The Connection Between Periodontal Disease and Systemic Health

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Why Testing, Monitoring, and Balanced Treatment Matter

Periodontal disease—commonly called gum disease or pyorrhea — is a chronic inflammatory infection affecting the tissues that support the teeth. It's often treated as a localized oral problem, but the science tells a much bigger story. The health of your gums is closely tied to the health of your **heart, brain, metabolism, immune system, and more**. Periodontal disease doesn't just stay in the mouth—it participates in systemic inflammation throughout the body. Understanding that connection changes how we diagnose, treat, and monitor it. This is why early detection, targeted testing, thoughtful treatment, and ongoing maintenance matter far more than most people realize.

The Mouth Is Not Separate From the Body

The mouth is one of the most biologically active gateways in the body. It contains a complex microbiome made up of bacteria, viruses, fungi, and other microorganisms that—when in balance—play important roles in immune regulation and overall health. Periodontal disease disrupts that balance. When gum tissue becomes chronically inflamed, the barrier between the oral environment and the bloodstream weakens. Harmful bacteria and their inflammatory byproducts can then enter circulation through compromised gum tissue. This doesn't usually cause an acute infection—but it **adds to the body's overall inflammatory burden**.
Chronic, low-grade inflammation is a known driver of many degenerative and metabolic diseases. Periodontal disease is one of the most common—and most overlooked—contributors.

Systemic Conditions Associated With Periodontal Disease

A growing body of research links periodontal disease to multiple systemic conditions. These are **associations**, not simplistic cause-and-effect claims—but they are consistent and biologically plausible.

1. Cardiovascular Disease & Stroke

Oral pathogens such as *Porphyromonas gingivalis* have been identified in arterial plaques. Chronic gum inflammation may contribute to atherosclerosis by promoting endothelial dysfunction and systemic inflammation. Some studies suggest oral bacteria may play a role in a significant proportion of cardiovascular events.

Study 1: Guo et al. (2023) - Meta-Analysis of 39 Studies
https://pubmed.ncbi.nlm.nih.gov/37682950/
This large analysis combined data from nearly 4.4 million people across 39 different studies. Researchers found that people with gum disease had higher risks of heart problems and strokes. Specifically, those with periodontal disease were 26% more likely to have a stroke, 20% more likely to develop heart disease, and 14% more likely to have a heart attack compared to people with healthy gums.

Study 2: Lee (2024) - Korean Nationwide Study
https://pubmed.ncbi.nlm.nih.gov/39093905/
This study followed 3.8 million Koreans for over 10 years to see how gum disease and tooth loss affected their heart health. People who lost teeth had a 9% higher risk of stroke. Those with both gingivitis (inflamed gums) and tooth loss had even higher risks—12% more strokes and 8% more overall heart problems. The connection was strongest in people over 50, males, smokers, and those with obesity.

Study 3: Sen et al. (2018) - ARIC Study
https://pubmed.ncbi.nlm.nih.gov/29335336/
This 15-year study of over 10,000 Americans examined how severe gum disease relates to different types of strokes. People with the worst gum disease had nearly 4 times the stroke rate compared to those with healthy gums. Severe periodontal disease was particularly linked to strokes caused by blood clots. Interestingly, people who visited the dentist regularly had a 23% lower stroke risk.

Study 4: Leishman et al. (2010) - Review of Oral Bacteria and Heart Disease
https://pmc.ncbi.nlm.nih.gov/articles/PMC3084572/
This review article examines how oral bacteria may contribute to heart disease.[4] While physicians traditionally focused on cholesterol as the primary cause of cardiovascular disease, research now suggests that infections from oral bacteria may also play a role.[4] The review explains how bacteria from periodontal disease interact with the body and discusses how these bacteria may contribute to the progression of heart disease.

2. Diabetes

The relationship between diabetes and periodontal disease is **bidirectional**.

- Diabetes increases susceptibility to gum disease
- Periodontal inflammation makes blood sugar regulation more difficult

Improving periodontal health has been shown to improve glycemic control in some patients, highlighting the importance of addressing both simultaneously.

Study 1: Genco et al. (2020) - Effects on Glycemic Control and Complications
https://pubmed.ncbi.nlm.nih.gov/32385875/
This review explains the two-way relationship between gum disease and diabetes.[1] People with diabetes are more likely to get gum disease, and people with gum disease have worse blood sugar control. When someone has both conditions together, they face higher risks of serious diabetes complications like heart disease and kidney failure. The study also suggests that gum disease might increase the chances of developing new cases of type 2 diabetes.

