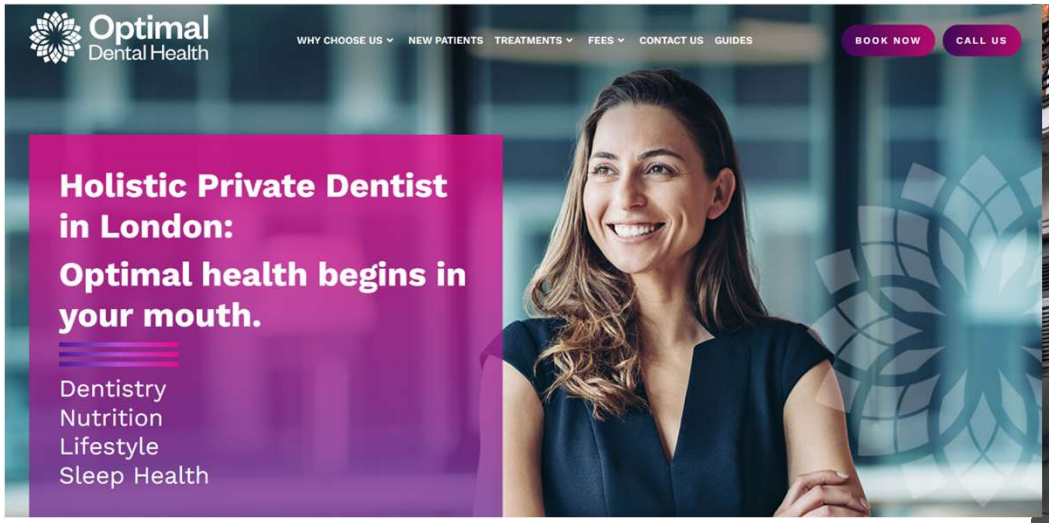
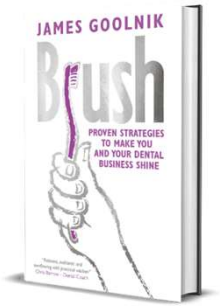
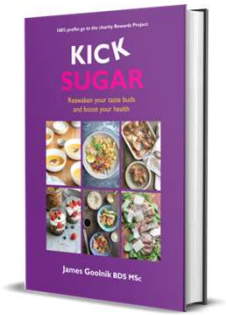

Oral health and systemic disease
Dr James Goolnik
Optimal Dental Health

ABOUT ME

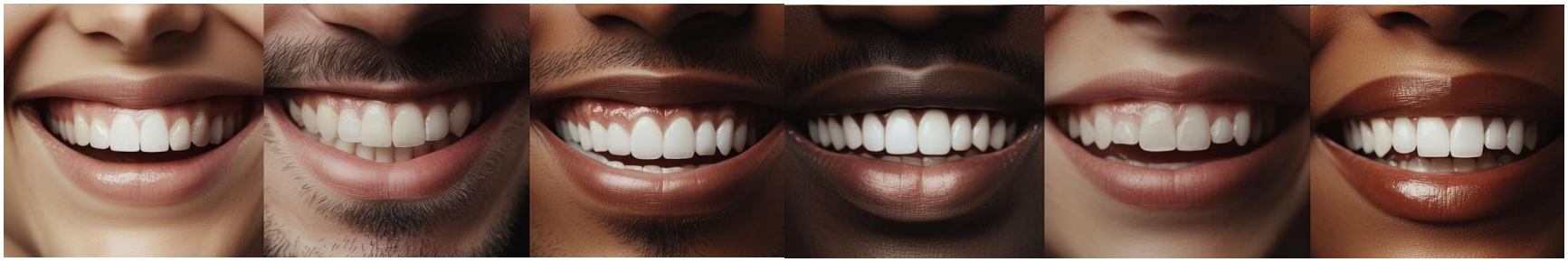






optimaldentalhealth

Your Team



Oral Microbiome
How oral health intersects
Targeted Interventions

Questions I ask:

- Any favourite toothpaste or mouthwash?
- What do you use to clean between your teeth?
- Any bad breath or bleeding gums?
- What supplements do you take?
- Any particular diet? Do you avoid certain foods such as Gluten or Dairy?
- Anyone in the family with CVS, Diabetes, Alzheimer's?
- What do you track?
- What do you to manage stress?
- Do you wake feeling refreshed?

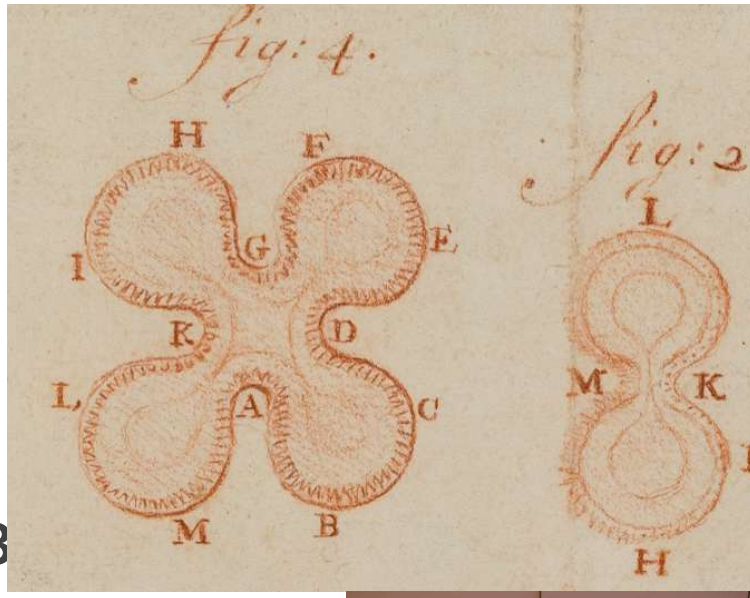
Ali Raad Hassoon, Al-Naji, A., Khalid, G. A., & Javaan Chahl. (2024). Tongue Disease Prediction Based on Machine Learning Algorithms

Signs in the mouth

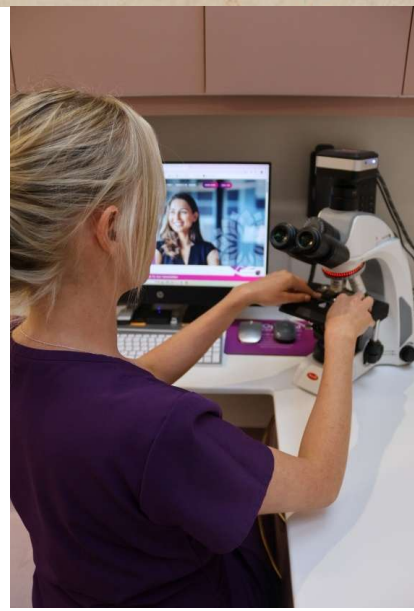
1. Diabetes	Gum disease, dry mouth, thrush	Poor blood sugar control impairs immune response
2. Cardiovascular Disease	Chronic gum inflammation	Shared inflammatory pathways with atherosclerosis
3. Autoimmune Disorders	Mouth ulcer's, dry mouth, cracked lips	Immune system attacks healthy tissue
4. Blood Disorders	Bleeding gums, pale mucosa, swollen gums	Reduced oxygen-carrying capacity or abnormal white cell activity
5. HIV/AIDS	Thrush, hairy leukoplakia, severe gum disease	Weakened immune system increases infections
6. Gastrointestinal Diseases	Mouth ulcers, enamel defects	Inflammation and nutrient malabsorption

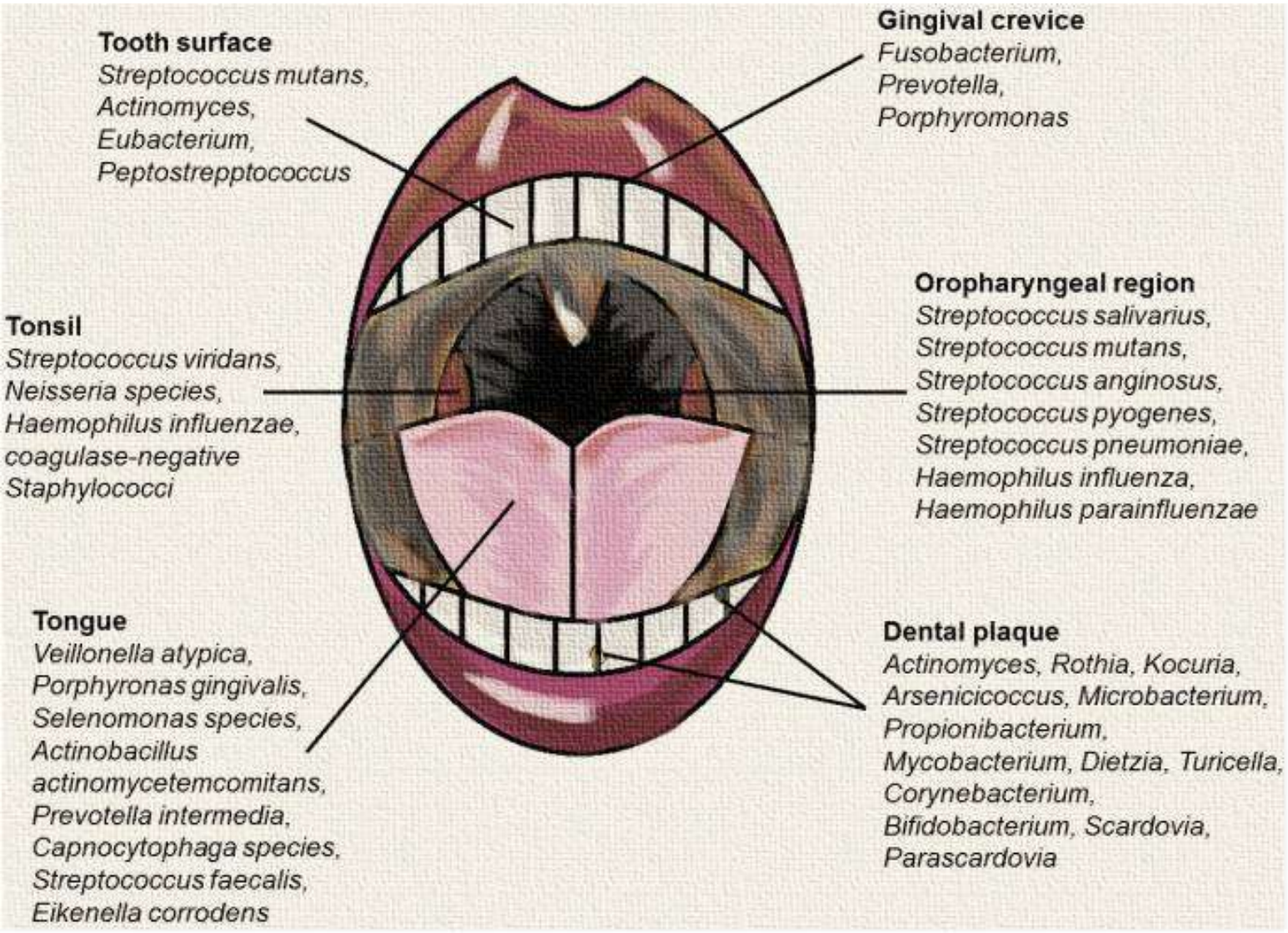
Baima, G. et al(2024).
Beydoun, M. et al (2020).
Cecoro, G., et al (2020).

Microbiome

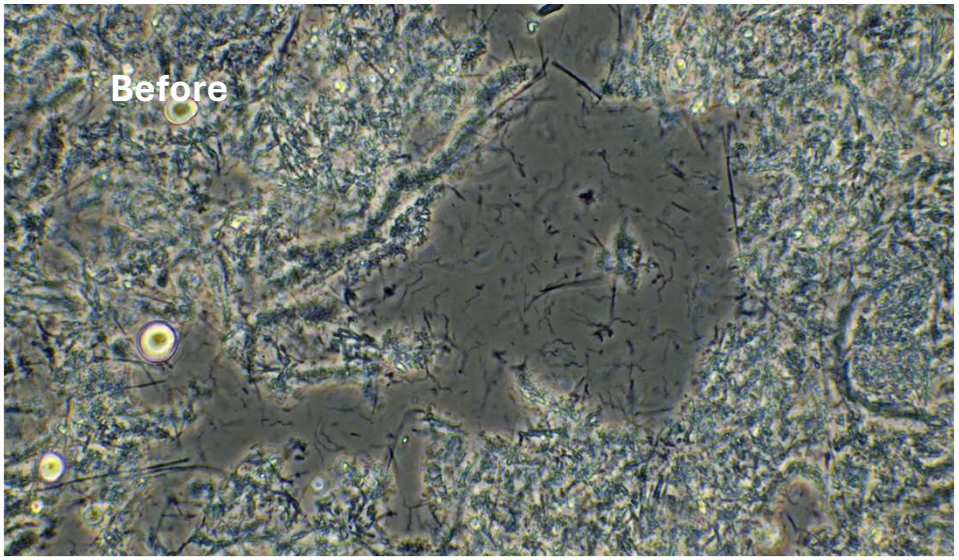


- We cannot survive without our bugs
- Discovered by Antonie Van Leeuwenhoek in 1683
- Over 700 different species of bacteria
- Second largest and most diverse microbiome after the gut!





