

# Duh! It's a Disease!

## The Latest in Evidence-Based Caries Prevention & Intervention

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### CARIES AS A DISEASE PROCESS

“...placing a restoration only removes the bacteria from that particular cavity and **does nothing** to lower the bacterial levels in the remainder of the mouth.” – Featherstone, 2006

As a rule, patients who get carious lesions will *continue to get* carious lesions

“Risk assessment is an essential component in the decision-making process for the correct prevention and management of dental caries.” – Twetman & Fontana, 2009

We need to **make a plan** for preventing and treating each individual patient's disease.

“Minimally Invasive Dentistry uses the medical model whereby disease is controlled by the “oral physician” and an affiliated dental team.

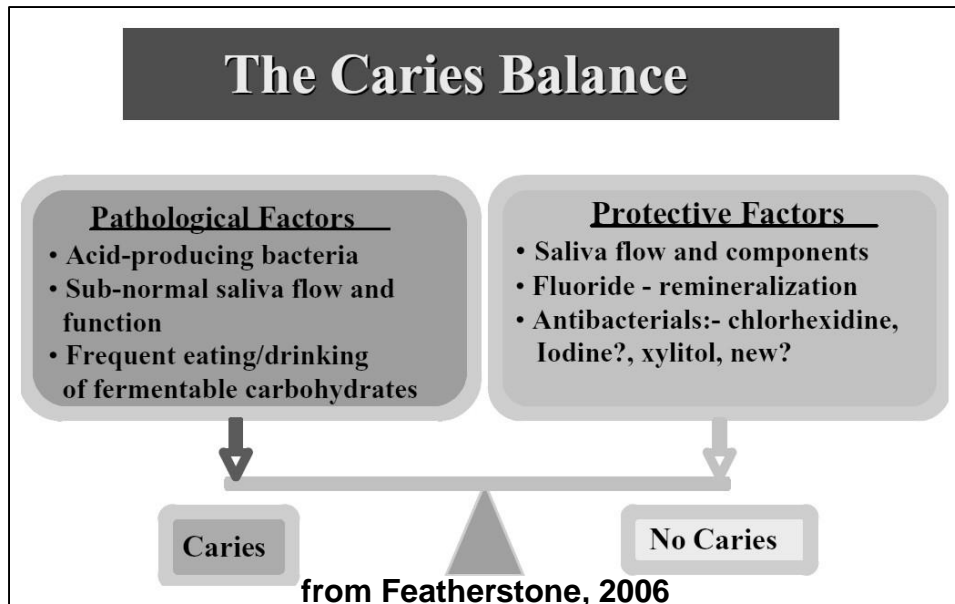
The main components of MID are

- assessment of the risk of disease, with a focus on early detection and prevention;
- external and internal remineralization;
- use of a range of restorations, dental materials and equipment;
- and surgical intervention **only when required** and **only after disease has been controlled.**” – Chalmers, 2006

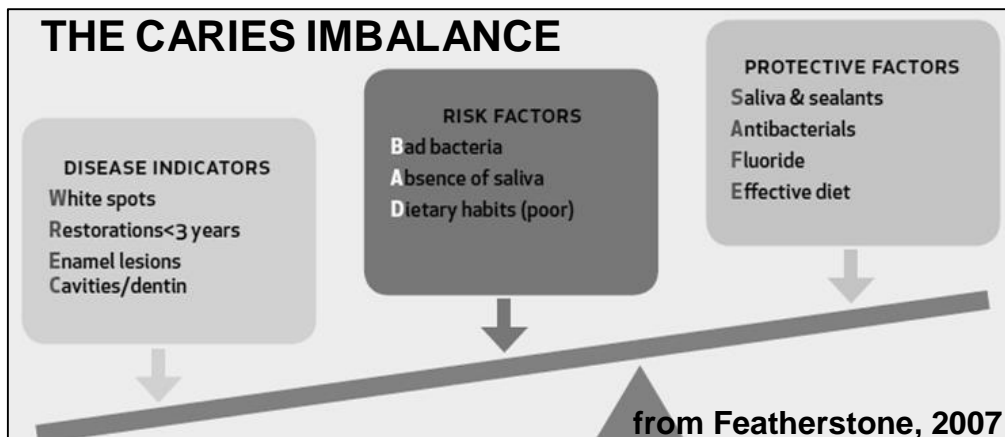
### THE MEDICAL MODEL FOR CARIES MANAGEMENT

- What's the PHYSIOLOGY of the disease process? (What's happening?)
- What's the ANATOMY of the disease process? (What does it look like?)
- What are the RISK FACTORS? (What helps us predict the disease?)
- How do we perform RISK ASSESSMENT? (How do we identify who gets the disease?)
- How do we prevent the disease from starting?
- How do we prevent the disease from progressing?
- How do we treat the disease minimally? (How do we prevent surgery/operative?)
- Which patients should receive which treatment?

## CARIES RISK ASSESSMENT



“For caries prevention or reversal, it is necessary to effectively increase the effect of one or more protective factors or to decrease the effect of one or more pathological factors.”  
– Featherstone, 2006



“Disease Indicators” help identify presence of the disease.  
These indicators place the patient at high risk of developing new or recurrent lesions, until the disease has been controlled.

### **PURPOSES of a CARIES RISK ASSESSMENT FORM**

1. Identify patients at risk for new lesions
2. Identify specific risk factors for a patient
3. Manage specific risk factors
4. Record risk and risk factors in the chart

“Indicators of past caries experience are the strongest predictors.” - Summitt, James B, *Fundamentals of Operative Dentistry: A Contemporary Approach, 2nd Edition.*

“...there is a strong body of evidence to support that caries experience is still, unfortunately, the single best predictor for future caries development.” – Twetman & Fontana, 2009

So, a patient who HAS carious lesions will *continue* to have new carious lesions.

Aside from current caries, it is hard to assess which factors are promoting the disease (for most age groups).

