

Caries Prevention and Management: A Medical Approach

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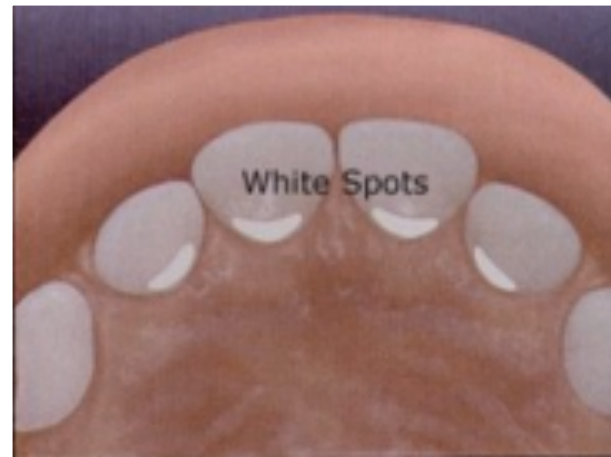
Minimally Invasive Treatments

- Infection control
- Tissue preservation
 - Hand instruments
 - Adhesive materials such as GI
 - Allow for pulpal healing
- Fluoride toothpaste/preventive education

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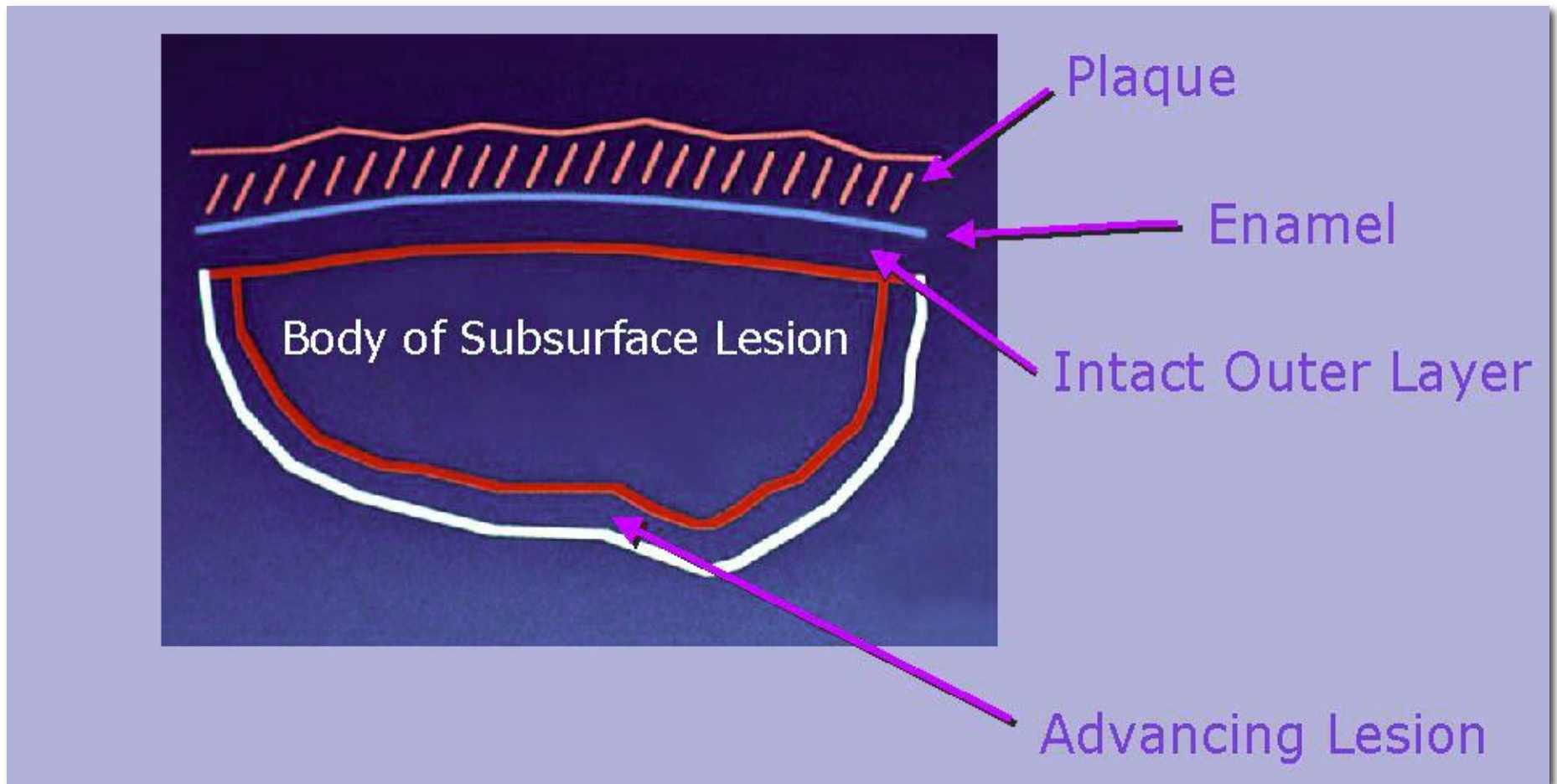
White Spots/Before Cavitation