(Lim et al., 2017)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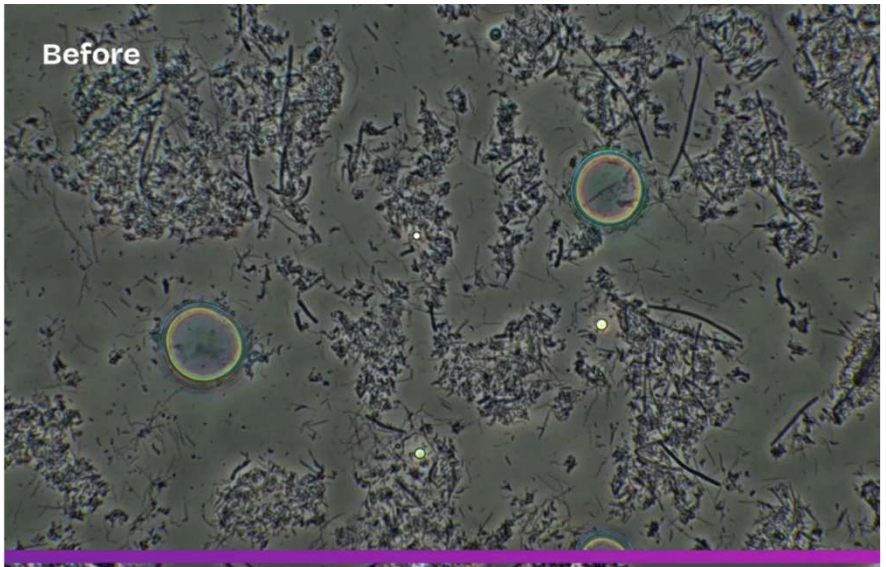
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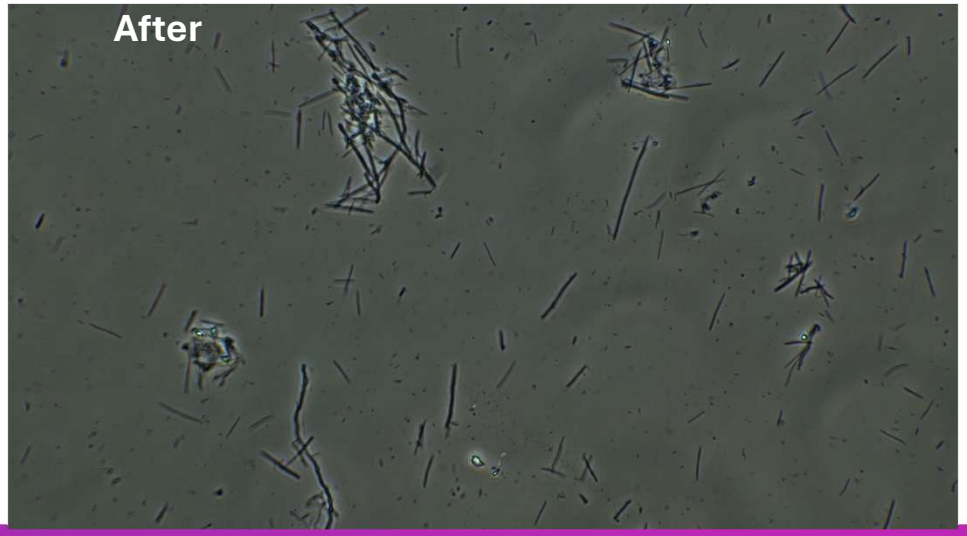
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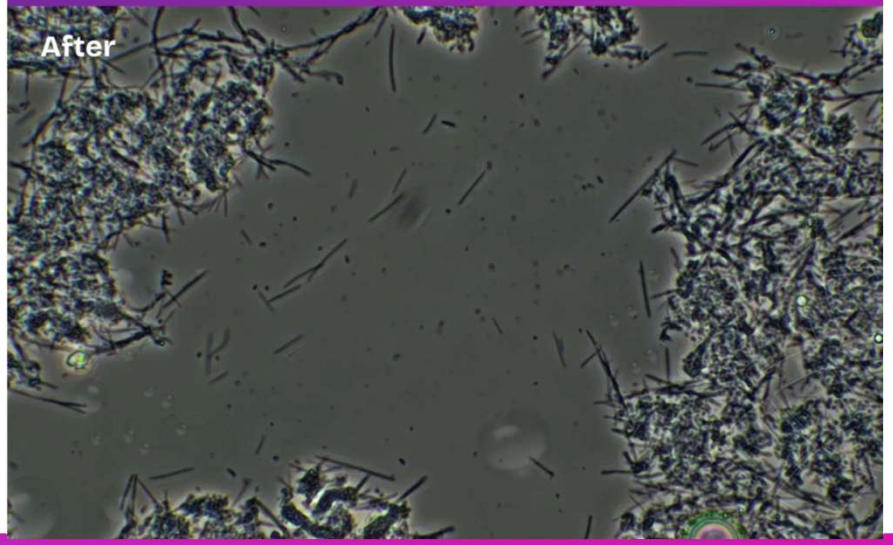
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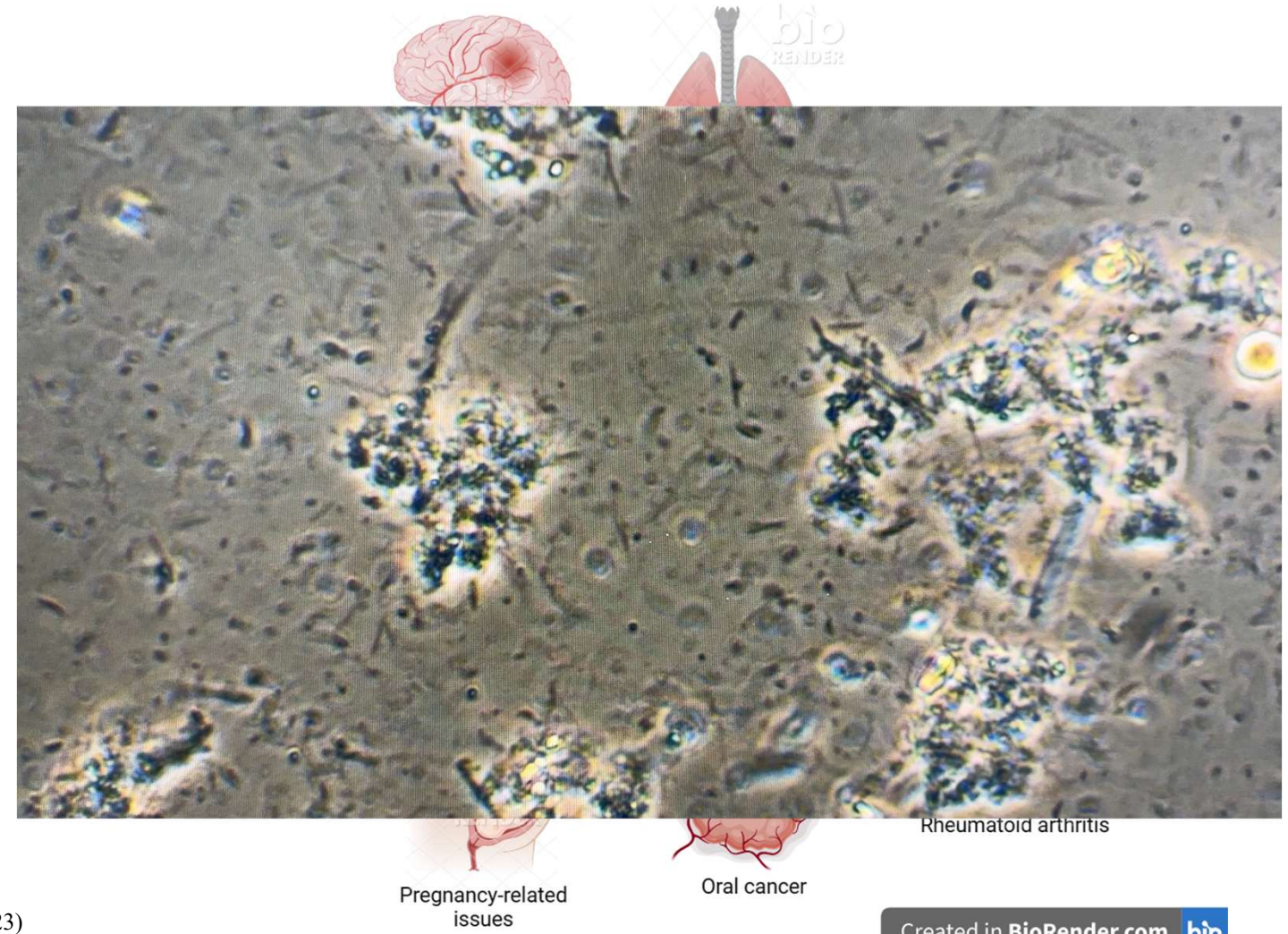


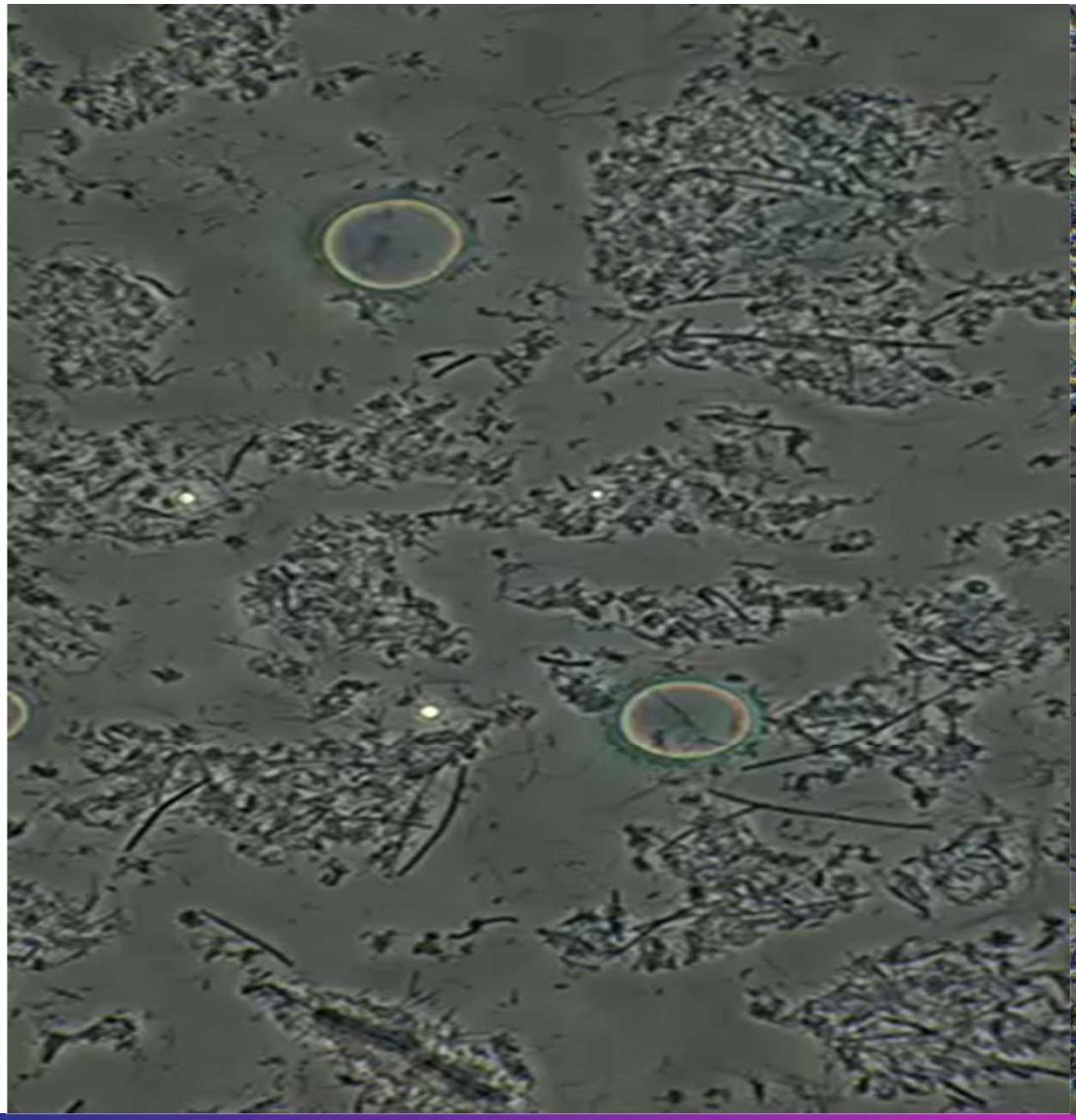
(Bouziane et al., 2023)