As oral physicians, we need to treat each patient’s disease personally.

| <b>DISEASE INDICATORS<br/>(Any one “YES” = High Risk)</b>                | <b>YES =<br/>CIRCLE</b> |
|--------------------------------------------------------------------------|-------------------------|
| Visible cavities and/or lesions, or radiographic penetration into dentin | <b>YES</b>              |
| Radiographic proximal enamel lesions                                     | <b>YES</b>              |
| White spots on smooth surfaces                                           | <b>YES</b>              |
| Restorations (for caries) in last 3 years                                | <b>YES</b>              |
| Extractions (due to caries), last 3 years                                | <b>YES</b>              |

ANY circled “YES” places the patient at HIGH risk.

| <b>RISK FACTORS (1-2 = Moderate Risk; 3 or more = High Risk)</b> | <b>YES =<br/>CIRCLE</b> |
|------------------------------------------------------------------|-------------------------|
| Visible plaque on teeth                                          | <b>YES</b>              |
| Deep pits and fissures                                           | <b>YES</b>              |
| Saliva reducing factors/meds                                     | <b>YES</b>              |
| Patient reports “dry mouth”                                      | <b>YES</b>              |
| Restorations with overhangs, open margins, or open contacts      | <b>YES</b>              |
| Exposed roots                                                    | <b>YES</b>              |
| Ortho appliances, partials dentures                              | <b>YES</b>              |
| Infrequent or irregular dental care                              | <b>YES</b>              |
| Frequent snacks (>3x/day)                                        | <b>YES</b>              |
| High sugar intake or >6 exposures                                | <b>YES</b>              |
| Recreational drug use                                            | <b>YES</b>              |

- These risk factors help predict caries risk in a patient with *no indicators* (lesions).
- In patients *with lesions*, these risk factors help us understand the patient’s disease and design protective factors for that patient.
- ONE circled “YES” places the patient at MODERATE risk (in absence of lesions).
- MORE than one circled “YES” could place the patient at MODERATE or HIGH risk, depending on the risk factors, & the patient.

| <b>PROTECTIVE FACTORS</b>     | <b>YES =<br/>CIRCLE</b> |
|-------------------------------|-------------------------|
| Fluoridated water intake      | <b>YES</b>              |
| Fluoride toothpaste 1x daily  | <b>YES</b>              |
| Fluoride toothpaste 2x daily  | <b>YES</b>              |
| OTC fluoride rinse daily      | <b>YES</b>              |
| Rx fluoride toothpaste daily  | <b>YES</b>              |
| Fluoride varnish in last 6 mo | <b>YES</b>              |
| Chlorhexidine 1 week/mo       | <b>YES</b>              |
| MI Paste in last 6 mo         | <b>YES</b>              |

- These protective factors can tip the balance.

NOTE: "YES" responses do not LOWER the risk; they help determine how protected the patient is currently.

## **PLAQUE REMOVAL**

WHY DO LESIONS HAVE DIFFERENT SHAPES?

Caries lesions develop in the shape of the biofilms (plaque) covering the surface of the tooth.

## **FLUORIDE**

FLUORIDE USES:

- to prevent caries
- to provide surface remineralization
- to desensitize

FLUORIDE SUMMARY

- enhances remineralization (surface layer)
- inhibits demineralization
- inhibits plaque bacteria
- forms a substance harder than tooth structure
- has its effect topically
- is stored in bone; transported by blood
- constant 0.1% have would prevent caries
- also effective & necessary in adults
- not effective with >6 sucrose exposures/day
- not effective when pH. drops below 4.5
- insufficient to prevent caries completely

## **AVAILABLE NaF REGIMENS**

### **RINSES**

OTC RINSE = 0.05% (226ppm)

Rx RINSE = 0.2% (920ppm)

### **TOOTHPASTES**

OTC TOOTHPASTE = 0.24% (1100 ppm)

Rx FL TOOTHPASTE = 1.1% (5000ppm)

Rx FL GEL = 1.1% (5000ppm)

### **PROFESSIONALLY APPLIED (CHAIRSIDE)**

GEL or FOAM = 2% (9000ppm)

VARNISH = 5% (22,500ppm)

**FLUORIDE PROTOCOL**, from ADA Council on Scientific Affairs, 2006

## **Professionally applied topical fluoride**

### **Evidence-based clinical recommendations**

1. Fluoride gel is effective in preventing caries in school-aged children.
2. Patients whose caries risk is low, as defined in this document, may not receive additional benefit from professional topical fluoride application.
3. There are considerable data on caries reduction for professionally applied topical fluoride gel treatments of four minutes or more. In contrast, there is laboratory, but no clinical equivalency, data on the effectiveness of one-minute fluoride gel applications.
4. Fluoride varnish applied every six months is effective in preventing caries in the primary and permanent dentition of children & adolescents.
5. Two or more applications of fluoride varnish per year are effective in preventing caries in high-risk populations.
6. Fluoride varnish applications take less time, create less patient discomfort and achieve greater patient acceptability than does fluoride gel, especially in preschool-aged children.
7. Four-minute fluoride foam applications, every six months, are effective in caries prevention in the primary dentition and newly erupted permanent first molars.
8. There is insufficient evidence to address whether or not there is a difference in the efficacy of NaF versus APF gels.

|                                                                                                                                                    |                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| <b><u>LOW RISK</u></b><br>- NO LESIONS* LAST 3 YEARS<br>- NO RISK FACTORS                                                                          | MAY NOT BENEFIT FROM<br>PROFESSIONALLY APPLIED<br>TOPICAL FLUORIDE |
| <b><u>MODERATE RISK</u></b><br>- 1-2 LESIONS * LAST 3 YEARS<br>OR<br>- AT LEAST 1 RISK FACTOR                                                      | FLUORIDE APPLICATION<br>EVERY 6 MOS                                |
| <b><u>HIGH RISK</u></b><br>- 3 or > LESIONS* LAST 3 YEARS<br>OR<br>- XEROSTOMIA<br>OR<br>- POOR FLUORIDE EXPOSURE<br>OR<br>- MULTIPLE RISK FACTORS | FLUORIDE APPLICATION<br>EVERY 3-6 MOS                              |
| * LESIONS INCLUDE CAVITATED AND INCIPIENT, NEW AND RECURRENT.                                                                                      |                                                                    |

## NOTES

- For high risk patients, new evidence suggests that twice a year may not be enough.
- Gels seem to be equivalent to varnishes, but this has not been shown *clinically*.
- Foam has not been shown *clinically* to be equivalent to gel or varnish.
- Gel & Foam should not be applied for four minutes.