Study 2: Stöhr et al. (2021) - Meta-Analysis of Bidirectional Association
https://pubmed.ncbi.nlm.nih.gov/34211029/
This large analysis combined data from 15 studies involving over 427,000 people to examine how gum disease and diabetes affect each other.[2] People with periodontitis were 26% more likely to develop diabetes compared to those with healthy gums. Going the other direction, people with diabetes were 24% more likely to develop gum disease. This confirms that the two diseases influence each other in both directions.

Study 3: Graves et al. (2025) - Understanding the Mechanisms
https://pubmed.ncbi.nlm.nih.gov/41292096/
This recent review explains how gum disease and diabetes worsen each other through biological processes.[3] High blood sugar in diabetes changes mouth bacteria and weakens the immune system, making gum disease worse. Meanwhile, gum disease causes body-wide inflammation that makes it harder to control blood sugar. Clinical trials show that treating gum disease can lower HbA1c (a diabetes marker) by about 0.43%, helping improve diabetes control.

Study 4: Nabila et al. (2023) - Korean Population Study
https://pubmed.ncbi.nlm.nih.gov/37640779/
This study followed over 14,000 Koreans to examine how gum disease affects diabetes risk.[4] Researchers found that people with periodontal disease had a 22% higher risk of developing diabetes after accounting for age, lifestyle, weight, and other health factors. The study confirmed that gum disease increases diabetes risk independent of other known risk factors.

3. Alzheimer's Disease & Dementia

Long-term periodontal disease has been associated with a significantly increased risk of Alzheimer's disease. Researchers believe chronic inflammation and the presence of oral pathogens may contribute to neuroinflammatory processes over time.

Study 1: Nadim et al. (2020) - Meta-Analysis of 12 Studies
https://pubmed.ncbi.nlm.nih.gov/32533373/
This analysis combined data from five long-term studies and seven comparison studies to examine how gum disease affects dementia risk. People with periodontal disease had a 38% higher risk of developing dementia compared to those with healthy gums. The researchers calculated that if we could cut gum disease rates in half worldwide, we might prevent 850,000 cases of dementia, showing that treating gum disease could help control the dementia epidemic.

Study 2: Asher et al. (2022) - Review of 47 Longitudinal Studies
https://pubmed.ncbi.nlm.nih.gov/36073186/
This comprehensive review analyzed 47 studies following people over time to see how poor oral health affects the brain. Poor periodontal health increased the risk of cognitive decline by 23% and dementia by 21%. Tooth loss was particularly important—partial tooth loss increased cognitive decline risk by 50%, while complete tooth loss increased dementia risk by 23%. The connection appears real, though more high-quality studies are needed.

Study 3: Dziedzic (2022) - Meta-Analysis Examining Confounding Factors
https://pubmed.ncbi.nlm.nih.gov/36499656/
This study carefully examined whether gum disease truly causes cognitive problems or if other factors explain the connection. After analyzing 17 studies involving over 262,000 people, researchers found that periodontitis increased dementia risk by 39% and Alzheimer's disease risk slightly. However, the quality of evidence was moderate, and factors like age, smoking, and overall health might partially explain these connections, requiring more research to confirm causation.

Study 4: Plachokova et al. (2024) - Comprehensive Review of Mechanisms
https://pubmed.ncbi.nlm.nih.gov/38674088/
This recent review examined how gum disease might lead to brain diseases. The connection likely involves three pathways: bacteria and inflammatory chemicals traveling through the bloodstream to the brain, bacteria moving along nerves, and immune cells carrying infection. The bacterium Porphyromonas gingivalis from gum disease has been found in Alzheimer's patients' brains. Common risk factors like age, smoking, and poor nutrition affect both conditions.

4. Cancer Risk

Periodontal disease has been linked in observational studies to increased risk of quite a few cancers at this point, including:

- ### Lung Cancer

Study 1: Chen et al. (2020) - Meta-Analysis of 12 Studies
https://pubmed.ncbi.nlm.nih.gov/32802852/
This analysis combined data from twelve studies involving 263,238 people to examine how gum disease affects lung cancer risk. People with periodontal disease had a 37% higher risk of developing lung cancer compared to those with healthy gums. Tooth loss also increased lung cancer risk by 69%. The study found that for every 5 teeth lost, lung cancer risk increased by 10%, showing a clear dose-response relationship.

