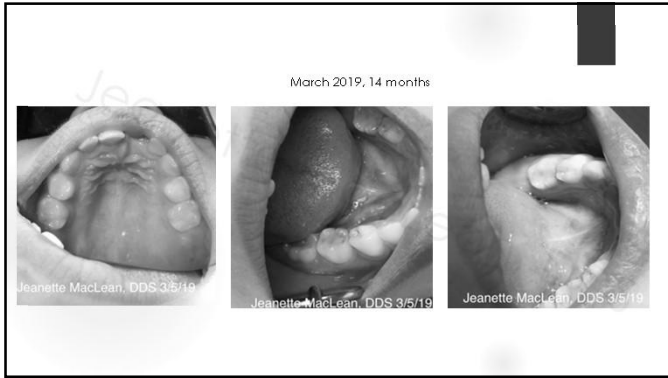
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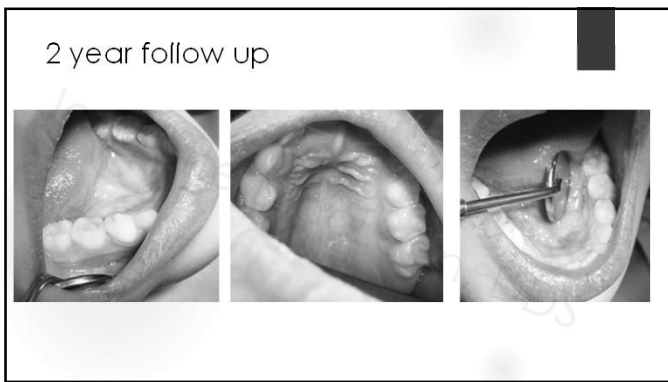
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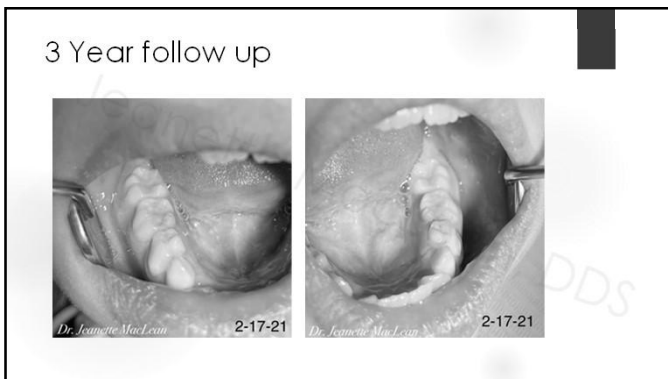
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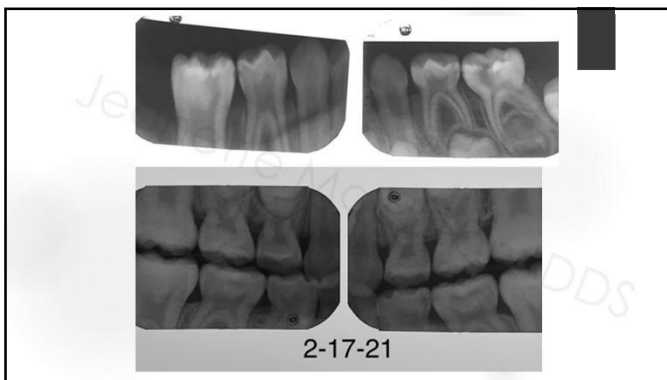
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From Doug Young

- ▶ Partial caries removal will always look the same (radiolucent) in the dentin on a radiograph. That goes for active or arrested, remin or demin, or even infected dentin. Enamel lesions often can appear to regress on a radiograph when remineralized but dentin has less mineral by volume and improvement is difficult or impossible to detect on a radiograph. I teach that a radiolucency under a filling can be three things:
  - ▶ 1. Recurrent decay
  - ▶ 2. Nonradiopaque dental material
  - ▶ 3. Partial caries removal (infected, affected, remin, demin, etc.)
- ▶ Only recurrent decay needs a new restoration and you simply tell this by clinical exam of the margins. It needs to have an open margin for bacteria to get in. #2 and #3 still have sealed margins....no treatment needed

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**DENOVO MATRIX SYSTEMS** **DENOVO DENTAL**