## **CDT CODES**

### **Topical Fluoride Treatment (Office Procedure)**

**D1206** topical application of fluoride varnish

**D1208** topical application of fluoride

## **ADA UPDATED CLINICAL RECOMMENDATIONS (2013)**

### CHAIRSIDE APPLICATION SUMMARY

At risk <6 yo: VARNISH every 3-6 mos

At risk 6 and >: VARNISH every 3-6 mos

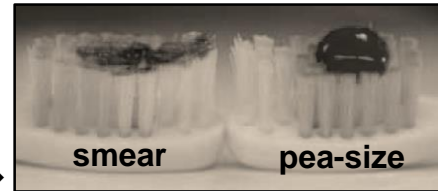
OR GEL (4 min) every 3-6 mos

Foam is NOT recommended.

|                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------|
| <b>fluoride protocols</b><br>(AGES 6+)                                                                              |
| HIGH RISK:<br>1. Fluoride varnish every 3-4 months<br>2. Rx toothpaste 2x/day, including before bed                 |
| MODERATE RISK:<br>1. Fluoride varnish every 6 months<br>2. OTC toothpaste twice daily<br>3. OTC rinse 1-2 times/day |
| LOW RISK:<br>OTC toothpaste twice daily                                                                             |

## AT HOME SUMMARY

At risk <6 yo: NO at-home Rx fluoride  
At risk 6 and >: Rx Gel/Paste 2x/day  
OR Rx Rinse at least weekly  
Root Caries: Rx Gel/Paste 2x/day  
OR Rx Rinse daily



## **FLUORIDE TOOTHPASTE FOR YOUNG CHILDREN →**

- For children 5 years and younger, fluoride toothpaste (over-the-counter, not prescription) is effective in reducing caries.
- Ingesting a pea-sized amount of toothpaste could lead to mild fluorosis.

### RECOMMENDATIONS:

- For children under the age of 2 years, a “*smear*” of toothpaste should be used to brush twice daily, as soon as teeth erupt.
- For children ages 2 through 5 years, a “*pea-sized*” amount of toothpaste should be used to brush twice daily.

## **WHAT TO SAY TO PATIENTS**

“We’re getting really serious about trying to prevent cavities.”

“According to the American Dental Association, you are at risk for developing more cavities.”

“I have to recommend that you have fluoride, but the choice is up to you.”

“We used to think that fluoride gets into your teeth before they come in and makes them stronger. We now know that’s not what happens...”

“Fluoride works on the surface of your tooth, as sugar and acid try to soften your tooth.”

“The fluoride has to be on your tooth when you are having sugar or acid on your teeth.”

## **CHLORHEXIDINE**

- antibacterial and anti-mutans
- can eliminate mutans in young children
- can be applied as a gel
- available as a 40% professional varnish
- reduces bacteria in pits and fissure
- reduces bacteria in orthodontic patients
- reduces bacteria when applied to margins of restorations
- effects only last for 6 months, at most (not long lasting)
- may not translate into reduced caries lesion incidence
- may be inactivated by toothpaste (Wait two hours to brush after chlorhexidine rinse.)

Patients with high risk can be placed on 0.12% chlorhexidine rinse ONE WEEK EACH MONTH.

Patients could be asked to rinse 1 minute each day for the first week of each month.

Antimicrobial modification of bacteria in plaque happens slowly and it must be repeated.

## **XYLITOL**

- Hexose sugars are fermented into acid by bacteria: *glucose, fructose, sucrose, maltose, dextrose*
- Sugar alcohols are not easily fermented by bacteria: *sorbitol, mannitol, xylitol*
- XYLITOL = “wood sugar” (Greek) It is found naturally in birch trees, sugar cane, and some mushrooms, berries and vegetables.

Clinical studies have demonstrated:

- Sucrose promotes caries.
- Sucrose stimulates plaque growth.
- Sucrose increases plaque adhesivity.
- Sucrose causes a more pronounced drop in plaque pH in patients who have a high caries risk.

Sorbitol, with or without Mannitol,:

- is slowly fermented by bacteria
- does not cause a critical pH drop in plaque
- does not appear to promote caries in clinical studies.

Xylitol in chewing gum:

- causes an increase in plaque pH.
- reduces mutans counts in plaque and saliva.
- encourages remineralization of early caries lesions.

- Xylitol should be used only as an adjunct to fluoride therapy.
- 5-6 grams/day is required.
- Patients should use xylitol at least 3 times/day.
- Patients should have exposures of 5-10 min.
- Xylitol products which stimulate saliva are best.
- Xylitol should be the only sweetener, and the majority of the weight in the product.

## **XYLITOL SUMMARY**

- noncariogenic
- anticariogenic / caries-inhibitory
- decreases acid production
- decreases mutans counts in saliva / plaque
- remaining mutans are not as adhesive
- prevents mutans transmission to babies
- may reduce lactobacilli
- promotes remineralization
- has prolonged effect
- more effective than sorbitol or others
- safe sugar for diabetic patients
- causes intestinal discomfort in some patients
- must be kept away from dogs



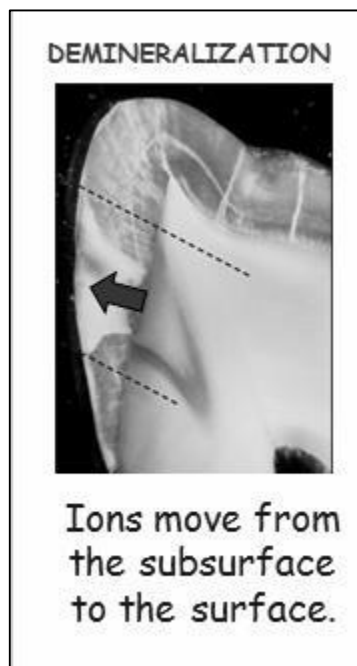
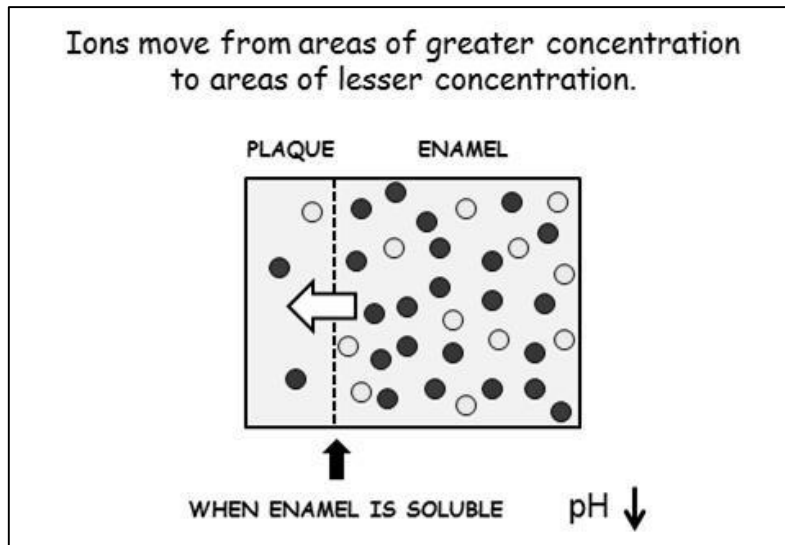
## XYLITOL USES