Study 2: Zhou et al. (2023) - ARIC Study on Oral Bacteria
https://pubmed.ncbi.nlm.nih.gov/35999656/
This study followed 4,263 people for over 17 years and measured antibodies to oral bacteria in their blood. Researchers found that antibodies to "orange complex" bacteria (moderately harmful gum disease bacteria) were associated with 15% higher lung cancer risk overall and 27% higher risk in men. Specific bacteria like P. intermedia and P. nigrescens were particularly linked to increased lung cancer risk, suggesting these oral bacteria may contribute to cancer development.

- ### Colorectal Cancer

Study 3: Pignatelli et al. (2023) - Role of Fusobacterium nucleatum
https://pubmed.ncbi.nlm.nih.gov/37764202/
This review explains how Fusobacterium nucleatum, a bacterium from gum disease, contributes to colorectal cancer development. This bacterium travels from the mouth to the colon through the bloodstream and produces proteins that activate cancer-promoting pathways in colon cells. It also helps cancer cells hide from the immune system and creates inflammation that supports tumor growth. Higher amounts of this bacterium in colorectal cancer tissue are linked to worse survival rates.

Study 4: Wang et al. (2024) - Meta-Analysis of Gastrointestinal Cancers
https://pubmed.ncbi.nlm.nih.gov/39185624/
This large analysis examined 19 studies with 16.6 million participants to see how gum disease affects digestive system cancers. People with periodontal disease had a 21% higher risk of developing colorectal cancer. The study also found that severe periodontitis nearly doubled the risk of gastrointestinal cancers overall. These findings suggest that preventing and treating gum disease might help reduce colorectal cancer risk.

- ### Breast Cancer

Study 5: Shao et al. (2018) - Meta-Analysis of 173,162 Participants
https://pmc.ncbi.nlm.nih.gov/articles/PMC6299876/
This analysis combined data from eleven studies involving 173,162 women to examine the connection between gum disease and breast cancer. Women with periodontal disease had a 22% higher risk of developing breast cancer compared to women with healthy gums. Interestingly, among women who received periodontal treatment, the increased breast cancer risk was not statistically significant, suggesting that treating gum disease might help prevent breast cancer.

Study 6: Abolhasani-Zadeh et al. (2025) - Case-Control Study
https://pmc.ncbi.nlm.nih.gov/articles/PMC11947191/
This study compared 200 women with breast cancer to 200 healthy women to identify risk factors. Researchers found that women with higher gingival index scores (indicating more gum inflammation) had significantly increased breast cancer risk. The study also confirmed that family history of breast cancer and higher body mass index were important risk factors. The findings suggest gum inflammation may contribute to breast cancer development.

- ### Pancreatic Cancer

Study 7: Maisonneuve et al. (2017) - Meta-Analysis
https://pubmed.ncbi.nlm.nih.gov/28453689/

This analysis examined eight studies to investigate how gum disease and tooth loss relate to pancreatic cancer. People with periodontitis had a 74% higher risk of developing pancreatic cancer, while those who had lost all their teeth had a 54% higher risk. These associations remained significant even after accounting for smoking, diabetes, body weight, and alcohol consumption, suggesting gum disease independently increases pancreatic cancer risk.

Study 8: Meng et al. (2025) - Oral Microbiome Study
https://jamanetwork.com/journals/jamaoncology/article-abstract/2839132
This recent study examined oral bacteria and fungi in relation to pancreatic cancer risk using advanced genetic sequencing. Researchers found that specific periodontal bacteria from the "red complex" (like P. gingivalis and T. forsythia) and "orange complex" were associated with increased pancreatic cancer risk. The study also discovered that Candida fungi in the mouth were linked to higher cancer risk. These oral microbes may travel from the mouth to the pancreas through the bloodstream.

- ## Head and Neck Cancers

Study 9: Zeng et al. (2013) - Meta-Analysis of Head and Neck Cancer
https://pubmed.ncbi.nlm.nih.gov/24194957/
This analysis combined seven studies examining how gum disease affects head and neck cancer risk. People with periodontal disease had 2.6 times higher odds of developing head and neck cancer compared to those with healthy gums. The association remained significant across different study designs, methods of measuring gum disease, tumor locations, and ethnic groups, suggesting that periodontal disease is an independent risk factor for these cancers.

Study 10: Xiong et al. (2024) - Mendelian Randomization Study
https://pubmed.ncbi.nlm.nih.gov/38822160/
This genetic study examined whether periodontitis causes head and neck cancers by analyzing DNA data from large populations. Researchers found that periodontitis increased the risk of oropharyngeal cancer (cancers of the throat and tonsils). The study identified Fusobacterium nucleatum, a common gum disease bacterium, as a likely intermediary—meaning this bacterium may be the link between gum disease and throat cancer development.