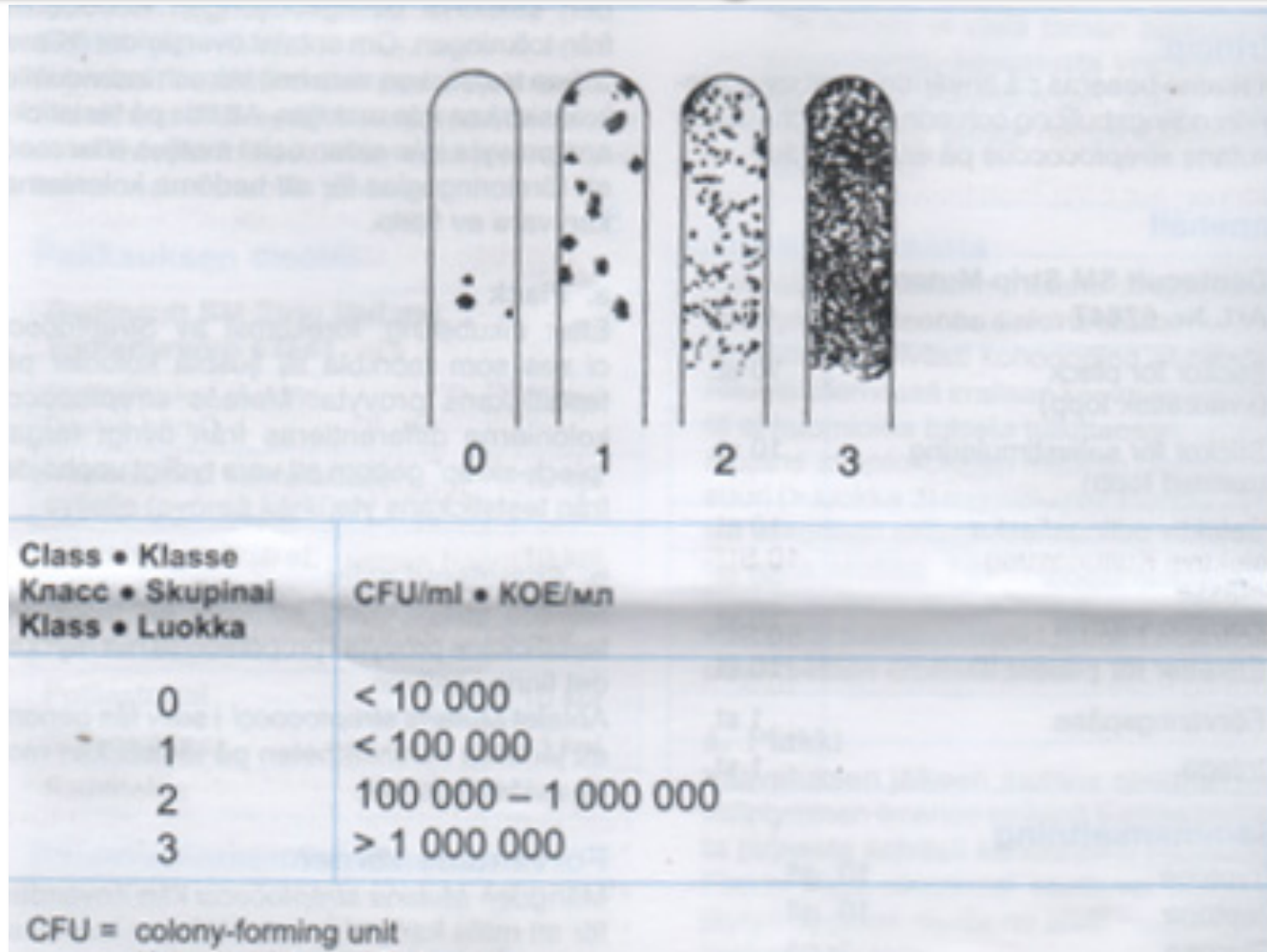
White Spot Lesions in Molars No Different Than Smooth Surface Lesions



