



Serious science behind every smile™

ORAL HEALTH: A COMPREHENSIVE GUIDE

By Biocidin®

ORAL HEALTH AND BEYOND

The vital importance of oral health is well established. But we are only recently beginning to understand the full ramifications of oral dysbiosis.

Chronic oral inflammatory conditions, such as gingivitis and periodontitis, are common, impacting nearly 50% of the population globally. Beyond that, researchers are discovering what grows in the mouth, will grow in the gut!

This should not surprise us. There are 700+ species of bacteria in the mouth. In one milliliter of saliva, there are 10^8 microorganisms, and we swallow one liter or more of saliva each day. One study that illustrated the relationship between oral and gut health showed that brushing the teeth more frequently reduced levels of candida in the stool!

There is an urgent need for clinicians to actively address patients' oral health, not only for the health of the oral microbiome but also as an integral part of enhancing whole-body health. Functionally, it is important to identify causative factors and implement effective therapeutic strategies.

THE ORAL MICROBIOME AND DYSBIOSIS

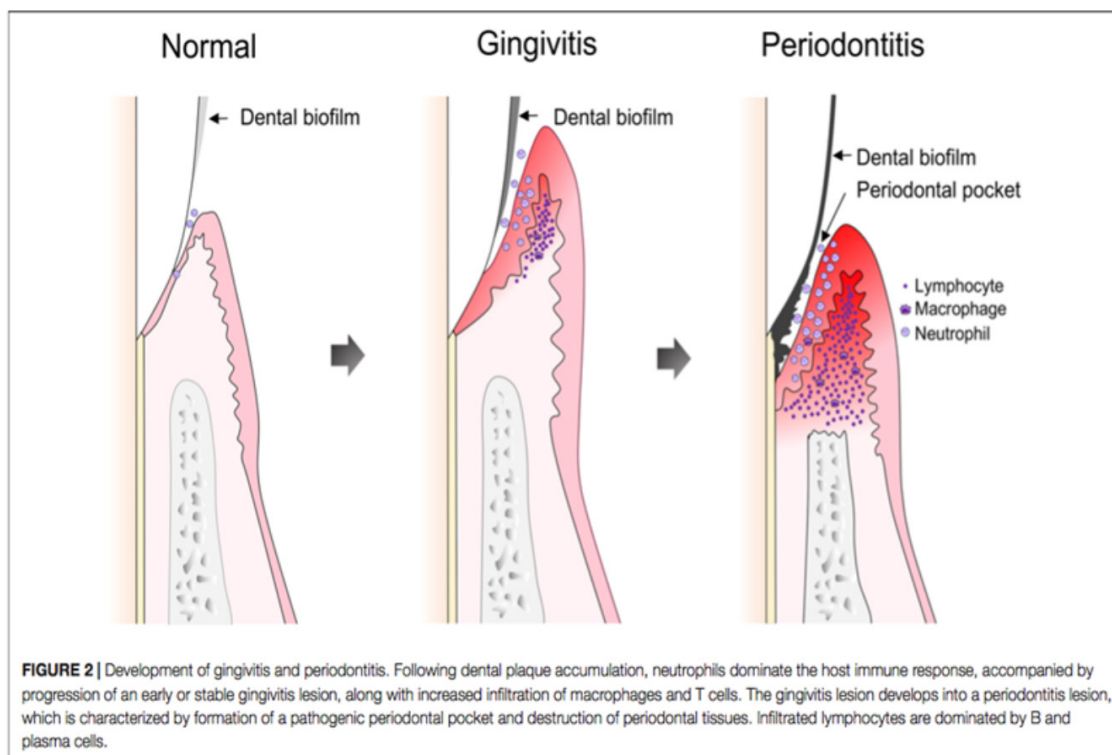
A healthy mouth requires balance in the oral microbiome. In the mouth, there is a complex interplay between microorganisms (bacteria, archaea, viruses, fungus, and protozoans), the immune system, and a variety of habitats in the body. A flourishing microbial community is essential both for oral and systemic health. When there is dysregulation between immune activity and existing microbes, dysbiosis occurs.

MICROBES IN THE MOUTH

Class	Notable Bugs	Associated Illness
Bacterial – a mix of commensals, symbionts, and pathogens	<i>Porphyromonas gingivalis</i>	Periodontitis and systemic illnesses
	<i>Streptococcus mutans</i>	Biofilm/plaque formation
	<i>Treponema denticola</i>	A main etiological bacteria of periodontitis
Fungal	<i>Candida albicans</i>	Biofilm/plaque formation, esophagitis, thrush, GI infection, disseminated systemic illness
Viral	Human papillomavirus	Oropharyngeal cancer
	Cytomegalovirus	Esophagitis, gastritis, enteritis, colitis