- ## Gastrointestinal Tract Cancers

Study 11: Son et al. (2025) - Esophageal Cancer Study
https://pubmed.ncbi.nlm.nih.gov/40831331/
This Korean study compared 4,238 esophageal cancer patients to 16,904 cancer-free controls. Missing teeth increased esophageal cancer odds by 16%, and periodontal disease increased odds by 5%. Poor oral hygiene behaviors like infrequent brushing and skipping dental visits also showed positive associations. The connections were strongest in men, younger adults, people with obesity, smokers, and drinkers.

Study 12: Wang et al. (2024) - Gastrointestinal Cancers Meta-Analysis
https://pubmed.ncbi.nlm.nih.gov/39185624/
This comprehensive analysis of 19 studies with 16.6 million participants found that periodontal disease increased risks across the digestive system: esophageal cancer by 39%, gastric (stomach) cancer by 13%, and liver cancer by 9%. Severe periodontitis nearly doubled the overall gastrointestinal cancer risk. These findings suggest that preventing and treating gum disease might help reduce digestive system cancer risk.

- ## Prostate Cancer

Study 13: Corbella et al. (2018) - Prostate Cancer Meta-Analysis
https://pubmed.ncbi.nlm.nih.gov/29664916/
This analysis examined multiple studies and found that men with periodontitis had a 25% higher risk of developing prostate cancer compared to men with healthy gums. While the association was statistically significant, the authors noted that more standardized research is needed to fully understand this relationship and determine if treating gum disease could help prevent prostate cancer.

Study 14: Michaud et al. (2018) - ARIC Study
https://pubmed.ncbi.nlm.nih.gov/29342298/
This study followed 7,466 people for nearly 15 years and measured gum disease through dental examinations rather than self-reports. Unlike some other cancers studied, researchers found no significant association between periodontal disease and prostate cancer risk in this cohort. This suggests the prostate cancer connection may be weaker or more complex than for other cancer types.

- ## Hematological Malignancies

Study 15: Corbella et al. (2018) - Blood Cancers Meta-Analysis
https://pubmed.ncbi.nlm.nih.gov/29664916/
This meta-analysis found that people with periodontitis had a 30% higher risk of hematological (blood) cancers overall and a 30% higher risk specifically for Non-Hodgkin lymphoma. The study combined data from multiple

research projects to show a consistent pattern linking gum disease to these blood-related cancers, though more research is needed to understand why this connection exists.

Study 16: Kim et al. (2022) - Korean Leukemia Study
https://pubmed.ncbi.nlm.nih.gov/36081548/
This large Korean study followed 713,201 people for up to 10 years. Researchers found that people with periodontitis had a 39% higher risk of developing leukemia (blood cancer) compared to those without gum disease. This association remained significant even after accounting for age, smoking, body weight, and other health conditions, suggesting gum disease independently increases leukemia risk.

- ### Other Cancers

Study 17: Kim et al. (2022) - Bladder and Thyroid Cancers
https://pubmed.ncbi.nlm.nih.gov/36081548/
This Korean nationwide study found that periodontitis increased bladder cancer risk by 31% and thyroid cancer risk by 19%. The bladder cancer association was particularly strong, while the thyroid cancer link was more moderate. These findings remained significant after controlling for smoking, obesity, and other confounding factors, suggesting gum disease may contribute to these cancer types.

Study 18: Ma et al. (2020) - Kidney Cancer and Melanoma
https://pubmed.ncbi.nlm.nih.gov/33029095/
This meta-analysis examined over 100,000 participants and found that people with periodontitis had a 21% higher risk of melanoma (skin cancer). However, the evidence for kidney cancer was less clear—while there was a trend toward increased risk (30% higher), it did not reach statistical significance, meaning more research is needed to confirm this connection.

Study 19: Corbella et al. (2018) - Endometrial Cancer
https://pubmed.ncbi.nlm.nih.gov/29664916/
This analysis found a striking association between periodontitis and endometrial (uterine lining) cancer, with women who had gum disease showing 120% higher risk—more than double the risk of women with healthy gums. This was one of the strongest cancer associations found in the study, though the authors noted that more research with standardized methods is needed to confirm this finding.

Study 20: Michaud et al. (2016) - Advanced Periodontitis and Multiple Cancers
https://pubmed.ncbi.nlm.nih.gov/26811350/
This 26-year study of male never-smokers found that advanced periodontitis (severe gum disease with significant tooth loss) increased risks for several cancers: esophageal and head/neck cancers by 6.3 times and bladder cancer by 5 times. The study showed that even without smoking—a major cancer risk factor—severe gum disease substantially increased cancer risk through immune system dysregulation.