How a white spot becomes a cavity



High mutans in early childhood is predictive of caries. Preschoolers with lots of plaque are high mutans and high risk.

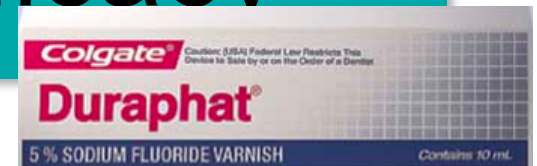


Fluoride Varnish Efficacy

- Average 33% caries reduction with 2 per year applications*
- 14% greater inhibitory effect than other topical fluorides**

*Helfenstein and Steiner, Community Dentistry and Oral Epidemiology, 1994

**Cochrane Library, Issue 4, 2003.



Children who receive at least 4 fluoride varnish treatments during from 9 to 30 months experience a 24-35% reduction in decay over children who receive less or no fluoride

Holve, Maternal Child Health J, Navajo

Combination Treatment: Povidone Iodine & Fluoride Varnish

- 10% PI = 1% iodine (Betadine)
- 12 to 19 mo toddlers, positive for mutans
- Applied q 2 months
- Examined after 1 year
- 91% disease free in treatment group
 - 54% disease free in control group

[Lopez, Pediatr Dent.](#)

Children 12-30 months treated with PVP-I & FV (ave 2.5 treatments) vs FV alone (ave 2.8 treatments) followed for 1 year.

Combined treatment reduced new decay by 31% over fluoride varnish alone



Milgrom P, Tut OK, Mancl LA. Topical Iodine And Fluoride Varnish Effectiveness In The Primary Dentition: A Quasi-Experimental Study. J Dent Child. (Sept 2011)

Evidence for Povidone Iodine Arresting Decay

- Children who received extensive restorative under GA
- Applied 3 times every 2 months
- 2/11 (18%) recurrent caries at 6 months in treatment group
- 5/8 (63%) recurrent caries in control grp

[Amin, Pediatr Dent.](#) 2004 Jan-Feb;26(1):5-10.