- as a noncariogenic substitute
- as an anticariogenic therapeutic

## XYLITOL HARD CANDY OR CHEWING GUM REGIMENS

- 6-10 grams/day
- 5 minute exposures
- 3-5 exposures/day

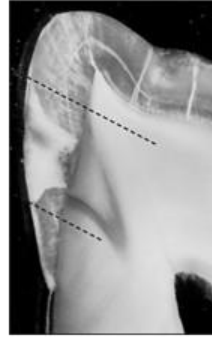
## REMINERALIZATION: CALCIUM & PHOSPHATE PRODUCTS



As the surface demineralizes, the lesion spreads into dentin without breakage of the surface.

As a result, many lesions are not yet cavitated when they reach dentin.

The uncavitated lesion is likely free of bacteria because they cannot fit into the small diffusion spaces in the surface.



Eventually, minerals (calcium, phosphate and hydroxyl ions) appear in the plaque fluid outside the tooth, and balance is achieved.

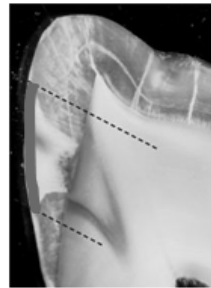
Then, the pH goes up.

**SUPERSATURATION:**

Now, demineralized enamel can remineralize.

So, remineralization not only depends on pH increase, but also on the availability of Ca & PO, and on the ionic strength of the plaque.

REMINERALIZATION

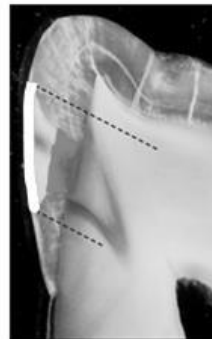


Fluoride hardens the surface layer of enamel.

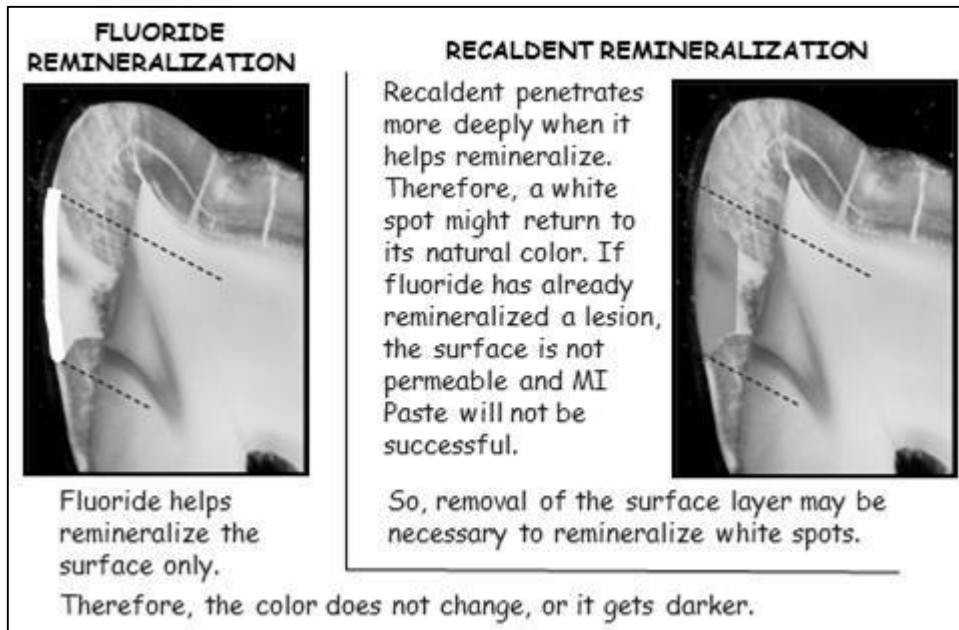
If the balance can be tipped, in favor of remineralization, the resulting surface is now more impermeable and resistant than before.

The SEALED subsurface may remain demineralized, which is not of clinical consequence UNLESS factors return that favor demineralization.

Often these remineralized lesions have white or brown surfaces.



Remineralization requires “bioavailable” calcium and phosphate. Remineralization is greatly enhanced by fluoride, which should be the first method of choice. Other remineralizing products are being developed and studied.



### RECALDENT (CPP-ACP) SUMMARY

- delivers ca to the biofilm
- increases fluoride in the biofilm
- slows demineralization
- facilitates remineralization
- provides deep remineralization
- anticariogenic
- anti-mutans streptococci
- inhibits fermentation
- causes regression of lesions
- can be used by lactose-intolerant patients
- cannot be used by patients with milk protein allergies

### RECALDENT USES

- to remineralize white lesions
- to remineralize interproximal lesions
- to prevent demineralization in orthodontic patients
- to prevent new carious lesions
- to desensitize

### RECALDENT (CPP-ACP) REGIMENS

- MI PASTE FOR WHITE SPOTS
  - Use with tray for 15 min BID
  - Wipe on teeth for 15 min BID
- MI PASTE FOR INTERPROXIMAL LESIONS
  - Wipe on teeth for 15 min BID
- TRIDENT CHEWING GUM
  - Chew 2 pieces, 20 minute exposure, 4 times/day

## PIT & FISSURE SEALANTS

GLOSSARY TERMS from Fontana et al, 2010:

### “noncavitated lesion”

- a lesion whose surface appears macroscopically to be intact
- a caries lesion without visual evidence of cavitation
- The lesion is still potentially reversible or arrestable.
- sometimes referred to as an *incipient lesion*, *initial lesion*, *early lesion* or *white-spot lesion*

