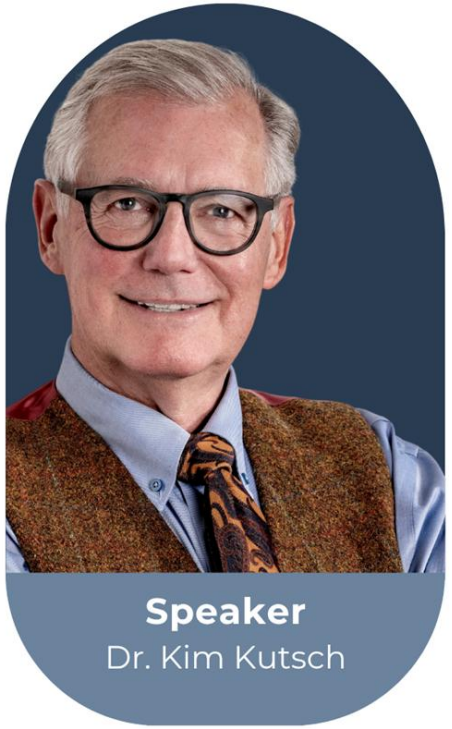
# CariFree Connection Webinar Series

## From Chaos to Control:

A Salivary Diagnostics-Driven Approach to Managing High-Risk Caries Patients



**Speaker**
Dr. Kim Kutsch

**Speaker**
Dr. Doug Thompson

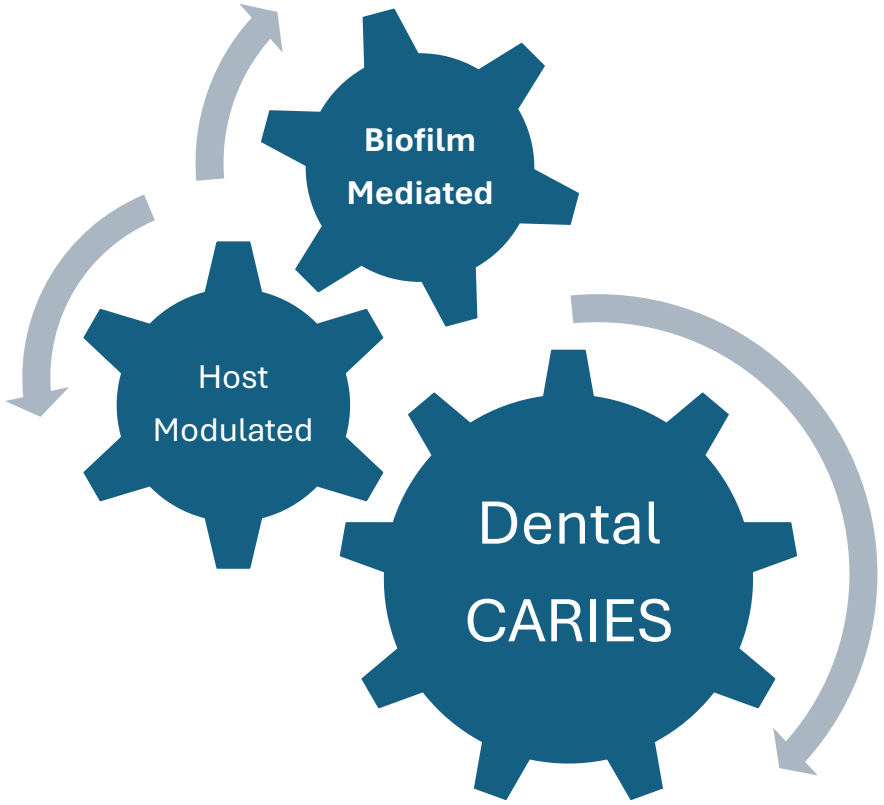
**Speaker**
Dr. Doug Young

**In this webinar, you'll learn:**

- → How salivary diagnostics guide treatment decisions
- → Strategies for targeted biofilm management
- → Practical steps to stabilize high-caries-risk patients long-term

**Stay tuned for a special offer at the end of tonight's webinar!**

**Machiulskiene V, Campus g, Carvalho JC, Dige J, Ekstrand KR et al. Terminology of dental caries and dental caries management: consensus report by ORCA and IADR. Caries Research 2020. 54(1):7-14.**

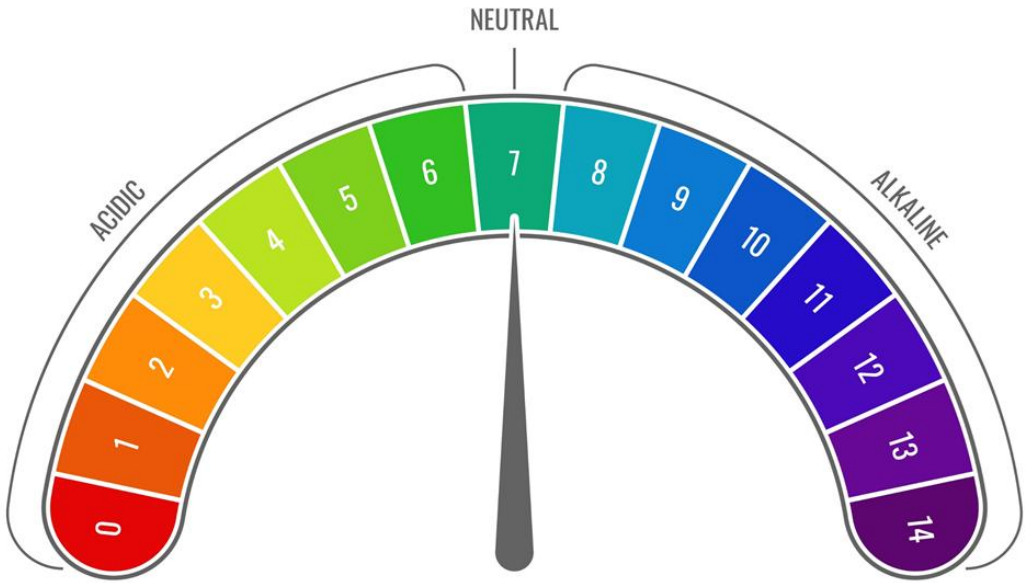



**"Dental caries is a biofilm-mediated, diet-modulated, multifactorial, non-communicable dynamic disease resulting in net mineral loss of dental hard tissues."**

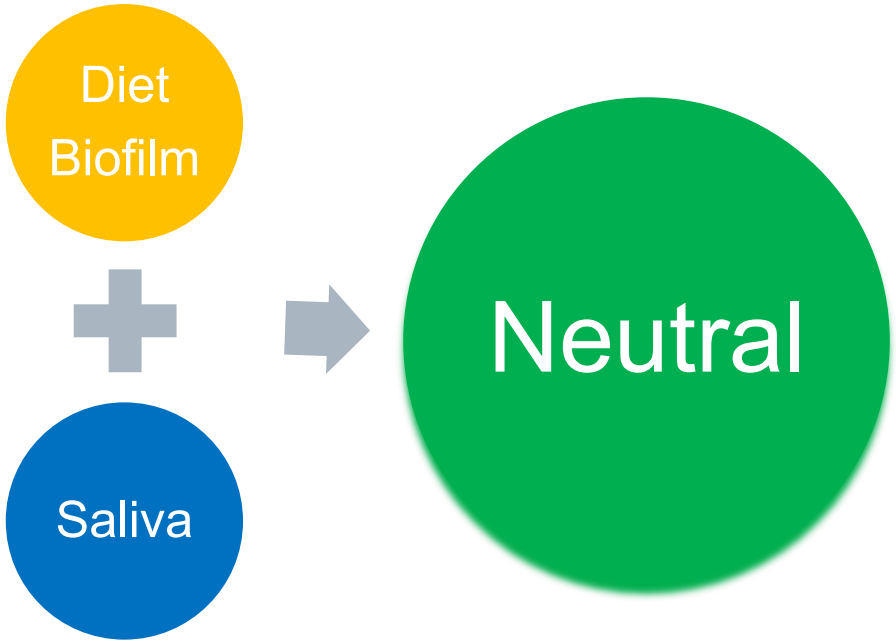
Bradshaw DJ, McKee AS, Marsh PD. Effects of carbohydrate pulses and pH on population shifts within oral microbial communities in vitro. J Dent Res. 1989 Sep;68(9):1298-302.

"Analysis of the data strongly suggests that the **pH generated** from carbohydrate metabolism, rather than carbohydrate availability per se, is responsible for the widely reported shifts in composition and metabolism of the oral microflora in vivo."

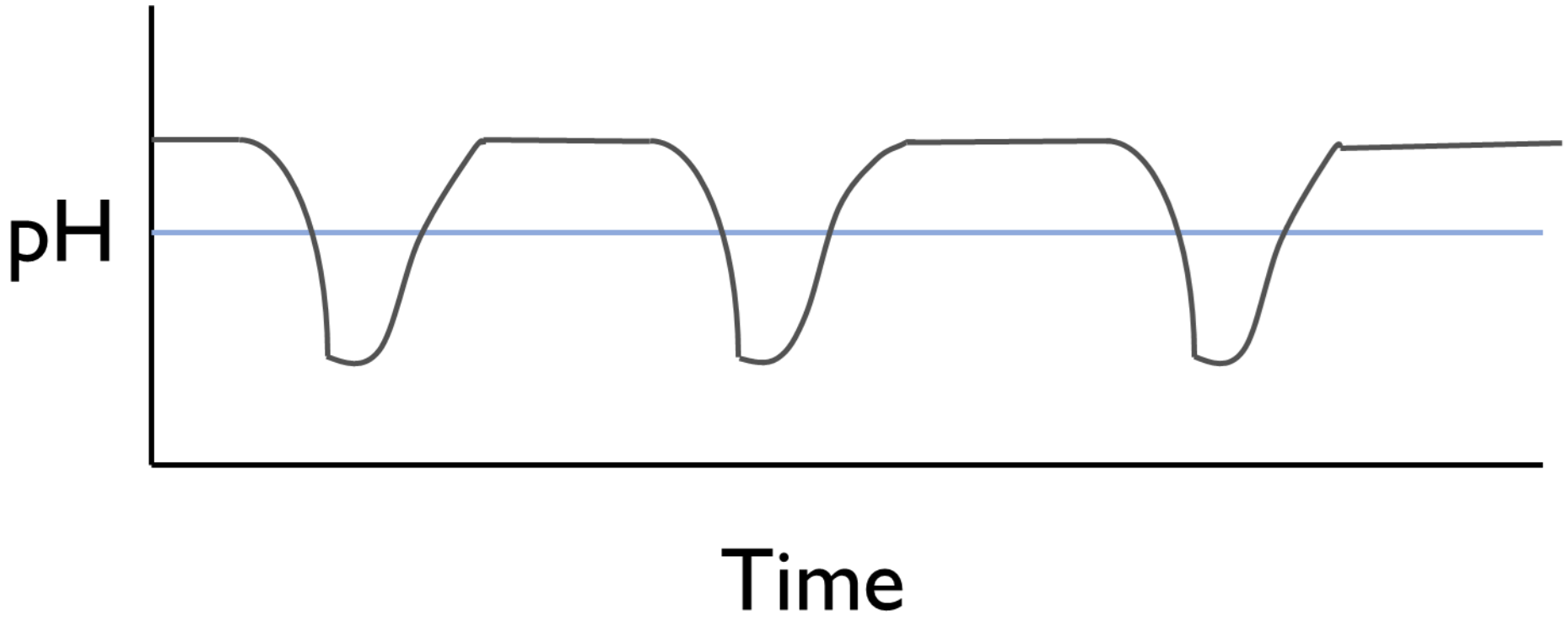
# WHY IS pH SO IMPORTANT?



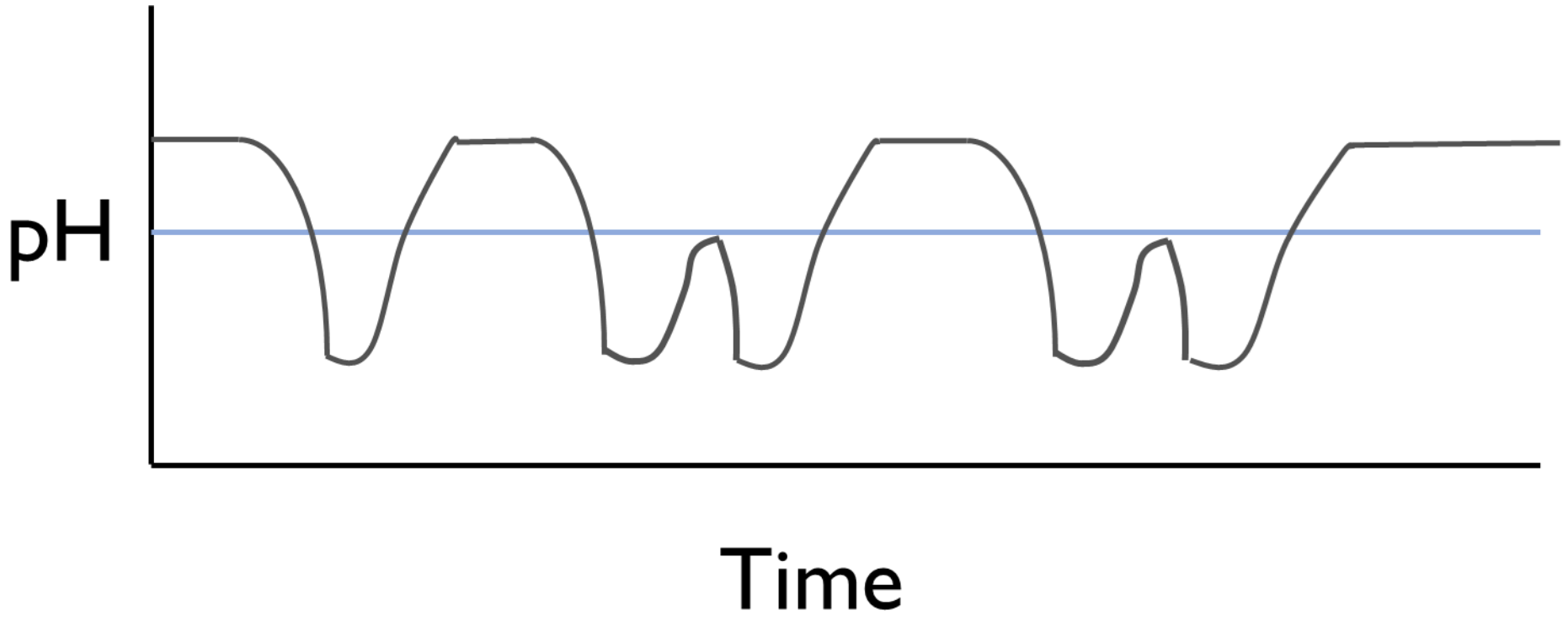




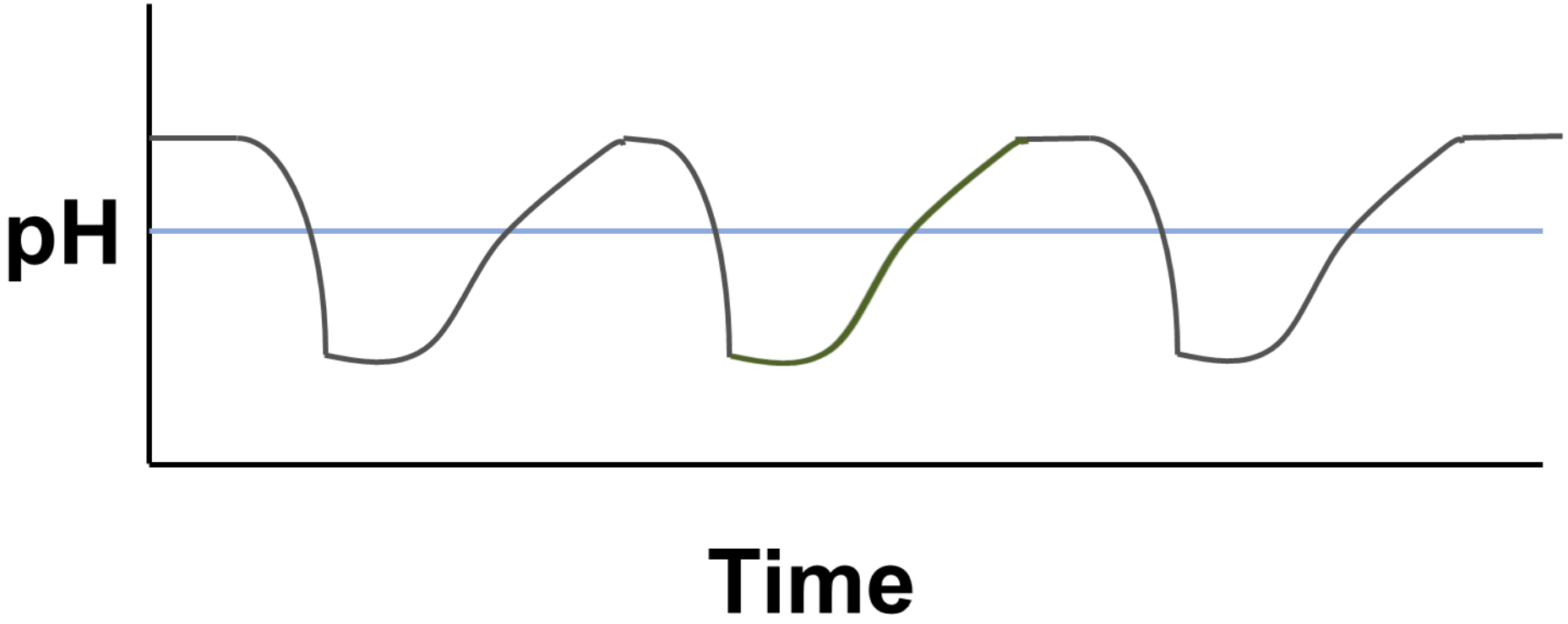
# STEPHAN CURVE (Normal)



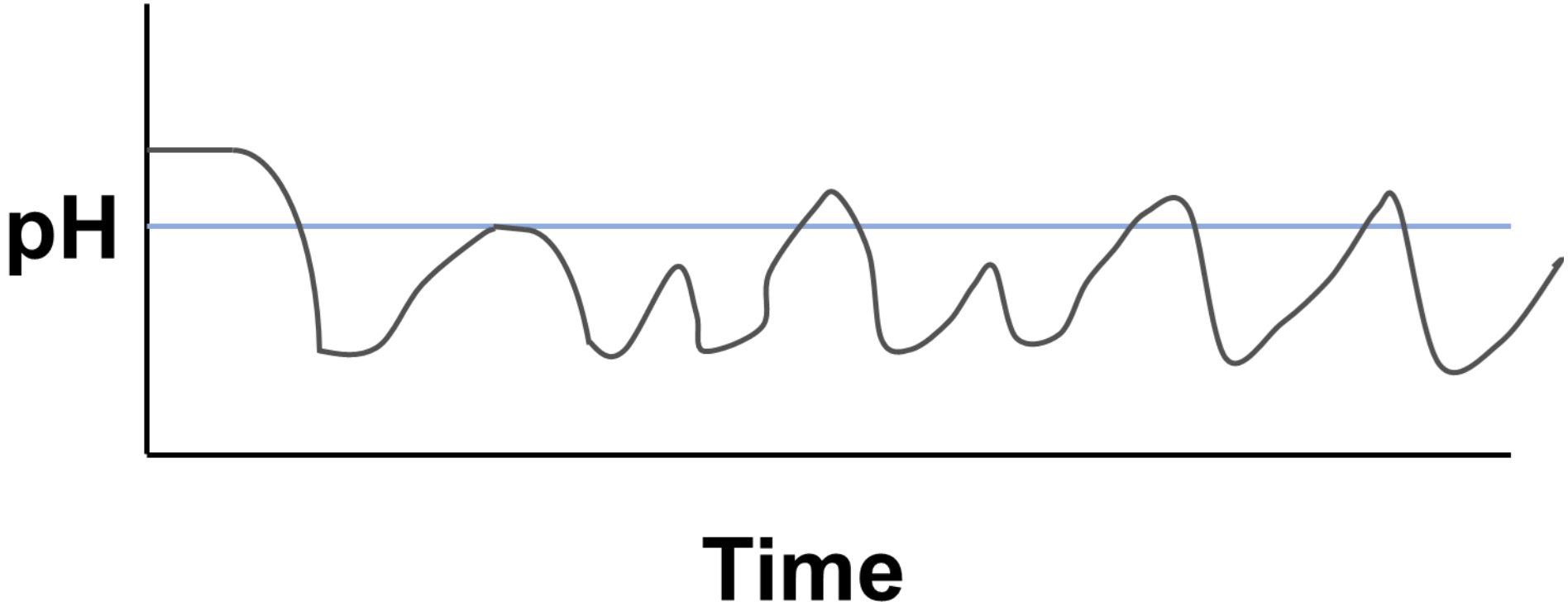
# STEPHAN CURVE (Snacking)



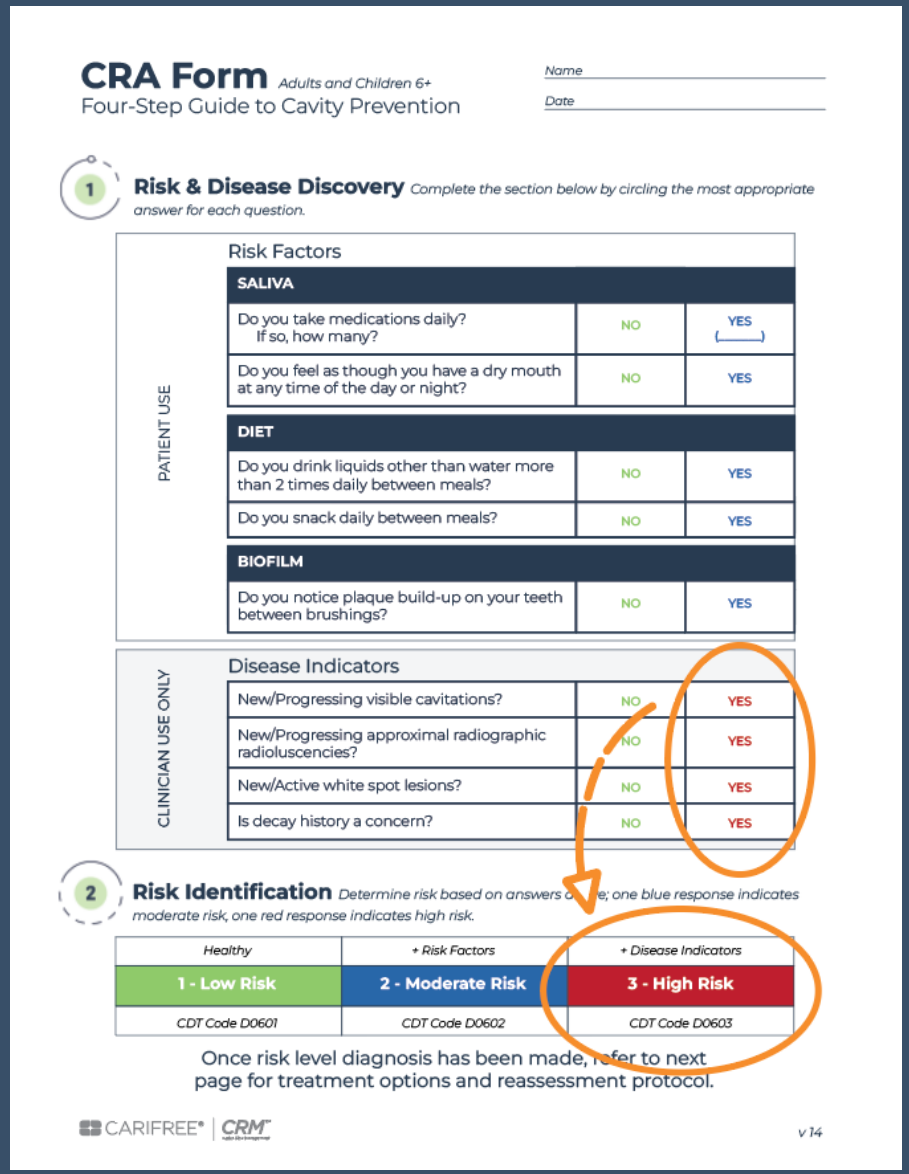
# STEPHAN CURVE (Hyposalivation)



# STEPHAN CURVE (S+H)



# CRA Form



## CRA Form *Adults and Children 6+*

Four-Step Guide to Cavity Prevention

Name

Date

**1 Risk & Disease Discovery** *Complete the section below by circling the most appropriate answer for each question.*

PATIENT USE

Risk Factors

| | | |
|---|---|---|
| **SALIVA** | | |
| Do you take medications daily? If so, how many? | NO | YES (_____) |
| Do you feel as though you have a dry mouth at any time of the day or night? | NO | YES |
| **DIET** | | |
| Do you drink liquids other than water more than 2 times daily between meals? | NO | YES |
| Do you snack daily between meals? | NO | YES |
| **BIOFILM** | | |
| Do you notice plaque build-up on your teeth between brushings? | NO | YES |