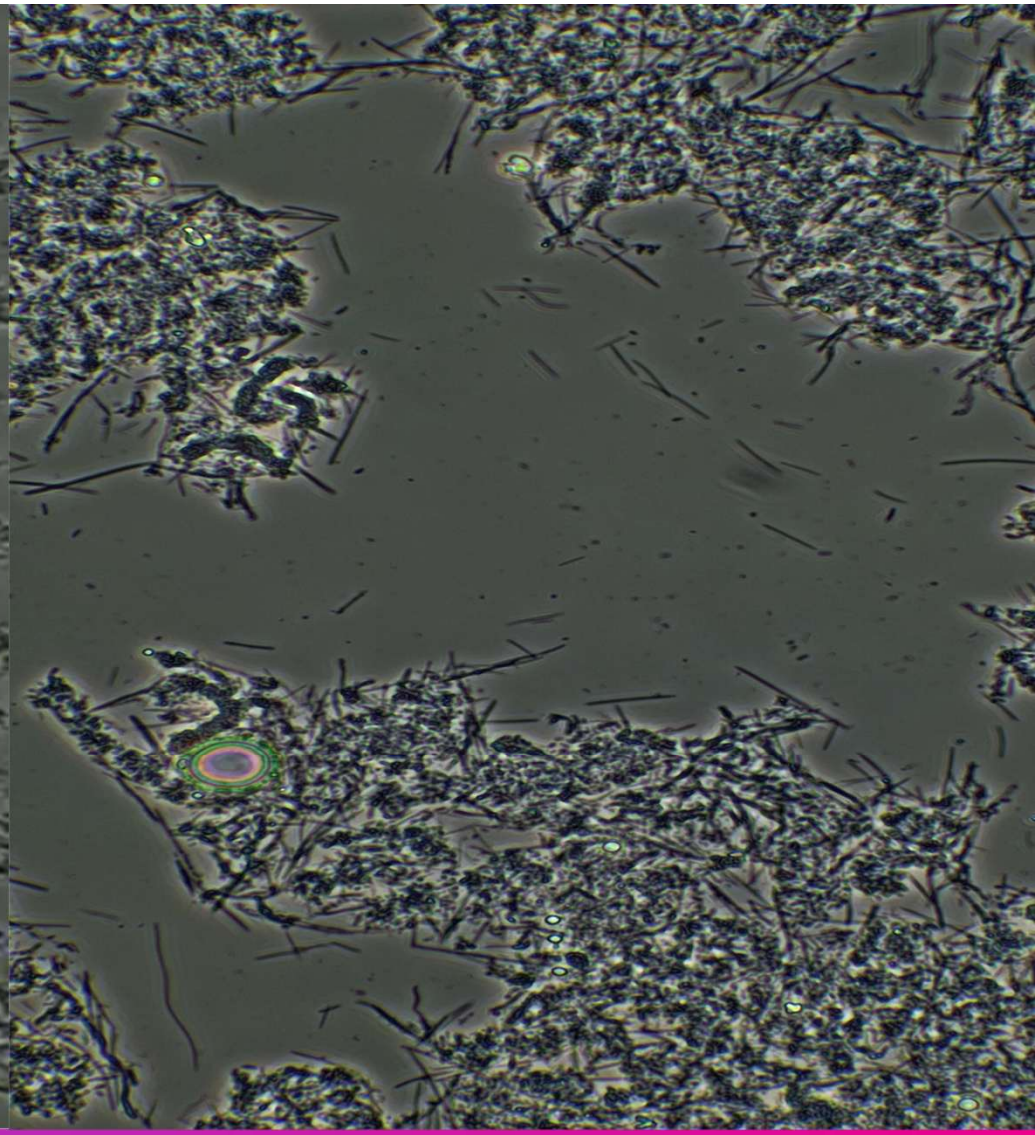
Adrian- 56 year old
Medications: Sulphasalazine 2g, naproxen and paracetamol.

Diagnosis: Seronegative RA, possible OA. Imaging shows cysts, joint and tendon issues/degeneration indicating possible biomechanical issues also.

CRP- 94.2mg/l July 25 reduced to 46.6 mg/l in Sept 25

30 Veg a week, green tea
Multi-essentials for Men
Omegagenics High Strength
Toco Pure D&G
Curcumin Pure
Magnesium Glycinate
Moss Probiotic Select

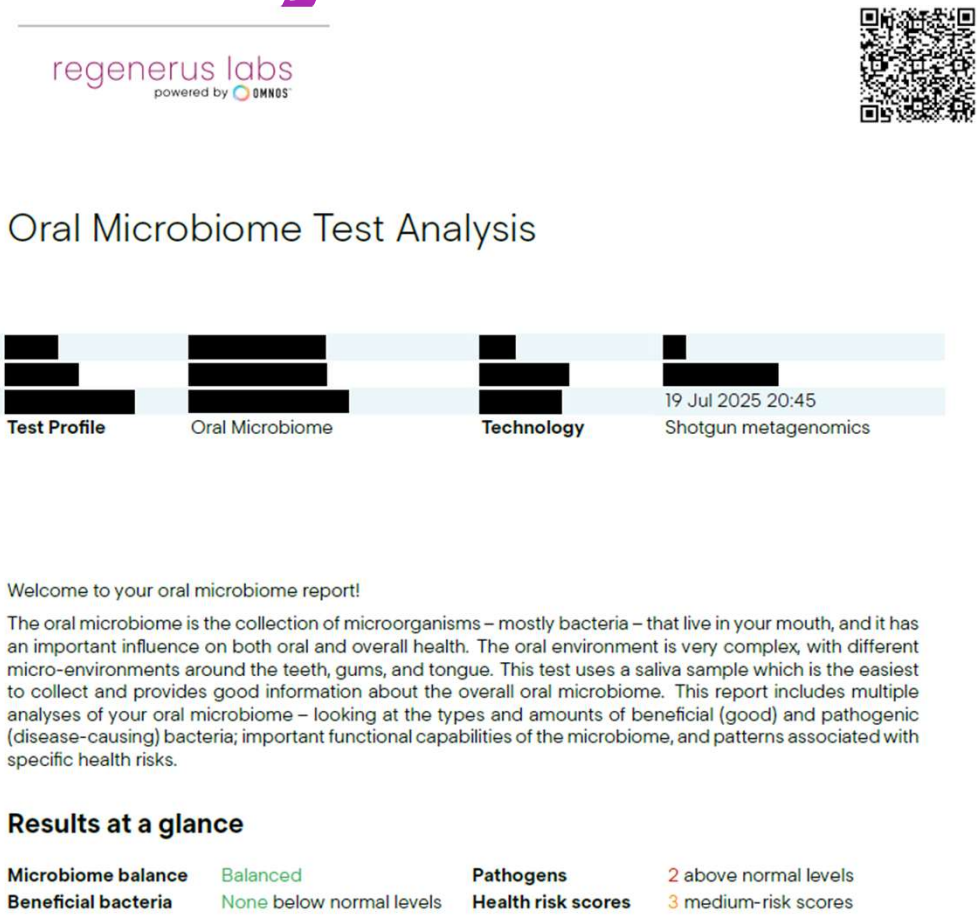




Oral microbiome dysbiosis

- Antibiotics
- Poor OH
- Diet
- Alcohol
- Disease
- Medications
- Salivary flow and quality
- Genetics
- Smoking

(Kilian et al, 2016)



regenerus labs
powered by OMNOS

Oral Microbiome Test Analysis

[redacted] [redacted] [redacted] 19 Jul 2025 20:45

Test Profile Oral Microbiome **Technology** Shotgun metagenomics

Welcome to your oral microbiome report!

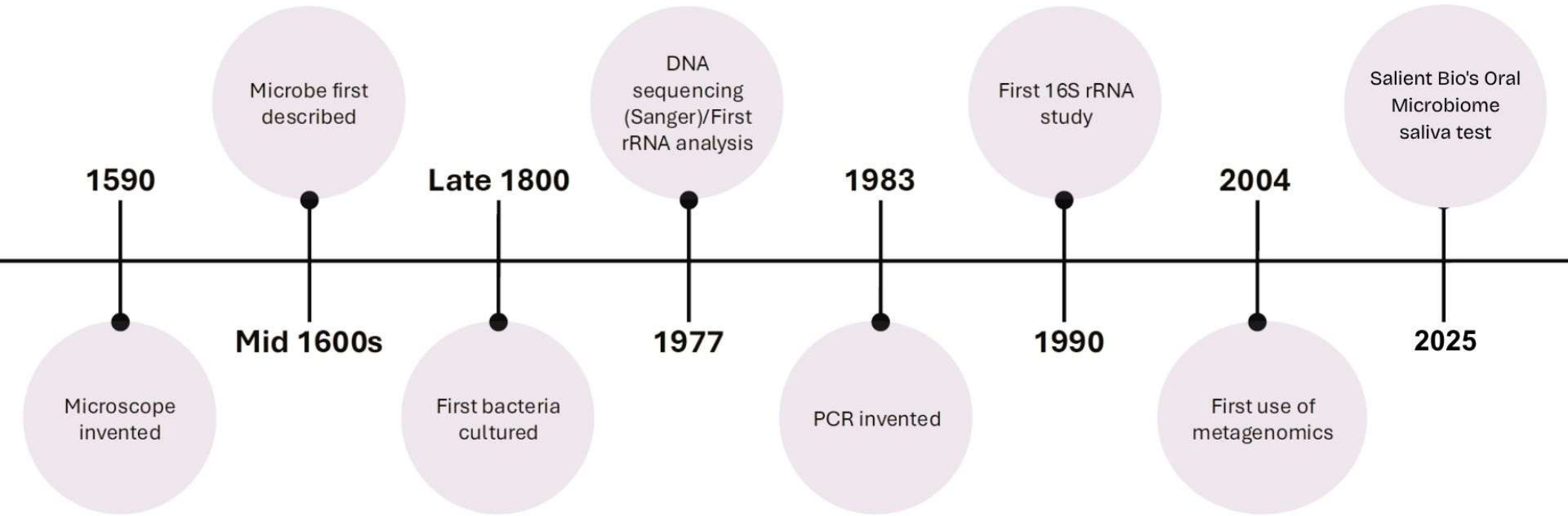
The oral microbiome is the collection of microorganisms – mostly bacteria – that live in your mouth, and it has an important influence on both oral and overall health. The oral environment is very complex, with different micro-environments around the teeth, gums, and tongue. This test uses a saliva sample which is the easiest to collect and provides good information about the overall oral microbiome. This report includes multiple analyses of your oral microbiome – looking at the types and amounts of beneficial (good) and pathogenic (disease-causing) bacteria; important functional capabilities of the microbiome, and patterns associated with specific health risks.