The proposed mechanisms include chronic inflammation, immune dysregulation, and microbial translocation. Either way, when a doctor sees a patient with cancer, one of their primary questions needs to be "When is the last time their patient has been to the dentist?"!!!

Why Testing and Ongoing Monitoring Are Essential

Given these connections, guessing is not an acceptable strategy. Periodontal disease is **microbial and inflammatory**, and different people harbor different pathogenic profiles. Without testing, you're treating blindly. Targeted saliva or plaque testing allows us to:

- Identify specific harmful bacteria
- Assess systemic risk more accurately
- Customize treatment strategies
- Monitor whether treatment is actually working
- Catch recurrence early

Testing turns periodontal care from reactive to **proactive and measurable**. We strongly recommend microbial testing rather than assumptions.

OralDNA: https://www.oraldna.com/test/myperiopath/

Treatment: Precision, Not "Scorched Earth"

Effective periodontal treatment is not about wiping out all bacteria. That approach doesn't work— and it isn't biologically sound. We are symbiotic beings. We NEED our bacteria and all of our microbiome. People who try to live in sterility end up with horrible allergy problems. The key is to figure out the PROPER BALANCE. And not be a nuclear bomb, but rather figure out how to crowd out the harmful elements with the beneficial ones. The goal is to **reduce pathogenic biofilm**, calm inflammation, and support a healthier microbial balance.

Guided Biofilm Therapy (GBT)

Guided Biofilm Therapy is currently the gold standard for professional periodontal care. It allows us to:

- Precisely identify pathogenic biofilm
- Remove it gently and effectively
- Preserve healthy tissue
- Minimize discomfort and tissue trauma

GBT is evidence-based, minimally invasive, and aligned with a biological approach to care.

Why Home Care (and Coaching) Matter So Much

In-office treatment alone is never enough. What happens **between visits** determines long-term success. Unfortunately, most dental offices don't have the time or structure to provide individualized home-care coaching. That's why we recommend working with an oral health coach like Melissa Flynn.

She can help you:

- Build realistic, sustainable routines
- Optimize oral hygiene techniques for *your* anatomy
- Address nutrition in a practical, budget-aware way
- Support detoxification and inflammation reduction without overwhelm

A short overview of foundational home care includes:

- Gentle brushing with a soft brush and non-toxic toothpaste
- Effective interdental cleaning
- Nutrient-dense diet that supports gum and immune health
- Adequate hydration to support saliva flow

The goal is **balance**, not sterilization. A healthy oral ecosystem crowds out harmful bacteria naturally.

Why Testing, Prevention, and Holistic Care Matter

Some sobering realities:

- Approximately **90% of adults** show signs of periodontal disease
- Periodontal disease is associated with up to **50% increased cancer risk** in some studies
- Long-standing gum disease has been associated with a **70% increased risk of Alzheimer's disease**

This is not about fear. It's about **awareness and prevention**. Biological dentistry approaches periodontal disease as a whole-body issue—using non-toxic materials, conservative techniques, and patient education to reduce systemic risk. Testing is vital. You cannot assume you are free of high-risk pathogens without measuring them.

If this list didn't exhaust or overwhelm you and you want MORE... Here is a link with lots more hard science on it.

Pathogens Identified in Root Canals & Cavitations
https://www.orabiologics.com/resource-library/oral-pathogens-%26-systemic-disease%3A-a-scientific-overview

But y'all, this is a TON of work, so I'm not going to promise to summarize those studies like I did these. I think after reading all of these summaries, you get the gist! There is a HUGE link between oral and systemic health. The geek in me needs you to see how important this is if you are a consumer, but also, if you are a healthcare provider, how incredibly important it is for you to talk to your patients about taking care of their oral health with a vetted biological dentist. Biological dentistry isn't just about taking out amalgams safely and pulling teeth and putting and replacing teeth. Biological dentistry is about SCIENCE. And your periodontal health is VITAL to your overall health. If your dentist isn't testing, ask our coaches about testing. If you are not testing your patients as a functional medicine doc, it's time to consider starting! And if you find something you don't like or need help with, then that is what our coaches are for - to help you improve your overall health by addressing your oral health at the root cause level!

Final Thoughts

Your mouth reflects what's happening in the rest of your body. When periodontal disease is ignored, inflammation doesn't stay local—it becomes systemic. When it's addressed early, monitored carefully, and treated thoughtfully, it becomes one of the most powerful leverage points for improving overall health. This isn't about fighting bacteria. It's about restoring balance, reducing inflammation, and supporting the body's innate ability to heal—starting in the mouth.