CLINICIAN USE ONLY

Disease Indicators

| | | |
|---|---|---|
| New/Progressing visible cavitations? | NO | YES |
| New/Progressing approximal radiographic radioluscencies? | NO | YES |
| New/Active white spot lesions? | NO | YES |
| Is decay history a concern? | NO | YES |

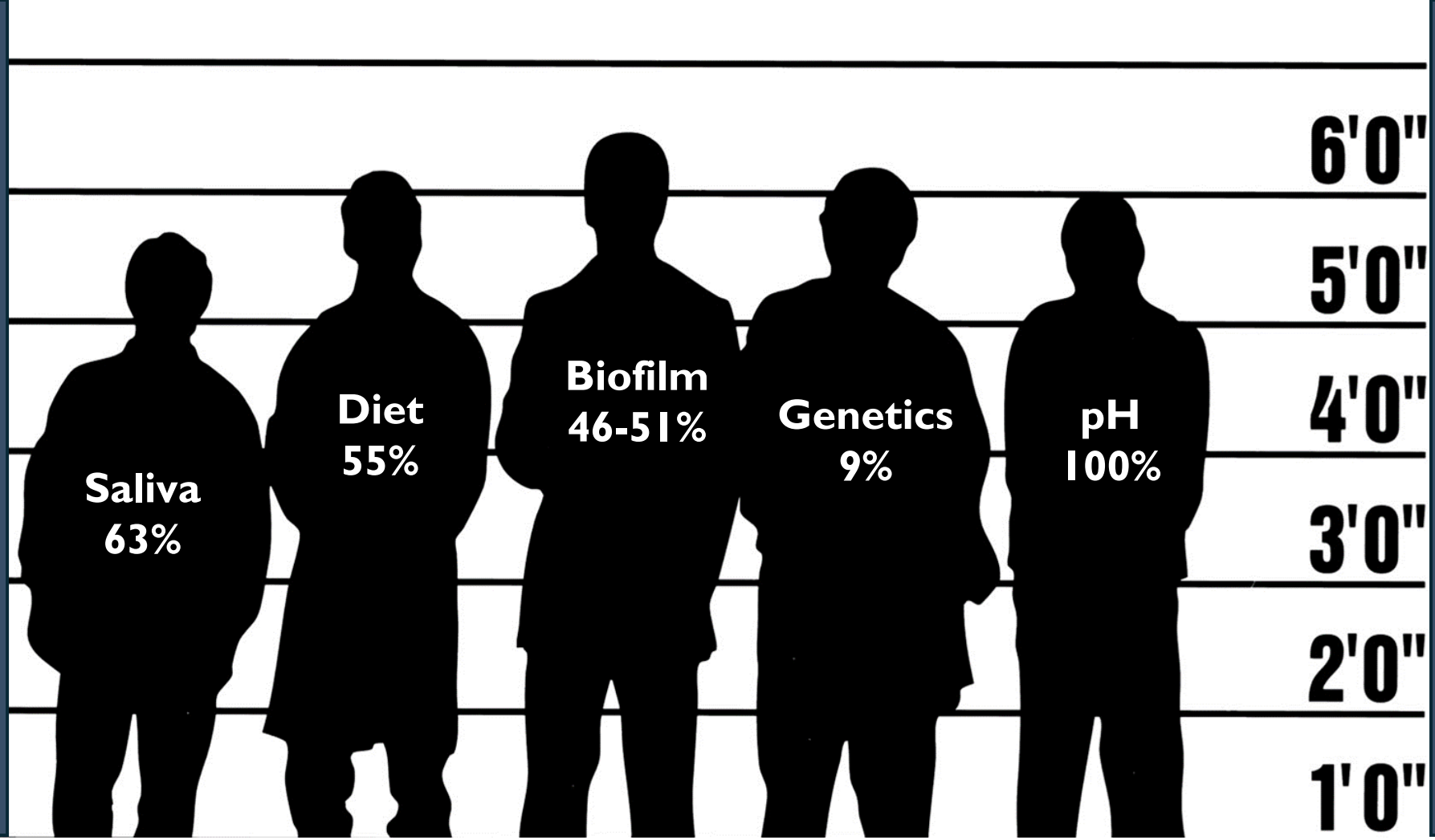
**2 Risk Identification** *Determine risk based on answers above; one blue response indicates moderate risk, one red response indicates high risk.*

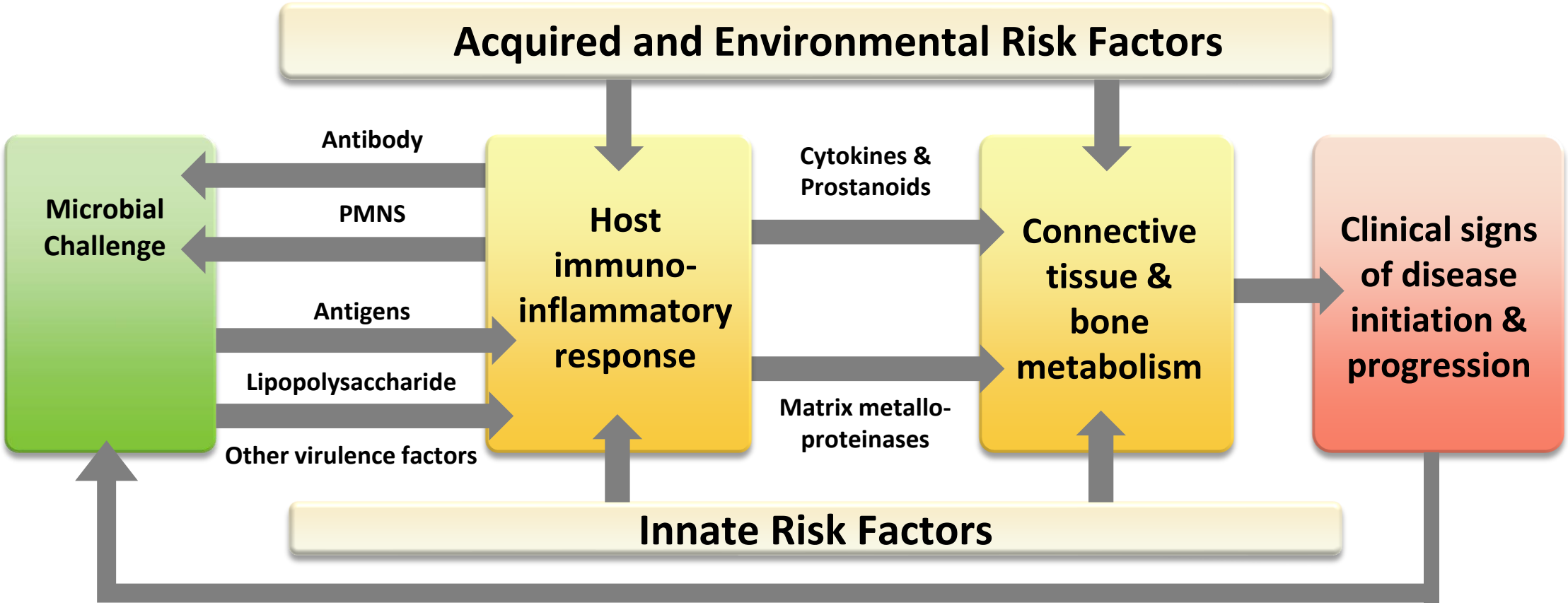
| *Healthy* | *+ Risk Factors* | *+ Disease Indicators* |
|---|---|---|
| **1 - Low Risk** | **2 - Moderate Risk** | **3 - High Risk** |
| *CDT Code D0601* | *CDT Code D0602* | *CDT Code D0603* |

Once risk level diagnosis has been made, refer to next page for treatment options and reassessment protocol.

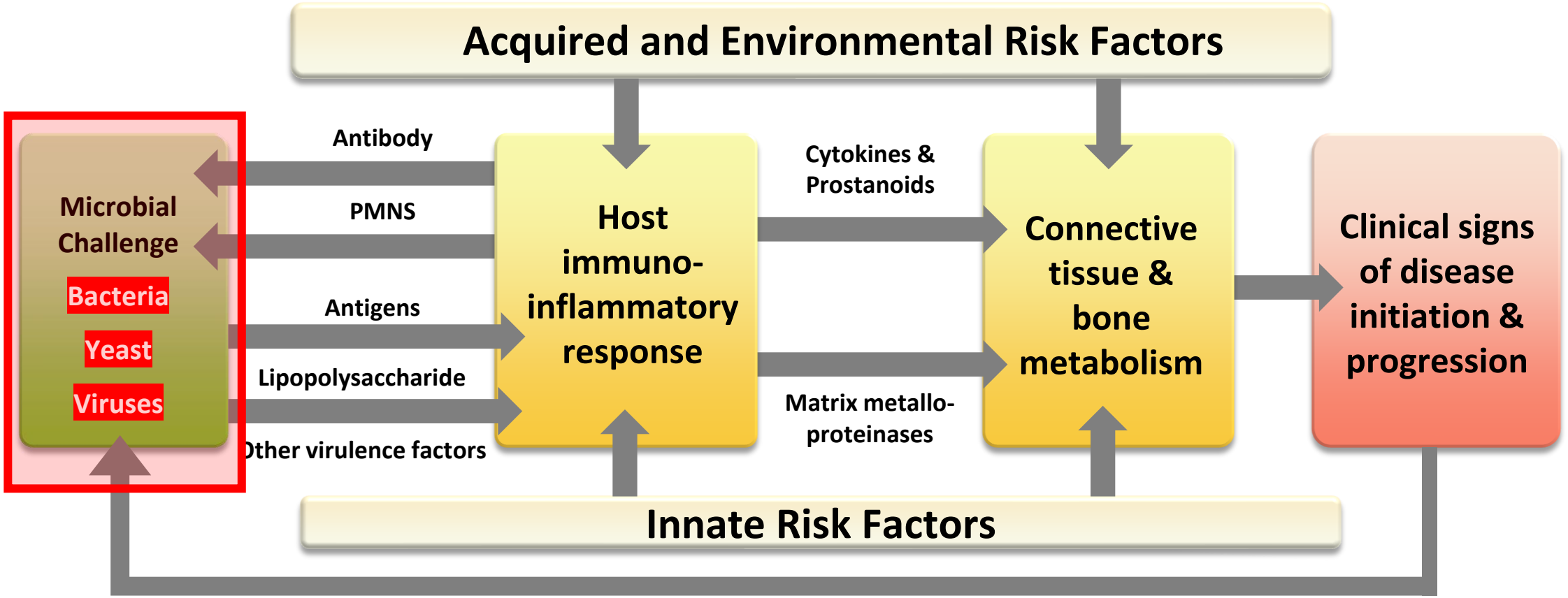
CARIFREE® | CRM™

v 14


6'0"
5'0"
4'0"
3'0"
2'0"
1'0"
Saliva
63%
Diet
55%
Biofilm
46-51%
Genetics
9%
pH
100%



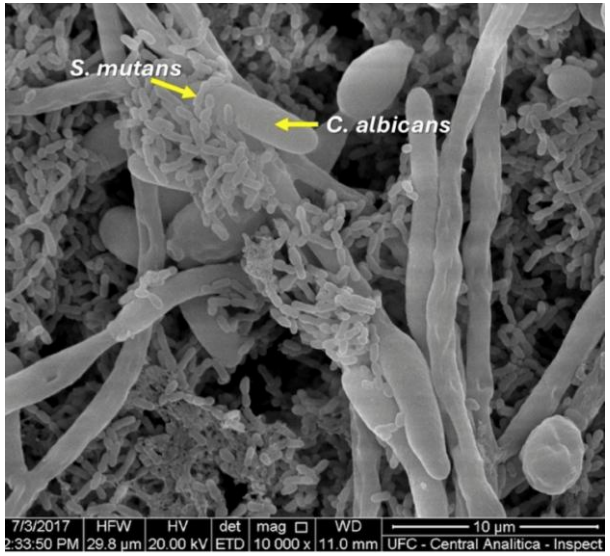

*Modified from Kornman KS: Clin Infect Dis 28: 520, 1999*




*Modified from Kornman KS: Clin Infect Dis 28: 520, 1999*

# Etiology: The Microbiome of Caries

- **Highly acidic** and **aciduric** species associated with caries include ***Streptococcus mutans***, ***Lactobacillus***, ***Actinomyces***, ***Bifidobacterium***, **and *Scardovia*** species.
- Excess acid production leads to a **dysbiotic shift** in the biofilm composition → demineralization of tooth structure → cavities.




***Scanning electron micrograph showing co-adhesion of Streptococcus mutans with Candida albicans***
*Image acquired by Wanessa Fernandes Matias Regis*

- The role of bacteria in the etiology of dental caries is long established, while the **role of fungi has only recently gained more attention.**
- There was a **higher ratio of fungi to bacteria in dentin-involved lesions compared to less severe lesions**
  - *Candida albicans*, *C. dubliniensis*, and *C. tropicalis*.
- *Candida albicans* and *Streptococcus mutans* frequently coexist within dental biofilms and **enhance each other's pathogenic potential.**
- These mixed-species biofilms exhibit **increased acid production** and **greater resistance to antimicrobial agents** compared to single-species biofilms.

*Matias Regis, W. F., et al. (2025). Insights into the role of Streptococcus mutans and Candida albicans in dental biofilm formation and cariogenicity: A literature review. Cureus, 17(6), e86159. https://doi.org/10.7759/cureus.86159*

*Spatafora, G., et al (2024). The evolving microbiome of dental caries. Microorganisms, 12(1), 121. https://doi.org/10.3390/microorganisms12010121*

# *“Are we treating teeth… or are we treating disease?”*

Research supports the disease of caries is biofilm mediated and host modulated and in addition to causing carious lesions in the teeth it affects:

- Serum hsCRP
- Strok risk (up to three-fold)
- Advancement of cardiovascular disease and atherosclerotic plaque
- Microbleeds in the brain
- Nitric Oxide production impairment
- Inflammatory bowel disease
- Tumors
- Infective endocarditis
- Etc.

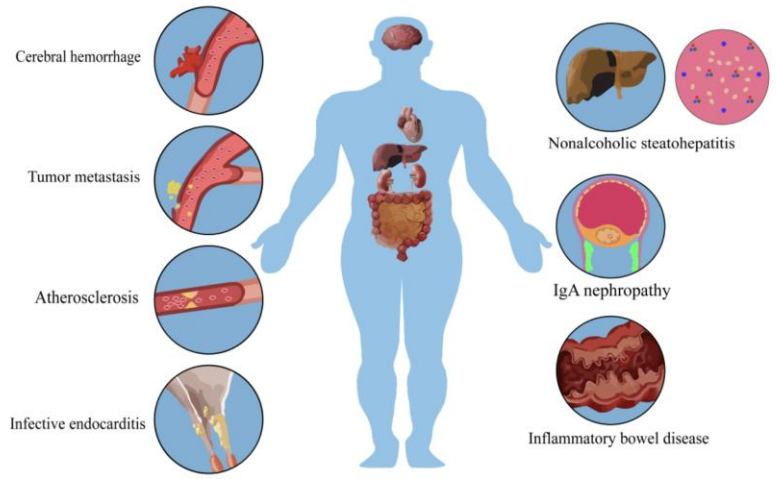



FIGURE 1
Multi-organ damage caused by *S. mutans* in systemic diseases.

*AlShammari, A., et al. (2024). The association between dental caries and serum CRP in the US adult population: Evidence from NHANES 2015–2018. BMC Public Health, 24, 2210. https://doi.org/10.1186/s12889-024-19681-6*

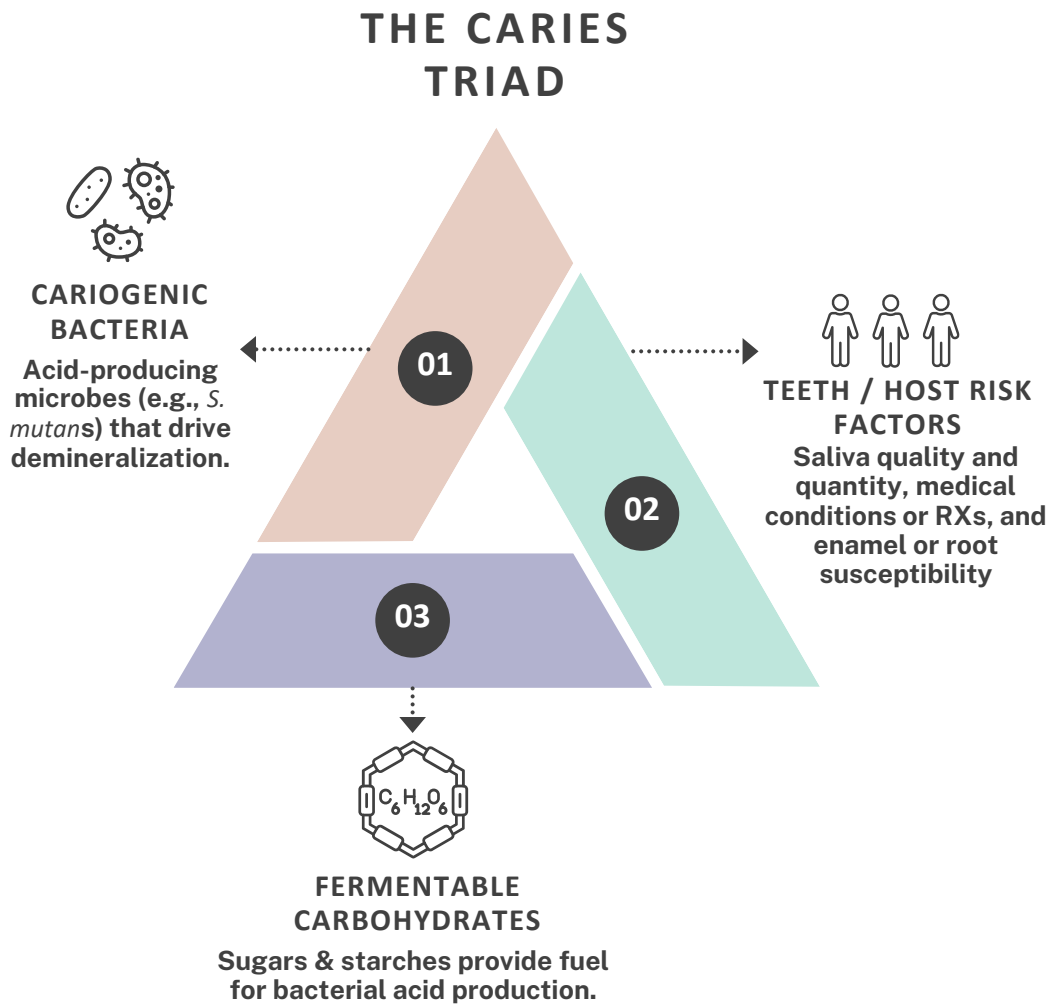
*Fang, Y., et al. (2024). Roles of Streptococcus mutans in human health: Beyond dental caries. Frontiers in Microbiology, 15, 1503657. https://doi.org/10.3389/fmicb.2024.1503657*

# Management Models

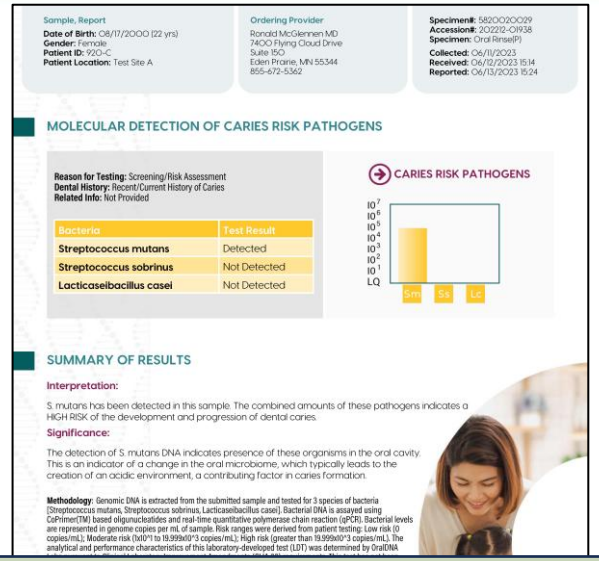
- **Traditional management** is based on the **surgical model**: **cutting and restoring the tooth to remove caries lesions.**
  - This restorative cycle can be ***short-sighted*** by not addressing full etiological source of caries.

- **The medical model of caries management is more conservative, preventive, and patient-centered.**

- The medical model involves four main principles
  1. **Control of bacterial infection**
  2. **Reduction of risk levels**
  3. **Remineralization of teeth**
  4. **Long-term follow-up.**



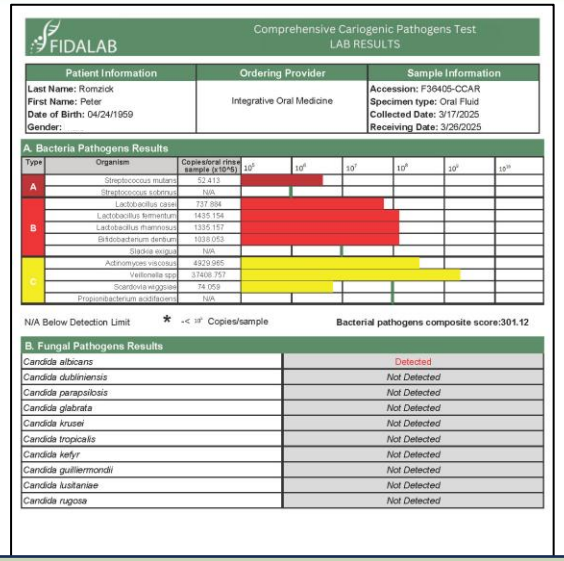
# Caries Management | Time for A New Management Model? | Control the Bacterial Infection




## OralDNA OraRisk Caries

Tests for *S. mutans*, *S. sobrinus*, and *L. casei*

Provides logarithmic amount, if detected

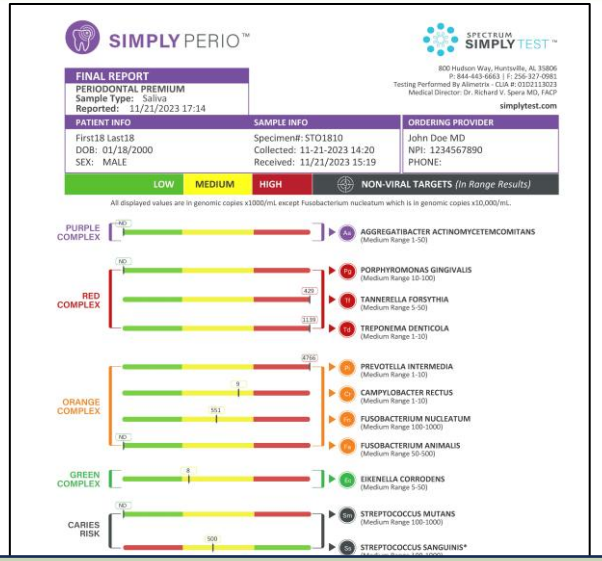



## FidaLab Comprehensive Caries

Tests for *S. mutans*, *S. sobrinus*, and nine more bacteria

Tests for 10 *Candida* spp.

Provides logarithmic amount and composite score




## Spectrum Diagnostics SimplyPerio

Tests for *S. mutans*, *S. sanguinis*, and *C. albicans*

Provides logarithmic amount, if detected


## CariScreen Meter

"CariScreen score had a strong positive correlation r = 0.76 with total cell count, a positive correlation with *MS* counts r = 0.69, and a positive correlation to caries risk status r = 0.55 with high significance p = 0.000001.