Results at a glance

Microbiome balance	Balanced	**Pathogens**	2 above normal levels
Beneficial bacteria	None below normal levels	**Health risk scores**	3 medium-risk scores

History of Microbiome Testing

Optimal Dental Health

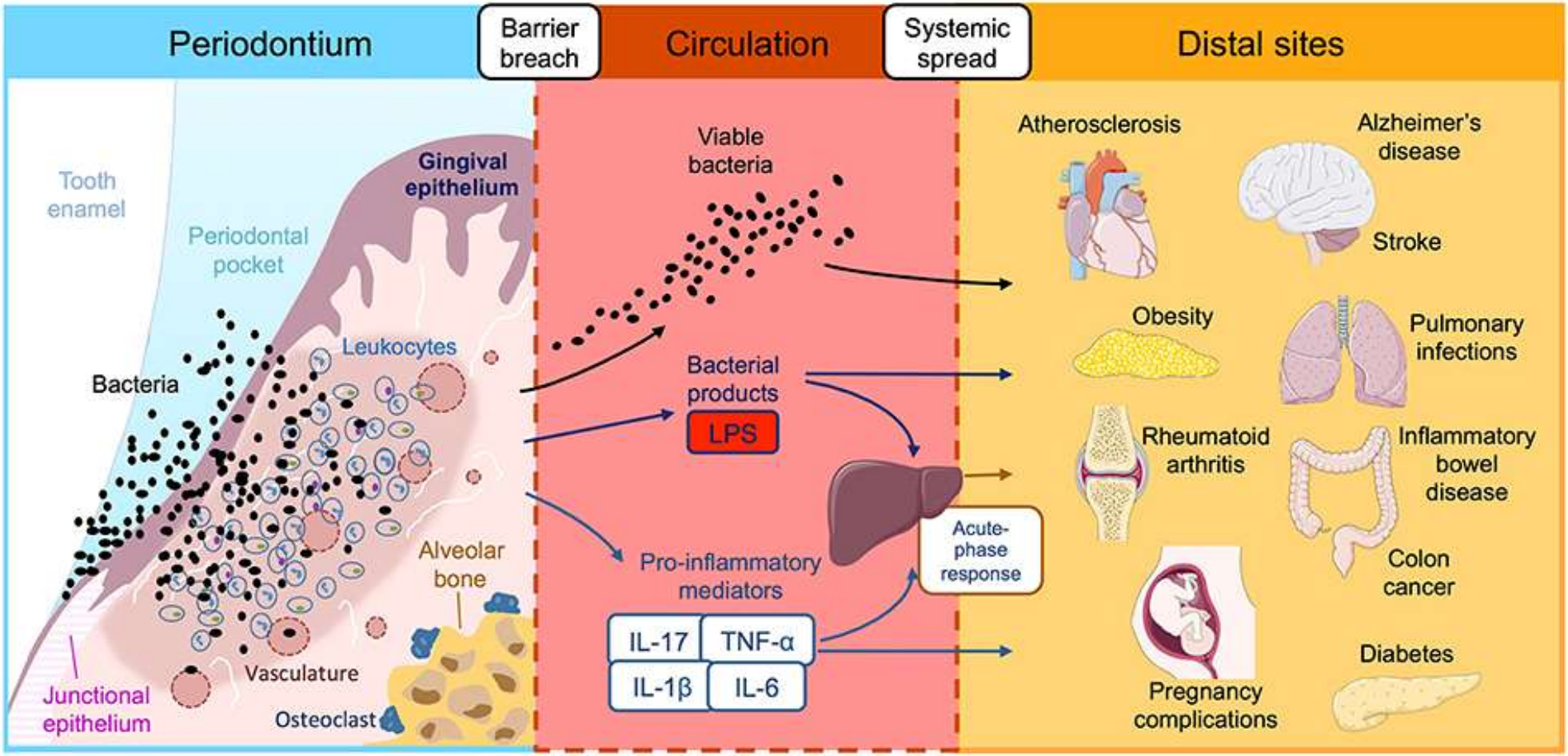


Why is the oral microbiome so important?

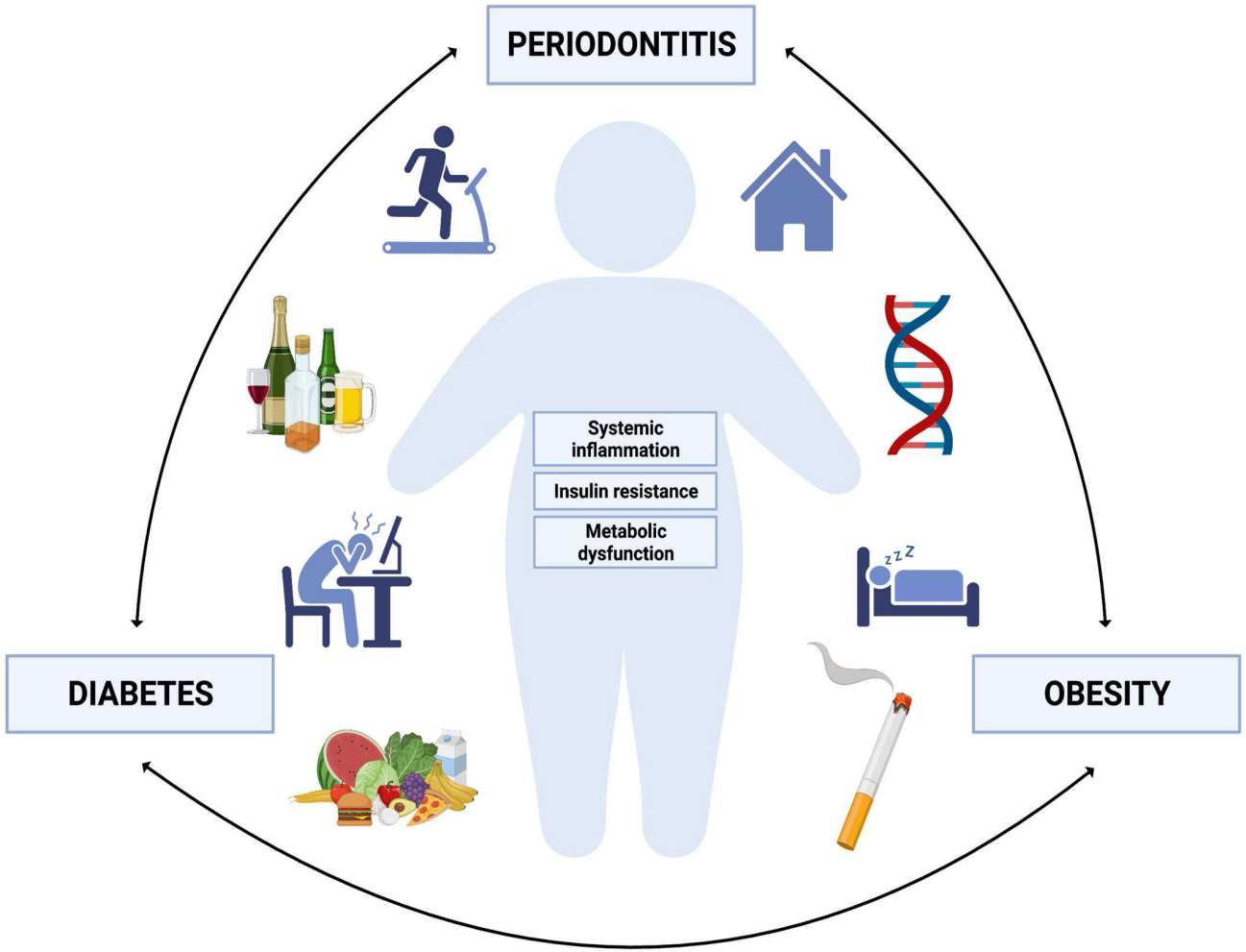
Systemic impacts in patients with periodontal disease:

- 25% increased risk cardiovascular disease (*DeStefano, 1993) (M Paizan, 2014)*
- x3 risk diabetes mellitus (*P. Preshaw 2012)*
- 20% increased risk hypertension *(Aguilera et al, 2019)*
- x3 risk of obesity *(Vecchia et al, 2004)*
- 70% increased risk of Alzheimer's Disease *(Beydoun et al, 2020)*
- Systemic Lupus Erythematosus (correlation?) (Pessoa et al, 2019)
- Head and neck squamous cell cancer (Hayes et al., 2018)

Low grade chronic inflammation? (Cecoro et al., 2020)

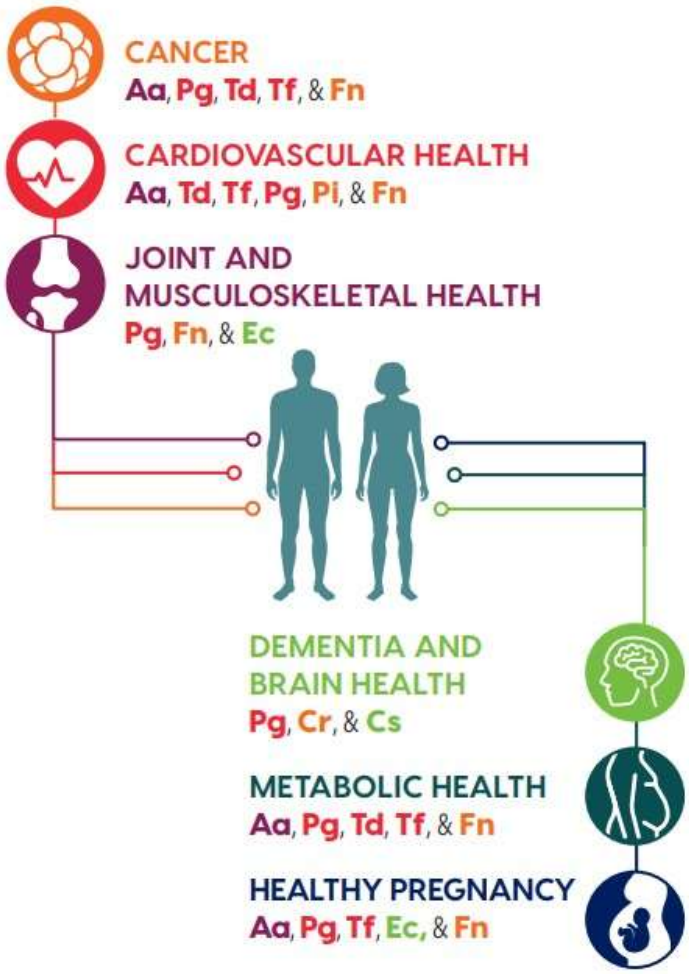


Periodontal pathogens can translocate to the gut, disrupt microbial balance, and contribute to systemic diseases via the oral-gut axis. (Xi et al., 2024)



(Marruganti et al., 2023) (Preshaw et al., 2011)

SYSTEMIC EFFECTS OF ORAL PATHOGENS



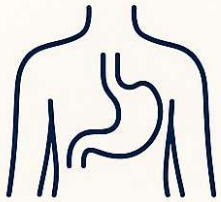
Impact of Periodontitis and its treatment on Oral and Gut Microbiota

Periodontitis Effects

Periodontitis significantly alters oral and gut mìcrobíota, increasing pathogenic bacteria

Therapeutic Impact

Non-surgical periodontal therapy can partially restore oral microbiota



Systemic Implications

Changes in gut microbiota due to periodontitis may contribute to systemic diseases

(Baima et al., 2024)

- **Dietary fiber and gum disease**
(Nielsen et al., 2016)

- **Stress impacts oral microbiome**
(Deinzer et al., 2005)

Poor Oral Hygiene
Poor Dietary choices
HPA Axis

Vasiliou *et al. BMC Oral Health* (2016) 16:88
DOI 10.1186/s12903-016-0284-y

BMC Oral Health

RESEARCH ARTICLE Open Access

Current stress and poor oral health

A. Vasiliou[1], K. Shankardass[2,3,4*], R. Nisenbaum[3,4] and C. Quiñonez[1,4]

Abstract

Background: Psychological stress appears to contribute to poor oral health systemically in combination with other chronic diseases. Few studies directly examine this relationship.

Methods: Data from a cross-sectional study of 2,412 participants between the ages of 25–64 years old living in the City of Toronto between 2009 and 2012 were used to examine the relationship between current stress and two self-rated oral health outcomes (general oral health and oral pain). Dental care utilization and access to dental insurance were examined as effect modifiers.

Results: A positive relationship between current stress and poor oral health was observed for both outcomes (oral pain coefficient 0.32, 95 % CI 0.26–0.38; general oral health coefficient 0.28, 95 % CI 0.19–0.36). Effects on oral pain were stronger for the uninsured, while effects on general oral health were stronger with decreasing socioeconomic position.

Conclusions: Our findings suggest that individuals with greater perceived stress also report poorer oral health, and that this relationship is modified by dental insurance and socioeconomic position. These findings warrant a greater focus on the role of psychological stress in the development of oral disease, including how perceived stress contributes to health inequities in self-reported oral health status. Patients experiencing stressful lives may differentially require closer monitoring and more vigilant maintenance of their oral health, above and beyond that which is needed to achieve a state of health in the oral environment of less stressed individuals. There may be health promoting effects of addressing psychosocial concerns related to dental care - particularly for the poor and uninsured.

Keywords: Stress, Oral pain, General oral health, Dental insurance

Abbreviations: NEHW, Neighbourhood effects on health and well-being; SEP, Socioeconomic position

Fusobacterium nucleatum (Fn) found in around 50% colorectal cancers

Via blood or swallowing?