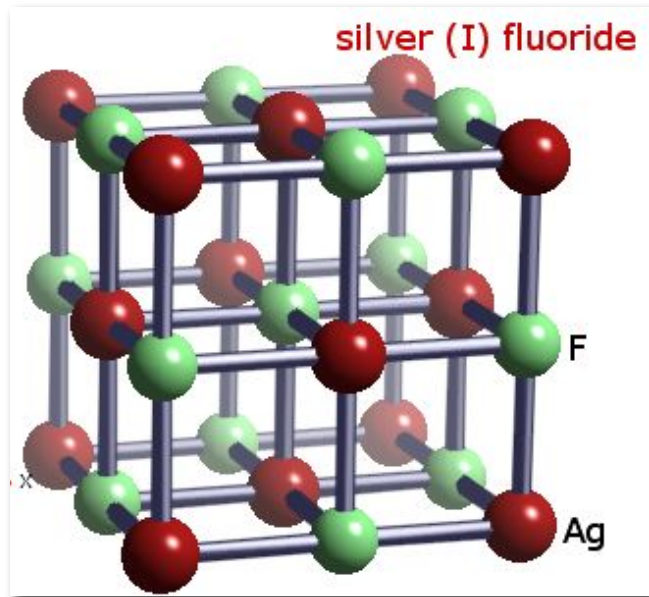
Fluoride Varnish Safety

- Do not exceed dose 0.473 mg F/kg body weight
- 10 fold less than any risk of toxicity
- 0.25 ml unit of varnish contains 5.65 mg F
- Child >12 kg (26 lbs), safe to apply whole container
- Child <12 kg, use no more than 50% of container
- Much safer than fluoride gels and foams
- No risk of fluorosis

Povidone Iodine Safety

- Minimum Risk Level 10 mcg/kg/day in addition to normal dietary intake
- Saturate a small cotton pledget with one drop of Betadine or equivalent and apply to teeth
- Delivers 150-300 mcg iodine
- No need to wipe off excess
- Will not stain or sting. Does not taste bad

Diammine Silver Fluoride



Used outside US
for more than 80
years

Topical application arrests
active open carious lesions
in primary and permanent
teeth in a single treatment

Can be used to treat occlusal
caries in permanent molars

Reacts with dentin to form an
impermeable layer,
resistant to acid

Can be repeated 2-3x/yr

Compatible with IRT/ART/GI

Reduce future decay in other
teeth by 50%. Twice as
effective as fluoride varnish

Application of DSF solution





Figure 2. Root caries at baseline (left panel), 24 hrs after treatment (middle panel), and 7 days after treatment with diammine silver fluoride (right panel).