# Case Study: Monica L.

*Dysbiotic Microbiome*

# Dental History Review

- In 2000 at age 20, had **20 cavities** which were taken care of at University of Michigan Dental School along with orthodontia
- **Patient stated she still gets constant cavities *"…no matter much I brush or floss or Waterpik…"***
- In 2010 at age 30, had **all amalgam fillings removed** and replaced.
- Experiences **unpleasant tastes and odors** from her mouth due to **food getting stuck**
- Reports **extreme gum recession** and that she has been told she has **very short roots** from other dentists
- **Reports constant cavities no matter how good her oral hygiene habits are or how frequently she gets her teeth cleaned**
- **Sought a second opinion after being advised to extract all teeth**

How would you rate the condition of your mouth?

| | | | | | |
|---|---|---|---|---|---|
| Excellent | No | Fair | No | | |
| Good | No | Poor | YES | | |

Previous Dentist?
Shoha
How long have you been a patient? (months/years)
2017
Date of most recent dental exam?
within 6 months
Date of most recent x-rays?
within 6 months
Date of most recent treatment (other than a cleaning)
within 6 months
I routinely see my dentist every

| | | | | | |
|---|---|---|---|---|---|
| 3 mo | No | 6 mo | YES | Not routinely | No |
| 4 mo | No | 12 mo | No | | |

What is your immediate concern?
Decay
PLEASE ANSWER YES OR NO TO THE FOLLOWING:

## PERSONAL HISTORY

| | | |
|---|---|---|
| 1. Are you fearful of dental treatment? How fearful, on a scale of 1 (least) to 10 (most) | YES | 5 |
| 2. Have you had an unfavorable dental experience? | YES | plenty |
| 3. Have you ever had complications from past dental treatment? | YES | didn't heal from root canal |
| 4. Have you ever had trouble getting numb or had any reactions to local anesthetic? | No | |
| 5. Did you ever have braces, orthodontic treatment or had your bite adjusted, and at what age? | YES | Lots of orthodontia as teen |
| 6. Have you had any teeth removed, missing teeth that never developed or lost teeth due to injury or facial trauma? | YES | Removed tooth in right rear upper due to not wanting to give it a root canal |
| 9. Have you ever noticed an unpleasant taste or odor in your mouth? | YES | I realize now that it's because I had food stuck where I didn't know about it |
| 10. Is there anyone with a history of periodontal disease in your family? | No | |
| 11. Have you ever experienced gum recession, or can you see more of the roots of your teeth? | YES | Extreme |
| 12. Have you ever had any teeth become loose on their own (without an injury), or do you have difficulty eating an apple? | YES | Shoha said only one tooth was loose but other dentists have said very short roots |
| 13. Have you experienced a burning or painful sensation in your mouth not related to your teeeth? | No | |

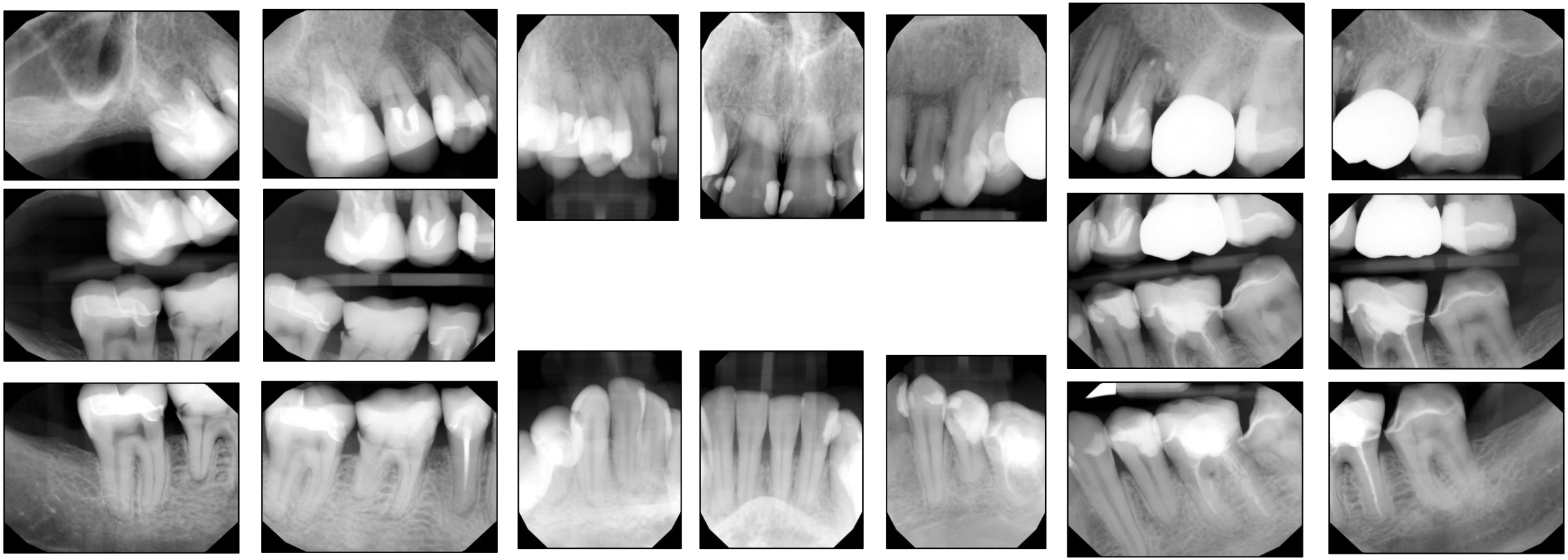
## TOOTH STRUCTURE

| | | |
|---|---|---|
| 14. Have you had any cavities within the past 3 years? | YES | Constant cavities no matter how good my oral hygiene is or if i get cleanings ever 3 months instead of 6 |
| 15. Does the amount of saliva in your mouth seem too little or do you have difficulty swallowing any food? | YES | I feel I have a lot of saliva |
| 16. Do you feel or notice any holes (i.e. pitting, craters) on the biting surface of your teeth? | No | |
| 17. Are any teeth sensitive to hot, cold, biting, sweets, or do you avoid brushing any part of your mouth? | No | |
| 18. Do you have grooves or notches on your teeth near the gum line? | No | |
| 19. Have you ever broken teeth, chipped teeth, or had a toothache or cracked filling? | No | |
| 20. Do you frequently get food caught between any teeth? | YES | In gun recession |

## BITE AND JAW JOINT

| | |
|---|---|
| 21. Do you have problems with your jaw joint? (pain, sounds, limited opening, locking, popping) | No |
| 22. Do you feel like your lower jaw is being pushed back when you try to bite your back teeth together? | No |
| 23. Do you avoid or have difficulty chewing gum, carrots, nuts, bagels, baguettes, protein bars, or other hard, dry foods? | No |
| 24. In the past 5 years, have your teeth changed (become shorter, thinner, or worn) or has your bite changed? | No |
| 25. Are your teeth becoming more crooked, crowded, or overlapped? | No |
| 26. Are your teeth developing spaces or becoming more loose? | No |
| 27. Do you have trouble finding your bite, or need to squeeze, tap your teeth together, or shift your jaw to make your teeth fit together? | No |
| 28. Do you place your tongue between your teeth or close your teeth against your tongue? | No |
| 29. Do you chew ice, bite your nails, use your teeth to hold objects, or have any other oral habits? | No |
| 30. Do you clench or grind your teeth together in the daytime or make them sore? | No |
| 31. Do you have any problems with sleep (i.e. restlessness or teeth grinding), wake up with a headache or an awareness of your teeth? | No |
| 32. Do you wear or have you ever worn a bite appliance? | No |

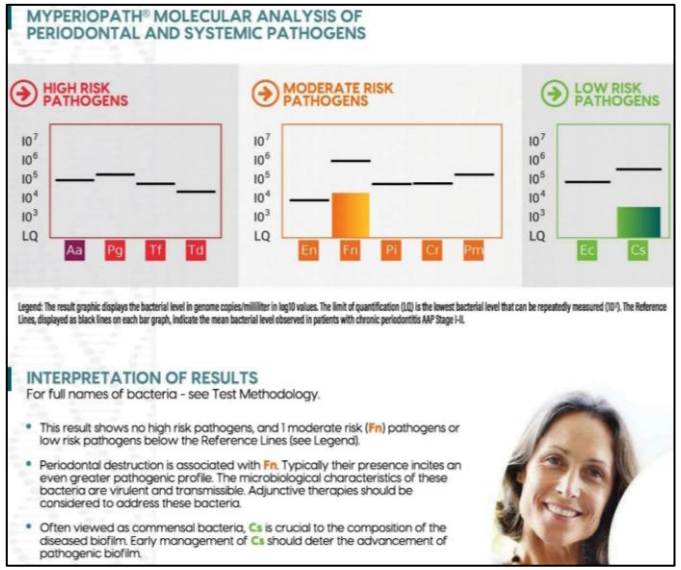
# FMX | 11-06-2023

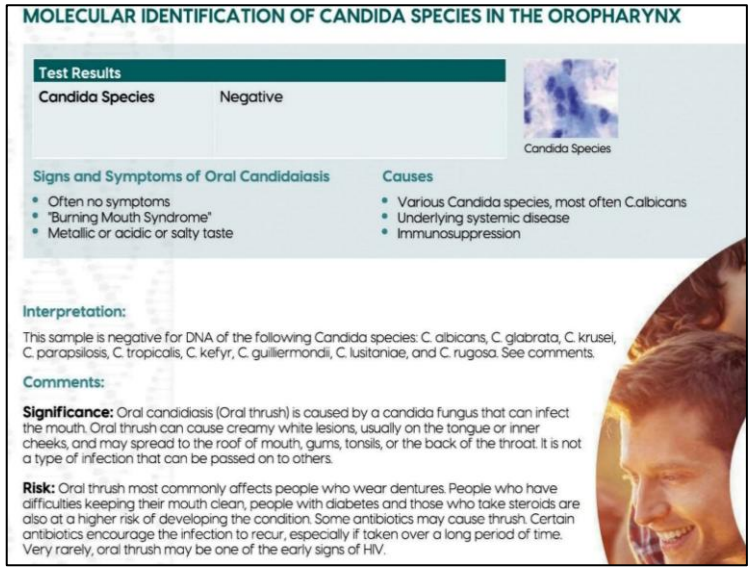


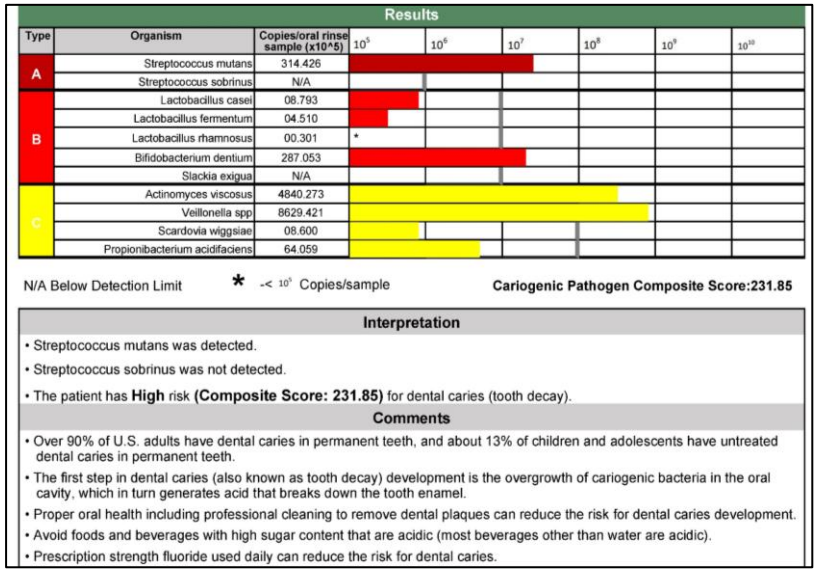
# Caries Case Study | Monica L. | OralDNA MPP + Candida and FidaLab Intial Test | 11-06-2023

## November 2023

- Consult for OralDNA MyPerioPath + Candida and FidaLab salivary diagnostic tests.




### OralDNA MyPerioPath

- No high-risk red-complex pathogens
- Fn only present orange-complex pathogen
- Cs present

### OralDNA OraRisk Candida

- Negative for *Candida* spp.
  *C. albicans, C. glabrata, C. krusei, C. parapsilosis, C. tropicalis, C. kefyr, C. guillermondii, C. lusitaniae,* and *C. rugosa*

### FidaLab Cariogenic Pathogen Test

- Composite score of 231.85 - **HIGH CARIES RISK**
- *S. mutans* present - **$314.426 \times 10^7$**

**November 2023 – February 2024**

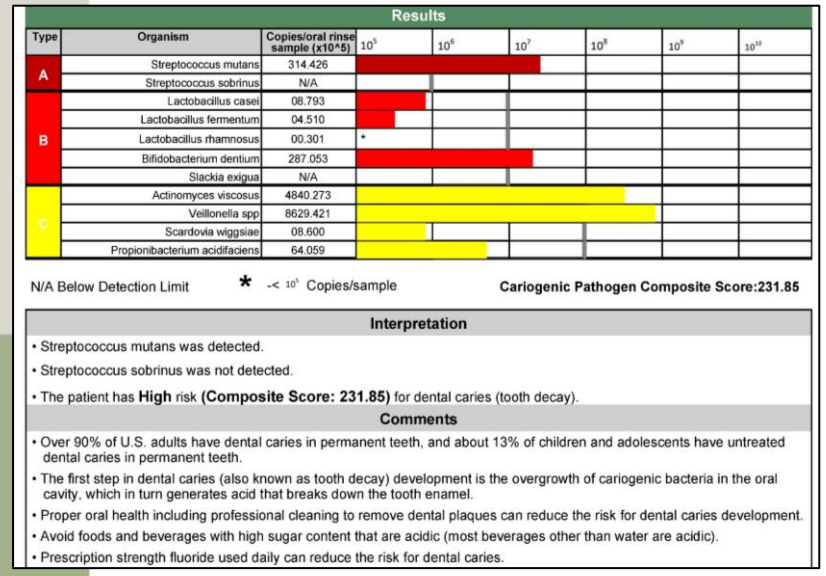
- **CHIEF CONCERN: CARIES**
- Recommended **CariFree Treatment Rinse and gel toothpaste**.
- **Hopeless teeth removed and Zirconia implants** scheduled for **early June**.
- Continue **CariFree Treatment Rinse** until profile is satisfactory.
- **Restorative** work on **non-hopeless teeth completed** at Integrative Oral Medicine.
- FidaLab Caries **retest scheduled** for **every three to six months.**

# Caries Case Study | Monica L. | FidaLab Results

## November 2023 - December 2024

Extractions, implants, restorations to restore function. CariFree Treatment Rinse and 3 month recare appointments the entire time.

### November 2023



Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 314.426 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 08.793 |
| | Lactobacillus fermentum | 04.510 |
| | Lactobacillus rhamnosus | 00.301 |
| | Bifidobacterium dentium | 287.053 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 4840.273 |
| | Veillonella spp | 8629.421 |
| | Scardovia wiggsiae | 08.600 |
| | Propionibacterium acidifaciens | 64.059 |

N/A Below Detection Limit * -< $10^5$ Copies/sample **Cariogenic Pathogen Composite Score:231.85**

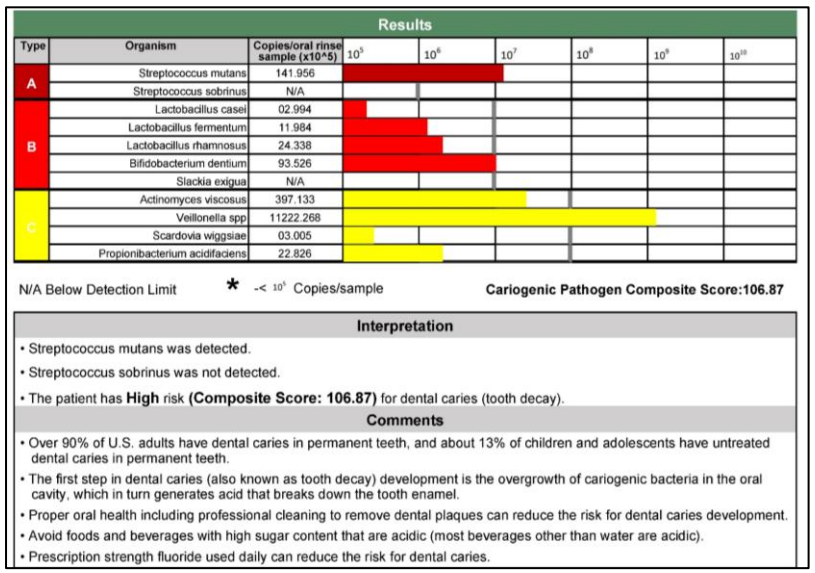
**Interpretation**

- Streptococcus mutans was detected.
- Streptococcus sobrinus was not detected.
- The patient has **High** risk **(Composite Score: 231.85)** for dental caries (tooth decay).

**Comments**

- Over 90% of U.S. adults have dental caries in permanent teeth, and about 13% of children and adolescents have untreated dental caries in permanent teeth.
- The first step in dental caries (also known as tooth decay) development is the overgrowth of cariogenic bacteria in the oral cavity, which in turn generates acid that breaks down the tooth enamel.
- Proper oral health including professional cleaning to remove dental plaques can reduce the risk for dental caries development.
- Avoid foods and beverages with high sugar content that are acidic (most beverages other than water are acidic).
- Prescription strength fluoride used daily can reduce the risk for dental caries.

### March 2024



Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 141.956 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 02.994 |
| | Lactobacillus fermentum | 11.984 |
| | Lactobacillus rhamnosus | 24.338 |
| | Bifidobacterium dentium | 93.526 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 397.133 |
| | Veillonella spp | 11222.268 |
| | Scardovia wiggsiae | 03.005 |
| | Propionibacterium acidifaciens | 22.826 |

N/A Below Detection Limit * -< $10^5$ Copies/sample **Cariogenic Pathogen Composite Score:106.87**

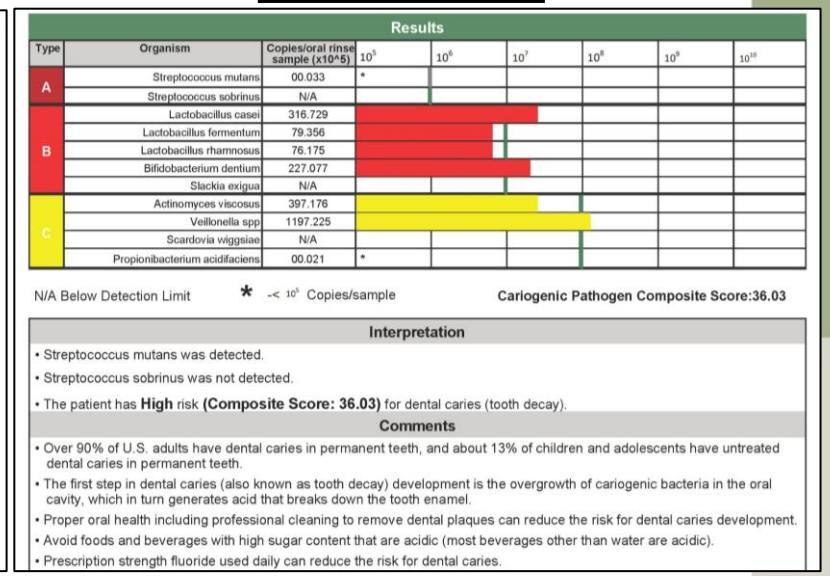
**Interpretation**

- Streptococcus mutans was detected.
- Streptococcus sobrinus was not detected.
- The patient has **High** risk **(Composite Score: 106.87)** for dental caries (tooth decay).

**Comments**

- Over 90% of U.S. adults have dental caries in permanent teeth, and about 13% of children and adolescents have untreated dental caries in permanent teeth.
- The first step in dental caries (also known as tooth decay) development is the overgrowth of cariogenic bacteria in the oral cavity, which in turn generates acid that breaks down the tooth enamel.
- Proper oral health including professional cleaning to remove dental plaques can reduce the risk for dental caries development.
- Avoid foods and beverages with high sugar content that are acidic (most beverages other than water are acidic).
- Prescription strength fluoride used daily can reduce the risk for dental caries.

### December 2024



Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 00.033 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 316.729 |
| | Lactobacillus fermentum | 79.356 |
| | Lactobacillus rhamnosus | 76.175 |
| | Bifidobacterium dentium | 227.077 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 397.176 |
| | Veillonella spp | 1197.225 |
| | Scardovia wiggsiae | N/A |
| | Propionibacterium acidifaciens | 00.021 |

N/A Below Detection Limit * -< $10^5$ Copies/sample **Cariogenic Pathogen Composite Score:36.03**

**Interpretation**

- Streptococcus mutans was detected.
- Streptococcus sobrinus was not detected.
- The patient has **High** risk **(Composite Score: 36.03)** for dental caries (tooth decay).

**Comments**

- Over 90% of U.S. adults have dental caries in permanent teeth, and about 13% of children and adolescents have untreated dental caries in permanent teeth.
- The first step in dental caries (also known as tooth decay) development is the overgrowth of cariogenic bacteria in the oral cavity, which in turn generates acid that breaks down the tooth enamel.
- Proper oral health including professional cleaning to remove dental plaques can reduce the risk for dental caries development.
- Avoid foods and beverages with high sugar content that are acidic (most beverages other than water are acidic).
- Prescription strength fluoride used daily can reduce the risk for dental caries.

### FidaLab Cariogenic Pathogen Test

- Composite score of 231.85 - **HIGH CARIES RISK**
- *S. mutans* present - **314.426 x $10^7$**

### FidaLab Cariogenic Pathogen Test

- Composite score of 231.85 > 106.87 - **Pt is still considered a HIGH CARIES RISK**
- *S. mutans* present - **314.426 x $10^7$ > 141.956 x $10^7$**

### FidaLab Cariogenic Pathogen Test

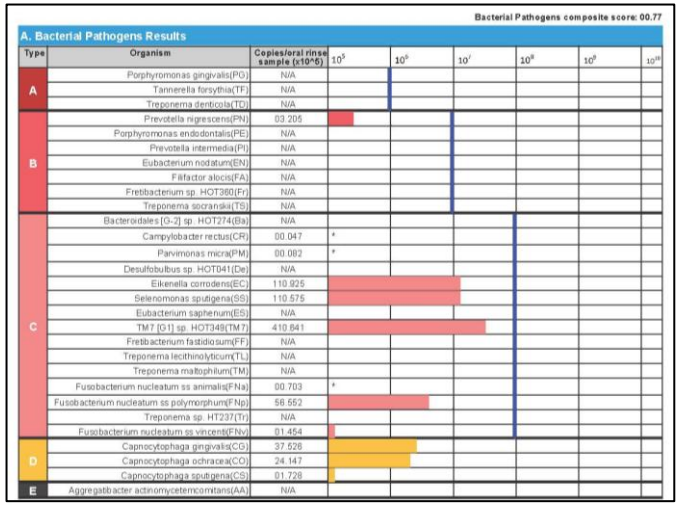
- Composite score of 106.87 > 36.03 - **Pt is still considered a HIGH CARIES RISK but composite score has DECREASED by 84%**
- ***S. mutans* NOT PRESENT**

## January 2025

- **Implant support zirconia crowns on #3, 12, 18, 19, 30, 31**.
- Agreed to **6-month radiograph recare to monitor for new lesions. Significantly** reduced **caries risk and new biofilm profile.**
- New FidaLab Cariogenic Pathogen Test and Fidalab Comprehensive Periodontal Pathogen Test administered.

## January 13, 2025

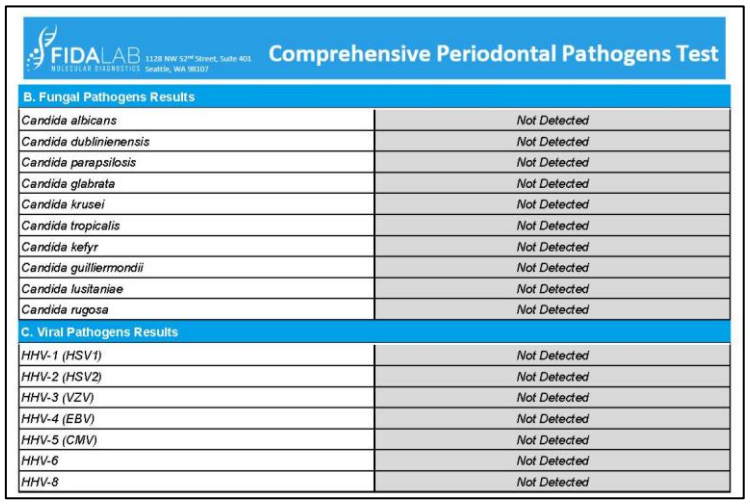
- Caries composite score reduction over time: **231.85 > 106.87 > 36.03 > 00.92**



Bacterial Pathogens composite score: 00.77

A. Bacterial Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^6) |
|---|---|---|
| A | Porphyromonas gingivalis(PG) | N/A |
| | Tannerella forsythia(TF) | N/A |
| | Treponema denticola(TD) | N/A |
| B | Prevotella nigrescens(PN) | 03.205 |
| | Porphyromonas endodontalis(PE) | N/A |
| | Prevotella intermedia(PI) | N/A |
| | Eubacterium nodatum(EN) | N/A |
| | Filifactor alocis(FA) | N/A |
| | Fretibacterium sp. HOT360(Fr) | N/A |
| | Treponema socranskii(TS) | N/A |
| C | Bacteroidales [G-2] sp. HOT274(Ba) | N/A |
| | Campylobacter rectus(CR) | 00.047 |
| | Parvimonas micra(PM) | 00.082 |
| | Desulfobulbus sp. HOT041(De) | N/A |
| | Eikenella corrodens(EC) | 110.925 |
| | Selenomonas sputigena(SS) | 110.575 |
| | Eubacterium saphenum(ES) | N/A |
| | TM7 [G1] sp. HOT348(TM7) | 410.841 |
| | Fretibacterium fastidiosum(FF) | N/A |
| | Treponema lecithinolyticum(TL) | N/A |
| | Treponema maltophilum(TM) | N/A |
| | Fusobacterium nucleatum ss animalis(FNa) | 00.703 |
| | Fusobacterium nucleatum ss polymorphum(FNp) | 56.552 |
| | Treponema sp. HT237(Tr) | N/A |
| | Fusobacterium nucleatum ss vincenti(FNv) | 01.454 |
| D | Capnocytophaga gingivalis(CG) | 37.526 |
| | Capnocytophaga ochracea(CO) | 24.147 |
| | Capnocytophaga sputigena(CS) | 01.728 |
| E | Aggregatibacter actinomycetemcomitans(AA) | N/A |



FIDALAB 1328 NW 52nd Street, Suite 401 Seattle, WA 98107

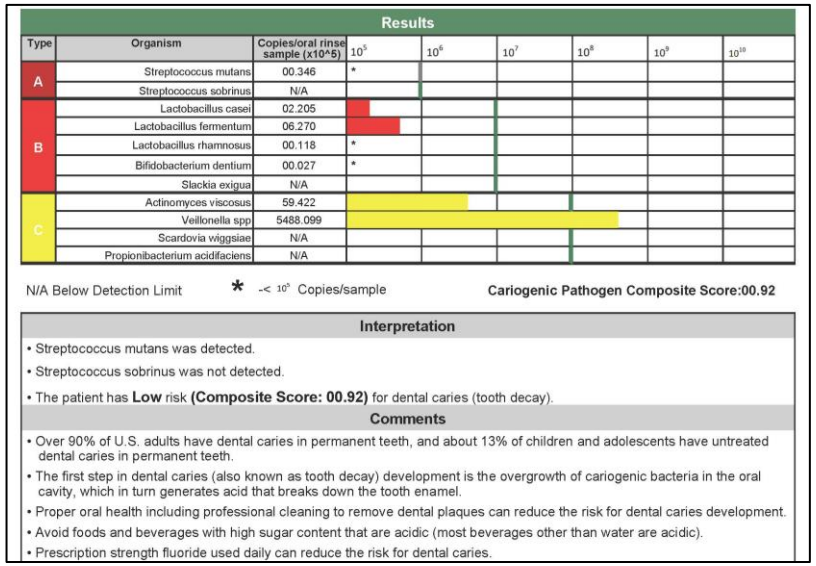
Comprehensive Periodontal Pathogens Test

B. Fungal Pathogens Results

| | |
|---|---|
| *Candida albicans* | Not Detected |
| *Candida dublinienensis* | Not Detected |
| *Candida parapsilosis* | Not Detected |
| *Candida glabrata* | Not Detected |
| *Candida krusei* | Not Detected |
| *Candida tropicalis* | Not Detected |
| *Candida kefyr* | Not Detected |
| *Candida guilliermondii* | Not Detected |
| *Candida lusitaniae* | Not Detected |
| *Candida rugosa* | Not Detected |

C. Viral Pathogens Results

| | |
|---|---|
| *HHV-1 (HSV1)* | Not Detected |
| *HHV-2 (HSV2)* | Not Detected |
| *HHV-3 (VZV)* | Not Detected |
| *HHV-4 (EBV)* | Not Detected |
| *HHV-5 (CMV)* | Not Detected |
| *HHV-6* | Not Detected |
| *HHV-8* | Not Detected |



Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 00.346 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 02.205 |
| | Lactobacillus fermentum | 06.270 |
| | Lactobacillus rhamnosus | 00.118 |
| | Bifidobacterium dentium | 00.027 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 59.422 |
| | Veillonella spp | 5488.099 |
| | Scardovia wiggsiae | N/A |
| | Propionibacterium acidifaciens | N/A |

N/A Below Detection Limit * -< $10^5$ Copies/sample

**Cariogenic Pathogen Composite Score:00.92**

**Interpretation**

- Streptococcus mutans was detected.
- Streptococcus sobrinus was not detected.
- The patient has **Low** risk **(Composite Score: 00.92)** for dental caries (tooth decay).