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Article | Open access | Published: 20 March 2024

A distinct *Fusobacterium nucleatum* clade dominates the colorectal cancer niche

Martha Zepeda-Rivera, Samuel S. Minot, Heather Bouzek, Hanrui Wu, Aitor Blanco-Míguez, Paolo Manghi, Dakota S. Jones, Kaitlyn D. LaCourse, Ying Wu, Elsa F. McMahon, Soon-Nang Park, Yun K. Lim, Andrew G. Kempchinsky, Amy D. Willis, Sean L. Cotton, Susan C. Yost, Ewa Sicinska, Joong-Ki Kook, Floyd E. Dewhirst, Nicola Segata, Susan Bullman ✉ & Christopher D. Johnston ✉

Nature **628**, 424–432 (2024) | Cite this article

Establishing nasal breathing is most important objective in securing adequate craniofacial and airway development in children.

PLUS improves gum health

Journal of Oral Hygiene & Health
ISSN: 2332-0702
Mummolo et al., J Oral Hyg Health 2020, 8:2
Research Article Open Access

Oral Microbiota in Mouth-Breathing Patients

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[2]*Department of Clinical Sciences and Translational Medicine, University of Rome, Rome, Italy*

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Abstract

Aim: The aim of this study was to evaluate the changes for some bacteria in the oral cavity (*Streptococcus Mutans* and *Lactobacillus Spp.)* over time, in mouth-breathing patients (test group) compared to nose-breathing patients (control group).

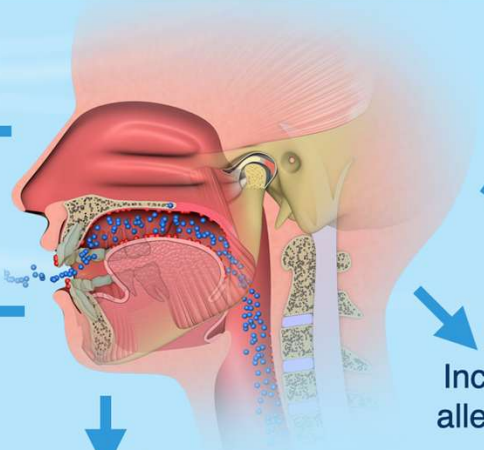
Materials and methods: 40 patients, homogeneous by age and sex, were evaluated: 20 mouth-breathing patients (Test group) and 20 nose-breathing patients (Control group). The levels of *S. Mutans* and *Lactobacillus Spp.*, salivary flow, saliva buffer capacity, and plaque index (PI) were assessed. Withdrawals were made at baseline (T0), after 3 months (T1) and after 6 months (T2). All data were compared using the "Student's test" statistical analysis.

Results: The control group has a reduced amount of S. Mutans compared to the test group (G. C. T0=10%, T1=0%, T2=0%) (G. T. T0=0%, T1=5%, T2=35%); while the quantity of Lactobacillus Spp. was different (control group T0=15%, T1=0%, T2=10%, test group T0=0%, T1=5%, T2=35%); Total salivary flows had increased in the control group (T0=47, T1=61, T2=61) compared to the test group, in which it had remained almost constant and lower (T0=44, T1=45, T2=45); Salivary buffering power is unchanged in all controls; Total PI-plaque indices had decreased in nose breathing subjects (T0=3, T1=0, T2=2) compared to mouth-breathing subjects (T0=0, T1=14, T2=27).

Conclusion: Comparing all the data, it can be inferred that mouth breathing predisposes patients to an increase in periodontal disease susceptibility with a noticeable increase in periodontal indices and bacterial colonization.

MOUTH BREATHING

O2 DEFICIENCY
(DUE TO A LOWER LEVEL OF CO2)



Hyper ventilation

Asthma

Increased allergy risk

Increased susceptibility to infections

Incorrect tongue position

NARROW UPPER ARCH

- Crowding
- Cross-bite
- Open-bite
- Nasal breathing difficulties
- Incorrect swallow
- Overjet
- Underdeveloped upper & lower jaw
- Backwards mandible position
- Forward head posture

SNORING OSA/TMJ

Increased heart rate

SLEEP DISORDERED BREATHING

- Learning difficulties
- Behavioural problems
- Teethgrinding
- Daytime sleepiness
- Restless legs
- Bedwetting
- Venous pooling
- Concentration problems
- Headache

STRESS

Production Cortisol; fight/flight response

Balanced

- Fresh breath
- Nose breathing
- Healthy gums
- No cavities
- No oral sores or infections
- Thin, clear biofilm

Imbalanced

- Bad breath (halitosis)
- Mouth breathing
- Gum disease
- Thick, sticky biofilm
- Frequent cavities
- Oral sores or infections
- Dry mouth

Ways to improve Microbiome?

- Don’t share toothbrushes or oral hygiene tools
- Tongue cleaning
- Floss or use interdental brushes
- Avoid mouthwashes
- Avoid antibiotics
- Stay hydrated
- Breathe through your nose
- Eat a varied, low-sugar diet
- Limit ultra-processed foods and alcohol
- Promote Breast-feeding
- Be careful who, and where you kiss them

Xylitol, a sugar alcohol,
naturally occurs in certain fruits
and vegetables,
prevents the growth of
streptococci mutans

(Trahan et al., 1991)
(Janakiram et al.2017)
(Söderling and Pienihäkkinen, 2020)

Why do we Need Toothpaste?

Fluoride:
Friend or Foe?

Fluoride topical efficacy

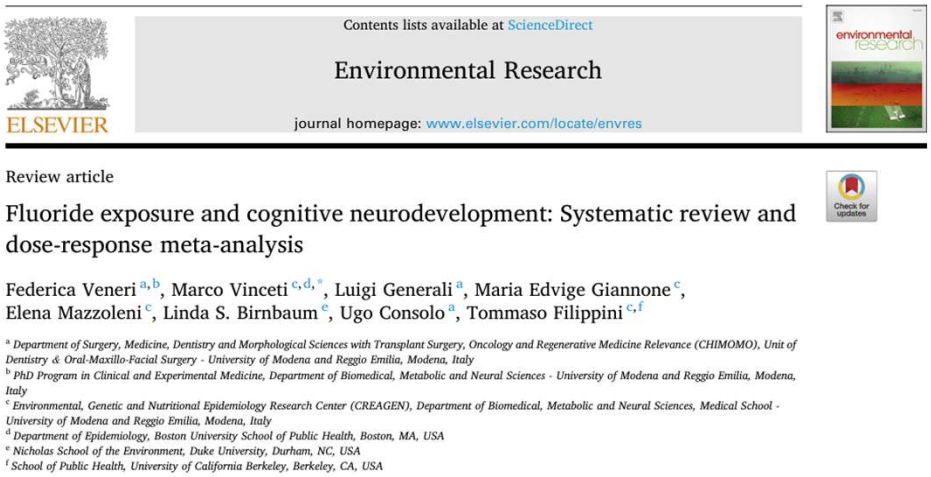
+

Remineralization

Inhibition of Demineralization

Antimicrobial Properties

(Featherstone, 1999)



Contents lists available at ScienceDirect

Environmental Research

journal homepage: www.elsevier.com/locate/envres

Review article

Fluoride exposure and cognitive neurodevelopment: Systematic review and dose-response meta-analysis

Federica Veneri [a,b], Marco Vinceti [c,d,*], Luigi Generali [a], Maria Edvige Giannone [c], Elena Mazzoleni [c], Linda S. Birnbaum [e], Ugo Consolo [a], Tommaso Filippini [c,f]

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[d] Department of Epidemiology, Boston University School of Public Health, Boston, MA, USA
[e] Nicholas School of the Environment, Duke University, Durham, NC, USA
[f] School of Public Health, University of California Berkeley, Berkeley, CA, USA

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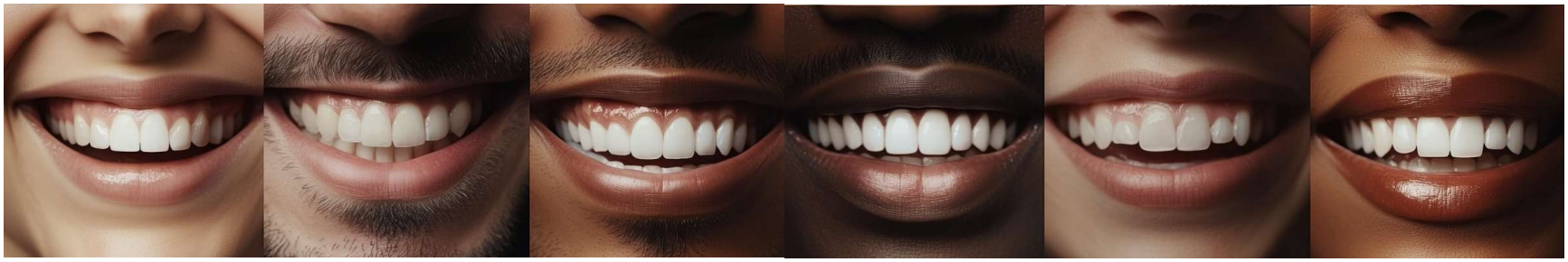
Fluorosis

Potential neurodevelopmental effects

(Veneri et al., 2023)

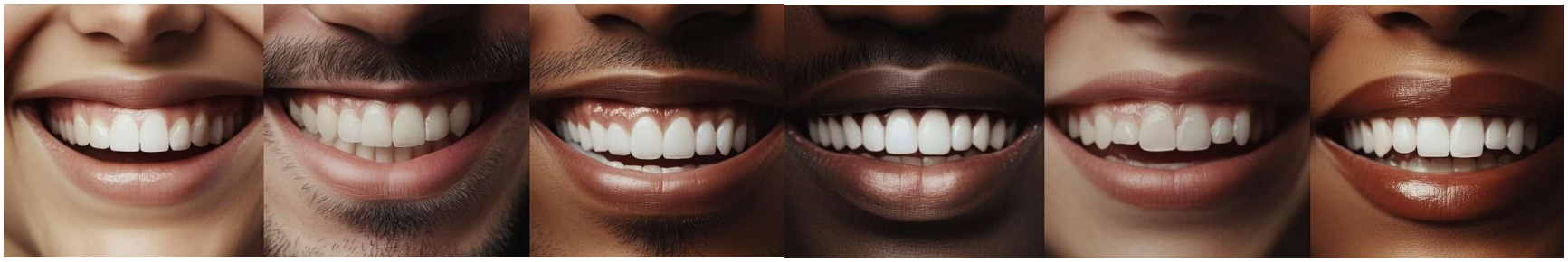


Fluoride

Topical effect

1930s:Frederick McKay links high natural fluoride levels in drinking water in Colorado Springs to dental fluorosis.
1942: H. Trendley Dean suggests that low levels of fluoride in water could reduce tooth decay.
1945: Grand Rapids, Michigan, becomes the first city to introduce artificial water fluoridation.
1960s: Fluoridated toothpaste becomes widely available.
1964: The UK begins water fluoridation trials in cities like Birmingham.
2025: Health secretary Robert F Kennedy first ban

Around 10% of the UK population
receives fluoridated water



Reverse Osmosis Activated Alumina

Oral Limitations of the Water Fluoridation Review (Cochrane 2024)

🔍 **Older studies**

📉 **Small benefits**

🧒 **Only studied children — no evidence about effects on adults.**

⏳ **Outdated side effect data**

⚖️ **Inequality impact unclear**

Hydroxyapatite

- **Natural Remineralization**
- **Safe Alternative to Fluoride**
- **Protects Against Acid Erosion**

AVOID toothpastes with:

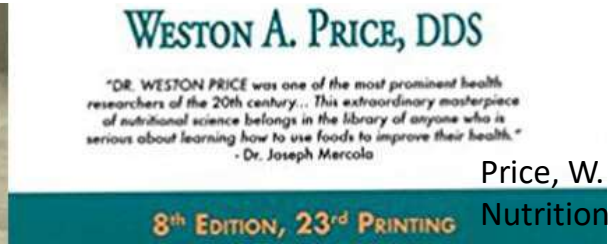
❌ Sodium Lauryl Sulphate (SLS)
❌ Microbeads, Triclosan or Titanium dioxide
❌ RDA over 70

Nano vs. Micro Hydroxyapatite:

In March 2023 the Scientific Committee on Consumer Safety (SCCS) wrote an opinion paper that concluded hydroxyapatite (nano) safe when used at concentrations up to 10% in toothpaste.