Castillo et al., JDR 2010

Silver Fluoride Safety

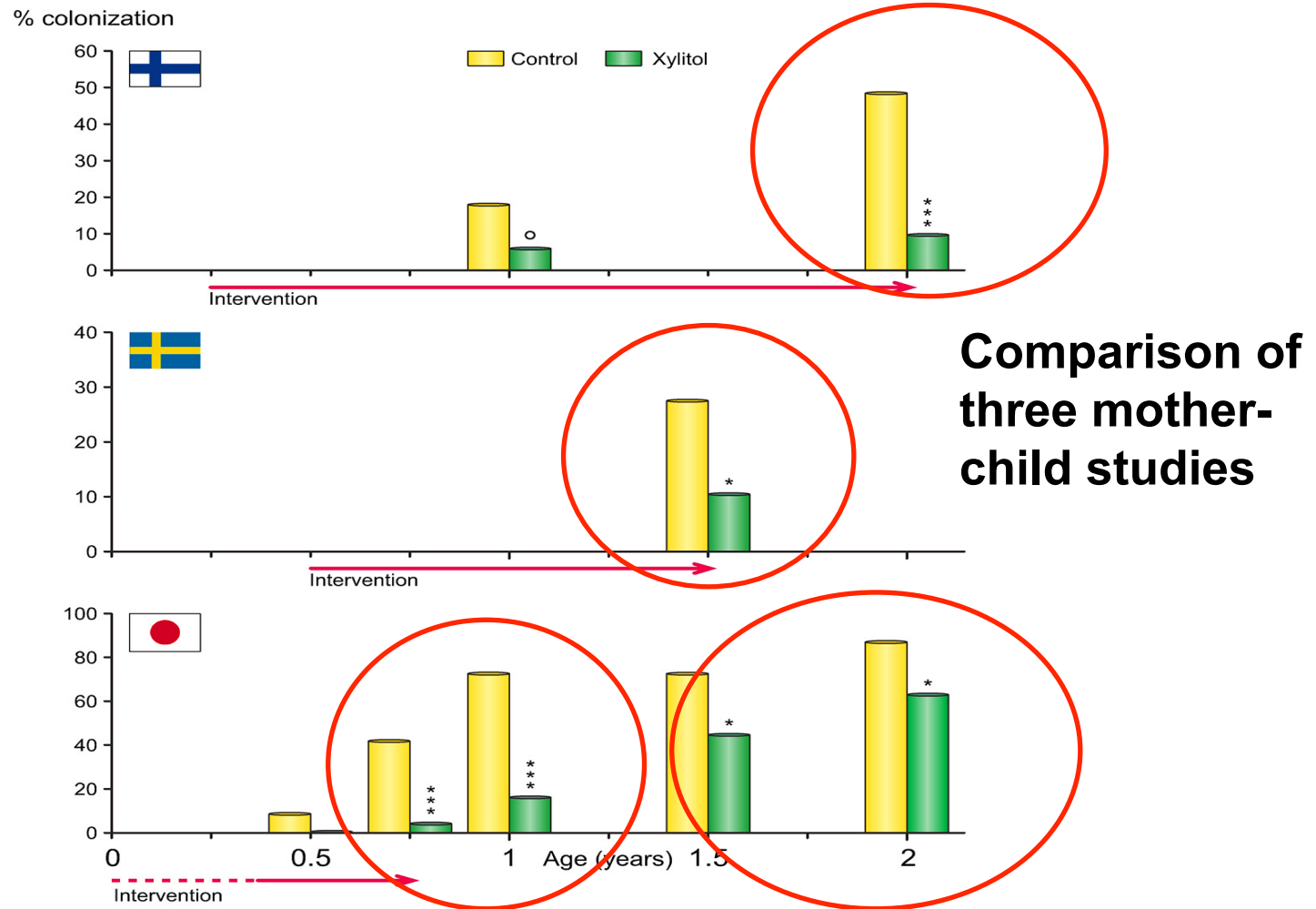
- 0.19 -0.76 mg/kg safe for a 10 kg child (22 lbs)
- This is application to at least 4 teeth in a single visit. Heavier children can have more applied
- Stains only decay, not intact enamel or cementum
- Irritating to pulp in deep lesions
- Does not harm gingiva
- Protect skin and eyes, pH 10, will stain face and clothes. Always wear gloves
- Wash any areas exposed with water. Stain will go away in days

Silver Nitrate

- First dental use in mid 1800s
- Silver reacts with organic material of dentin and forms a protective layer and is more resistant to acid (Hill & Arnold, JDR, 1937)
- Effective in arresting initial lesions, repeat per 12 months (Hyde, JCDA, 1973)
- Antiseptic, antimicrobial
- Limit application in children <10 kg as DSF
- Irritating to pulp, will stain decay and skin

Dental Care Is Safe During
Pregnancy and for Nursing
Mothers: Preventing the
Caries Infection

Growing evidence for maternal transmission and impact of interventions



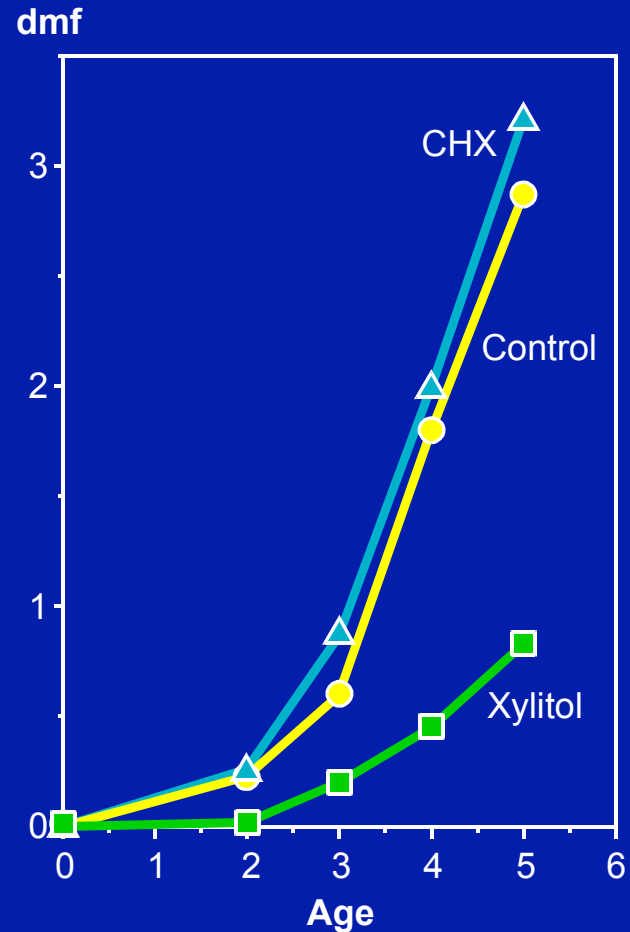
Slide courtesy of Dr. Eva Söderling, University of Turku