**Comments**

- Over 90% of U.S. adults have dental caries in permanent teeth, and about 13% of children and adolescents have untreated dental caries in permanent teeth.
- The first step in dental caries (also known as tooth decay) development is the overgrowth of cariogenic bacteria in the oral cavity, which in turn generates acid that breaks down the tooth enamel.
- Proper oral health including professional cleaning to remove dental plaques can reduce the risk for dental caries development.
- Avoid foods and beverages with high sugar content that are acidic (most beverages other than water are acidic).
- Prescription strength fluoride used daily can reduce the risk for dental caries.

### FidaLab Perio - Bacteria

- No red-complex bacteria
- Composite score: **00.77**

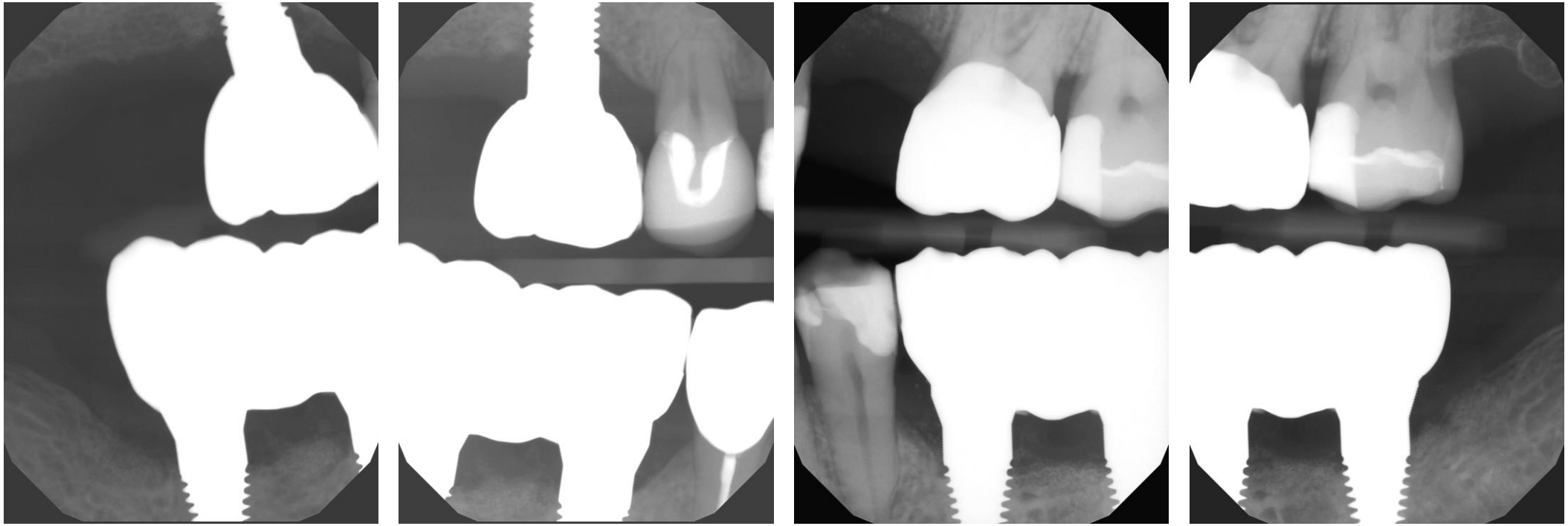
### FidaLab Perio – Yeast / Viruses

- **Negative for 10 *Candida* spp.**
- **Negative for HHV-6**

### FidaLab Cariogenic Pathogen Test

- Composite score of **231.85>106.87 > 36.03** > **00.92**
- **Pt is no longer considered HIGH CARIES RISK composite score has reduced significantly**
- ***S. mutans* NOT PRESENT**

# BWX | 6-05-2025



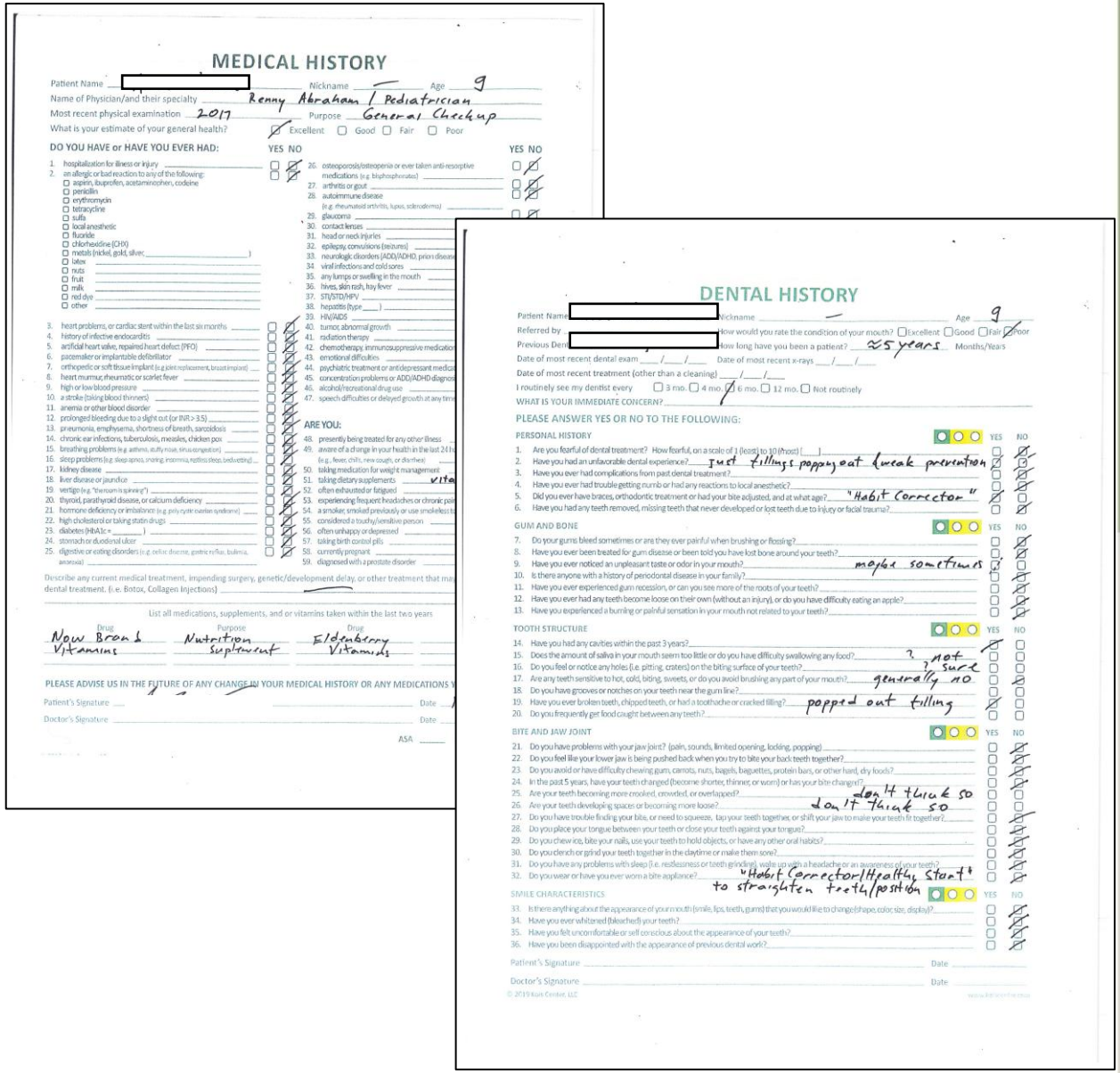
## No New Lesions!

# Case Study: Ava N.

*Pediatric Case*

# Medical / Dental History Review

- **9-year-old female**
- No reported medical conditions and reported only taking vitamins.
- **Previous history of fillings ‘popping out’**
- **No significant cavity prevention plan**
- Wore a “Habit Corrector”; but no longer utilizes the device
- **Using a colloidal silver toothpaste**
- Referred to a pediatric dentist **due to cavities on all her deciduous teeth and early lesions on her permanent teeth**
- Ava’s parents were interested in maintaining a **holistic approach**



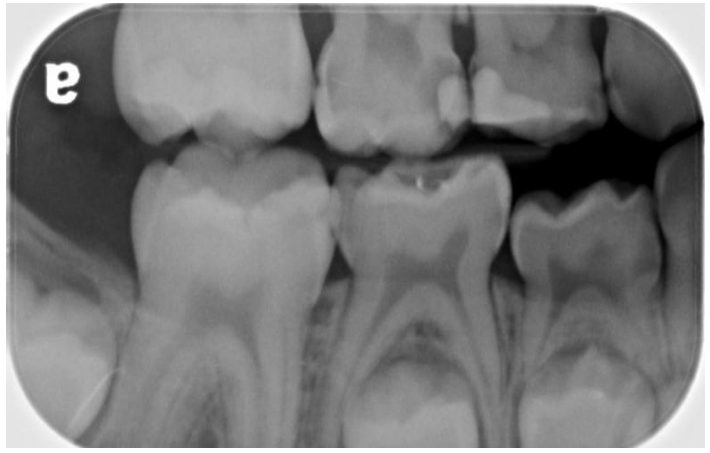
MEDICAL HISTORY

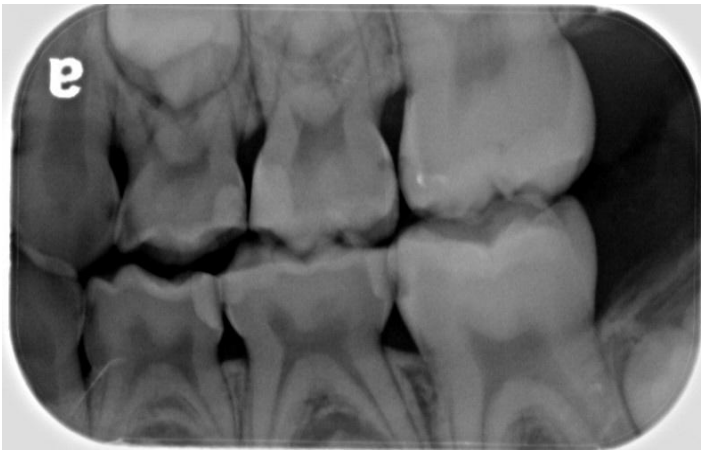
Patient Name [redacted] Nickname — Age 9
Name of Physician/and their specialty Benny Abraham / Pediatrician
Most recent physical examination 2017 Purpose General Checkup
What is your estimate of your general health? ☑ Excellent ☐ Good ☐ Fair ☐ Poor

DENTAL HISTORY

Patient Name [redacted] Nickname — Age 9
Referred by [redacted] How would you rate the condition of your mouth? ☐ Excellent ☐ Good ☐ Fair ☑ Poor
Previous Dentist [redacted] How long have you been a patient? ≈5 years Months/Years
Date of most recent dental exam ___/___/___ Date of most recent x-rays ___/___/___
Date of most recent treatment (other than a cleaning) ___/___/___
I routinely see my dentist every ☐ 3 mo. ☐ 4 mo. ☑ 6 mo. ☐ 12 mo. ☐ Not routinely
WHAT IS YOUR IMMEDIATE CONCERN?
PLEASE ANSWER YES OR NO TO THE FOLLOWING:

# Caries Case Study | Ava N. | Radiographs and Photos, 11-21-2019





11-21-2019

# FidaLab Caries | 11-2019

## Score: 4.36, Moderate Risk

Results

| Type | Bacteria | Copies/oral rinse sample (x10^5) |
|---|---|---|
| I | Streptococcus mutans | 0.1 |
| | Streptococcus sobrinus | N/A |
| II | Lactobacillus casei | 16.2 |
| | Lactobacillus fermentum | 9.4 |
| | Lactobacillus rhamnosus | 3.5 |
| | Bifidobacterium dentium | 285.0 |
| | Slackia exigua | N/A |
| III | Scardovia wiggsiae | N/A |
| | Propionibacterium acidifaciens | N/A |
| | Actinomyces viscosus | 61.1 |
| | Veillonella spp | 16341.2 |


**N/A** - Below detection limit

* - <$10^5$ copies / sample

**Cariogenic Pathogen Composite Score: 4.36**

## Composite Score Key

<1 = Low Risk

**> 1 but < 10 = Moderate Risk**

> 10 = High Risk

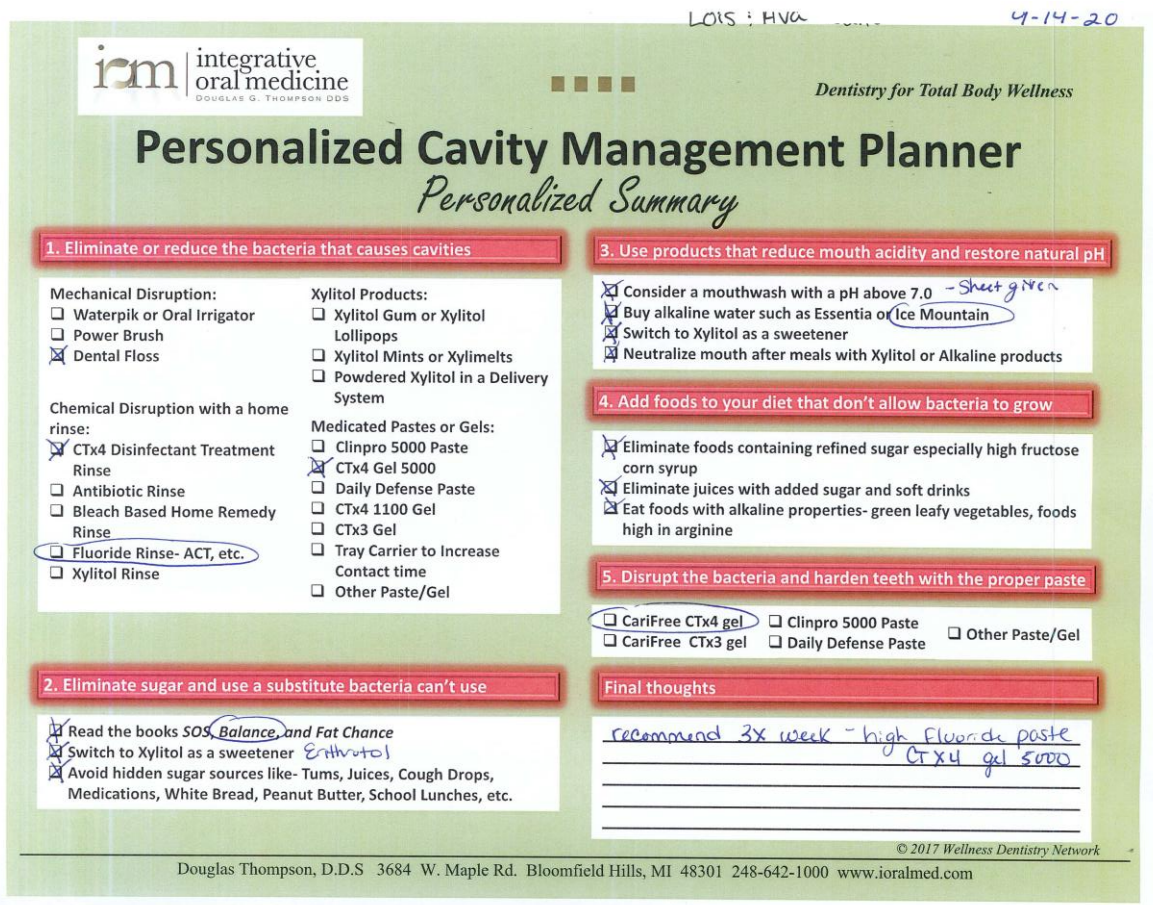
# Caries Case Study | Ava N. | Photos






# April 2020 – November 2022: Cavity Management Planning Consultation

- Reviewed **importance of fluoride and frequent radiographs** for monitoring lesions
- Recommended homecare: **CariFree Treatment Rinse, CariFree CTx4 gel toothpaste, some nutritional counseling**
- *Balance* by Dr. Kim Kutsch dispensed to parents for reading.
- All treatment & homecare recommendations reviewed at a **Cavity Management Planning Consultative session** with her parent.
- **Seen every 6 months per patient request; fluoride varnish at each visit, annual bitewings for monitoring.**



Lois ; Ava 4-14-20

integrative oral medicine
Douglas G. Thompson DDS

*Dentistry for Total Body Wellness*

## Personalized Cavity Management Planner

*Personalized Summary*

**1. Eliminate or reduce the bacteria that causes cavities**

Mechanical Disruption:
- ☐ Waterpik or Oral Irrigator
- ☐ Power Brush
- ☒ Dental Floss

Chemical Disruption with a home rinse:
- ☒ CTx4 Disinfectant Treatment Rinse
- ☐ Antibiotic Rinse
- ☐ Bleach Based Home Remedy Rinse
- ☐ Fluoride Rinse- ACT, etc.
- ☐ Xylitol Rinse

Xylitol Products:
- ☐ Xylitol Gum or Xylitol Lollipops
- ☐ Xylitol Mints or Xylimelts
- ☐ Powdered Xylitol in a Delivery System

Medicated Pastes or Gels:
- ☐ Clinpro 5000 Paste
- ☒ CTx4 Gel 5000
- ☐ Daily Defense Paste
- ☐ CTx4 1100 Gel
- ☐ CTx3 Gel
- ☐ Tray Carrier to Increase Contact time
- ☐ Other Paste/Gel

**2. Eliminate sugar and use a substitute bacteria can't use**

- ☒ Read the books *SOS, Balance, and Fat Chance*
- ☒ Switch to Xylitol as a sweetener Erithrytol
- ☒ Avoid hidden sugar sources like- Tums, Juices, Cough Drops, Medications, White Bread, Peanut Butter, School Lunches, etc.

**3. Use products that reduce mouth acidity and restore natural pH**

- ☒ Consider a mouthwash with a pH above 7.0 - Sheet given
- ☒ Buy alkaline water such as Essentia or Ice Mountain
- ☒ Switch to Xylitol as a sweetener
- ☒ Neutralize mouth after meals with Xylitol or Alkaline products

**4. Add foods to your diet that don't allow bacteria to grow**

- ☒ Eliminate foods containing refined sugar especially high fructose corn syrup
- ☒ Eliminate juices with added sugar and soft drinks
- ☒ Eat foods with alkaline properties- green leafy vegetables, foods high in arginine

**5. Disrupt the bacteria and harden teeth with the proper paste**

- ☐ CariFree CTx4 gel
- ☐ CariFree CTx3 gel
- ☐ Clinpro 5000 Paste
- ☐ Daily Defense Paste
- ☐ Other Paste/Gel

**Final thoughts**

recommend 3x week - high Fluoride paste CTx4 gel 5000



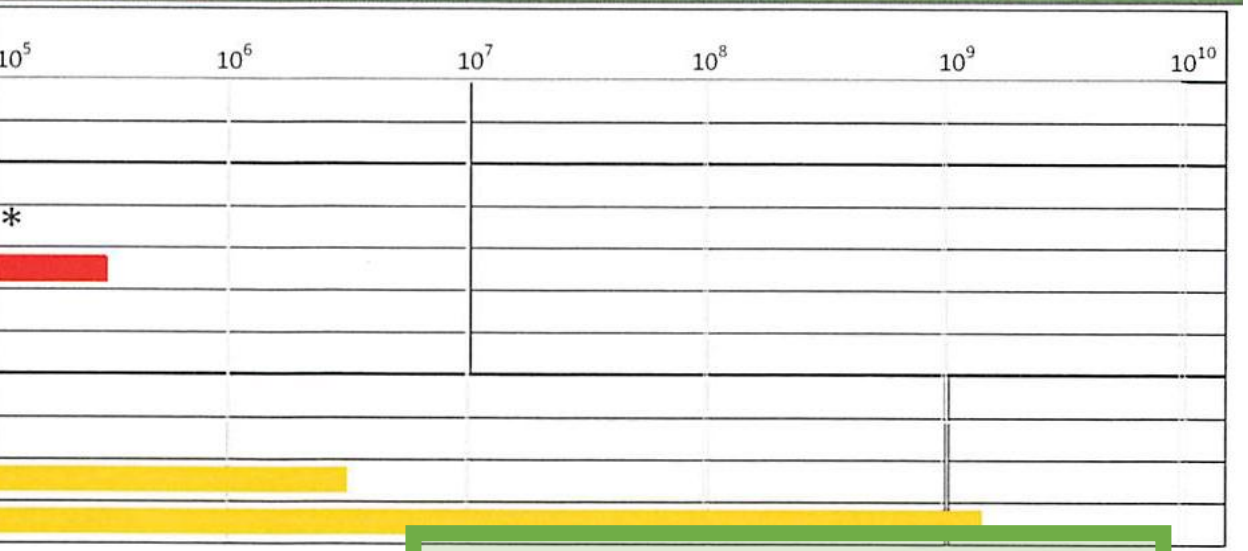
Douglas Thompson, D.D.S 3684 W. Maple Rd. Bloomfield Hills, MI 48301 248-642-1000 www.ioralmed.com

# FidaLab Caries | 08-2020

## Score: .33, Low Risk

### Results

| Type | Bacteria | Copies/oral rinse sample (x10^5) |
|---|---|---|
| I | Streptococcus mutans | N/A |
| | Streptococcus sobrinus | N/A |
| II | Lactobacillus casei | N/A |
| | Lactobacillus fermentum | 0.0 |
| | Lactobacillus rhamnosus | 3.1 |
| | Bifidobacterium dentium | N/A |
| | Slackia exigua | N/A |
| III | Scardovia wiggsiae | N/A |
| | Propionibacterium acidifaciens | N/A |
| | Actinomyces viscosus | 31.3 |
| | Veillonella spp | 14826.7 |