SCCS - Final Opinion on Hydroxyapatite (nano). (2023, March 23). Public Health

1939



Price, W. (2010). Nutrition and physical degeneration

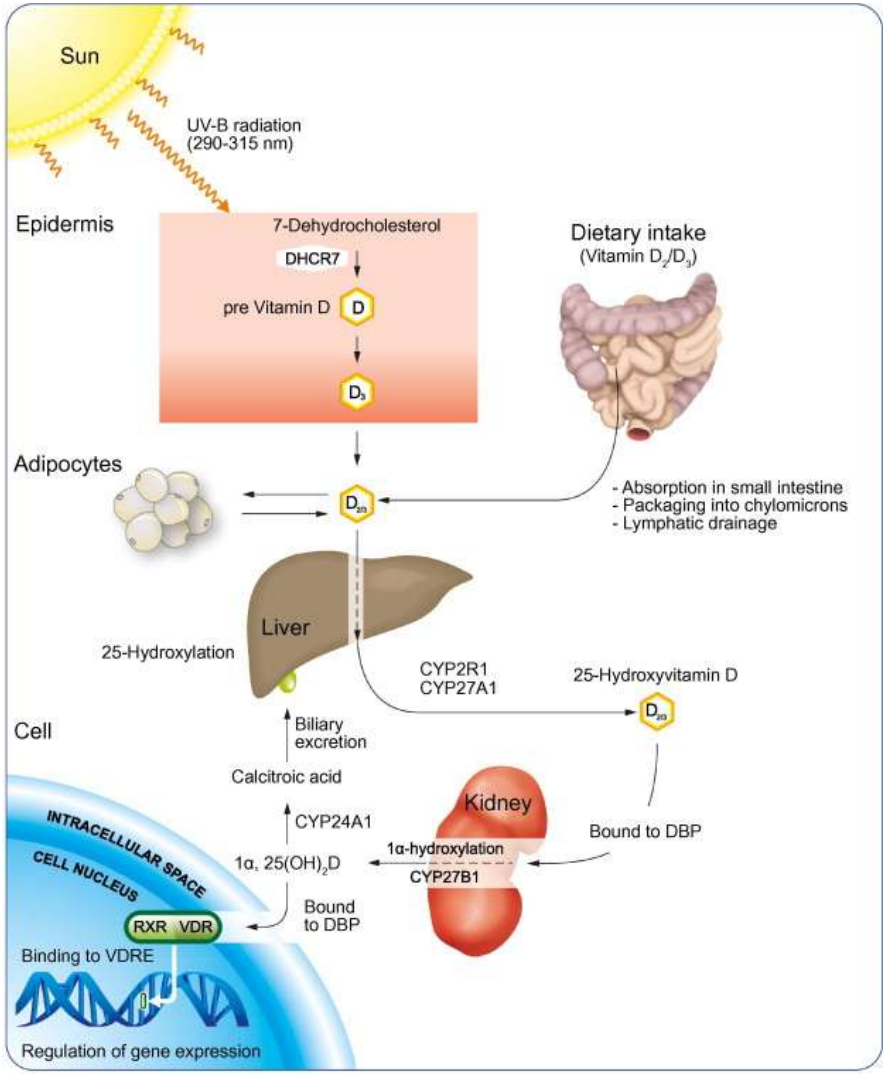
Vitamin D

Functions:

- Association between vitamin D deficiency and bone health (calcium-phosphorous homeostasis and bone metabolism)
- Growing evidence base for preventative role in immune health, cancer, cardiovascular disease, diabetes, autoimmune diseases, and depression
- Protection against viruses?

Sources: Sunlight, butter, oily fish such as salmon, mackerel, and sardines

Botelho, J., Machado, V., Proença, L., Delgado, A. S., & Mendes, J. J. (2020). Vitamin D Deficiency and Oral Health.



Deficiency: In addition to reduced sun exposure (e.g. immobile, hospitalised), age and skin type, deficiency is linked to malabsorption syndromes such as celiac disease, gastric bypass, inflammatory bowel disease, chronic pancreatic insufficiency, cystic fibrosis and chronic liver disease

- Serum 25(OH)D is best indicator of vitamin D status

Adults: Optimal Serum 25(OH)D level of 75–125 nmol/L (30–50 ng/mL) for benefits (like immune function and inflammation reduction)

Around 1 in 6 adults in the UK have levels below 25 nmol/L,

which can lead to rickets, bone pain and disabilities.

Vitamin K

Functions:

- Essential to the blood clotting process
- Cardiovascular function

Vitamin D and Vitamin K

- Vitamin D facilitates effective absorption of Ca and maintain a proper balance in bones and blood
- Helps facilitate transport of Ca into bones and teeth
- **K2 Facilitates role of Vitamin D**

Bioavailability of micronutrients

Affected by:

- Food source
- Cooking method
- Content of meal
- Presence of inhibitors and competing nutrients
- Soil quality e.g. Mg affected
- Digestive health e.g. conditions that cause malabsorption of nutrients


jamesgoolnik

Preshaw PM et al. Periodontitis and diabetes: a two-way relationship. Diabetologia. 2012

Naseem, M., Muhammad Faheem Khiyani, Nauman, H., Zafar, M. S., Shah, A. H., & Khalil, H. S. (2017). Oil pulling and importance of traditional medicine in oral health maintenance.

Dental caries in adult teeth is most common health condition

2 billion adults suffer from caries and 514 million children suffer

Jain, N., Dutt, U., Radenkov, I., & Jain, S. (2023). WHO's global oral health status report 2022

FOR DECAY YOU NEED 4 THINGS

Sugar

Decay producing bacteria

Teeth

Time –minimum three months

HOW TO REVERSE A CAVITY

Stop feeding the bacteria! Cut down the frequency of sugar and carbohydrates.

Brush twice a day for two minutes and use interdental brushes or floss.

Use a fluoride toothpaste. Spit and don't rinse.

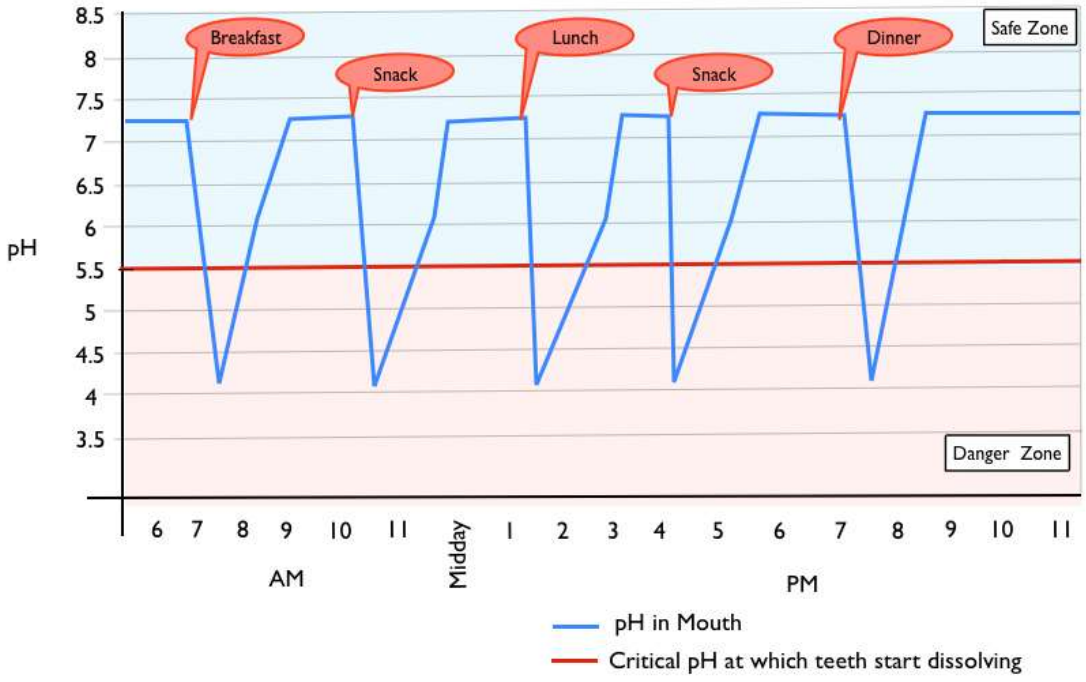
Your dentist or hygienist can also apply topical fluoride.

Once you have done this, if the cavity is large enough to trap food it needs to be filled by a dentist to stop it starting again.

If it is just a white or brown spot it can be left. If you don't like the look of it your dentist can bleach it or apply some resin to hide it.

Return to your dentist after 3 months for them to x-ray and check it has healed.

A Healthy Stephan Curve



Bowen, W. H. (2012) The Stephan Curve revisited.

Targeted Interventions

Optimal Dental Health

A Holistic Patient Guide

Optimal Guide To Ozone Therapy

Optimal Dental Health

optimaldentalhealth.co.uk

Accelerates healing
Natural disinfectant
Supports gum and root health
Reduces need for antibiotics

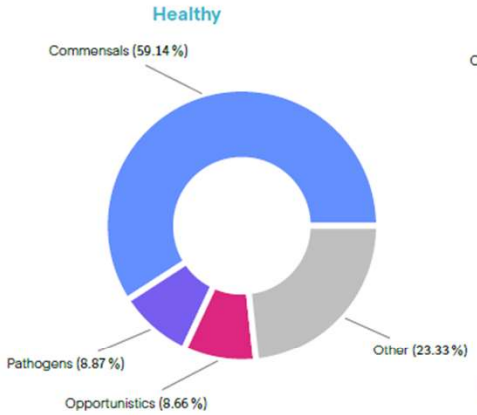
(Khan et al., 2019)

“The potent antimicrobial power of ozone, along with its capacity to stimulate the circulatory system and modulate the immune response, makes it a therapeutic agent of choice for infectious oral diseases.“

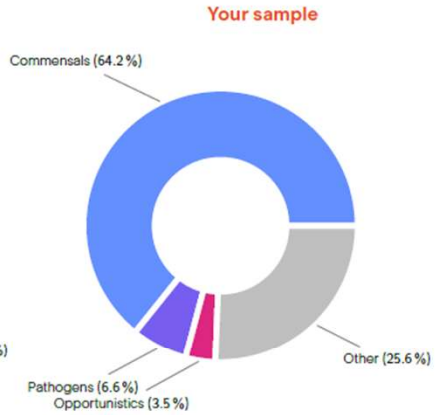
Srikanth, A., Sathish, M., & Sri Harsha, A. (2013). Application of ozone in the treatment of periodontal disease.
Journal of Pharmacy and Bioallied Sciences, *5*(5), 89.
https://doi.org/10.4103/0975-7406.113304

Microbiome balance

The oral microbiome contains a huge variety of microbes, many of which are commensal with neutral or beneficial impacts on health, and others which could be pathogens or opportunistic pathogens. The overall balance of your microbiome between commensal and pathogenic is presented here. Unlike the gut or vaginal microbiomes, there are no clear links between oral microbiome diversity and health, so diversity metrics are not included.



This chart shows the proportions of selected bacterial groups in a representative healthy sample.



This chart shows the proportions of selected bacterial groups in your sample.

			Very low	Low	Normal	High	Very high
Commensals (64.2 %)	Normal range: 49.77–68.51 %	Normal					
Pathogens (6.6 %)	Normal range: 5.02–12.72 %	Normal					
Opportunistics (3.5 %)	Normal range: 2.34–14.98 %	Normal					
Other (25.6 %)	Normal range: 17.36–29.30 %	Normal					

These doughnut charts compare the balance of commensal and pathogenic or potentially pathogenic microbes in your sample to an average healthy sample. The sliders for each category help to quantify this balance. A healthy oral microbiome will have normal levels of all three groups, whereas an unhealthy microbiome might contain lower levels of commensal bacteria and/or higher levels of pathogens or opportunistic pathogens.

The balance of microbes in your sample is **similar to an average healthy oral microbiome**, though the levels of individual microbes are still important for health – see the following sections of this report. For tips on how to maintain a healthy microbiome see the **Recommendations** section.

Health risks

In this section of your report you can view the levels of microbes that are associated with particular oral diseases, as well as relevant data on symptoms and lifestyle that you entered when registering your sample. This report cannot be used to diagnose any disease, but will provide you with a holistic view of each health risk, helping you to decide whether further investigations may be necessary.