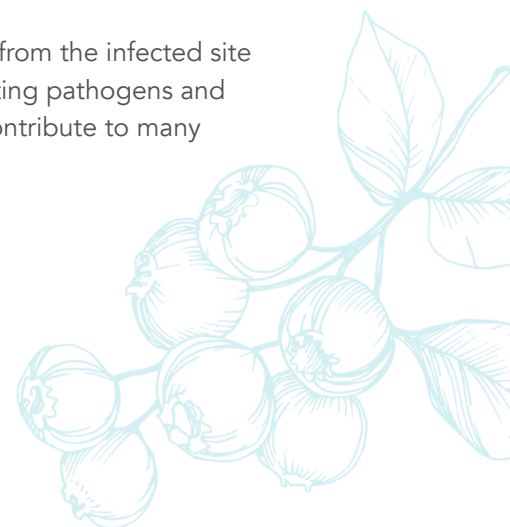
ORAL AND SYSTEMIC IMPACTS

The effects of oral dysbiosis are far-reaching. Most obvious, it causes negative health implications such as caries, periodontitis, endodontic infection, alveolar bone loss, and tonsillitis.



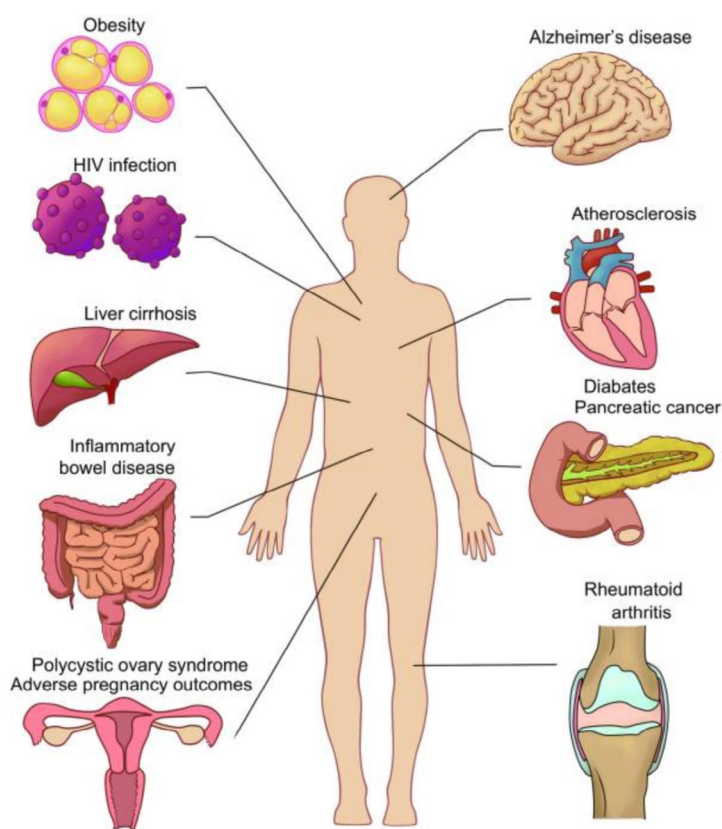
Kriebel K, Hieke C, Muller-Hilke B, Nakata M, Kreikemeyer. Oral Biofilms for Symbiotic to Pathogenic Interactions and Associated disease – Connection of Periodontitis and Rheumatic Arthritis by Peptidylarginine Deiminase. *Frontiers Microbio.* Jan 2018; Vol.9: article 53. with permission.

Research also shows that less than one minute after an oral procedure, organisms from the infected site may have reached the heart, lungs, and peripheral blood capillary system. Circulating pathogens and inflammatory metabolites then result in a rise of system-wide inflammation, and contribute to many common conditions.



SYSTEMIC CONDITIONS RELATED TO ORAL DYSBIOSIS

Neuroinflammation (Alzheimer's, mental health)	Cancer (oropharyngeal, esophageal, colorectal)
Cardiovascular Disease	Appendicitis
Inflammatory Bowel Disease	Obesity
Autoimmunity	Diabetes Mellitus
Respiratory Tract Infection	Abscess (brain, lung, liver, spleen)
Meningitis	Adverse Pregnancy Outcomes



Oral microbiomes and whole-body systemic diseases. Oral microbial dysbiosis contributes to variable systemic diseases processing including gastrointestinal system diseases like inflammatory bowel disease, liver cirrhosis, pancreatic cancer, nervous system diseases like Alzheimer's disease, endocrine system diseases like diabetes, adverse pregnancy outcomes, obesity and polycystic ovary syndrome, immune system diseases like rheumatoid arthritis and HIV infection, and cardiovascular system diseases like atherosclerosis.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5960472/>

BIOFILMS PLAY A SIGNIFICANT ROLE IN THE ORAL MICROBIOME

Biofilm: bi-o-film (noun)

A thin layer of microorganisms adhering to the surface of a structure, which may be organic or inorganic, together with the polymers that they secrete.

Plaque is an example of a biofilm. A biofilm is a living community of various microbial organisms (including bacterial, fungal, and viral species) that stick to each other and attach to surfaces. Teeth provide an ideal, non-shedding surface.

Biofilms can form in less than an hour and offer a way for microorganisms to survive hostile environments. They are responsible for 80% of all infections, including most chronic infections, and are highly resistant to antibiotics.