### “white-spot lesion”

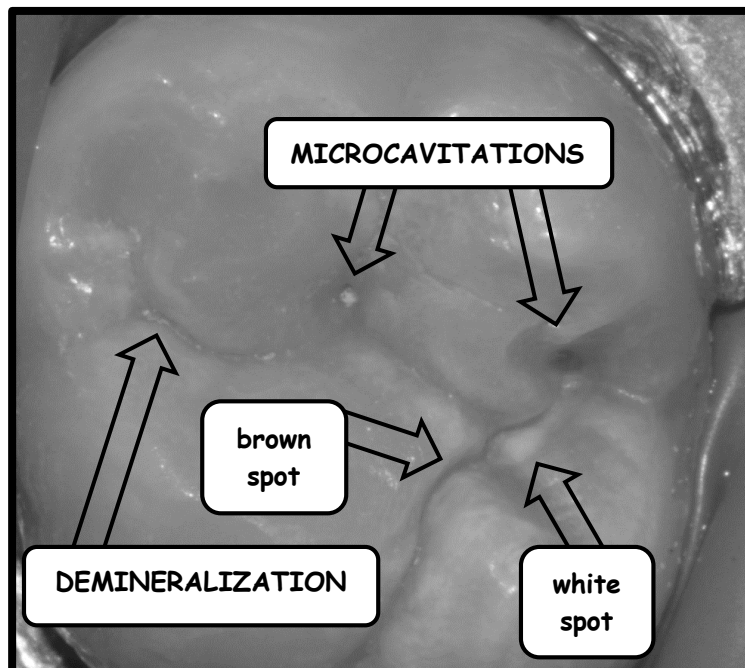
- a noncavitated lesion where mineral loss has produced changes in optical properties of enamel
- a loss of translucency results in a white appearance in the enamel
- not necessarily incipient
- may involve dentin

### “brown-spot lesion”

- a noncavitated lesion where mineral loss has produced changes in optical properties of enamel
- the acquisition of intrinsic or exogenous pigments produces a brown discoloration.
- So, a brown-spot lesion is a stained white-spot lesion.
- It is *not* just a surface stain.

### “microcavitation”

- a lesion with a surface that has lost its original contour/ integrity, without distinct cavity formation
- can involve ‘widening’ of the enamel fissure beyond its original features, *and/or*
- a very small cavity with no detectable dentin at its base



## PIT & FISSURE SEALANTS

### Evidence-based clinical recommendations for the use of pit-and-fissure sealants

from ADA Council on Scientific Affairs, 2006

#### PRIMARY PREVENTION:

“interventions provided to avert the onset of caries”

#### SECONDARY PREVENTION:

“interventions to avert the progression of early caries to cavitation”

- Resin sealants reduce caries in *permanent* teeth.
- Sealants reduce the need for restorations in *permanent molars*.
- If teeth are sealed and the teeth still become carious, it will take longer and the caries will be less extensive.
- Sealants should be monitored and repaired or replaced as needed.
- We should feel comfortable sealing a tooth if:
  - We don't see a hole or a shadow.
  - We can't feel a hole.
  - We don't see a huge lesion on x-ray.
- Sealants placed over non-cavitated lesions significantly reduce progression of the lesion.
- When lesions are sealed, bacterial number decrease by as much as 100-fold.
- For patients of all ages, pit-and-fissure sealants should be placed on early (non-cavitated) carious lesions to prevent progression of the lesion.
- “The use of explorers is not necessary for the detection of early lesions, and forceful use of a sharp explorer can damage tooth surfaces.”
- Resin sealants seem to be more effective than glass ionomer (GI) sealants in reducing caries.
- Resin-based sealants are the first choice.
- GI can be used as a *temporary* sealant if isolation is an issue.
- Evidence that air abrasion increases retention is limited and conflicting.
- Substituting air abrasion for acid etching LOWERS sealant retention.
- Evidence that preparing enamel with a bur increases retention is limited and conflicting.
- Routine preparation of enamel with burs is not recommended.
- Retention of resin sealants is improved with a four-handed technique.
- The dental professional placing the sealant should be assisted whenever possible (for resin *and* GI).
- Retention of resin sealants can be improved if a bonding agent is used.
- A bonding agent can be used when the dentist thinks it might improve retention.
- Self-etching bond agents (without a separate etching step) often result in lower sealant retention rates.
- Self-etching bond agents should not be used with sealants.

- *Primary teeth* should be sealed when either the tooth or the patient is at risk.
- *Permanent teeth in children* should be sealed when either the tooth or the patient is at risk.
- *Permanent teeth in adults* should be sealed when either the tooth or the patient is at risk.

### **SEALANT SUMMARY**

- Recommended when the tooth or the patient is at risk.
- Effective for primary and permanent teeth.
- Sealants over non-cavitated lesions are effective at stopping lesion progression.
- Bacteria decrease, or disappear, when Sealants are placed over cavitated lesions.
- Resin sealants are retained longer than glass ionomer sealants.
- Air abrasion / bur preparation is not necessary.
- A bonding agent might increase longevity.
- Glass Ionomer sealants can be used temporarily (if isolation is a problem).
- 4-handed placement increases longevity.
- Sealants should be monitored and repaired.

### **WHAT TO SAY TO PATIENTS**

“We’ve changed the way we look at this, and we now consider this a cavity.”  
 “It needs to be treated but we’re just not going to drill into it...”

### **INTERPROXIMAL LESION SUMMARY**

- Approximately 20% of interproximal lesions in the outer half of the enamel are cavitated.
- Approximately 47% of interproximal lesions in the inner half of the enamel are cavitated.
- Many interproximal lesions at the DEJ or just inside dentin are still not yet cavitated.
- Tooth separation for 24 hours, followed by resin sealant placement, can arrest or reverse interproximal lesions.
- Tooth separation for 24 hours, followed by a glass ionomer sealant (Fuji Triage) placement, can arrest or reverse interproximal lesions.
- Repeated, direct application of fluoride varnish can arrest or reverse interproximal lesions.
- “Resin infiltration” involves etching with 15% hydrochloric acid. After application of a “drying agent” (alcohol), a resin is applied. Deep penetration occurs.
- Each step is repeated before proceeding to the next step.
- Resin infiltration can arrest or reverse interproximal lesions.
- Resin infiltration can arrest or reverse facial “white spot” lesions.
- Resin infiltration can change the color of a white spot lesion.
- A low number of patients will comply with flossing.