Dental Caries – Medium risk

Dental caries, commonly known as tooth decay or cavities, are caused when oral microbes ferment sugars from foods and drinks to produce acids. These acids can dissolve the tooth enamel, and is especially problematic when the microbes are trapped close to the tooth in **plaque**. Initially, caries can appear as a white spot, and decay is reversible at this point with good oral hygiene and fluoride toothpaste. If more minerals are lost from the tooth than can be restored the enamel eventually breaks down, forming a cavity. If tooth decay is not treated it can cause pain, infection, and even tooth loss. Dentists commonly treat cavities by removing the decayed tooth tissue and filling the hole. You can reduce the risk of caries by maintaining good oral hygiene, including regular dental check-ups, and reducing your intake of sugary and acidic foods – see the **Recommendations** section for general advice on diet and oral hygiene.

Microbes

Limosilactobacillus fermentum: Not detected	Normal range: 0–0.02 %	Low
Prevotella histicola: 0.044 %	Normal range: 0–2.95 %	Normal
Scardovia wiggsiae: Not detected	Normal range: Not Detected	Normal
Streptococcus mutans: Not detected	Normal range: 0–0.15 %	Low
Streptococcus sobrinus: Not detected	Normal range: Not Detected	Normal

Symptoms summary

Relevant symptoms from the information registered with this sample are summarised here:

Symptom	Sample information
Tooth pain	Yes
Bad breath	No
Sensitive teeth	Yes
White spots	No
Yellow film on teeth	No
Fuzzy texture	No
Holes or pits	No
Grey/brown/black patches	None
Issues with sense of taste	No issues

Assessment

Your overall risk assessment for caries is **medium**, as you do not have above-average levels of many of the microbes present that are normally associated with this disease. However, you do have some of the symptoms associated with this disease. Bear in mind that some symptoms are shared with other oral health risks, and some individuals may be more susceptible to disease than average. Maintain a good oral hygiene routine and monitor your symptoms, and seek further advice from your dentist if there is no improvement or if you are otherwise concerned.

Gum disease – Medium risk

Gum disease is an infection that can occur when untreated **plaque** builds up on teeth close the gums. **Gingivitis** is the earliest and reversible stage of gum disease, leading to **periodontitis** which is a serious infection that irreversibly damages the gums and tissues that support the teeth, including bone. The different stages of gum disease are associated with different types of bacteria that are involved in colonising and infecting the gums. The severity of gum disease depends on both the microbes that are present and the host immune response, so it is important to take into account both microbes and symptoms when assessing gum disease risk. There are different classification systems for gum disease microbes, but we use three categories here: ***Early colonisers*** come first and allow other microbes to attach to the teeth and gums, and are often present in healthy individuals. ***Bridging species*** attach to early colonisers and create the conditions that allow for aggregation of diverse bacteria including pathogens. ***Advanced infection*** species are associated with more severe disease, and include **'red complex'** bacteria.

Microbes

Early colonisers

Capnocytophaga gingivalis: 0.49 %	Normal range: 0.00–0.52 %	Normal
Capnocytophaga granulosa: Not detected	Normal range: Not Detected	Normal
Eikenella corrodens: 0.27 %	Normal range: 0–0.23 %	High
Streptococcus gordonii: 0.16 %	Normal range: 0–0.57 %	Normal
Streptococcus oralis: 1.53 %	Normal range: 0.14–2.26 %	Normal

Bridging species

Campylobacter rectus: 0.061 %	Normal range: 0–0.11 %	Normal
Campylobacter showae: 0.40 %	Normal range: 0–0.41 %	Normal
Capnocytophaga periodontitidis: Not detected	Normal range: Not Detected	Normal
Fusobacterium nucleatum: 0.28 %	Normal range: 0–0.25 %	High
Fusobacterium periodonticum: 0.52 %	Normal range: 0–0.18 %	Very High
Prevotella intermedia: 0.14 %	Normal range: 0.05–0.53 %	Normal
Prevotella nigrescens: 0.65 %	Normal range: 0–2.29 %	Normal
Veillonella parvula: 0.43 %	Normal range: 0.04–1.33 %	Normal
Veillonella tobetsuensis: Not detected	Normal range: Not Detected	Normal

Advanced infection

Aggregatibacter actinomycetemcomitans: Not detected	Normal range: 0–0.09 %	Low
Porphyromonas gingivalis: 0.075 %	Normal range: 0–0.26 %	Normal
Tannerella forsythia: 0.060 %	Normal range: 0–0.26 %	Normal
Treponema denticola: Not detected	Normal range: 0–0.13 %	Low

Halitosis – Medium risk

Halitosis, or bad breath, is most often caused by oral microbes breaking down food into foul smelling chemicals, oft
sulphur-containing chemicals. This risk score is for halitosis caused by oral microbes, but smelly breath may also be
symptom of other non-oral diseases. Dry mouth is a common symptom of halitosis, as is a white coating on the tongu
Because halitosis is often caused by poor oral hygiene it can also occur alongside gum disease. Halitosis can usually b
prevented with good oral hygiene, including gentle cleaning of the tongue. It is important to also address any underlyi
causes of related problems such as dry mouth, for example by staying hydrated. A healthcare professional can help y
create a personalised plan to identify and overcome the causes of halitosis.

Microbes

Dialister: Not detected	Normal range: Not Detected	Normal
Fusobacterium nucleatum: 0.28 %	Normal range: 0–0.25 %	High
Fusobacterium periodonticum: 0.52 %	Normal range: 0–0.18 %	Very High
Lancefieldella parvula: 0.070 %	Normal range: 0.07–1.28 %	Normal
Porphyromonas gingivalis: 0.075 %	Normal range: 0–0.26 %	Normal
Prevotella intermedia: 0.14 %	Normal range: 0.05–0.53 %	Normal
Solobacterium moorei: Not detected	Normal range: Not Detected	Normal
Streptococcus milleri: Not detected	Normal range: 0–0.03 %	Low
[Eubacterium] sulci: Not detected	Normal range: Not Detected	Normal

Symptoms summary

Relevant symptoms from the information registered with this sample are summarised here:

Symptom	Sample information
White coating on a large area of the tongue	Yes
Bad breath	No
Dry mouth	No
Thick saliva	No

Assessment

Your overall risk assessment for halitosis is **medium**, as you have above-average levels of microbes that are associate
with this disease, but you don't have many of the usual symptoms. Monitor your symptoms, maintain a good oral hygie
routine, and seek further advice from your dentist if you are concerned.

Optimal Dental Health

Oral thrush – Low risk

Oral thrush, or candidiasis, is caused by Candida yeast. These yeast are found in low amounts in most healthy microbiomes, but can cause a problem if they grow too much, including symptoms of creamy white patches in the mouth, redness and soreness. Oral thrush is usually treated with antifungal medication, but it is important to understand and solve the underlying cause of oral thrush. Oral thrush may occur due to other health issues, such as diabetes, nutritional deficiencies, or as the result of taking some medications. The results shown are not a diagnosis. Consult with a qualified health practitioner before making decisions about starting or stopping medication or other treatments.

Microbes

Candida: Not detected	Normal range: Not Detected	Normal

Symptoms summary

Relevant symptoms from the information registered with this sample are summarised here:

Symptom	Sample information
Redness of the gums	No
Redness of the tongue	Yes
Redness of the throat	No
Creamy white patches on tongue/gums/inner cheeks	No
Pain in the mouth generally	No
Issues with sense of taste	No issues
Cracks at the corner of the mouth	No
Dry mouth	No

Assessment

Your overall risk assessment for oral thrush is **low** as you do not have above-average levels of Car
the symptoms normally associated with this disease, which indicates a good, healthy result. Having
is not a formal diagnosis however, and if you have any concerns about your health you should d
dentist or a qualified healthcare practitioner.

Oral Microbiome Functions

Oral bacteria are involved in a wide range of metabolic processes, which include the ability to break down different components of your diet and to produce chemicals which can damage or protect with your teeth. Our analysis directly detects which functional genes are present in your sample. The higher the score, the more potential your microbiome has to perform that function. Your score is compared to the average score of a healthy population.

		very low	low	normal	high	very high
Oral - Sugar Degradation	Normal			○		

A high score for this function is linked to a higher risk of tooth decay. Oral microbes break down sugars as the first step towards production of acids that dissolve the tooth enamel, leading to formation of caries.

		very low	low	normal	high	very high
Oral - Acid Production	High				○	

Acids produced by oral microbes, especially those found in plaque deposits attached to the tooth surface, cause dental caries by dissolving the outer enamel layer of the teeth. Lactic acid is the major decay-causing acid produced by oral microbes, though short-chain fatty acids such as acetate and propionate also contribute.

Recommendations

Here is a summary of your test results and actions you can take to improve your oral health. For fully personalised advice, please consult with a dentist or qualified healthcare practitioner.

Pathogens and opportunistic pathogens

We detected **21 potential pathogens or opportunistic pathogens** in your sample, and **5 are above the levels expected** in a healthy population. This means it is more likely that you have or may develop an oral health issue, but you should interpret your results in the context of any symptoms you may have, and consult with a dentist if you have any concerns. Maintaining a healthy oral microbiome through good hygiene and diet is a good general defence against oral pathogens.

Health risks

This test is intended as a tool for assessing disease risk and cannot be used to provide a formal diagnosis. Based on the levels of relevant microbe in your sample and the symptoms you reported, you have:

- A **medium risk** of Dental Caries, Gum disease, and Halitosis – continue to monitor your symptoms and follow up with a healthcare professional if you are concerned.
- A **low risk** of Oral thrush but trust your instincts about your own health and seek further advice if you are still concerned about these or other diseases.

Diet and lifestyle

A high-sugar diet increases the risk of tooth decay by feeding acid-producing microbes, and acidic food or drink (e.g. orange juice or fizzy drinks) is directly harmful to teeth. A healthy diet should contain a limited amount of sugar and acidic foods, and include fibre from fruit, vegetables and grains which helps stimulate saliva to wash out acids. Sources of calcium, phosphorus and vitamin D, such as dairy, fish, eggs, and nuts. Staying hydrated helps to maintain saliva production; drinking water with meals will also help to rinse out food. You said that you do not eat sugary food or drinks, and that you never drink fizzy drinks. You also reported that you do not smoke or vape. Smoking is a risk factor for many oral diseases, including cancer.

Oral hygiene

Most people will benefit from an oral hygiene routine that includes:

- Brushing at least twice a day with a fluoride toothpaste (your dentist can advise if a hydroxyapatite toothpaste is a suitable alternative for you).
- Flossing daily.
- Visit the dentist at least every two years, but more frequently if you have a history of dental problems.

You reported that you brush your teeth once per day with a toothpaste that contains hydroxyapatite. You floss daily, and you have visited a dentist within the last two years. Everyone's mouth and oral health needs are unique; your dentist can help create a personalised oral hygiene routine for you.

Probiotics

Following a good oral hygiene routine, with a healthy diet and lifestyle, is the best way to build and maintain a healthy oral microbiome. However, if the oral microbiome is unbalanced, particularly after illness or antibiotic treatment, it may be worthwhile to try probiotic supplements to help rebalance the microbiome. The balance of your microbiome was similar to an average healthy oral microbiome. Oral probiotics usually contain bacteria that have been shown to inhibit the growth of oral pathogens. Discuss possible probiotic supplements with a qualified healthcare practitioner, and be aware of any unwanted side effects such as stomach upset or (rarely) allergic reactions.

Optimal Dental Health

What the saliva test shows

- Your overall mouth bacteria balance is **similar to a healthy pattern**, which is reassuring.
- A few "bridge" bacteria that help plaque communities stick together are **a bit higher than ideal**, especially **Fusobacterium species** (including *Fusobacterium nucleatum*) and **Prevotella intermedia**. These are linked to gum irritation, pockets, and bad breath when they overgrow.
- Specifically:
  - *Fusobacterium nucleatum* is just above the normal range.
  - *Fusobacterium periodonticum* is higher than expected.
  - *Prevotella intermedia* is marginally high.
- The report's risk flags line up with what you're feeling: **medium gum-disease risk** and **high halitosis (bad-breath) risk**, both of which improve when we reduce those bridge bacteria and clean deep pockets with Ozone therapy.

Why this matters for you

- You also have a **deep pocket around the lower-right wisdom tooth**; pockets are perfect hiding places for the specific bacteria your test picked up. Cleaning this properly (and deciding whether the tooth should stay or go) is key.
- Your long-standing **dry mouth** can worsen breath and bacterial overgrowth. Addressing saliva flow will support everything else.

Our plan

1) Hygiene therapy ASAP (45 minutes) – "full-mouth disinfection" with ozone

- Deep gum cleaning throughout, with extra focus around the lower-right wisdom tooth pocket. Ozone helps disrupt these bridge bacteria and support healing. Then review.