- ▶ GREAT FOR PRIMARY TEETH
- ▶ BAND CAN HOLD ITSELF OR USE WITH A C-RING/BITENE RING OR WEDGE
- ▶ Average Tooth Sizing:
  - ▶ - 1st permanent molar size 12
  - ▶ - 2nd primary molar size 7
  - ▶ - 1st primary molar size 3
- ▶ - Primary
- ▶ canine size 1
- ▶ Kit available



Matrix Band Refills — Pedro 3/16" (box of 20) Price: \$12.95

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**Howe Plier** **DENOVO DENTAL**

- ▶ Place and remove matrix bands
- ▶ Adjust SSCs
- ▶ Place wedges



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**EQUIA FORTE  
FUJI II LC**

- Wait longer to remove the matrix
- GIC can stick to metal, especially when not fully set
- Vaseline? (not my preference, could get on the enamel)
- Wait 3.5 minutes (vs. 2.5)
- Check the material with a Hollanback
- Peel back the matrix with an instrument
- Gently slide matrix out to the side



**Class II EQUIA Forte Tutorial: Glass Hybrid Restorative...**

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**Tips**

- ▶ Restore entire quad or ½ mouth at a time
  - ▶ Utilizing a DryShield (or similar) helps facilitate this
- ▶ Minimizes material waste
  - ▶ Utilize 1 capsule of GI by bulk-filling and sealing simultaneously
- ▶ Shortens appointment time
- ▶ More productive for you, easier on the child

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**ADJUSTING AND FINISHING**



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**GARRISON POLISHING STONES  
FINISHING BURS**



**Rally™ Composite Mini Polisher Refills**

**7901CM FG Flame C-Series Carbide (1)**

5025813UD  
UNSPSC #: 42131814

Blade Configuration: 12 Blade  
Cutting Length (mm): 3.3  
Head Size (LxW mm): 009  
Shaper: Flame  
US Number: 7901CM  
Shank: 3/16 Friction Grip Standard  
Package Quantity: 5/PA

**7404CM FG Football I C-Series Carbide (5 P)**

5025814UD  
UNSPSC #: 42131814

Blade Configuration: 12 Blade  
Cutting Length (mm): 3.2  
Head Size (LxW mm): 014  
Shank: 3/16 Friction Grip Standard 13  
Shaper: Football  
US Number: 7404CM  
Package Quantity: 5/PA

- USE WATER SPRAY WITH THE SLOW SPEED LATCH STONE
- BE CAUTIOUS ON EQUIA FORTE WITH BURS, HASN'T REACHED MAXIMUM HARDNESS (LIKE WAITING TO POLISH AMALGAM)

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Class II EQUIA Forte Tutorial: Glass Hybrid Restorative from GC America  
6,826 views • Premiered Apr 8, 2021

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Twirl it like  
a sardine  
can

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### Finishing and adjusting

- ▶ Use water spray
- ▶ Fuji II LC – gold polishing burs work well in high speed
- ▶ Caution with EQUJA Forte, it is soft initially
  - ▶ Slow speed latch polishing stones work best to adjust without accidentally removing excessive material
- ▶ TIPS for Class II, III, V:
  - ▶ Over fill
  - ▶ Let it set
  - ▶ Cut back with stone under water spray
  - ▶ (vs. messing around with the material while it's setting and messing it up)
  - ▶ Apply Fuji Coat and light cure 20 seconds
  - ▶ (Coat seals the margin and surface defects, leaving an extra smooth surface on final restorations. GC Fuji COAT LC protects against moisture contamination and serves as a protective shield for glass ionomer materials.)

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### Dentaltown, March 2020

## The Hall Technique

A minimally invasive method of treating cavities in pediatric patients



The parents of this 3-year-old patient traveled 2,000 miles from the Northern Territory of Canada to Dr. Jennifer MacLean could treat her with the Hall Technique in Arizona, in lieu of general anesthesia.

The patient's dental crown is on all four oral primary molars.

Because the Hall Technique is simple and finished in minutes, the stainless steel crowns are not a big deal aesthetically—the patient has her to share.