**N/A** - Below detection limit

* - <$10^5$ copies / sample

Cariogenic Pathogen Composite Score: 0.33

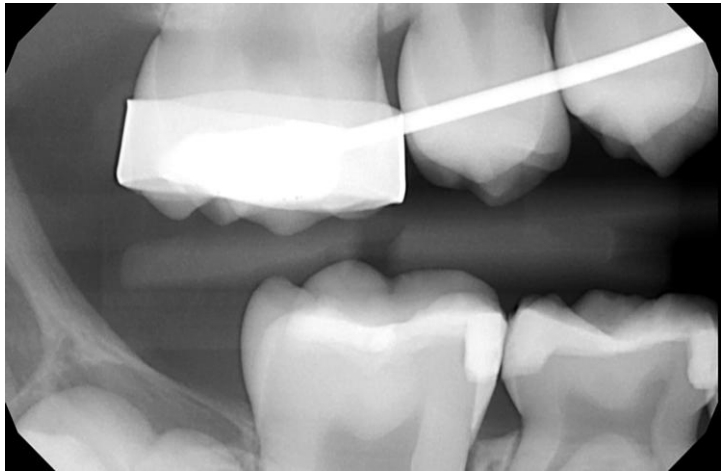
## Composite Score Key

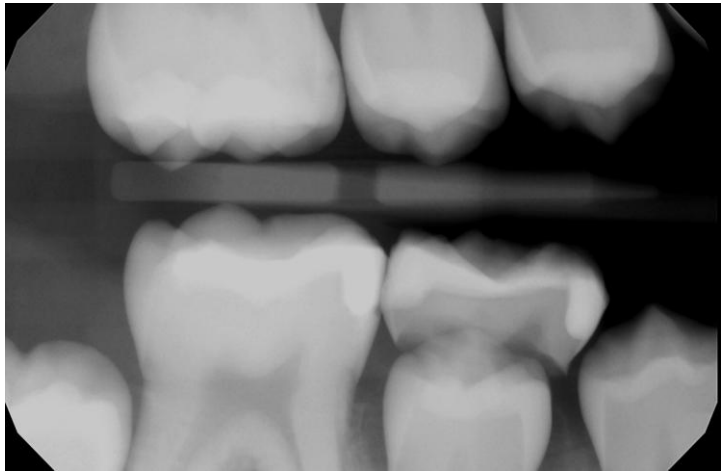
**<1 = Low Risk**

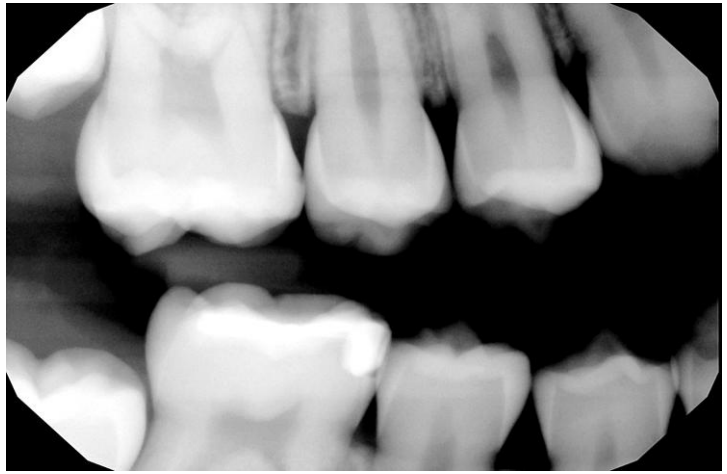
> 1 but < 10 = Moderate Risk

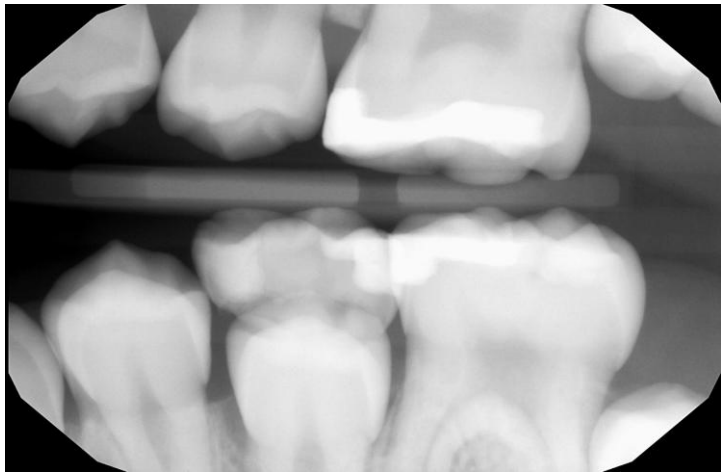
> 10 = High Risk

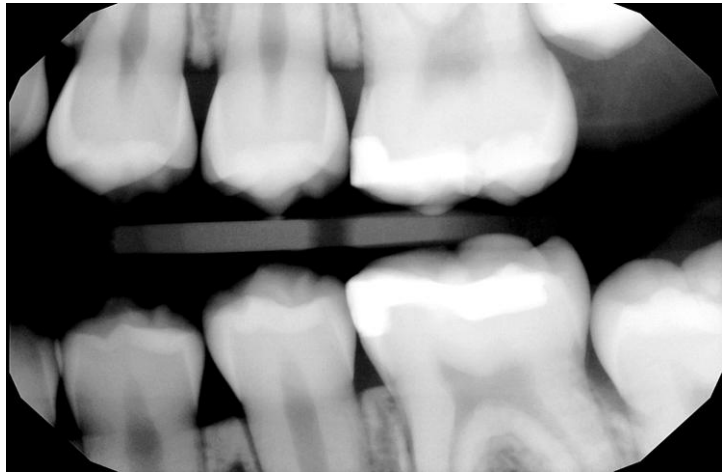
# Caries Case Study | Ava N. | Radiograph Series 2020 - 2022









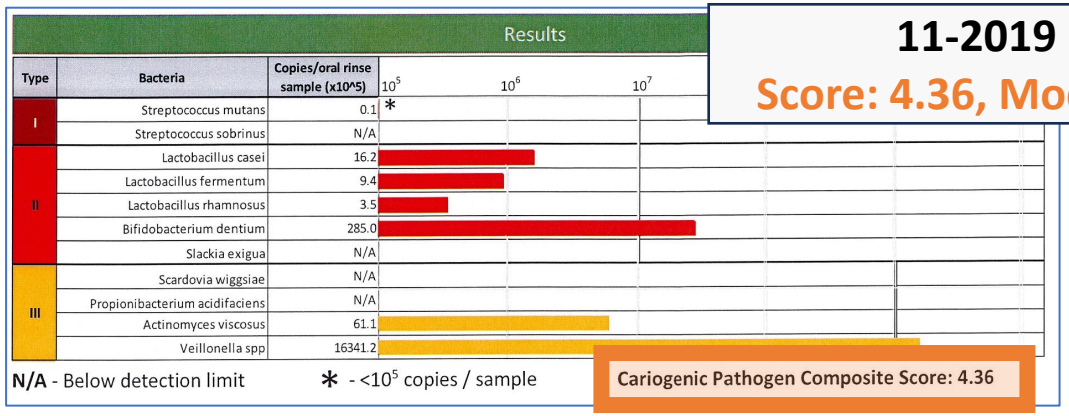


**11-05-2020**

**10-27-2021**

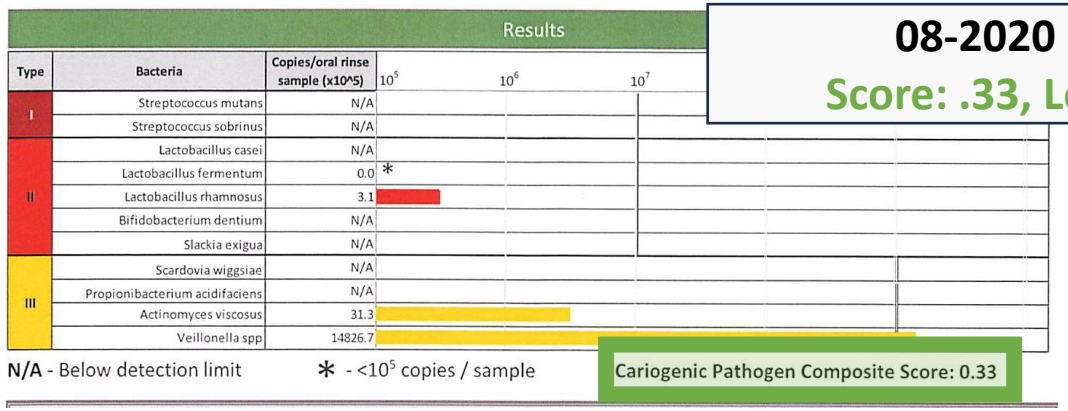
**5-17-2022**

# Caries Case Study | Ava N. | Salivary Diagnostic Test Review



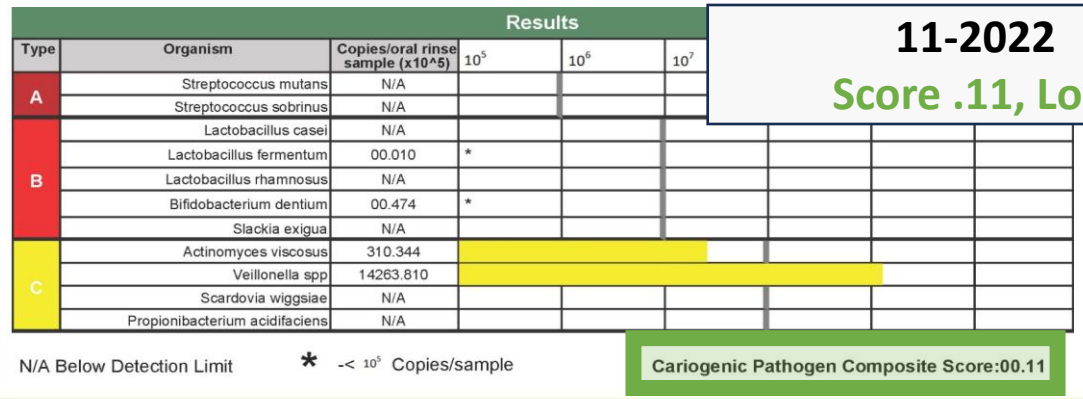

**11-2019**

**Score: 4.36, Moderate**




**08-2020**

**Score: .33, Low**




**11-2022**

**Score .11, Low**

Ava's FIDA Lab results after three years of maintenance

## Composite Score Key

- <1 = Low Risk
- > 1 but < 10 = Moderate Risk
- > 10 = High Risk

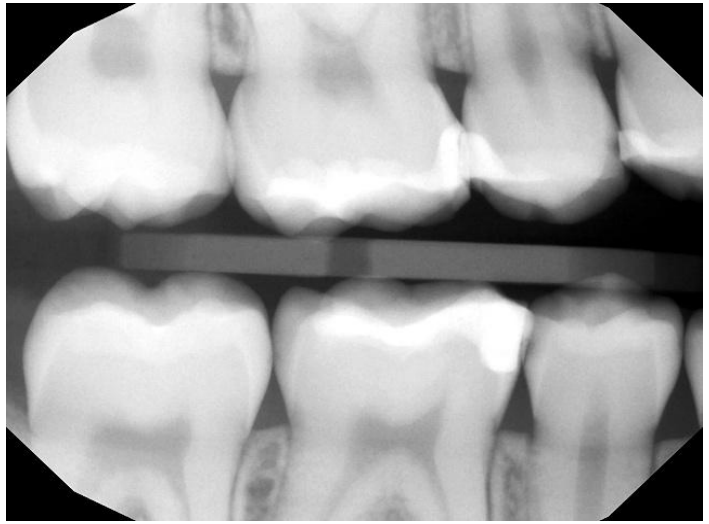
## November 2022

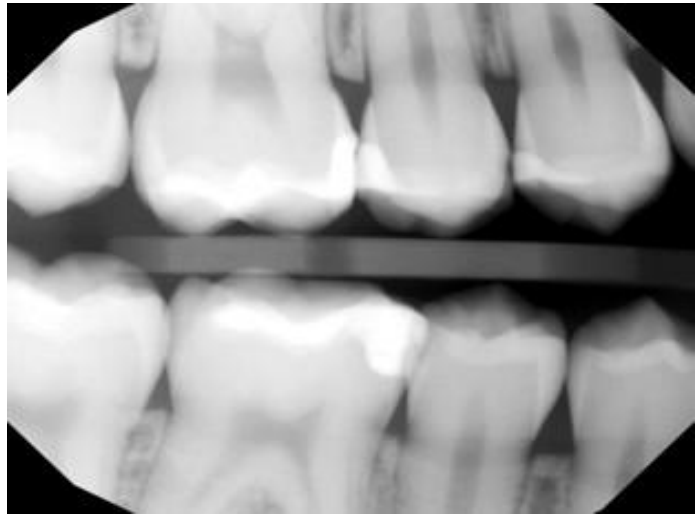
- Ava's last appointment in our office was in **November 2022 due to her family moving 1 hour away from our office**.
- She planned to continue dental care at a clinic closer to her new home.

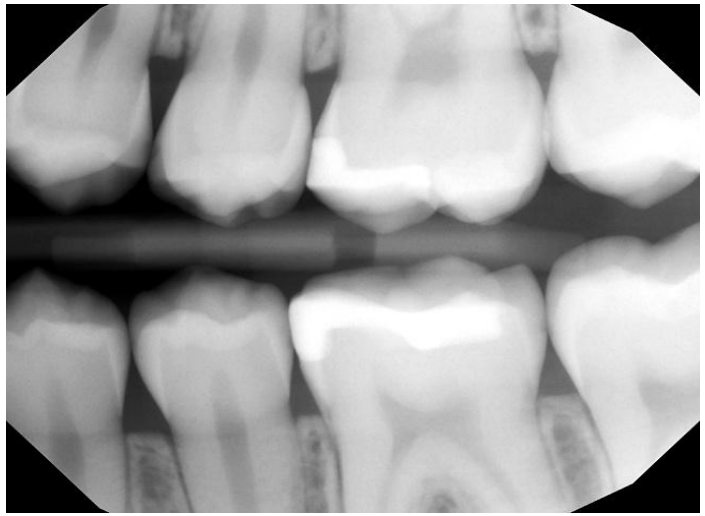
## January 2025

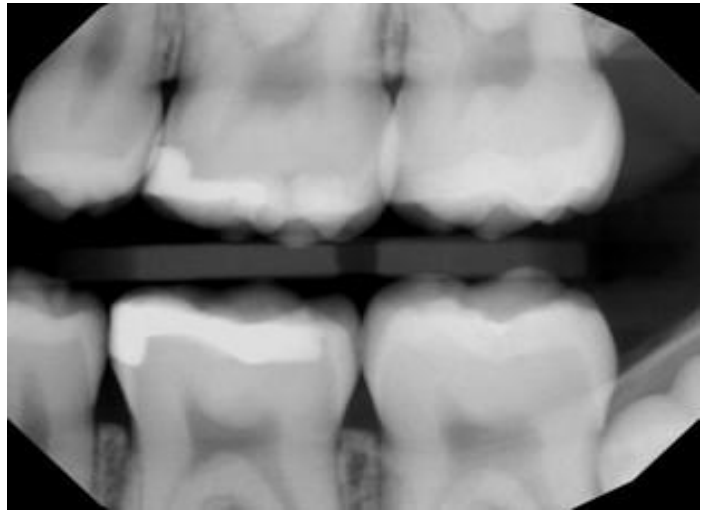
- In early 2025, we contacted Ava's parents to follow up on her care.
- **By January 2025 (age 14), we completed a new Fidalab Comprehensive Caries test, bitewing radiographs, and clinical photos.**

# Caries Case Study | Ava N. | Radiographs and Clinical Photos, 1-2025

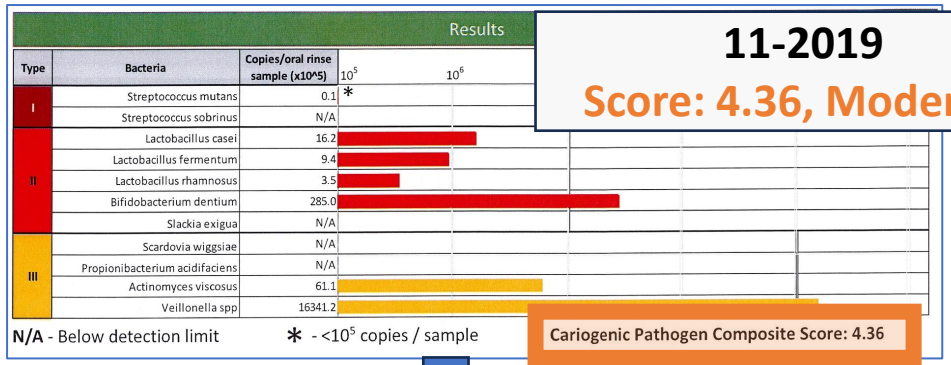








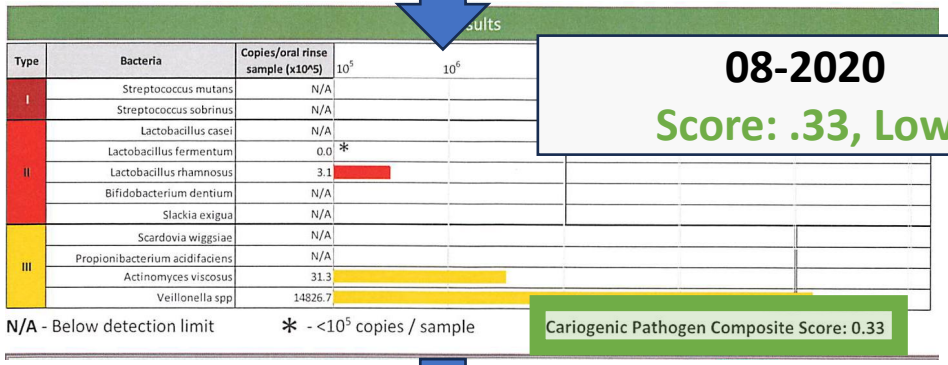
# Caries Case Study | Ava N. | Salivary Diagnostic 5-Year Test Review




**11-2019**

**Score: 4.36, Moderate**

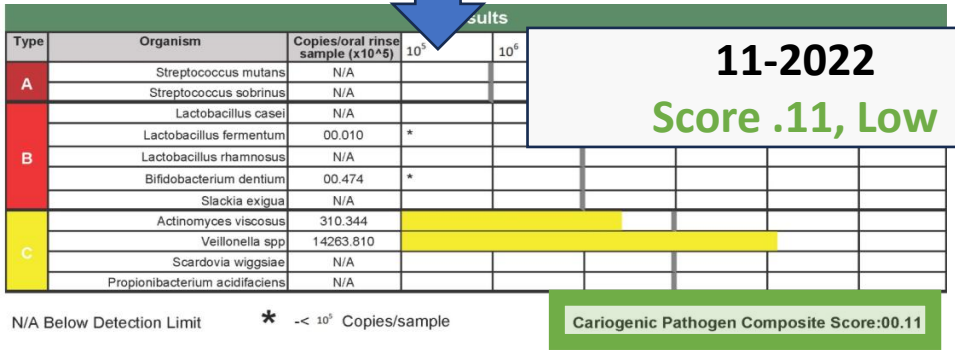
Cariogenic Pathogen Composite Score: 4.36




**08-2020**

**Score: .33, Low**

Cariogenic Pathogen Composite Score: 0.33




**11-2022**

**Score .11, Low**

Cariogenic Pathogen Composite Score:00.11

## FidaLab Comprehensive Caries | 01-2025

**Score: .02 Low Risk | No Yeast Detected**

**A. Bacteria Pathogens Results**

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | N/A |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | N/A |
| | Lactobacillus fermentum | N/A |
| | Lactobacillus rhamnosus | N/A |
| | Bifidobacterium dentium | N/A |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 00.960 * |
| | Veillonella spp | 2498.372 |
| | Scardovia wiggsiae | N/A |
| | Propionibacterium acidifaciens | N/A |

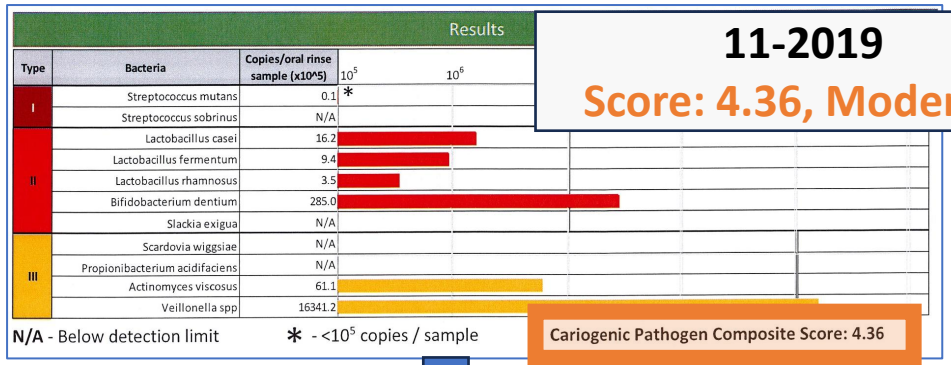
N/A Below Detection Limit * -< $10^5$ Copies/sample

Bacterial pathogens composite score:00.02

**B. Fungal Pathogens Results**

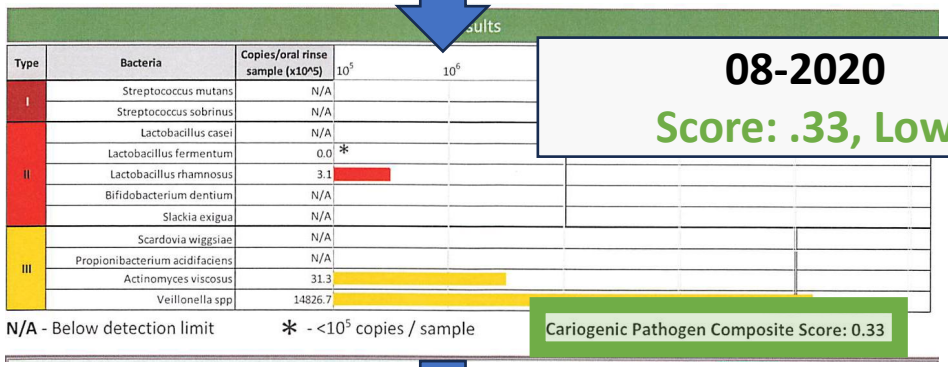
| | |
|---|---|
| *Candida albicans* | Not Detected |
| *Candida dublinienensis* | Not Detected |
| *Candida parapsilosis* | Not Detected |
| *Candida glabrata* | Not Detected |
| *Candida krusei* | Not Detected |
| *Candida tropicalis* | Not Detected |
| *Candida kefyr* | Not Detected |
| *Candida guilliermondii* | Not Detected |
| *Candida lusitaniae* | Not Detected |
| *Candida rugosa* | Not Detected |

# Caries Case Study | Ava N. | Salivary Diagnostic 5-Year Test Review



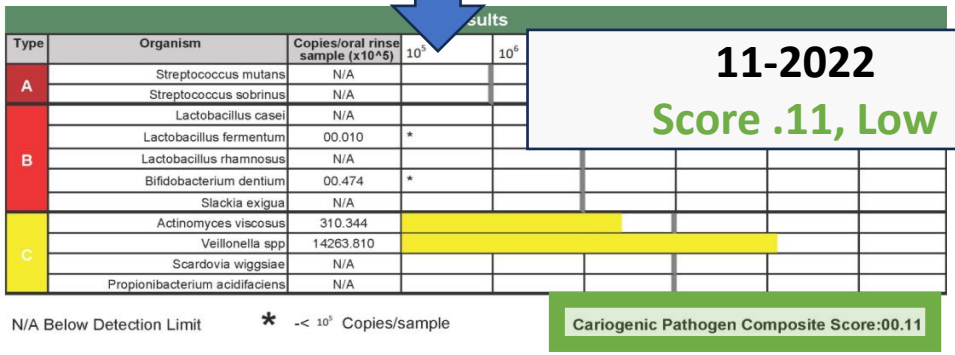

**11-2019**

**Score: 4.36, Moderate**




**08-2020**

**Score: .33, Low**




**11-2022**

**Score .11, Low**

## FidaLab Comprehensive Caries | 01-2025

**Score: .02 Low Risk | No Yeast Detected**

**A. Bacteria Pathogens Results**

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | N/A |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | N/A |
| | Lactobacillus fermentum | N/A |
| | Lactobacillus rhamnosus | N/A |
| | Bifidobacterium dentium | N/A |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 00.960 * |
| | Veillonella spp | 2498.372 |
| | Scardovia wiggsiae | N/A |
| | Propionibacterium acidifaciens | N/A |

N/A Below Detection Limit * -< $10^5$ Copies/sample

Bacterial pathogens composite score:00.02

**B. Fungal Pathogens Results**

| | |
|---|---|
| *Candida albicans* | Not Detected |
| *Candida dublinienensis* | Not Detected |
| *Candida parapsilosis* | Not Detected |
| *Candida glabrata* | Not Detected |
| *Candida krusei* | Not Detected |
| *Candida tropicalis* | Not Detected |
| *Candida kefyr* | Not Detected |
| *Candida guilliermondii* | Not Detected |
| *Candida lusitaniae* | Not Detected |
| *Candida rugosa* | Not Detected |

# No New Lesions!

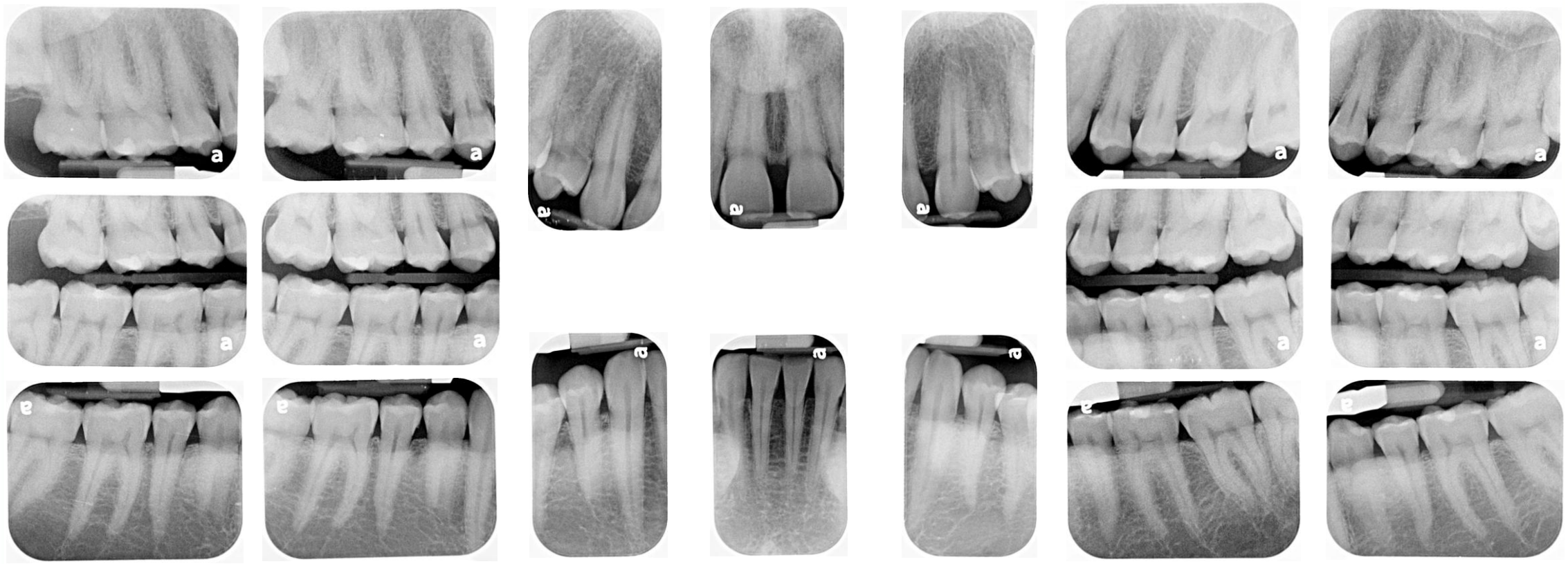
# Case Study: Daniel M.