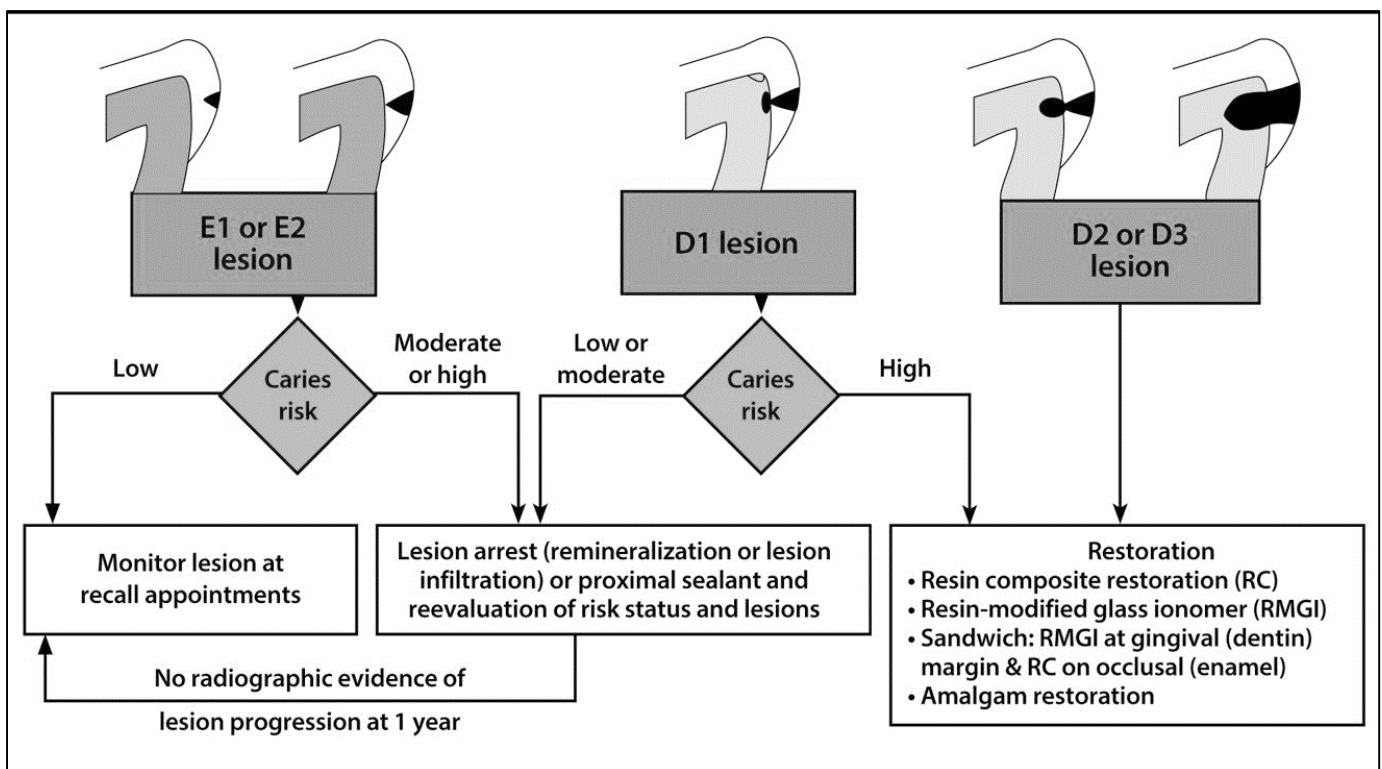
## INTERPROXIMAL LESION OPTIONS

- MI paste BID for 15 min
- Separation and fluoride varnish every 3 mos
- Separation and resin sealant
- Separation and glass ionomer sealant
- Resin infiltration (ICON)

*If we suspect a lesion is active, it should NOT be “watched”; it should be treated with one of the above options.*

*If we determine a lesion is inactive, it does not need treatment, and it does NOT need to be “watched”.*

## PROXIMAL LESION DECISION TREE



Hilton, *Summitt's Fundamentals of Operative Dentistry: A Contemporary Approach, 4th Edition.*

## **ACTION STEPS TO CONSIDER**

- Use a Caries Risk Assessment form (*page 3, top of page 4, pages 19-21*)
- Implement ADA Fluoride Protocols by risk (*top and bottom charts, page 6*)
- Switch to Fluoride Varnish for kids <6yo (*“chairside application summary”, page 6*)
- Switch to Fluoride Varnish or 4 min Fluoride Gel (no foam) for patients >5yo (*“chairside application summary”, page 6*)
- 5000 Toothpaste for high risk patients >5yo (*“at home summary”, top of page 7*)
- Use a form for chairside dietary sugar *analysis* (*pages 22-23*)
- Stop “watching” and try to arrest active lesions (*page 15, including decision tree*)
- Seal teeth, even for adults, when indicated (*page 13, top of page 14*)
- Consider xylitol chewing gum for some patients (*top of page 9*)
- Consider CPP-ACP paste for some patients (*bottom of page 11*)
- Offer resin infiltration for white spot patients



# Managing Caries: From Fluoride to Fillings, and Everything in Between

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## RECOMMENDED READING

1. **Caries risk assessment in practice for age 6 through adult**<sup>3</sup> – Featherstone JD, Domejean-Orliaguet S, Jenson L, Wolff M, Young DA, J Calif Dent Assoc. 2007 Oct;35(10):703-7, 710-3
2. **Caries risk assessment appropriate for the age 1 visit (infants and toddlers)**<sup>3</sup> - Ramos-Gomez FJ, Crall J, Gansky SA, Slayton RL, Featherstone JD, J Calif Dent Assoc. 2007 Oct;35(10):687-702
3. **Caries management by risk assessment: implementation guidelines**<sup>3</sup>- Young DA, Featherstone JD, Roth JR, Anderson M, Autio-Gold J, Christensen GJ, Fontana M, Kutsch VK, Peters MC, Simonsen RJ, Wolff MS., J Calif Dent Assoc. 2007 Nov;35(11):799-805.
- ★ 4. **Professionally Applied Topical Fluoride: Evidence-Based Clinical Recommendations**<sup>4</sup> - American Dental Association Council on Scientific Affairs, J Am Dent Assoc 2006;137;1151-1159
- ★ 5. **Topical fluoride for caries prevention: executive summary of the updated clinical recommendations and supporting systematic review**<sup>4</sup>, - Weyant RJ, Tracy SL, Anselmo TT, Beltrán-Aguilar ED, Donly KJ, Frese WA, Hujoel PP, Iafolla T, Kohn W, Kumar J, Levy SM, Tinanoff N, Wright JT, Zero D, Aravamudhan K, Frantsve-Hawley J, Meyer DM; American Dental Association Council on Scientific Affairs Expert Panel on Topical Fluoride Caries Preventive Agents, J Am Dent Assoc. 2013 Nov;144(11):1279-91