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### SMART Hall Technique video



SMART Hall Crown Technique With NuSmile Stainless Steel Crowns and Advantage Arrest SDF

457,751 views · Jan 14, 2019

2.4K 256 SHARE SAVE

Affiliated Children's Dental Specialists  
6.01K subscribers

YouTube

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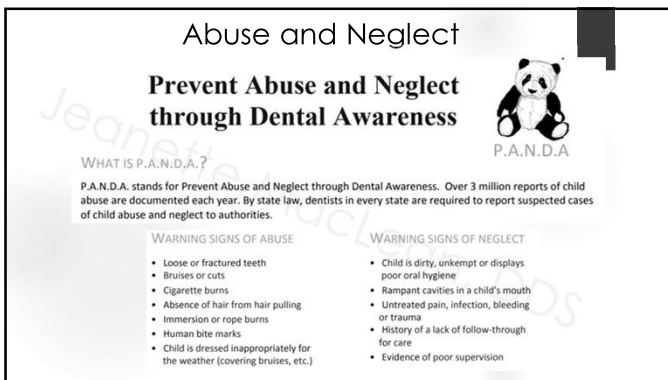
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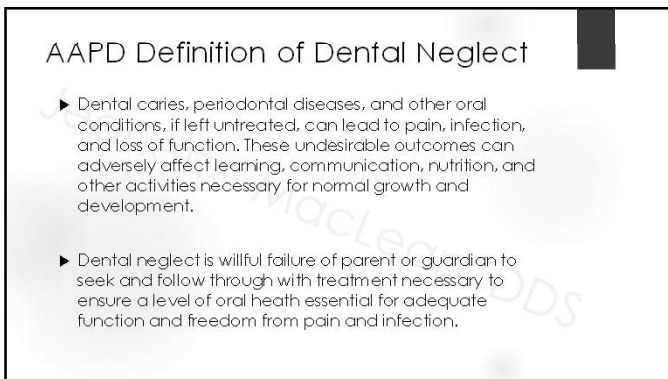
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Think before you act.

- ▶ Do they understand?
- ▶ Do they have the financial means?
- ▶ Do they have transportation?
- ▶ What are the barriers?

*Jeanette MacLean, DDS*

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When to Refer

*Jeanette MacLean, DDS*

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When should you refer to a pediatric dentist, orthodontist, or other allied health professional ?

*Jeanette MacLean, DDS*

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### When in doubt, refer them out!

- ▶ Don't try to be a hero
- ▶ If you don't know what you're doing and/or don't have the proper materials and experience, refer out to someone who does



MacLean, DDS

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Just because you don't treat it, doesn't mean you can't screen for it!



MacLean, DDS

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### If you see something, say something

- "(Dental Home)land Security"
- ▶ Mouth breathing
  - ▶ Narrow, high-vaulted palate
  - ▶ Erosion
  - ▶ Tethered oral tissue
  - ▶ Dry, cracked lips
  - ▶ Bruxing
  - ▶ Snoring
  - ▶ Obstruction
    - ▶ Tonsils, Adenoids, Turbinates, Allergies, Large tongue



MacLean, DDS

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Find your teammates!

- GP
- Pediatric Dentist
- Orthodontist
- Oral Surgeon
- Periodontist
- TMD Specialist
- Myofunctional Therapist
- Pediatrician
- ENT

Team Approach to Comprehensive Care

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The New York Times

*Texas Boy Speaks Clearly for First Time After Dentist Discovered He Was Tongue-Tied*



Dr. Amy Luedemann-Lazar



Dr. Richard Baxter

TONGUE-TIED ACADEMY

**TONGUE TIED**

RICHARD BAXTER, DMD, MS

Tongue- and lip-ties are causing heartache for the families you serve.

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<https://mymyomyhealth.com/teletherapy>



**KELLEY QUOLAS - PHOENIX/VIRTUAL**  
BS, EDH, QOM, Botox/Breathing Practitioner, TOTS Trained

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### Airway Screening Questions

DOES YOUR CHILD...

- ▶ SNORE ?
- ▶ HAVE LOUD BREATHING WHEN ASLEEP ?
- ▶ HAVE NASAL CONGESTION ?
- ▶ BREATHE MOSTLY THROUGH HIS OR HER MOUTH ?
- ▶ HAVE YOU EVER OBSERVED YOUR CHILD PAUSE IN HIS OR HER BREATHING DURING SLEEP ?
- ▶ IS YOUR CHILD A RESTLESS SLEEPER ?
- ▶ IS YOUR CHILD EXCESSIVELY SLEEPY ?
- ▶ IS YOUR CHILD HYPERACTIVE OR INATTENTIVE ?

**DR. SOROUSH ZAGHI**

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For more information;  @drmaclean

 info@kidsteethandbraces.com

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