*Traditional Restorative Method*

# Medical / Dental History Review

- Initially presented in our office in 2018
- Estimated health as ‘Excellent’
- **Had not been to a dentist in 20 years**
- **Reported pain in lower left; patient suspected a cavity**.

# FMX | 03-2018



No obvious pathology noted. Diagnosis is debris around the 3rd molar on left lower side causing pain. Pain was resolved with irrigation.

# Case Narrative

- Patient then did not return to our office until July 2025.

# July 2025

- July 2025: Patient presented for a cleaning.
  - **Carious lesions present on almost all permanent teeth with heavy staining. Erosion present on occlusal surfaces.**
  - Patient reports no changes to his health, medications, home habits, alcohol/drug use, or diet from previously stated in 2018.
  - Recommended a biofilm assessment.

# CariScreen & Caries Risk Assessment, 7-15-2025

## Score: 7777, High Risk

### CRA Form
Adults and Children 6+
Four-Step Guide to Cavity Prevention

Name Daniel
Date 7/15/25

**1 Risk & Disease Discovery** *Complete the section below by circling the most appropriate answer for each question.*

Risk Factors

PATIENT USE

| SALIVA | | |
|---|---|---|
| Do you take medications daily? If so, how many? | NO | YES (5) |
| Do you feel as though you have a dry mouth at any time of the day or night? | NO | YES |
| **DIET** | | |
| Do you drink liquids other than water more than 2 times daily between meals? | NO | YES |
| Do you snack daily between meals? | NO | YES |
| **BIOFILM** | | |
| Do you notice plaque build-up on your teeth between brushings? | NO | YES |

CLINICIAN USE ONLY

| | | |
|---|---|---|
| CariScreen reading results: | LOW (0-1500) | HIGH (1501-9999) 7777 |
| **Disease Indicators** | | |
| New/Progressing visible cavitations? | NO | YES |
| New/Progressing approximal radiographic radioluscencies? | NO | YES |
| New/Active white spot lesions? | NO | YES |
| Is decay history a concern? | NO | YES |

**2 Risk Identification** *Determine risk based on answers above; one blue response indicates moderate risk, one red response indicates high risk.*

| Healthy | + Risk Factors | + Disease Indicators |
|---|---|---|
| 1 - Low Risk | 2 - Moderate Risk | 3 - High Risk |
| CDT Code D0601 | CDT Code D0602 | CDT Code D0603 |

Once risk level diagnosis has been made, refer to next page for treatment options and reassessment protocol.

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### CRA Form
Four-Step Guide to Cavity Prevention

**3 Treatment Options**

| 1 - Low Risk | 2 - Moderate Risk | 3 - High Risk |
|---|---|---|
|  |  |  |
| Gel 1100 or PRO Gel 5000 | Maintenance Rinse and PRO Gel 5000 (or 3-month Maintenance Kit) | Treatment Rinse and PRO Gel 5000 (or 3-month Treatment Kit) |

**Dry Mouth**

If dry mouth diagnosis has been made or if answered yes to dry mouth question, it is recommended to add moisturizing products such as Spray, Breath Mints, or Fluoride Free Gel for use throughout the day.

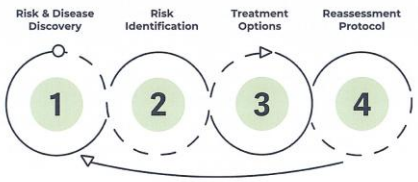
**4 Reassessment Protocol**

High Risk: Reassess every three months until moderate risk.

Moderate Risk: Reassess at every re-care appointment until low risk.

Low Risk: Reassess annually.

**Four-Step Guide to Cavity Prevention**

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### CRA FORM
Rev 8-3

First name: Daniel Last nam Date: 7/15/25

Adults and Children Age 6+

Due to new research on cavities and what causes them, we know everyone is at risk of developing decay at some point during their lifetime. The goal of this assessment form and the bacterial screening test is to determine your likelihood of experiencing new decay in the next 12 months. Please fill out the "Patient Use" section of this form to the best of your ability. These items will be discussed with your dental professional during your appointment today. Questions about this form? See the back for Q&A.

| | | | |
|---|---|---|---|
| **Would you like a free bacterial screening test to help determine your risk for cavities?** (The test is a quick, painless swab of your teeth.) | yes | | no |
| If diagnosed at risk for cavities today, would you be interested in discussing treatment options? | yes | maybe | no |
| If needed, are you willing to modify your dietary habits? | yes | maybe | no |

PATIENT USE

| RISK FACTORS | | |
|---|---|---|
| Do you notice plaque build-up on your teeth between brushings? | no | yes |
| Do you take medications daily? If yes, how many? (#____) | no | yes |
| Do you feel like you have a dry mouth at any time of the day or night? | no | yes |
| Do you drink liquids other than water more than 2 times daily between meals? | no | yes |
| Do you snack daily between meals? | no | yes |
| Do you have oral appliances present? | no | yes |
| Do any of these other health concerns apply to you? (check all that apply) ☐ Frequent tobacco use ☐ Acid reflux ☐ Diabetes ☐ Head/neck radiation therapy ☐ Other drug use ☐ Bulimia ☐ Sjogren's Syndrome | no | yes |

CLINICIAN USE ONLY

| DISEASE INDICATORS | | |
|---|---|---|
| New/Progressing Visible Cavitations | no | yes |
| New/Progressing Approximal Radiographic Radiolucencies | no | yes |
| New/Active White Spot Lesions | no | yes |
| Decay History is a Concern | no | yes |
| **BIOFILM CHALLENGE** | | |
| CariScreen Bacterial Assessment (0-1500 low, 1501-9999 high) | low | high 7777 |
| **PROFESSIONAL ASSESSMENT SUMMARY** | | |
| Risk Factors are a Concern | no | yes |
| Disease Indicators are a Concern | no | yes |
| Biofilm Challenge is a Concern | no | yes |

**RISK IDENTIFICATION** Transfer information above to boxes below to determine risk.

| N Y | N Y | N Y | N Y | N Y |
|---|---|---|---|---|
| ☐ Risk Factors | ☐ Risk Factors | ☐ Risk Factors | ☐ Risk Factors | ☐ Risk Factors |
| ☐ Disease Indicators | ☐ Disease Indicators | ☐ Disease Indicators | ☐ Disease Indicators | ☐ Disease Indicators |
| ☐ Biofilm Challenge | ☐ Biofilm Challenge | ☐ Biofilm Challenge | ☐ Biofilm Challenge | ☐ Biofilm Challenge |
| LOW RISK | MODERATE RISK | HIGH RISK | HIGH RISK | HIGH/EXTREME RISK |
| 1 | 2 | 3 | 4 | 5 |

RECOMMENDED PROVISIONAL DECLINE

# FidaLab Comprehensive Caries, Pre-Restorative | 07-2025

## Score: 311.10, High Risk | No Yeast Detected

### A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) | $10^5$ | $10^6$ | $10^7$ | $10^8$ | $10^9$ | $10^{10}$ |
|---|---|---|---|---|---|---|---|---|
| A | Streptococcus mutans | 01.530 | | | | | | |
| | Streptococcus sobrinus | N/A | | | | | | |
| B | Lactobacillus casei | 3416.959 | | | | | | |
| | Lactobacillus fermentum | 07.460 | | | | | | |
| | Lactobacillus rhamnosus | 823.236 | | | | | | |
| | Bifidobacterium dentium | 134.523 | | | | | | |
| | Slackia exigua | N/A | | | | | | |
| C | Actinomyces viscosus | 13.143 | | | | | | |
| | Veillonella spp | 11829.211 | | | | | | |
| | Scardovia wiggsiae | 13.592 | | | | | | |
| | Propionibacterium acidifaciens | 19.231 | | | | | | |

N/A Below Detection Limit * -< $10^5$ Copies/sample

**Bacterial pathogens composite score:311.10**

### B. Fungal Pathogens Results

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

# Saliva-Check Buffer Test| 07-2025

Saliva-Check Buffer Tests:

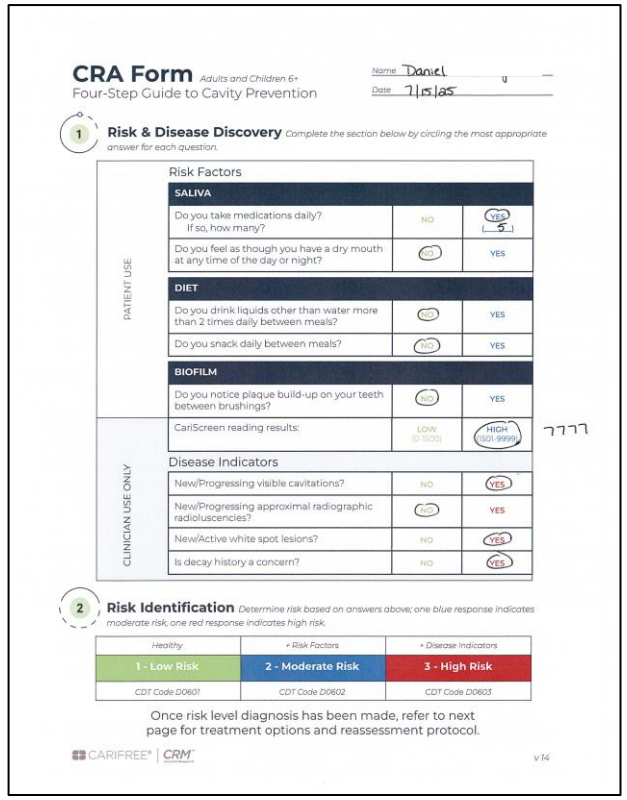
1. Resting saliva → **Normal (>60 seconds)**
   - *Visual inspection of level of hydration; observe lower lip labial mucosa gland secretion.*
2. Saliva consistency → **Normal (Watery clear saliva)**
   - *Visually assessing resting salivary consistency.*
3. pH measurement → **Moderately acidic (6.0 – 6.6 pH)**
   - *pH testing strip into salivary sample for 10 seconds*
4. Saliva quantity → **Normal (>5.0 mL)**
   - *Stimulate saliva for 30 seconds by chewing piece of wax. Expectorate saliva into cup and continue chewing for 5 minutes with expectoration.*
5. Buffering capacity: **Very low (0 – 5 score)**
   - *Pipette saliva from collection cup onto 3 test pads, wait 2 minutes, and read test pad.*

# Caries Case Study | Daniel M. | Initial Salivary Diagnostic Test, Results Review

## A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) | $10^5$ | $10^6$ | $10^7$ | $10^8$ | $10^9$ | $10^{10}$ |
|---|---|---|---|---|---|---|---|---|
| A | Streptococcus mutans | 01.530 | | | | | | |
| | Streptococcus sobrinus | N/A | | | | | | |
| B | Lactobacillus casei | 3416.959 | | | | | | |
| | Lactobacillus fermentum | 07.460 | | | | | | |
| | Lactobacillus rhamnosus | 823.236 | | | | | | |
| | Bifidobacterium dentium | 134.523 | | | | | | |
| | Slackia exigua | N/A | | | | | | |
| C | Actinomyces viscosus | 13.143 | | | | | | |
| | Veillonella spp | 11829.211 | | | | | | |
| | Scardovia wiggsiae | 13.592 | | | | | | |
| | Propionibacterium acidifaciens | 19.231 | | | | | | |

N/A Below Detection Limit  * -< $10^5$ Copies/sample  **Bacterial pathogens composite score:311.10**



CRA Form
Adults and Children 6+
Four-Step Guide to Cavity Prevention

Name Daniel
Date 7/15/25

1 **Risk & Disease Discovery** *Complete the section below by circling the most appropriate answer for each question.*

Risk Factors

PATIENT USE

SALIVA
- Do you take medications daily? If so, how many? — NO / YES 5
- Do you feel as though you have a dry mouth at any time of the day or night? — NO / YES

DIET
- Do you drink liquids other than water more than 2 times daily between meals? — NO / YES
- Do you snack daily between meals? — NO / YES

BIOFILM
- Do you notice plaque build-up on your teeth between brushings? — NO / YES

CLINICIAN USE ONLY

- CariScreen reading results: — LOW (0-1600) / HIGH (501-9999)

Disease Indicators
- New/Progressing visible cavitations? — NO / YES
- New/Progressing approximal radiographic radiolucencies? — NO / YES
- New/Active white spot lesions? — NO / YES
- Is decay history a concern? — NO / YES

2 **Risk Identification** *Determine risk based on answers above; one blue response indicates moderate risk, one red response indicates high risk.*

| Healthy | + Risk Factors | + Disease Indicators |
|---|---|---|
| 1 - Low Risk | 2 - Moderate Risk | 3 - High Risk |
| CDT Code D0601 | CDT Code D0602 | CDT Code D0603 |

Once risk level diagnosis has been made, refer to next page for treatment options and reassessment protocol.

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# TEST RESULTS SUMMARY

**1. Dysbiotic microbiome with high levels of cariogenic bacteria present**

**+**

**2. Dan's saliva is naturally more acidic; 6.0 – 6.6 pH**

**+**

**3. Dan's saliva naturally has very low buffering capabilities**

## Case Narrative: August 2025

- **All current restorative needs were addressed in July**
- Only homecare recommendations followed during restorative treatment was utilizing **CariFree ProGel 5000**
- Did not start any biofilm management yet. Wanted to do restorations and reevaluate the microbiome.
- **Fidalab Comprehensive Caries test re-administered**

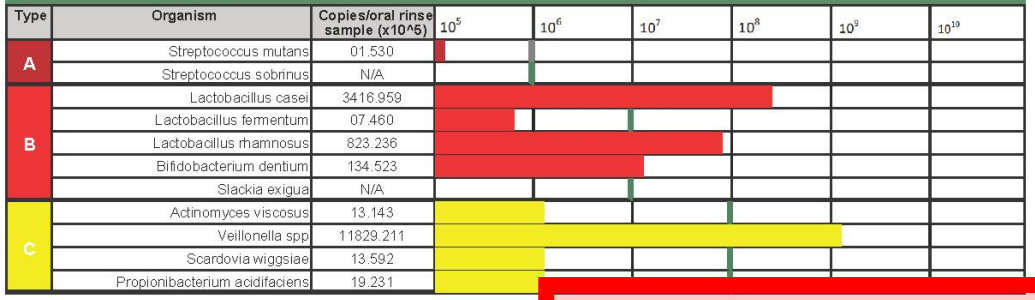
# Caries Case Study | Daniel M. | Salivary Diagnostic Test, Pre vs Post Restorative

## FidaLab Comprehensive Caries, Pre-Restorative | 07-2025

**Score: 311.10, High Risk** | **No Yeast Detected**

### A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 01.530 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 3416.959 |
| | Lactobacillus fermentum | 07.460 |
| | Lactobacillus rhamnosus | 823.236 |
| | Bifidobacterium dentium | 134.523 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 13.143 |
| | Veillonella spp | 11829.211 |
| | Scardovia wiggsiae | 13.592 |
| | Propionibacterium acidifaciens | 19.231 |




N/A Below Detection Limit  * -< $10^5$ Copies/sample

**Bacterial pathogens composite score:311.10**

### B. Fungal Pathogens Results

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

**HIGHER SCORE?**

## FidaLab Comprehensive Caries, Post-Restorative | 08-2025

**Score: 373.95, High Risk** | **No Yeast Detected**

### A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 01.100 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 1577.486 |
| | Lactobacillus fermentum | 356.552 |
| | Lactobacillus rhamnosus | 2891.586 |
| | Bifidobacterium dentium | 3038.298 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 986.899 |
| | Veillonella spp | 12283.857 |
| | Scardovia wiggsiae | 07.421 |
| | Propionibacterium acidifaciens | 18.936 |


**Bacterial pathogens composite score:373.95**

### B. Fungal Pathogens Results

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

# Caries Case Study | Daniel M. | Salivary Diagnostic Test, Pre vs Post Restorative

## FidaLab Comprehensive Caries, Pre-Restorative | 07-2025

**Score: 311.10, High Risk** | **No Yeast Detected**

### A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 01.530 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 3416.959 |
| | Lactobacillus fermentum | 07.460 |
| | Lactobacillus rhamnosus | 823.236 |
| | Bifidobacterium dentium | 134.523 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 13.143 |
| | Veillonella spp | 11829.211 |
| | Scardovia wiggsiae | 13.592 |
| | Propionibacterium acidifaciens | 19.231 |

N/A Below Detection Limit  * -< $10^5$ Copies/sample

**Bacterial pathogens composite score:311.10**

### B. Fungal Pathogens Results

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

**HIGHER SCORE?**

## FidaLab Comprehensive Caries, Post-Restorative | 08-2025

**Score: 373.95, High Risk** | **No Yeast Detected**

### A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) |
|---|---|---|
| A | Streptococcus mutans | 01.100 |
| | Streptococcus sobrinus | N/A |
| B | Lactobacillus casei | 1577.486 |
| | Lactobacillus fermentum | 356.552 |
| | Lactobacillus rhamnosus | 2891.586 |
| | Bifidobacterium dentium | 3038.298 |
| | Slackia exigua | N/A |
| C | Actinomyces viscosus | 986.899 |
| | Veillonella spp | 12283.857 |
| | Scardovia wiggsiae | 07.421 |
| | Propionibacterium acidifaciens | 18.936 |

**Bacterial pathogens composite score:373.95**

### B. Fungal Pathogens Results

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

## WHAT DOES THIS MEAN?

**The traditional dental strategy of performing restorative work and prescribing supplemental fluoride fails to effectively target one of the main etiologies of dental caries, which is the cariogenic biofilm.**

# Case Study: Peter R.

*Wellness Dentistry Method*

# Medical / Dental History Review

- 66-year-old male.
- Reports overall health as "good."
- Light sleeper.
- No history of sleep apnea.
- Borderline high cholesterol.
- **Average arterial buildup; wants to reverse heart disease.**
- Takes dietary supplements for heart health
- **Congenitally missing teeth #7 and #10.**
- **Referred by physician and reports frequent cavities**
- Issues with root canal on tooth #15.
- Had completed CIMT tests, OralDNA MyPerioPath, previous sleep test, pulmonary function reports, and bloodwork sent to our office.

What is your estimate of your general health?

| | |
|---|---|
| Excellent | No |
| Good | **YES** |
| Fair | No |
| Poor | No |

| | | |
|---|---|---|
| 14. Chronic ear infections, tuberculosis, measles, chicen pox | **YES** | Not sure, but I may have had measles and or chicken pox when I was a child. Did they have vaccines in 60's? |
| 15. Breathing problems (e.g. asthma, stuffy nose, sinus congestion) | No | |
| 16. Sleep problems (e.g.sleep apnea, snoring, insomnia, restless sleep, bedwetting) | **YES** | I am a very light sleeper, wake frequently majority of the time, but do not have sleep apnea (was tested) |
| 17. Kidney disease | No | |
| 18. Liver disease or jaundice | No | |
| 19. Vertigo (e.g. "the room is spinning") | No | |
| 20. Thyroid, parathyroid disease, or calcium deficiency | No | |
| 21. Hormone deficiency or imbalance (e.g.poly cystic ovarian syndrome) | No | |
| 22. High cholesterol or taking statin drugs | **YES** | Cholesterol is on borderline for high |
| 48. Presently being treated for any other illness | **YES** | Trying to reduce heart disease, I am average as far as the level of arterial buildup, but trying to reverse/stop it from progressing. |
| 49. Aware of any change in your health in the last 24 hours (e.g. fever, chills, new cough, or diarrhea) | No | |
| 50. Taking medication for weight management | No | |
| 51. Taking dietary supplements, vitamins, and/or probiotics | **YES** | Methyl B Complex, K-Force (Vit k and D), CoQ10, EPA, Magnesium Glycinate. |
| 52. Often exhausted or fatigued | No | |

# FMX | 03-2025

**Treatment plan: #2 crown, #3-MO, #15 crown due to recurrent decay on root surface, #18 RCT and crown. Awaiting Fidalab Comprehensive Caries results for further homecare recommendations**

# FidaLab Comprehensive Caries | 03-2025

## Score: 301.12, High Risk| *C. albicans* Detected

### A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) | $10^5$ | $10^6$ | $10^7$ | $10^8$ | $10^9$ | $10^{10}$ |
|---|---|---|---|---|---|---|---|---|
| A | Streptococcus mutans | 52.413 | | | | | | |
| | Streptococcus sobrinus | N/A | | | | | | |
| B | Lactobacillus casei | 737.884 | | | | | | |
| | Lactobacillus fermentum | 1435.154 | | | | | | |
| | Lactobacillus rhamnosus | 1335.157 | | | | | | |
| | Bifidobacterium dentium | 1038.053 | | | | | | |
| | Slackia exigua | N/A | | | | | | |
| C | Actinomyces viscosus | 4929.965 | | | | | | |
| | Veillonella spp | 37408.757 | | | | | | |
| | Scardovia wiggsiae | 74.059 | | | | | | |
| | Propionibacterium acidifaciens | N/A | | | | | | |

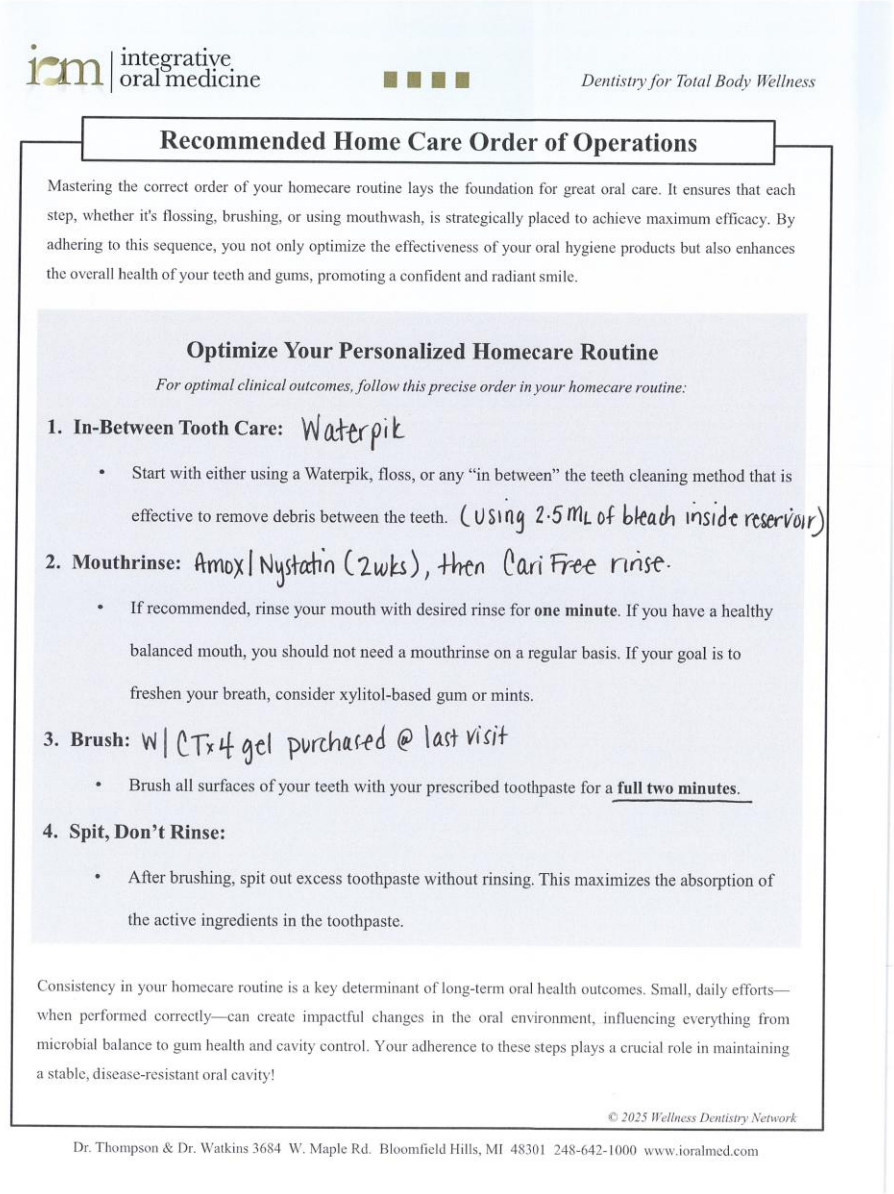
N/A Below Detection Limit * -< $10^5$ Copies/sample

**Bacterial pathogens composite score:301.12**

| | |
|---|---|
| *Candida albicans* | Detected |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

# Case Narrative, Cont'd

- 03/2025: Completed #2 crown and #3 MO restoration.
- 04/2025: Patient seen for caries consultation at crown seat appointment.
  - **High caries risk due to composite score of 301.12, presence of *S. mutans* and *C. albicans***
- **Prescribed a 1000 mg/tsp amoxicillin/nystatin rinse to be used for 2 weeks to manage dysbiotic oral environment. Follow with CariFree Treatment Rinse twice daily for one minute.**
- **Follow-up caries test scheduled for 6 weeks post-rinse**.
- Ordered **CHL lab panel** for blood analysis.
- Patient purchased **CariFree Treatment Rinse and a Waterpik**. Dispensed & personalized **Order of Operations** take-home resource



integrative oral medicine

*Dentistry for Total Body Wellness*

**Recommended Home Care Order of Operations**

Mastering the correct order of your homecare routine lays the foundation for great oral care. It ensures that each step, whether it's flossing, brushing, or using mouthwash, is strategically placed to achieve maximum efficacy. By adhering to this sequence, you not only optimize the effectiveness of your oral hygiene products but also enhances the overall health of your teeth and gums, promoting a confident and radiant smile.