Neutrophils are the primary immune defense against biofilms in the mouth - but are not effective against biofilm-associated bacteria. As they attack biofilms, they set off an inflammatory cascade that develops into gingivitis, periodontitis, a periodontal pocket, and finally the destruction of surrounding tissue.

RISK FACTORS FOR GINGIVAL AND PERIODONTAL CONDITIONS

- Diets high in refined carbohydrates
- Smoking
- Mouth breathing
- Pregnancy
- Immune suppression



THERAPEUTIC PLAN SUGGESTIONS

Created by Ariana Ebrahimian, DDS

Biocidin® has formulated two innovative oral health care products designed to address microbial imbalances and biofilms simultaneously. These products are designed to be used as a two-part program for complete oral care. Combined with probiotics for microbiome support, lifestyle recommendations, and a regular dental health program, they can pave the way for healthy oral microbial balance.

BIOCIDIN® PRODUCTS

Product	Usage	Key Activities <small>See Product Sheets for ingredient-specific actions</small>
Dentalcidin™ Toothpaste <small>(Step 1)</small>	1 pump on toothbrush, twice daily	Biofilm Disruptor, Immunomodulatory, Microbial Balance, Healthy Inflammatory Response, Antioxidant
Dentalcidin™LS Oral Rinse <small>(Step 2)</small>	Swish with 2 pumps, twice daily after brushing, then spit. Can be used with a Waterpik: 2 pumps in 200mL of water. Trace the gumline of each tooth for approximately 5 seconds, aiming into the gum.	Liposomal technology provides deeper activity. Biofilm Disruptor, Immunomodulatory, Microbial Balance, Healthy Inflammatory Response, Antioxidant
Proflora®4R <small>Probiotics are part of a comprehensive oral health program</small>	1 capsule nightly	Antioxidant, Immunomodulatory, Healthy Elimination, Healthy Gastrointestinal Flora, Microbial Balance

ADDITIONAL SUPPLEMENTS TO CONSIDER FOR ORAL AND GUT HEALTH SUPPORT

Vitamin D3	Regulates genes that affect inflammation and immunity, mood regulation, aids in sleep
Methylated B vitamins	Important for connective tissue health
Vitamins A, C, E	Antioxidant support
Vitamin K2	Gets calcium into teeth and bones
CoQ10 (ingredient in Dentalcidin™LS)	Supports healthy oral mucosa
Omega-3	Helps prevent gum disease, anti-inflammatory

DIET AND NUTRITIONAL CONSIDERATIONS

Foods that may harm oral and gut health	Foods that optimize oral and gut health
Sugar: Cane sugar, high fructose corn syrup, artificial sweeteners, fruit juices	Prebiotics: Dandelion greens, artichokes, asparagus, alliums, resistant starches (e.g., yucca, cassava, plantains, sweet potatoes/yams, taro, jicama)
Gluten: Wheat, barley, rye, spelt, oats, farro, kamut, triticale	Probiotics: Fermented & cultured foods like kimchi, sauerkraut, natto, tempeh, pickles, miso, unpasteurized ACV, tamari, kefir from goat or sheep
Vegetables: White potatoes, corn	Organic fiber-rich foods: Avocados, beans, brassicas, nuts & seeds, leafy greens, seaweed, mushrooms, pumpkin seeds
Lectins: Legumes, nightshades, cashews, chia	Polyphenols: Extra virgin olive oil, cranberries, green tea, blueberries, raspberries, blackberries, cherries, pomegranates, red wine, Tartary buckwheat, dark chocolate (the more bitter the better).
Cow's milk dairy	Wild-caught, sustainable seafood: Alaskan salmon, shrimp, squid, oysters, clams, mussels, sardines, anchovies
Refined oils: Soy, grapeseed, corn, peanut, cottonseed, safflower, sunflower, partially hydrogenated, vegetable, canola	Healthy fats: Coconut oil, MCT oil, avocado oil, cod liver oil, grass-fed ghee, flax oil
Highly processed/packaged food	Pasture-raised, regeneratively farmed meats
Alcohol	
Glyphosate-laden produce	

ADDITIONAL SUGGESTIONS:

- Recommend regular cleanings and oral health exams for proper prevention and early detection.
- The oral and GI microbiomes are intimately related. You can address dysbiosis originating in the GI tract with our [Bioclear™ Cleansing Program](#).
- Recommend patients drink plenty of purified water for salivary formation and flow.
- Evaluate lifestyle factors (assess smoking, alcohol consumption, and stress).
- Encourage regular brushing and flossing to help with the mechanical reduction of biofilms.

REFERENCES

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6057715/>
2. <https://www.nature.com/articles/sj.bdj.2016.865>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5274568/>
4. https://www.jstage.jst.go.jp/article/internalmedicine/advpub/0/advpub_2908-19/_article-HPV
5. <https://www.mdpi.com/2304-6767/6/2/10/htm>
6. <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1600-0757.1994.tb00019.x?sid=nlm%3Apubmed>
7. <https://www.ncbi.nlm.nih.gov/pubmed/29563402>
8. <https://www.tandfonline.com/doi/full/10.1080/20002297.2019.1650597>
9. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5797574/>