- ★ 6. **Evidence-Based Clinical Recommendations for the Use of Pit-and-Fissure Sealants**<sup>4</sup> - American Dental Association Council on Scientific Affairs, J Am Dent Assoc 2008;139;257-268
7. **Sealants and dental caries: dentists' perspectives on evidence-based recommendations**<sup>4</sup>, Tellez M, Gray SL, Gray S, Lim S, Ismail AI, J Am Dent Assoc. 2011 Sep;142(9):1033-40.
8. **Sealants and dental caries: insight into dentists' behaviors regarding implementation of clinical practice recommendations**<sup>4</sup>, O'Donnell JA, Modesto A, Oakley M, Polk DE, Valappil B, Spallek H, J Am Dent Assoc. 2013 Apr;144(4):e24-30.
9. **Concordance between clinical practice and published evidence: Findings from The National Dental Practice-Based Research Network**<sup>4</sup>, Norton WE, Funkhouser E, Makhija SK, Gordan VV, Bader JD, Rindal DB, Pihlstrom DJ, Hilton TJ, Frantsve-Hawley J, Gilbert GH; National Dental Practice-Based Research Network Collaborative Group, J Am Dent Assoc. 2014 Jan;145(1):22-31.
10. **Minimally invasive resin infiltration of arrested white-spot lesions: a randomized clinical trial**<sup>4</sup>, Senestraro SV, Crowe JJ, Wang M, Vo A, Huang G, Ferracane J, Covell DA Jr., J Am Dent Assoc. 2013 Sep;144(9):997-1005.
- ★ 11. **Chairside Diet Assessment of Caries Risk**<sup>5</sup> - Teresa A. Marshall, J Am Dent Assoc 2009;140;670-674
- ★ 12. **ADA CENTER FOR EVIDENCE-BASED DENTISTRY**  
<http://ebd.ada.org/>  
 Click on "Clinical Recommendations" on the top menu bar.  
 Topical Fluoride and Sealants are found here, among other EBD topics.  
*This website is open to everyone. You do not need to be an ADA member.*

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<sup>1</sup> To get a free copy, google the title, or go to Karger: <http://www.karger.com/Article/Pdf/77770>

<sup>2</sup> Available on the JADA website to ADA member dentists,

[http://jada.ada.org/content/129/1/55.full.pdf+html?login\\_referer=http://jada.ada.org/content/129/1/55.abstr](http://jada.ada.org/content/129/1/55.full.pdf+html?login_referer=http://jada.ada.org/content/129/1/55.abstr) act

<sup>3</sup> The California Dental Journal can be accessed at <http://www.cda.org/member-resources/journal>. On the website, go to Journal Archive in the middle of the page and select the year and month of the article. You will get a free copy of that month's issue, and you can flip to the article.

<sup>4</sup> Available on the JADA website. Google the title and look for the link that leads you to the JADA website.

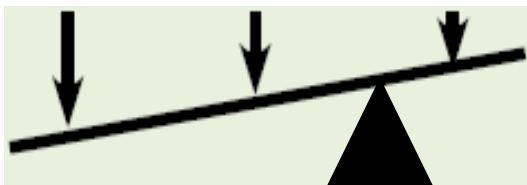
<sup>5</sup> Available on the JADA website to ADA member dentists, through archives: <http://jada.ada.org/>

## CARIES RISK ASSESSMENT FORM

Patient Name: \_\_\_\_\_ Chart #: \_\_\_\_\_ Date of initial assessment: \_\_\_\_\_

Completed by: \_\_\_\_\_ Reviewed by: \_\_\_\_\_ Date of next Recall: \_\_\_\_\_

| DISEASE INDICATORS<br>(Any one "YES" = High Risk)                        | YES =<br>CIRCLE | RISK FACTORS<br>(In the absence of indicators,<br>risk determined by dentist) | YES =<br>CIRCLE | PROTECTIVE FACTORS                                  | YES =<br>CIRCLE |
|--------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------|-----------------|-----------------------------------------------------|-----------------|
| Visible cavities and/or lesions, or radiographic penetration into dentin | <b>YES</b>      | Visible plaque on teeth                                                       | <b>YES</b>      | Fluoridated water intake                            | <b>YES</b>      |
| <b>Active</b> proximal enamel lesions on xray                            | <b>YES</b>      | Deep pits and fissures                                                        | <b>YES</b>      | Fluoride toothpaste 1x daily                        | <b>YES</b>      |
| <b>Active</b> white spots on smooth surfaces                             | <b>YES</b>      | Saliva reducing factors/meds                                                  | <b>YES</b>      | Fluoride toothpaste 2x daily                        | <b>YES</b>      |
| Restorations (for caries) in last 3 years                                | <b>YES</b>      | Patient reports "dry mouth"                                                   | <b>YES</b>      | OTC fluoride rinse daily                            | <b>YES</b>      |
| Extractions (due to caries), last 3 years                                | <b>YES</b>      | Restorations with overhangs, open margins, or open contacts                   | <b>YES</b>      | Rx fluoride toothpaste daily                        | <b>YES</b>      |
|                                                                          |                 | Exposed roots                                                                 | <b>YES</b>      | Fluoride varnish in last 6 mo                       | <b>YES</b>      |
|                                                                          |                 | Ortho appliances, partials dentures                                           | <b>YES</b>      | Chlorhexidine 1 week/mo                             | <b>YES</b>      |
|                                                                          |                 | Infrequent or irregular dental care                                           | <b>YES</b>      | MI Paste in last 6 mo                               | <b>YES</b>      |
|                                                                          |                 | Frequent snacks (>3x/day)                                                     | <b>YES</b>      | <b>RISK LEVEL (Circle)</b><br>HIGH    MEDIUM    LOW |                 |
|                                                                          |                 | High sugar intake or >6 exposures                                             | <b>YES</b>      |                                                     |                 |
|                                                                          |                 | Recreational drug use                                                         | <b>YES</b>      |                                                     |                 |
|                                                                          |                 |                                                                               |                 |                                                     |                 |



### Directions:

1. After clinical and radiographic examination (and review of restorative history in the patient's record), circle "YES" for all items that apply in the left column ("Disease Indicators"). Any "yes" response places the patient at High Risk.
2. Using information from the examination, and from interviewing the patient, circle "YES" for all items that apply in the center column ("Risk Factors").  
**In the absence of any Disease Indicators in the first column, the dentist determines the patient's risk based on risk factors present.**  
Patients with NO circled "YES" items in the first two columns are at Low Risk. CIRCLE THE RISK LEVEL in the box above.
3. Ask patients about each item in the right column, and circle each "YES" that applies.