Good Dental Care

- Remove hopeless teeth
- Restore clearly active lesions or treat with DSF or SN
- Control infections with xylitol
- Chlorhexidine rinses not very effective, need stronger concentrations as in Europe

Daily use of xylitol gum to prevent transmission reduced caries in children

- At 5 years the need of restorative treatment was 71-75% lower in the Xylitol group as compared to the F and CHX groups
- The occurrence of caries and early mutans streptococci colonization were in agreement



(Isokangas et al., JDR 2000)

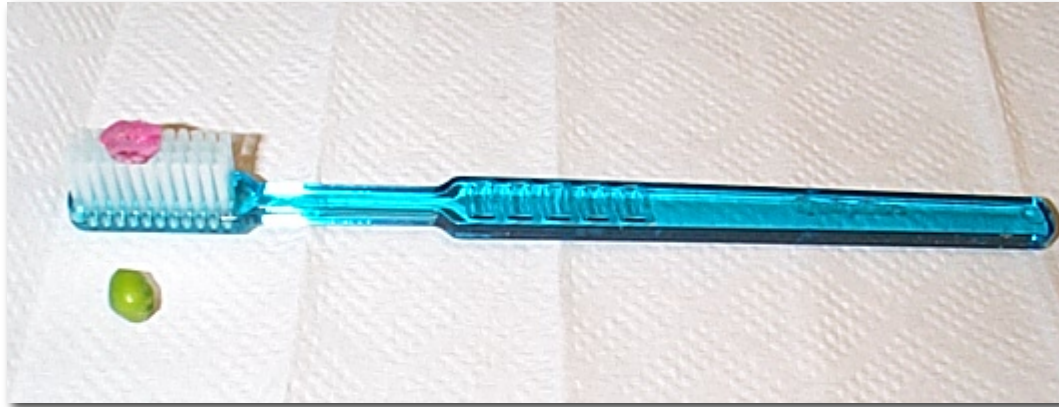
Forms of Xylitol for Daily Use

- Chewing gum—6 g/day total in 2-3 doses. Must be first ingredient on label
- Mouth rinse (Epic xylitol mouthwash) 2-3 doses per day
- Xylitol toothpaste, baby wipes, nasal sprays probably not effective
- Introduce slowly to avoid cramps

Mother Applying Xylitol Syrup



Toothpaste



A small pea size amount (0.25 mg) of toothpaste is effective. 0.125 mg (smear) for children under 2. Smaller amount may be ineffective.

Manchester Postal Study

- Distributed toothpaste to 5 year olds at home by mail in a randomized design
- Low income families, no fluoridation
- Reduced tooth decay by about 16%
- Cost effective

*Davies et al., Community Dental Health 2003;20(4):
207-10 & 2002;19(3):131-6

What Constitutes Good Parent Education about Toothpaste?

- Parents think 2X is reasonable but few achieve this
- Some are afraid it will pick off the enamel
- Many think child should brush his/her own teeth
- Need to be shown how and how much to use
- Need help in choosing a fluoride toothpaste
- Biggest risk of fluorosis is with eating toothpaste
- Young children swallow about 35% of the toothpaste but this is the not cause of fluorosis.