2) Imaging and diagnosis

- Please **email us your previous CBCT** of the lower-right wisdom tooth if you have it; if not, we'll take a new CBCT so we can see the exact anatomy, infection risk, and proximity to the nerve.
- Hopefully it also includes tooth **45 (the re-treated root-canal)** so we can see if this tooth is leaking bacteria.

4) Dry-mouth support

- Sip water regularly; aim for 2 L/day.
- Use **xylitol** mints or pastilles after meals.
- Consider a saliva gel/spray for comfort, especially in the evening.

5) Targeted microbiome support

- Tongue hygiene (gentle scraper/brush once daily) helps with the halitosis-linked species.
- Optional: a short course of an **oral probiotic** (e.g., *Streptococcus salivarius* lozenges) after we've completed the deep clean this can help maintain a healthier balance.

Invivo Bio.Me Oral https://healf.com/en-uk/products/invivo-bio-me-oral?variant=46172778496239&tw_source=google&tw_adid=&tw_campaign=21540427352&tw_kwdid=&gad_source=1&gad_campaignid=21534016074&gbraid=0AAAAAoQ3uJWdipv9tXx84tQ61BdwCR2nz&gclid=CjwKCAjwpOfHBhAxEiwAm1SwEq7QE3b4FBf1Gim6-t-53k6T7YmsSkb0UA6Ygrhn2TEQZq4IJHyMERoCCk4QAvD_BwE&selling_plan=6452707567

Superteeth (but this contains xylitol as well) https://getsuperteeth.com/en-gb?srsltid=AfmBOoq5aVyXSqJLO3BR1uYGx68naMGhb7oNpWVd9-VMkRcP4F7ryh08

There are also Luvbiotics but I haven't used them:

https://luvbiotics.co.uk/?srsltid=AfmBOopzP4dRQGXzXj3kTQEHrcpuAKwcrKJFiJRixih9jRVn0Liur4_A

You can also eat natural probiotic foods like yogurt, kefir, sauerkraut, and kimchi, as well as drinks like kombucha. Try and choose plain, unsweetened varieties along with a fibre-rich plant-based diet.

Aging (Albany NY). 2016 Jun; 8(6): 1250–1258.
Published online 2016 Jun 12. doi: 10.18632/aging.100981

PMCID: PMC4931830
PMID: 27294343

Reversal of cognitive decline in Alzheimer's disease

Dale E. Bredesen,[1,2] Edwin C. Amos,[3] Jonathan Canick,[4] Mary Ackerley,[5] Cyrus Raji,[6] Milan Fiala,[7] and Jamila Ahdidan[8]

Journal of Alzheimer's Disease & Parkinsonism
ISSN: 2161-0460

Bredesen et al., J Alzheimers Dis Parkinsonism 2018, 8:5
DOI: 10.4172/2161-0460.1000450

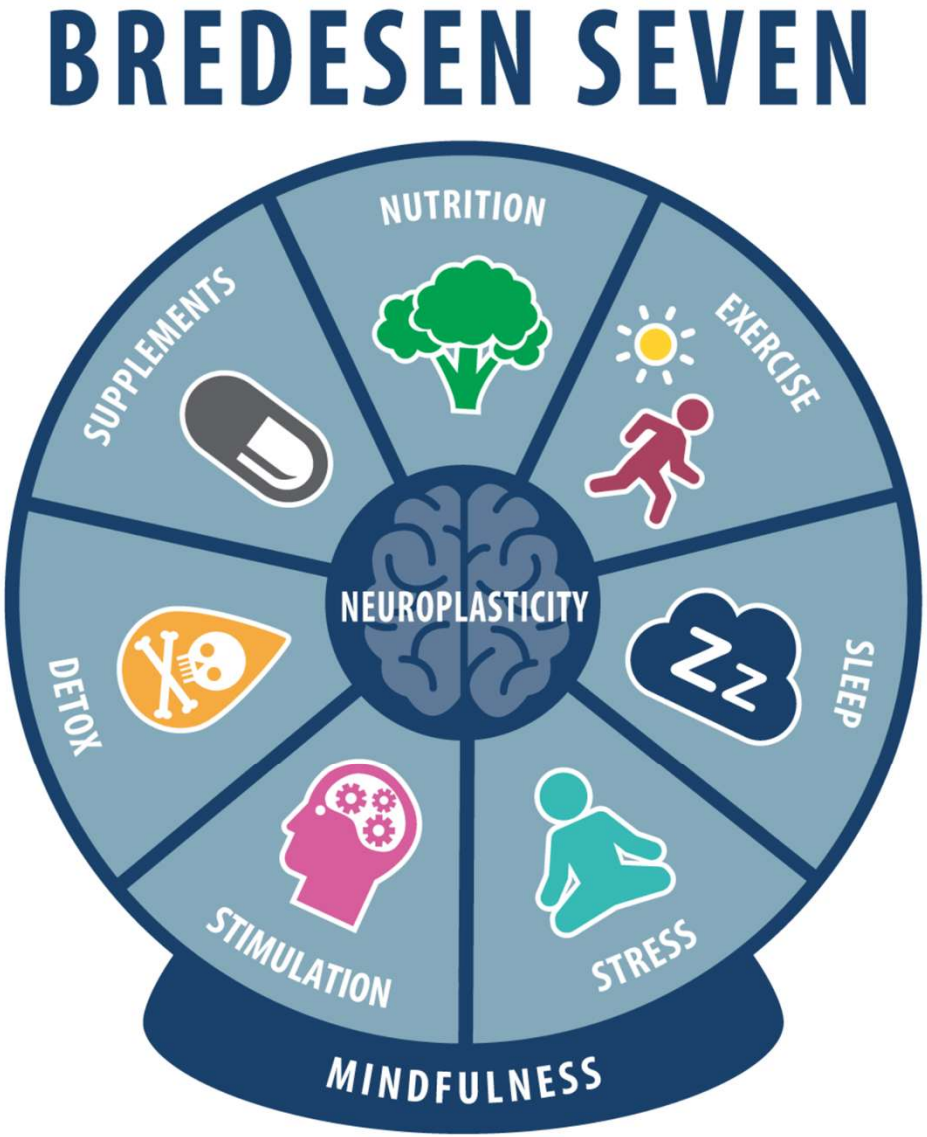
Case Report Open Access

Reversal of Cognitive Decline: 100 Patients

Dale E Bredesen[1*], Kenneth Sharlin[2], David Jenkins[3], Miki Okuno[3], Wes Youngberg[4], Sharon Hausman Cohen[5], Anne Stefani[5], Ronald L Brown[6], Seth Conger[6], Craig Tanio[7], Ann Hathaway[8], Mikhail Kogan[9], David Hagedorn[10], Edwin Amos[11], Amylee Amos[12], Nathaniel Bergman[13], Carol Diamond[14], Jean Lawrence[15], Ilene Naomi Rusk[16], Patricia Henry[16] and Mary Braud[16]

The Bredesen 7

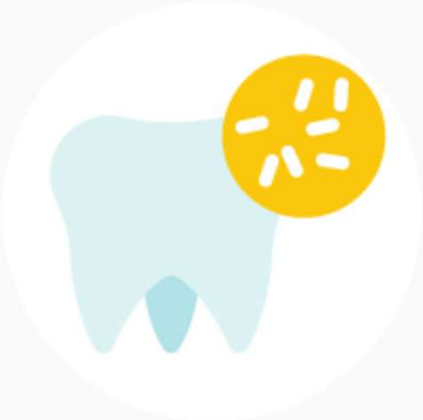
- Also referred to as the “B7”
- Illustrates the seven main strategies of The ReCODE Program™ that create neuroplasticity – the ability of the brain to heal, grow new neurons and synaptic connections
- Each strategy alone can promote neuroplasticity, but when practiced together, they create a powerful synergy



APOLLO HEALTH

Oral Health Plays a Pivotal Role in Dementia Prevention & Reversal

Oral Contributors to Alzheimer's' Disease include:



Oral Bacteria

Airway

Mercury

Pamidi & Tasali (2012)

Sleep

Sleep disordered breathing

Impact of sleep on the microbiome of oral biofilms

Maki Sotozono [1], Nanako Kuriki [2], Yoko Asahi [2], Yuichiro Noiri [1], Mikako Hayashi [2], Daisuke Motooka [3], Shota Nakamura [3], Mikiyo Yamaguchi [2], Tetsuya Iida [3], Shigeyuki Ebisu [2]

Affiliations + expand

PMID: 34882696 PMCID: PMC8659294 DOI: 10.1371/journal.pone.0259850

Abstract

Dysbiosis of the oral microbiome is associated with diseases such as periodontitis and dental caries. Because the bacterial counts in saliva increase markedly during sleep, it is broadly accepted that the mouth should be cleaned before sleep to help prevent these diseases. However, this practice does not consider oral biofilms, including the dental biofilm. This study aimed to investigate sleep-related changes in the microbiome of oral biofilms by using 16S rRNA gene sequence analysis. Two experimental schedules-post-sleep and pre-sleep biofilm collection-were applied to 10 healthy subjects. Subjects had their teeth and oral mucosa professionally cleaned 7 days and 24 h before sample collection. Samples were collected from several locations in the oral cavity: the buccal mucosa, hard palate, tongue dorsum, gingival mucosa, tooth surface, and saliva. Prevotella and Corynebacterium had higher relative abundance on awakening than before sleep in all locations of the oral cavity, whereas fluctuations in Rothia levels differed depending on location. The microbiome in different locations in the oral cavity is affected by sleep, and changes in the microbiome composition depend on characteristics of the surfaces on which oral biofilms form.

PubMed Disclaimer

Sotozono, M., Kuriki, N., Asahi, Y., Noiri, Y., Hayashi, M., Motooka, D., Nakamura, S., Yamaguchi, M., Iida, T., & Ebisu, S. (2021). Impact of sleep on the microbiome of oral biofilms

WatchPAT Automated Report and Clinical Parameters

ZOLL itamar
Home Sleep Apnea Testing Products

Yalamanchali et al. JAMA Otolaryngol Head Neck Surg, 2013, Diagnosis of Obstructive Sleep Apnea by Peripheral Arterial Tonometry (Meta-Analysis)

Oral candidia

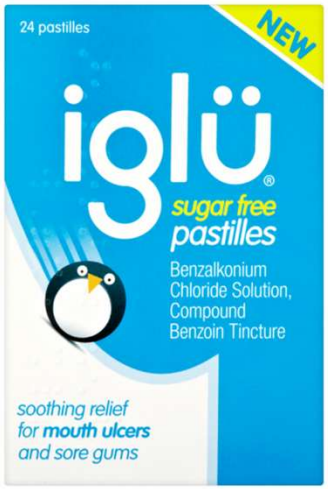
- Conventionally treated with anti-fungal medication e.g. Nystatin or Fluconazole.
- Reducing intake of sugars and processed foods.
- Increasing dietary fibre and vegetable intake.
- Taking an oral probiotic

Mouth Ulcer

- Trauma
- SLS
- Celiac disease or gluten sensitivity
- Candida, EBV, HSV
- Nutritional deficiency- Vitamin C,D, Iron, B12 & Zinc
- Hypochloridria
- Microbiome- dysbiosis

Ulcer not healed in 2 weeks refer

Blood test: FBC, Fe (panel), Zinc, B12, Vit D, VitK,HbA1c, Mg



Propolis

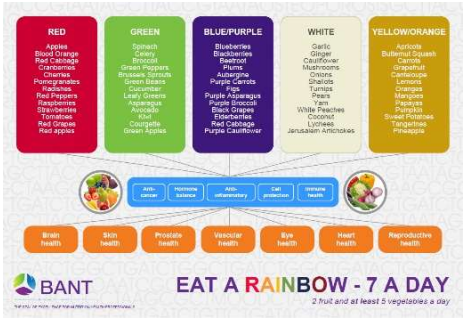
(Yoshimasu et al., 2018) (Zulhendri et al., 2021)

Optimal Dental Health

Information

Testing

Collaboration



Food first

Supplements?

Treatment

Retest?

Optimal Dental Health

Take aways:

- Ask about bleeding gums, silver fillings and sleep.
- Test not guess
- Build relationship with a Biological dentist

James@optimaldental.co.uk


James Goolnik - Dentist
London Dentist 🦷 Author✍️
Speaker 🧐 Studying Nutrition...
James@optimaldental.co.uk

Ali Raad Hassoon, Al-Naji, A., Khalid, G. A., & Javaan Chahl. (2024). Tongue Disease Prediction Based on Machine Learning Algorithms. Technologies, 12(7), 97–97. https://doi.org/10.3390/technologies12070097
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