### Notes:

1. Students will NOT be allowed to develop a treatment plan until this form has been completed, reviewed with the supervising faculty and recommendations based on caries risk have been given to the patient.
2. In conjunction with a comprehensive oral exam, completion of this form should take no more than 10 minutes.
3. Presence of **Disease Indicators** (Left Column) is the most accurate predictor of future lesion formation.  
**Risk Factors** (Center Column) help predict future lesion formation in patients without new or recent (past 3 years) lesions, and they help identify causal agents in patients with new or recent lesions so appropriate protective factors can be prescribed for that patient.  
**Protective Factors** (Right Column) give an idea of the patient's current level of protection against future lesions. (See "Recommendations Based On Caries Risk", on reverse side of this form.)
4. The clinical judgment of the clinical instructor may justify a change for the patient's risk level (increased or decreased) based on review of this form and other pertinent information.

**SEE REVERSE FOR RECOMMENDATIONS**

## RECOMMENDATIONS BASED ON CARIES RISK

### High Risk

#### FOR ALL (HIGH RISK) PATIENTS

- Periodontal assessment and professional cleaning including patient education and oral hygiene instructions at initial visit and re-assessed in subsequent visits.
- Review dietary and oral hygiene habits. Provide instructions on both.
- In-office fluoride varnish treatment **every 3-4 months** at caries recall exams.
- Brush **twice daily** with a high fluoride prescription toothpaste, (Prevent Plus toothpaste - 5,000 parts per million fluoride). We can provide a prescription or dispense it. Spit out after brushing; do not rinse with water. Use **regular toothpaste the rest of the day**.
- Have the necessary restorative treatment performed.
- Caries recall **every 3-4 months** to re-evaluate progress and current caries risk.
- New bitewing radiographs every 6-12 months.

#### FOR SPECIFIC (HIGH RISK) PATIENTS

- Rinse for one minute, once a day with chlorhexidine gluconate mouthrinse. Use once daily just before bed at night (10 ml for 1 minute), every night for the first week of each month. Use at least one hour after brushing. We can provide a prescription or dispense it at the SDM.
- Sealants to be applied to all occlusal surfaces.

INDICATIONS: patients (of all ages) with a high lesion incidence and untreated occlusal surfaces with deep pits and fissures

- MI Paste (dispensed), pea size amount applied (with a finger) to all surfaces of all teeth, twice a day. Let sit for 15 minutes, without rinsing, eating or drinking; expectorate.

INDICATIONS: patients with incipient non-cavitated lesions on smooth surfaces (interproximal or free surfaces)

### Moderate Risk

#### FOR ALL (MODERATE RISK) PATIENTS

- Periodontal assessment and professional cleaning including patient education and oral hygiene instructions at initial visit and re-assessed in subsequent visits.
- Review dietary and oral hygiene habits. Provide instructions on both.
- In-office fluoride varnish treatment **every 4-6 months** at caries recall exams.
- Brush twice daily with an over-the-counter fluoride-containing toothpaste following oral hygiene instructions provided. Spit out after brushing; do not rinse with water.
- Use an over-the-counter fluoride rinse (0.05% sodium fluoride, e.g. Fluorigard or ACT) and rinse with 10 ml (one cap full) once or twice daily after you have used your fluoride toothpaste. Continue daily until your next dental exam.
- New bitewing radiographs every 12-24 months.
- Caries recall **every 4-6 months** to re-evaluate progress and current caries risk.

#### FOR SPECIFIC (MODERATE RISK) PATIENTS

- Sealants to be applied to all occlusal surfaces.

INDICATIONS: patients (of all ages) with a high lesion incidence and untreated occlusal surfaces with deep pits and fissures

- MI Paste (dispensed), pea size amount applied (with a finger) to all surfaces of all teeth, twice a day. Let sit for 15 minutes, without rinsing, eating or drinking; expectorate.

INDICATIONS: patients with incipient non-cavitated lesions on smooth surfaces (interproximal or free surfaces)

### Low Risk

- Periodontal assessment and professional cleaning including patient education and oral hygiene instructions at initial visit and re-assessed in subsequent visits.
- Review dietary and oral hygiene habits. Provide instructions on both.
- Brush twice daily with an over-the-counter fluoride-containing toothpaste. Spit out after brushing; do not rinse with water.
- Return for a caries recall exam (when indicated) in 6-12 months to re-evaluate your current caries risk.

*\*At caries recall exams, in-office fluoride varnish treatment, sealants, and others are optional and may not provide any benefit for a patient at low risk.*

Name \_\_\_\_\_

| DATE                    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| new lesion(s) (w/in 3y) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| rest for caries (3y)    |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ext for caries (3y)     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| visible plaque          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| deep pits/fissures      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| saliva reduced/meds     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| dry mouth*              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| poor restorations       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| exposed roots           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ortho appliances        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RPD or bridge           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| irregular dental care   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| frequent snack (3+)     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| high sugar intake       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| recreational drugs      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| family caries (<6yo)*   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| fluoridated water       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| toothpaste 1xdaily      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| toothpaste 2xdaily      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| OTC fluoride rinse      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| RX fluoride paste       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fl Varnish today?       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Chlorhexidine 1w/mo     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MI paste last 6mo       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CARIES RISK LEVEL       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

\*might be automatic high risk



NUMBER OF MEALS/SNACKS PER DAY

< 6/day = **LOW RISK**

> 6/day = **MODERATE RISK**

MEAL/SNACK STRUCTURE

structured = **LOW RISK**

unstructured (grazing) = **MODERATE RISK**

TYPE OF SNACKS

Dairy Products = **LOW RISK**

Chips, Pretzels = **MODERATE RISK**

Sugar-containing = **HIGH RISK**

→ SUGARED BEVERAGES ←

QUANTITY

< 12 ounces/day = **LOW RISK**

12-20 ounces/day = **MODERATE RISK**

>20 ounces/day = **HIGH RISK**

TIMING (circle)

WITH MEALS = **LOW RISK**

WITH SNACKS = **MODERATE RISK**

BETWEEN MEALS/SNACKS = **HIGH RISK**

FREQUENCY

1/day = **LOW RISK**

2-3/day = **MODERATE RISK**

4 or >4/day = **HIGH RISK**

LENGTH OF EXPOSURE

< 15 min = **LOW RISK**

15 - 30 min = **MODERATE RISK**

> 30 min = **HIGH RISK**

DRINKING STYLE

STRAW = **LOW RISK**

CAN/BOTTLE = **MODERATE RISK**

SWISH = **HIGH RISK**