**Optimize Your Personalized Homecare Routine**

*For optimal clinical outcomes, follow this precise order in your homecare routine:*

1. **In-Between Tooth Care:** Waterpik
   - Start with either using a Waterpik, floss, or any "in between" the teeth cleaning method that is effective to remove debris between the teeth. (using 2.5 mL of bleach inside reservoir)
2. **Mouthrinse:** Amox | Nystatin (2wks), then Cari Free rinse.
   - If recommended, rinse your mouth with desired rinse for **one minute**. If you have a healthy balanced mouth, you should not need a mouthrinse on a regular basis. If your goal is to freshen your breath, consider xylitol-based gum or mints.
3. **Brush:** W | CTx4 gel purchased @ last visit
   - Brush all surfaces of your teeth with your prescribed toothpaste for a **full two minutes**.
4. **Spit, Don't Rinse:**
   - After brushing, spit out excess toothpaste without rinsing. This maximizes the absorption of the active ingredients in the toothpaste.

Consistency in your homecare routine is a key determinant of long-term oral health outcomes. Small, daily efforts—when performed correctly—can create impactful changes in the oral environment, influencing everything from microbial balance to gum health and cavity control. Your adherence to these steps plays a crucial role in maintaining a stable, disease-resistant oral cavity!



Dr. Thompson & Dr. Watkins 3684 W. Maple Rd. Bloomfield Hills, MI 48301 248-642-1000 www.ioralmed.com

# Caries Case Study | Peter R. | Post Restorative + Antibiotic Rinse Salivary Diagnostic Test Results, 6-2025

## 06-2025

### A. Bacteria Pathogens Results

| Type | Organism | Copies/oral rinse sample (x10^5) | $10^5$ | $10^6$ | $10^7$ | $10^8$ | $10^9$ | $10^{10}$ |
|---|---|---|---|---|---|---|---|---|
| A | Streptococcus mutans | 01.833 | | | | | | |
| | Streptococcus sobrinus | N/A | | | | | | |
| B | Lactobacillus casei | N/A | | | | | | |
| | Lactobacillus fermentum | N/A | | | | | | |
| | Lactobacillus rhamnosus | N/A | | | | | | |
| | Bifidobacterium dentium | 01.076 | | | | | | |
| | Slackia exigua | 00.046 | * | | | | | |
| C | Actinomyces viscosus | 224.474 | | | | | | |
| | Veillonella spp | 31210.178 | | | | | | |
| | Scardovia wiggsiae | 27.009 | | | | | | |
| | Propionibacterium acidifaciens | N/A | | | | | | |

N/A Below Detection Limit  * -< $10^5$ Copies/sample

**Bacterial pathogens composite score:01.57**

### B. Fungal Pathogens Results

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

**FidaLab Comprehensive Caries | 03-2025**

**Score: 301.12, High Risk| *C. albicans* Detected**

**FidaLab Comprehensive Caries | 06-2025**

**Score: 1.57, Low Risk**

**No Yeast Detected**

# Caries Case Study | Peter R. | Post Restorative + Antibiotic Rinse Salivary Diagnostic Test Results, 10-2025

## 10-2025

**A. Bacteria Pathogens Results**

| Type | Organism | Copies/oral rinse sample (x10^5) | $10^5$ | $10^6$ | $10^7$ | $10^8$ | $10^9$ | $10^{10}$ |
|---|---|---|---|---|---|---|---|---|
| A | Streptococcus mutans | 00.596 | * | | | | | |
| | Streptococcus sobrinus | N/A | | | | | | |
| B | Lactobacillus casei | N/A | | | | | | |
| | Lactobacillus fermentum | N/A | | | | | | |
| | Lactobacillus rhamnosus | 00.130 | * | | | | | |
| | Bifidobacterium dentium | 00.792 | * | | | | | |
| | Slackia exigua | N/A | | | | | | |
| C | Actinomyces viscosus | 104.748 | | | | | | |
| | Veillonella spp | 17003.961 | | | | | | |
| | Scardovia wiggsiae | 28.965 | | | | | | |
| | Propionibacterium acidifaciens | N/A | | | | | | |

N/A Below Detection Limit  * -< $10^5$ Copies/sample

**Bacterial pathogens composite score:00.57**

**B. Fungal Pathogens Results**

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

**No New Lesions!**

**FidaLab Comprehensive Caries 03-2025**

**Score: 301.12, High Risk| *C. albicans* Detected**

**FidaLab Comprehensive Caries 06-2025**

**Score: 1.57, Moderate Risk**
**No Yeast Detected**

**FidaLab Comprehensive Caries 10-2025**

**Score: 0.57, Low Risk**
**No Yeast Detected**

# Caries Case Study | Peter R. | Post Restorative + Antibiotic Rinse Salivary Diagnostic Test Results, 10-2025

**10-2025**

**A. Bacteria Pathogens Results**

| Type | Organism | Copies/oral rinse sample (x10^5) | $10^5$ | $10^6$ | $10^7$ | $10^8$ | $10^9$ | $10^{10}$ |
|---|---|---|---|---|---|---|---|---|
| A | Streptococcus mutans | 00.596 | * | | | | | |
| | Streptococcus sobrinus | N/A | | | | | | |
| B | Lactobacillus casei | N/A | | | | | | |
| | Lactobacillus fermentum | N/A | | | | | | |
| | Lactobacillus rhamnosus | 00.130 | * | | | | | |
| | Bifidobacterium dentium | 00.792 | * | | | | | |
| | Slackia exigua | N/A | | | | | | |
| C | Actinomyces viscosus | 104.748 | | | | | | |
| | Veillonella spp | 17003.961 | | | | | | |
| | Scardovia wiggsiae | 28.965 | | | | | | |
| | Propionibacterium acidifaciens | N/A | | | | | | |

N/A Below Detection Limit  * -< $10^5$ Copies/sample

**Bacterial pathogens composite score:00.57**

**B. Fungal Pathogens Results**

| | |
|---|---|
| *Candida albicans* | *Not Detected* |
| *Candida dubliniensis* | *Not Detected* |
| *Candida parapsilosis* | *Not Detected* |
| *Candida glabrata* | *Not Detected* |
| *Candida krusei* | *Not Detected* |
| *Candida tropicalis* | *Not Detected* |
| *Candida kefyr* | *Not Detected* |
| *Candida guilliermondii* | *Not Detected* |
| *Candida lusitaniae* | *Not Detected* |
| *Candida rugosa* | *Not Detected* |

## WHAT DOES THIS MEAN?

By addressing Peter's restorative needs, adjusting his homecare, and shifting one of the main underlying etiological agents of caries development (his dysbiotic microbiome), we were successfully able to alter his biofilm to healthier metrics, supporting long-term oral and systemic health.

# Practical implementation of caries disease management in the era of CAMBRA: a guide for the general dentist

Douglas A. Young, DDS, EdD, MBA, MS ■ Ryan L. Quock, DDS ■ Susie Goolsby, DDS, MSHA
Martha McComas, RDH, MS ■ Steven Powell, DDS ■ Gregory G. Zeller, DDS, MS
Allen Wong, DDS, EdD ■ Brian B. Novy, DDS

Although the philosophy of caries management by risk assessment (CAMBRA) is widely accepted as an essential part of comprehensive disease management, its implementation in daily clinical practice has historically been hindered by a lack of concise guidance that bridges the gap between scholarly research and the logistics of patient care. With the aim of guiding comprehensive disease management for dental caries by integrating available evidence-based systems such as the American Dental Association Caries Classification System (ADA CCS) and caries risk assessment (CRA), this review presents clinical strategies in a functional format. Clinical caries management strategies that integrate the ADA CCS with CRA were compiled and evaluated by clinicians representing a variety of practice settings. Examples of clinical protocols were selected to illustrate the use of CRA at the patient level and ADA CCS lesion classification at the tooth level to comprehensively manage caries lesions in a high-caries-risk population. Comprehensive caries management combines the clinical use of CRA and caries lesion classification to guide clinical decisions and to support tooth preservation in high-risk populations. These strategies should be individualized and fulfill evidence-based clinical practice criteria with oral health as the primary outcome. Person-centered comprehensive caries management integrating CRA and classification of caries lesions has the potential to improve patient outcomes by addressing the underlying causes of caries disease. Documenting and measuring the processes at the tooth, patient, and practice levels are essential for generating outcomes that will drive future approaches aimed at improving patient health.

**Received:** February 16, 2025
**Revised:** May 25, 2025
**Accepted:** June 30, 2025

**Keywords:** caries classification system, caries management, caries risk assessment, caries risk management, clinical protocols, dental caries, oral health



The respect for comprehensive disease management as a whole, and caries management by risk assessment (CAMBRA) as a leading philosophy, has continued to increase among payers, educators, clinicians, organized oral healthcare, and the US Health Resources and Services Administration. Yet in an era of evidence-based clinical decision-making, the adoption of these concepts by more clinicians seems to be stalled by a lack of practical translational strategies that are urgently needed for the improvement of patient health. This is not to say that the underlying science is lacking or that research has failed to show any positive health outcomes from these approaches. Instead, the situation highlights the hurdles that make it difficult to evaluate and adopt the vast array of available information in the form of effective clinical protocols. Given that dental caries is one of the most common diseases treated in dentistry, it could be argued that every general dentist functions as a practical cariologist, requiring actionable information. This summary of clinical cariology based on the philosophy of CAMBRA is meant to provide guidance for general dentists to implement disease management concepts in daily practice and improve the oral health of the patients they treat.

## Terminology

The term *caries* by itself is open to several interpretations, and *caries* is colloquially used to describe both the disease and the resulting symptomatic lesion; this may create confusing variations in diagnosis and treatment. Adoption of high-level consensus terminology, such as that described jointly by the International Association for Dental Research Cariology Research Group, the European Organization for Caries Research, and the International Caries Consensus Collaboration is recommended for more precise diagnosis, treatment, and communication.[1-3] For example, the term *dental caries* is used to describe the actual disease process, while *caries lesion* describes the clinical manifestation of the disease; the 2 terms are closely related yet distinct.

*Caries management* is defined as "...actions taken to interfere with mineral loss at all stages of the caries disease, including nonoperative and operative interventions/treatments."[1] The term *nonoperative* refers to treating the lesion without tooth structure removal by employing the following strategies: surface protection (including barriers or sealants), biofilm modification, remineralization via chemotherapeutics, saliva supplementation, and behavioral modification, including changes in diet and lifestyle.



| | Low caries risk | Moderate caries risk | High caries risk | Extreme caries risk |
|---|---|---|---|---|
| Determining caries risk: The checked item farthest to the right determines overall caries risk | ☐No active caries lesion or radiolucency (cavitated or noncavitated) during past 24 mo<br>☐Healthy lifestyle habits, including diet with little to no consumption of simple sugars, infrequent snacking, and no drug or alcohol misuse<br>☐No visible plaque | ☐No active caries lesion or radiolucency (cavitated or noncavitated) during past 12 mo<br>*1-2 of the following:*<br>☐Unhealthy lifestyle habits, including occasional (≤ 2 times per day) between-meal snacks of simple sugars, or drug or alcohol misuse<br>☐Inadequate oral hygiene or visible plaque<br>☐Wearing dental or orthodontic appliances<br>☐Susceptible pits and fissures<br>☐Exposed root surfaces<br>☐Saliva-reducing factors (medications, radiation, or systemic diseases) | ☐Any active caries lesion or radiolucency (cavitated or noncavitated) during the past 12 mo<br>☐High bacterial load by measurement or observation (heavy plaque)<br>*3 or more of the following:*<br>☐Unhealthy lifestyle habits, including frequent (≥ 3 times per day) between-meal snacks of simple sugars or drug or alcohol misuse<br>☐Inadequate oral hygiene<br>☐Wearing dental or orthodontic appliances<br>☐Susceptible pits and fissures<br>☐Exposed root surfaces<br>☐Saliva-reducing factors (medications, radiation, or systemic diseases) | ☐High caries risk with hyposalivation by observation or measurement<br>☐High dependency on others for care |
| Circle overall caries risk | Low caries risk | Moderate caries risk | High caries risk | Extreme caries risk |
| Recall interval | 12 mo | 6 mo | 3 mo | 3 mo |
| Radiographs | 24-36 mo | 18-24 mo | 6-18 mo | 6 mo (until no new caries lesions) |

[a]This new tabular caries risk assessment form, adapted from the caries management by risk assessment form published in 2013 and revised in 2019, automatically incorporates the instructions and guidelines of those protocols.[11,25] The checked item farthest to the right determines the overall caries risk level as well as the recommended recall and radiographic intervals. This form, completed after the comprehensive clinical examination, is meant to be fast and simple; clinicians should be able to complete it within 1 to 2 minutes. The user starts in the last column on the right and works to the left. Studies have validated that the instructions and guidelines used in this table lead to selection of the correct caries risk levels no matter who fills out the form.[26-27]

CRA FORM

CRM Strategy

| Risk level | Home care recommendations | Recall interval, mo | Radiographs, mo |
|---|---|---|---|
| Low | Effective toothbrushing and interdental cleaning, oral hygiene instruction, individualized diet modification (eg, reduced frequency and exposure to sugary snacks), and, OTC fluoride toothpaste | 12 | 24-36 |
| Moderate | *All of the above plus:*<br>• Xylitol chewing gum or mints throughout the day<br>• 0.05% sodium fluoride mouthrinse after meals, if possible<br>• Alternative therapy: 5000 ppm fluoride toothpaste twice daily (instead of OTC fluoride toothpaste) and no mouthrinse | 6 | 18-24 |
| High | *All the above plus:*<br>• 5000 ppm fluoride toothpaste (instead of OTC toothpaste), morning and night<br>• Antibacterial[b] and pH neutralization strategies (eg, 0.2% hypochlorite rinse) before bedtime or topical office application of povidone iodine and fluoride varnish. | 3 | 6-18 |
| Extreme | *All the above plus:*<br>• pH neutralization (neutralizing sprays, rinses, lozenges), xylitol gum, and/or xylitol lollipops throughout the day<br>• Calcium and phosphate supplementation (eg, nano hydroxyapatite) throughout the day and right before bedtime | 3 | 6 (until no new caries lesions) |

Practical implementation of caries disease management in the era of CAMBRA: a guide for the general dentist. Young DA, Quock RL, Goolsby S, et al. *Gen Dent*. 2025;73(6):56-66. Agd.org/generaldentistry

# Caries Risk Assessment Form

| Determining caries risk: The checked item farthest to the right determines overall caries risk | Low caries risk | Moderate caries risk | High caries risk | Extreme caries risk |
|---|---|---|---|---|
| | ☐No active caries lesion or radiolucency (cavitated or noncavitated) during past 24 mo<br>☐Healthy lifestyle habits, including diet with little to no consumption of simple sugars, infrequent snacking, and no drug or alcohol misuse<br>☐No visible plaque | ☐No active caries lesion or radiolucency (cavitated or noncavitated) during past 12 mo<br>*1-2 of the following:*<br>☐Unhealthy lifestyle habits, including occasional (≤ 2 times per day) between-meal snacks of simple sugars, or drug or alcohol misuse<br>☐Inadequate oral hygiene or visible plaque<br>☐Wearing dental or orthodontic appliances<br>☐Susceptible pits and fissures<br>☐Exposed root surfaces<br>☐Saliva-reducing factors (medications, radiation, or systemic diseases) | ☐Any active caries lesion or radiolucency (cavitated or noncavitated) during the past 12 mo<br>☐High bacterial load by measurement or observation (heavy plaque)<br>*3 or more of the following:*<br>☐Unhealthy lifestyle habits, including frequent (≥ 3 times per day) between-meal snacks of simple sugars or drug or alcohol misuse<br>☐Inadequate oral hygiene<br>☐Wearing dental or orthodontic appliances<br>☐Susceptible pits and fissures<br>☐Exposed root surfaces<br>☐Saliva-reducing factors (medications, radiation, or systemic diseases) | ☐High caries risk with hyposalivation by observation or measurement<br>☐High dependency on others for care |
| Circle overall caries risk | Low caries risk | Moderate caries risk | High caries risk | Extreme caries risk |
| Recall interval | 12 mo | 6 mo | 3 mo | 3 mo |
| Radiographs | 24-36 mo | 18-24 mo | 6-18 mo | 6 mo (until no new caries lesions) |

[a]This new tabular caries risk assessment form, adapted from the caries management by risk assessment form published in 2013 and revised in 2019, automatically incorporates the instructions and guidelines of those protocols.[11,25] The checked item farthest to the right determines the overall caries risk level as well as the recommended recall and radiographic intervals. This form, completed after the comprehensive clinical examination, is meant to be fast and simple; clinicians should be able to complete it within 1 to 2 minutes. The user starts in the last column on the right and works to the left. Studies have validated that the instructions and guidelines used in this table lead to selection of the correct caries risk levels no matter who fills out the form.[25-27]

Agd.org/generaldentistry; Young DA, Quock RL, Goolsby S, et al. Practical implementation of caries disease management in the era of CAMBRA: a guide for the general dentist. *Gen Dent*. 2025;73(6):56-66.

# Home Care - Caries Risk Management Strategy

| Risk level | Home care recommendations | Recall interval, mo | Radiographs, mo |
|---|---|---|---|
| Low | Effective toothbrushing and interdental cleaning, oral hygiene instruction, individualized diet modification (eg, reduced frequency and exposure to sugary snacks), and, OTC fluoride toothpaste | 12 | 24-36 |
| Moderate | *All of the above plus:*<br>• Xylitol chewing gum or mints throughout the day<br>• 0.05% sodium fluoride mouthrinse after meals, if possible<br>• Alternative therapy: 5000 ppm fluoride toothpaste twice daily (instead of OTC fluoride toothpaste) and no mouthrinse | 6 | 18-24 |
| High | *All the above plus:*<br>• 5000 ppm fl<br>and night<br>• Antibacterial<br>rinse) before bedtime or topical office application of povidone iodine and fluoride varnish. | 3 | 6-18 |
| Extreme | *All the above plus:*<br>• pH neutralization (ne<br>or xylitol lollipops thr<br>• Calcium and phosph<br>throughout the day and right before bedtime | 3 | 6 (until no new caries lesions) |

**BACTERIAL ASSESSMENT**

**SALIVA ASSESSMENT**

**Adapted from University of the Pacific AEGD clinics.**

Agd.org/generaldentistry; Young DA, Quock RL, Goolsby S, et al. Practical implementation of caries disease management in the era of CAMBRA: a guide for the general dentist. *Gen Dent*. 2025;73(6):56-66.

# ADA CCS

**JADA Feb 2015**

COVER STORY

## The American Dental Association Caries Classification System for Clinical Practice

### A report of the American Dental Association Council on Scientific Affairs

Douglas A. Young, DDS, EdD, MBA, MS; Brian B. Nový, DDS; Gregory G. Zeller, DDS, MS; Robert Hale, DDS; Thomas C. Hart, DDS, PhD; Edmond L. Truelove, DDS, MSD; American Dental Association Council on Scientific Affairs

Dental caries remains a common chronic disease and, in the absence of treatment, it may progress until the tooth is destroyed. Despite advances in restorative materials and the implementation of various preventive approaches, more than 90% of adults in the United States have experienced dental caries before 30 years of age.[1,2]

Dental caries is a multifactorial disease involving many complex risk and protective factors.[3] The clinical presentation of caries disease is a caries lesion; the severity of the disease and of individual caries lesions is the result of complex personal, biological, behavioral, and environmental factors. Some factors are protective, such as the presence of fluoride in the biofilm, whereas others lead to hard tissue destruction, such as lower plaque pH.[4-6] Caries risk assessment is the organized process of evaluating these protective and pathogenic factors and provides the foundation[7-9] for selecting treatment interventions.


The dental profession continues to implement a more interceptive nonsurgical therapeutic model to prevent, treat, and reverse caries lesions, particularly in the early stages. Despite progress, the profession still

This article has an accompanying online continuing education activity available at: http://jada.ada.org/ce/home.


**ABSTRACT**

**Background.** The caries lesion, the most commonly observed sign of dental caries disease, is the cumulative result of an imbalance in the dynamic demineralization and remineralization process that causes a net mineral loss over time. A classification system to categorize the location, site of origin, extent, and when possible, activity level of caries lesions consistently over time is necessary to determine which clinical treatments and therapeutic interventions are appropriate to control and treat these lesions.

**Methods.** In 2008, the American Dental Association (ADA) convened a group of experts to develop an easy-to-implement caries classification system. The ADA Council on Scientific Affairs subsequently compiled information from these discussions to create the ADA Caries Classification System (CCS) presented in this article.

**Conclusions.** The ADA CCS offers clinicians the capability to capture the spectrum of caries disease presentations ranging from clinically unaffected (sound) tooth structure to noncavitated initial lesions to extensively cavitated advanced lesions. The ADA CCS supports a broad range of clinical management options necessary to treat both noncavitated and cavitated caries lesions.

**Practical Implications.** The ADA CCS is available for implementation in clinical practice to evaluate its usability, reliability, and validity. Feedback from clinical practitioners and researchers will allow system improvement. Use of the ADA CCS will offer standardized data that can be used to improve the scientific rationale for the treatment of all stages of caries disease.

**Key Words.** Caries classification system; caries lesion classification; caries location; caries extent; caries activity; caries management.

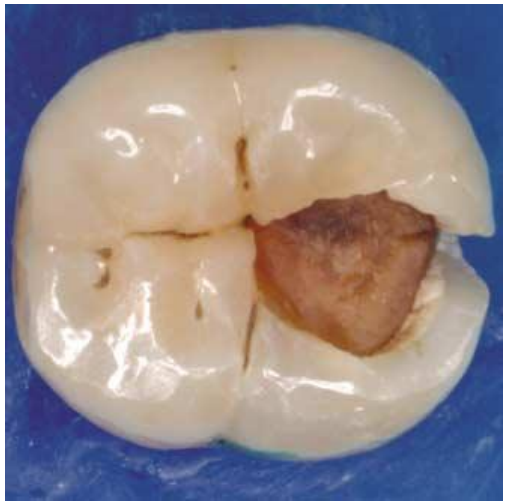
JADA 2015;146(2):79-86

http://dx.doi.org/10.1016/j.adaj.2014.11.018

# The Importance of Cavitation

Bacteria are too big to penetrate the enamel

# When do you drill a tooth?

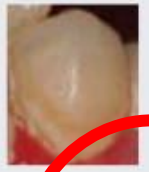
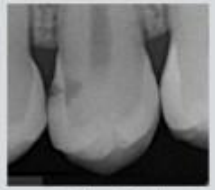
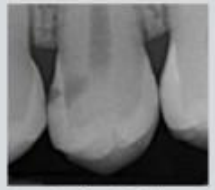


When it is fully cavitated

JADA
Feb 2015

TABLE 2

**American Dental Association Caries Classification System.**

| | AMERICAN DENTAL ASSOCIATION CARIES CLASSIFICATION SYSTEM | | | |
|---|---|---|---|---|
| | **Sound** | **Initial** | **Moderate** | **Advanced** |
| **Clinical Presentation** | No clinically detectable lesion. Dental hard tissue appears normal in color, translucency, and gloss. | Earliest clinically detectable lesion compatible with mild demineralization. Lesion limited to enamel or to shallow demineralization of cementum/dentin. Mildest forms are detectable only after drying. When established and active, lesions may be white or brown and enamel has lost its normal gloss. | Visible signs of enamel breakdown or signs the dentin is moderately demineralized. | Enamel is fully cavitated and dentin is exposed. Dentin lesion is deeply/ severely demineralized. |
| **Other Labels** | No surface change or adequately restored | Visually noncavitated | Established, early cavitated, shallow cavitation, microcavitation | Spread/disseminated, late cavitated, deep cavitation |
| **Infected Dentin** | None | Unlikely | Possible | Present |
| **Appearance of Occlusal Surfaces (Pit and Fissure)**[*,†] | ICDAS 0  | ICDAS 1  ICDAS 2  | ICDAS 3  ICDAS 4  | ICDAS 5  ICDAS 6  |
| **Accessible Smooth Surfaces, Including Cervical and Root**[‡] |  |   |   |   |
| **Radiographic Presentation of the Approximal Surface**[§] |  E0[¶] or RO[#] No radiolucency |    E1[¶] or RA1[#] E2[¶] or RA2[#] D1[¶] or RA3[#] Radiolucency may extend to the dentinoenamel junction or outer one-third of the dentin. Note: radiographs are not reliable for minimally occlusal lesions. |  D2[¶] or RB4[#] Radiolucency extends into the middle one-third of the dentin |  D3[¶] or RC5[#] Radiolucency extends into the inner one-third of the dentin |

Secondary teeth 10 %

Primary teeth 3 %

40 % 28 %

Use minimally invasive GI restoratives for moderate (D2) and advanced (D3) caries lesions only

# 2018 ADA Clinical Practice Guidelines

Cover Story

## Evidence-based clinical practice guideline on nonrestorative treatments for carious lesions

A report from the American Dental Association

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ABSTRACT

**Background.** An expert panel convened by the American Dental Association Council on Scientific Affairs and the Center for Evidence-Based Dentistry conducted a systematic review and formulated evidence-based clinical recommendations for the arrest or reversal of noncavitated and cavitated dental caries using nonrestorative treatments in children and adults.

**Types of Studies Reviewed.** The authors conducted a systematic search of the literature in MEDLINE and Embase via Ovid, Cochrane CENTRAL, and Cochrane database of systematic reviews to identify randomized controlled trials reporting on nonrestorative treatments for noncavitated and cavitated carious lesions. The authors used the Grading of Recommendations Assessment, Development and Evaluation approach to assess the certainty in the evidence and move from the evidence to the decisions.

**Results.** The expert panel formulated 11 clinical recommendations, each specific to lesion type, tooth surface, and dentition. Of the most effective interventions, the panel provided recommendations for the use of 38% silver diamine fluoride, sealants, 5% sodium fluoride varnish, 1.23% acidulated phosphate fluoride gel, and 5,000 parts per million fluoride (1.1% sodium fluoride) toothpaste or gel, among others. The panel also provided a recommendation against the use of 10% casein phosphopeptide–amorphous calcium phosphate.

**Conclusions and Practical Implications.** Although the recommended interventions are often used for caries prevention, or in conjunction with restorative treatment options, these approaches have shown to be effective in arresting or reversing carious lesions. Clinicians are encouraged to prioritize use of these interventions based on effectiveness, safety, and feasibility.

# SELECTIVE CARIES REMOVAL

July 2023
JADA


**"More conservative carious tissue removal (CTR) approaches may decrease the risk of adverse events."**

Clinical Practice Guideline

Cover Story

## Evidence-based clinical practice guideline on restorative treatments for caries lesions

A report from the American Dental Association

**Types of Studies Reviewed.** The authors searched for systematic reviews comparing carious tissue removal (CTR) approaches in Ovid MEDLINE, Embase, Cochrane Database of Systematic Reviews, and Trip Medical Database. The authors also conducted a systematic search for randomized controlled trials comparing direct restorative materials in Ovid MEDLINE, Embase, Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and the World Health Organization International Clinical Trials Registry Platform. The authors used the Grading of Recommendations Assessment, Development, and Evaluation approach to assess the certainty of the evidence and formulate recommendations.

**Results.** The panel formulated 16 recommendations and good practice statements: 4 on CTR approaches specific to lesion depth and 12 on direct restorative materials specific to tooth location and surfaces involved. The panel conditionally recommended for the use of conservative CTR approaches, especially for advanced lesions. Although the panel conditionally recommended for the use of all direct restorative materials, they prioritized some materials over the use of others for certain clinical scenarios.

**Practical Implications.** The evidence suggests that more conservative CTR approaches may decrease the risk of adverse effects. All included direct restorative materials may be effective in treating moderate and advanced caries lesions on vital, nonendodontically treated primary and permanent teeth.

**Key Words.** Evidence-based dentistry; clinical practice guideline; direct restorative materials; caries; general dentistry; pediatric dentistry; American Dental Association.

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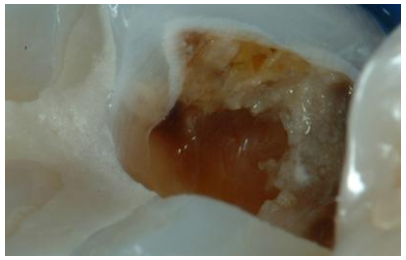
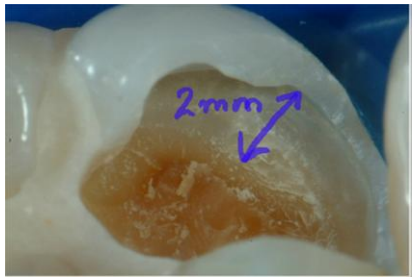
# Selective Caries Removal
# Know when to stop!

- **Clean the perimeter** of the lesion using the 2mm rule to **avoid pulp exposure**
- Rationale: demineralization precedes bacterial penetration of dentinal tubules, so removing most of the **soft & wet** dentin will remove most of the infected tissue
- Glass ionomer will **seal out nutrient sources** from entering. Thus no acid or demineralization will occur

Courtesy of Dr. Hien Ngo



Infected = Wet & Soft




Affected = Dry & Soft

# Selective caries removal will leave a radiolucency on the radiograph

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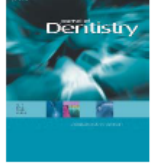


# Chemical exchange between glass-ionomer restorations and residual carious dentine in permanent molars: An in vivo study

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ABSTRACT

**Objective:** To evaluate the remineralization of carious dentine following the restoration of an extensive lesion in a permanent molar with a high strength glass-ionomer cement (GIC).
**Materials and methods:** Thirteen first permanent molars, which were scheduled for extraction because of the presence of extensive caries lesions, were selected for this study. They were first restored, according to the ART technique, using encapsulated Fuji $IX_{GP}$, which contains a strontium glass rather than the traditional calcium glass. The cavities were prepared with a clean enamel margin and minimal removal of the carious dentine around the walls. After a period of 1–3 months they were harvested and subsequently sectioned and examined using an electron probe microanalysis (EPMA) and scanning electron microscopy (SEM).
**Results:** EPMA demonstrated that both fluorine and strontium ions had penetrated deep into the underlying demineralized dentine. The only possible source of these ions was the GIC restoration.
**Conclusion:** The pattern of penetration of the fluorine and strontium ions into the dentine was consistent with a remineralization process.



## 1. Introduction

Since the time of Dr. G.V. Black the profession has been taught to completely remove softened and discoloured dentine to eliminate infected tissue and create a hard foundation to support a proposed restoration. The suggested routine has been to remove all demineralized dentine, using aggressive hand instrumentation or a round bur, until sound, normal dentine formed the entire pulpal floor. The objective was to ensure the elimination of all remaining microorganisms thus eliminating a possible recurrence of caries. However, Lager et al. showed that this is not always successful and some microorganisms may remain even after all softened dentine has been removed and the cavity treated with sodium hypochlorite.[1] The main risk with this traditional approach is the possible accidental exposure of the pulp, particularly in young patients, where the rate of pulp exposure following excavation of large carious lesions in permanent molars has been rated at 40%.[2]

A step-wise excavation technique was introduced by Bodecker[3] designed to decrease the risk of mechanical pulp exposure. Bodecker recommended partial removal of the soft demineralized dentine on the cavity floor followed by immediate restoration with a temporary material such as zinc oxide/eugenol. The transitional material was expected to remain for a brief period of weeks and then replaced with

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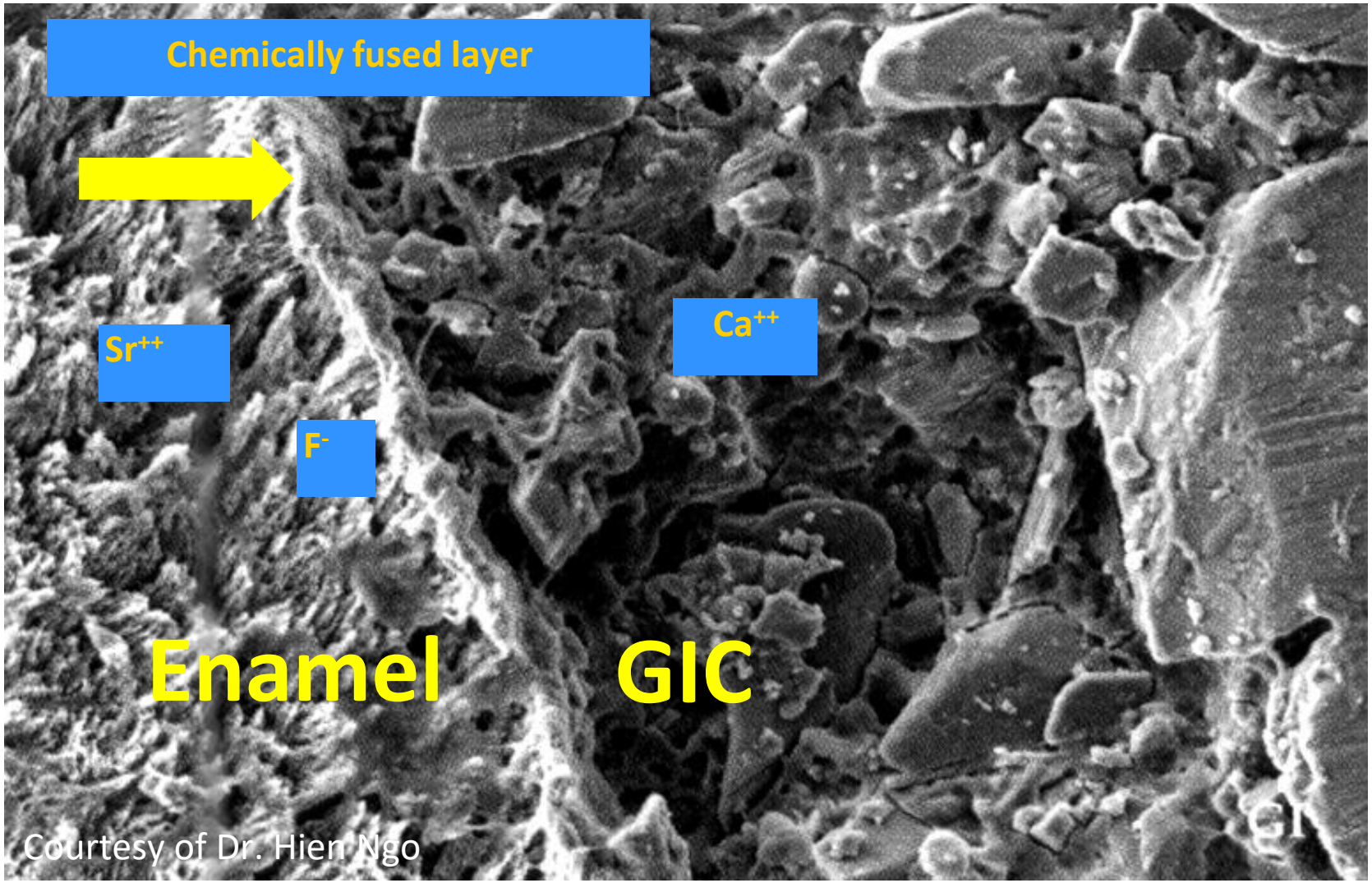
# Internal Remineralization

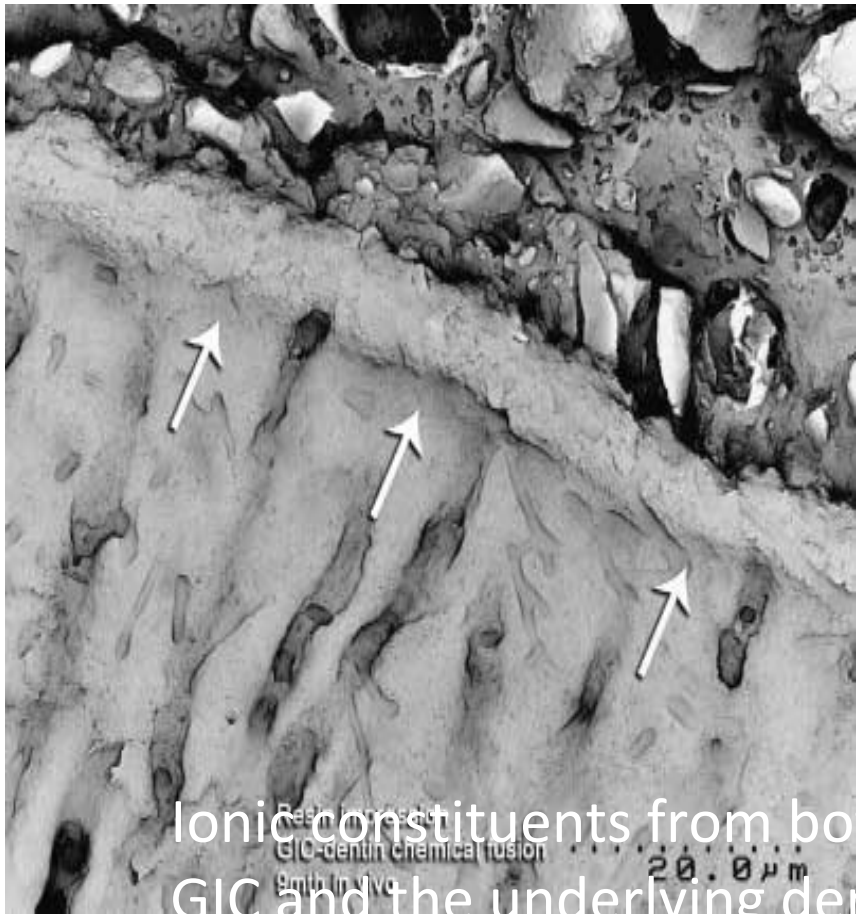
"Electron probe microanalysis demonstrated that both fluorine and strontium ions had penetrated deep into underlying demineralized dentin. The pattern was consistent with remineralization. The only source of these ions was the glass ionomer restoration."

# Studies by Dr. Hien Ngo
# The "Chemically Fused Layer on Enamel"

## Internal Remineralization is Acid Resistant



# Chemically Fused Zone on Dentin




Ionic constituents from bo
GIC and the underlying de

SEM technique for examining the glass–ionomer cement chemical fusion zone. Milicich G. Journal of Microscopy, Vol. 217, Pt 1 January 2005, pp. 44–48

# Practical implementation of caries disease management in the era of CAMBRA: a guide for the general dentist

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Martha McComas, RDH, MS ■ Steven Powell, DDS ■ Gregory G. Zeller, DDS, MS
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Although the philosophy of caries management by risk assessment (CAMBRA) is widely accepted as an essential part of comprehensive disease management, its implementation in daily clinical practice has historically been hindered by a lack of concise guidance that bridges the gap between scholarly research and the logistics of patient care. With the aim of guiding comprehensive disease management for dental caries by integrating available evidence-based systems such as the American Dental Association Caries Classification System (ADA CCS) and caries risk assessment (CRA), this review presents clinical strategies in a functional format. Clinical caries management strategies that integrate the ADA CCS with CRA were compiled and evaluated by clinicians representing a variety of practice settings. Examples of clinical protocols were selected to illustrate the use of CRA at the patient level and ADA CCS lesion classification at the tooth level to comprehensively manage caries lesions in a high-caries-risk population. Comprehensive caries management combines the clinical use of CRA and caries lesion classification to guide clinical decisions and to support tooth preservation in high-risk populations. These strategies should be individualized and fulfill evidence-based clinical practice criteria with oral health as the primary outcome. Person-centered comprehensive caries management integrating CRA and classification of caries lesions has the potential to improve patient outcomes by addressing the underlying causes of caries disease. Documenting and measuring the processes at the tooth, patient, and practice levels are essential for generating outcomes that will drive future approaches aimed at improving patient health.

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**Accepted:** June 30, 2025

**Keywords:** caries classification system, caries management, caries risk assessment, caries risk management, clinical protocols, dental caries, oral health



The respect for comprehensive disease management as a whole, and caries management by risk assessment (CAMBRA) as a leading philosophy, has continued to increase among payers, educators, clinicians, organized oral healthcare, and the US Health Resources and Services Administration. Yet in an era of evidence-based clinical decision-making, the adoption of these concepts by more clinicians seems to be stalled by a lack of practical translational strategies that are urgently needed for the improvement of patient health. This is not to say that the underlying science is lacking or that research has failed to show any positive health outcomes from these approaches. Instead, the situation highlights the hurdles that make it difficult to evaluate and adopt the vast array of available information in the form of effective clinical protocols. Given that dental caries is one of the most common diseases treated in dentistry, it could be argued that every general dentist functions as a practical cariologist, requiring actionable information. This summary of clinical cariology based on the philosophy of CAMBRA is meant to provide guidance for general dentists to implement disease management concepts in daily practice and improve the oral health of the patients they treat.

## Terminology

The term *caries* by itself is open to several interpretations, and *caries* is colloquially used to describe both the disease and the resulting symptomatic lesion; this may create confusing variations in diagnosis and treatment. Adoption of high-level consensus terminology, such as that described jointly by the International Association for Dental Research Cariology Research Group, the European Organization for Caries Research, and the International Caries Consensus Collaboration is recommended for more precise diagnosis, treatment, and communication.[1-3] For example, the term *dental caries* is used to describe the actual disease process, while *caries lesion* describes the clinical manifestation of the disease; the 2 terms are closely related yet distinct.

*Caries management* is defined as "...actions taken to interfere with mineral loss at all stages of the caries disease, including nonoperative and operative interventions/treatments."[1] The term *nonoperative* refers to treating the lesion without tooth structure removal by employing the following strategies: surface protection (including barriers or sealants), biofilm modification, remineralization via chemotherapeutics, saliva supplementation, and behavioral modification, including changes in diet and lifestyle.





**Table 5.** Example hard tissue preservation strategy based on the ADA CCS category using current tooth-preserving (tooth-level) and behavior management (patient-level) strategies.

| Characteristics | Sound | Initial | Moderate | Advanced |
|---|---|---|---|---|
| Infected dentin (full cavitation) | None | Unlikely | Possible | Present |
| **Occlusal** | | | | |
| Clinical presentation | ICDAS 0  | ICDAS 1  ICDAS 2  | ICDAS 3  ICDAS 4  | ICDAS 5  ICDAS 6  |
| Insidious caries lesion; few lesions, slow progression | Co… GIC sealant for primary prevention (no preparation) | Place GIC sealant (no preparation) | Place GIC … (no preparation) | Place MID GIC restoration (selective caries removal) |
| Rampant or aggressive caries lesion; multiple lesions, aggressive progression | Place GIC sealant (no preparation) | Arrest with SDF; place GIC sealant (no preparation) | Arrest with SDF; place GIC sealant (no preparation) | Consider SDF; place MID GIC restoration (selective caries removal) |
| **Facial/lingual** | | | | |
| Clinical presentation | ICDAS 0  | ICDAS 1  ICDAS 2  | ICDAS 3  ICDAS 4  | ICDAS 5  ICDAS 6  |
| Insidious caries lesion; few lesions, slow progression | …w CRM protocol for primary prevention | Arrest and remineral… using risk- | Arrest and remineralize u… …face protection (no preparation) for deeper microcavitations and/or SDF per patient wants | Place MID GIC restoration (selective caries removal) |
| Rampant or aggressive caries lesion; multiple lesions, aggressive progression | Follow CRM protocol for primary prevention | Arrest and remineralize using risk-based CRM; consider SDF | Arrest and remineralize using CRM; consider GIC surface protection (no preparation) and/… | Consider SDF; place GIC restoration (selective caries removal) |
| **Approximal** | | | | |
| Clinical presentation | …or R0* | E1* or RA1* E2* or RA2* D1* or … | D2* or RB4* | D3* or RC5* |
| Difficult to assess insidious vs aggressive progression | Follow … protocol for primary prevention | Arrest and remineraliz… …g CRM; consider SDF | …separation, surface protection with no preparation, and/or MID restoration with selective caries removal with or without SDF | Place MID GIC restoration (selective caries removal) with or without SDF |

**CRM protocol:** topical fluoride; pH neutralization; biofilm modification; saliva supplementation with calcium and phosphate based on caries risk; and behavioral modification (healthy diet and lifestyle choices and good oral hygiene).

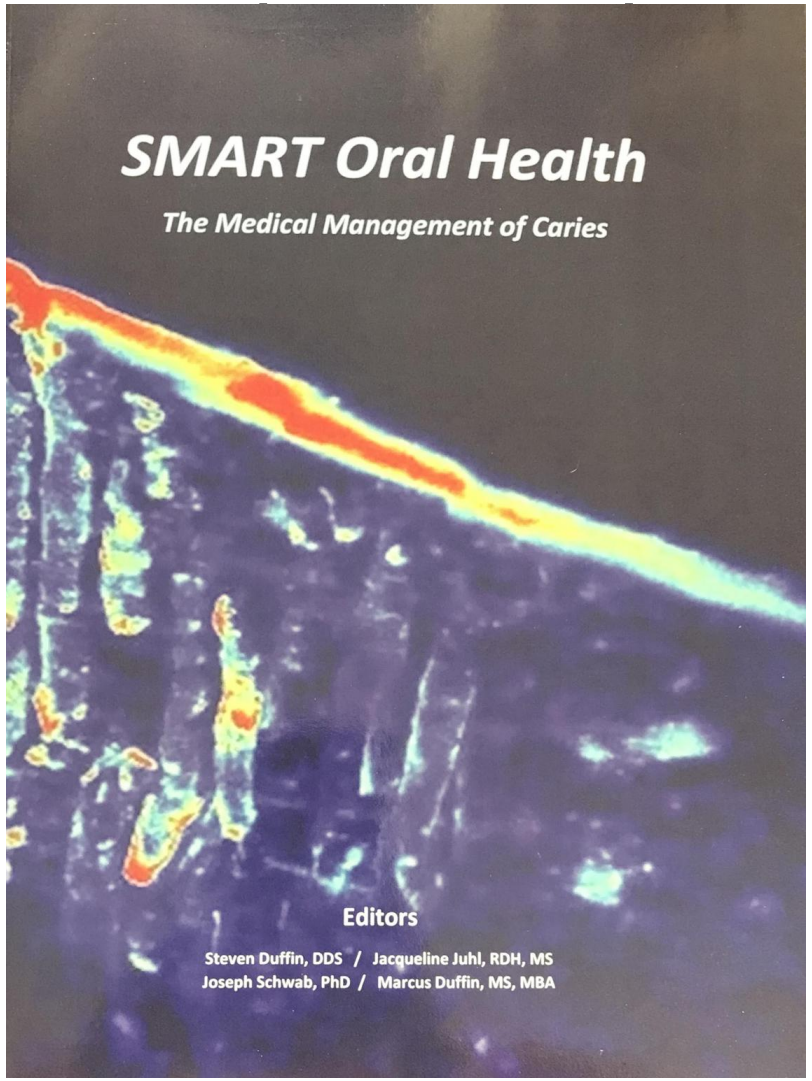
**Abbreviations:** ADA CCS, American Dental Association Caries Classification System; CRM, caries risk management; GIC, glass ionomer cement; ICDAS, International Caries Detection and Assessment System; MID, minimally invasive dentistry; SDF, silver diamine fluoride.





Agd.org/generaldentistry; Young DA, Quock RL, Goolsby S, et al. Practical implementation of caries disease management in the era of CAMBRA: a guide for the general dentist. *Gen Dent*. 2025;73(6):56-66.

# SMART Textbook

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