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## Functional Dentistry: How Dentists Can Affect the Chronic Disease Epidemic in our Nation

It's no secret Americans are getting sicker quicker evidenced by the alarming statistics of chronic disease reaching even into our youngest population. Today 48.9 percent of Americans are on at least one pharmaceutical drug, 23.1 percent on 3 or more and 11.9 percent on 5 or more.<sup>i</sup> More alarming is 1 in 5 children are classified as obese. According to the CDC's report in 2015-2016, "the prevalence of obesity was 39.8 percent in adults and 18.5 percent in children aged 2-19," a huge increase from 30.5 and 13.9 percent in 1999.<sup>ii</sup>

Dental caries rates in children, showed a steady decline from the 1970s until the mid-1990s when the trend started to significantly increase.<sup>iii</sup> And overtaking caries as the most prevalent chronic disease in our youngest citizens, sleep disordered breathing symptoms are estimated to affect 9 out of 10 children.<sup>iv</sup> The lack of recognition and proper diagnosis of this epidemic is leading to skyrocketing numbers of prescriptions for ADHD and depression in our most vulnerable population.

What is going on and how can we as dentists help reverse these startling trends? According to the CDC in 2016, 84.6 percent of children 2-17 visited a dentist in the previous year and 64.3 percent of adults did the same.<sup>v</sup> We often see patients twice a year, 50 percent more than their physician if they only go for annual well visits. Therefore, we have the unique opportunity, and often more face time, to recognize signs of imbalances and help prevent overt disease before it manifests in disabling symptoms.

The Standard American Diet, aptly abbreviated SAD, exceeds the recommended intake levels of calories from saturated fats, added sugars, refined grains, sodium, and adulterated fats.<sup>vi</sup> According to the quoted study, reducing sodium intake by 1200mg per day "could save up to \$20 billion a year in medical costs." Think of that staggering cost reduction by one simple change in our habits. We all know our medical system is in peril and is crippling the overall economy with no answers in sight. What if educating the population about these simple diet and lifestyle changes could impact the future of our healthcare system? Who can help educate the populace about these changes and have a positive impact on our future?

As dentists we are physicians of the masticatory system, as Pete Dawson states. He believes no dentist can practice at the highest competency "without an understanding of how the teeth relate to the rest of the masticatory system, including the TMJs."<sup>vii</sup> The key to successful treatment outcomes lies in proper diagnosis. Therefore, I propose a step further. We should be experts not only in diagnosis and treatment of problems in the teeth and gums, but we should also understand how the entire oral cavity and associated structures, function and interact with the rest of the body for ultimate health. The mouth after all is the gateway to health. The gut begins in the mouth, and it has been well established in recent years how our gut health is the cornerstone of overall health. As Hippocrates stated in 400BC, "All disease begins in the gut." We know 80 percent of our serotonin is produced in the gut. Experts call the gut the second brain due to the immense network of nerves lining the entire GI tract called the enteric nervous system. In addition, 80 percent of our immune system lies below the gut lining, therefore it is crucial to keep the gut healthy and in balance.

The germ theory of disease was first proposed back in 1546 but for centuries competed with the miasma theory or early day homeopathy. Louis Pasteur and later Robert Koch are credited with

expanding the study of bacteriology and the assumption microorganisms cause disease. With the advent of vaccines and antibiotics, this theory has continued to persist as the way disease develops, despite the work of Royal Rife's which showed "microorganisms are pleomorphic, they can change, and often do." A bacterium can mutate into yeast or fungus and back again. Royal Rife saw this and even photographed it. He even saw a bacterium "poop" out viruses, as he described it.<sup>viii</sup> Other contemporaries of Pasteur including Bernard and Bechamp proclaimed it is the environment in which germs live and not the germs themselves that create disease. To this day, this germ theory persists because the pharmaceutical industry is a multibillion-dollar industry. Traditional and natural remedies can not be patented and therefore have been pushed to the wayside and practitioners labeled "quacks". However, it is Eastern medicine and traditional homeopathy which understood even thousands of years ago the body has the innate ability to heal itself if given the proper environment. To quote Hippocrates again, "It is more important to know what sort of person has a disease than to know what sort of disease a person has." With this in mind, we can step back from labeling people with diseases and instead look at the processes occurring in each unique body to determine where the appropriate support is needed.

Fortunately, functional medicine is becoming more widespread as many people spurn our disease care system and look for alternative means of wellness. Can dentists also adopt this functional view of health?

In dentistry, we are trained to eradicate bacteria at all costs. We must remove all forms of germs with bactericidal mouthwashes and drugs, cut out the decay as soon as it's evidenced on a radiograph, meanwhile ignoring the terrain or ecosystem of each individual patient. Is this effective? In many cases, reducing the quantity of aggressive bacteria is crucial for helping a person heal, but why did that person develop such an imbalance of bacteria? We've all heard our patients state, "It is genetics" OR "Soft teeth run in the family." It is no longer accepted by the scientific community to blame genes on every disease state. We know through the field of epigenetics environment plays a much larger role in the development of disease, and therefore as dentists, we can have an impact by helping to recognize and correct the diet and lifestyle factors that allow the expression of faulty genes.

We are taught in dental school about the link between periodontal disease and cardiovascular disease risk as well as the association between gingival health and diabetes. That common link is inflammation. And as we know, inflammation is a major contributor to most chronic diseases. Therefore, as dentists we are in the position to identify this inflammation and provide treatment and education to not only help heal the oral cavity but effect changes throughout the entire body.

We now have access to salivary screening tests in which we can monitor pH, cariogenic bacteria, buffering capacity, blood, leukocytes, protein and ammonia. These inexpensive, noninvasive modalities allow us to monitor the inflammation at the root of so much disease. Over time we can objectively see if our recommendations are making a positive impact on our patient's health. This data allows for conversation with our medical colleagues to give our patients a truly wholistic view of their health and work in cooperation to provide the complete care our patients deserve.

If a patient presents with high blood pressure, cholesterol, and or arthritis this should inform us of underlying inflammation in the body. How does that manifest in the mouth? Could the condition of the oral cavity be contributing to the inflammation? There is much evidence of how heavy metals contribute to toxicity throughout the body. The World Health Organization in a 2005 Policy Paper wrote: "Adverse health effects from mercury exposure can be: tremors, impaired vision and hearing, paralysis, insomnia, emotional instability, developmental deficits during fetal development, and attention deficit and developmental delays during childhood. Recent studies suggest mercury may have no threshold below which some adverse effects do not occur."<sup>ix</sup> However it is extremely important to remember

individual response to mercury varies, and some of the factors known to potentially impact those exposed to mercury include their allergies, diet, gender, genetic predispositions to adverse reactions from mercury, the number of amalgam fillings in the mouth, and concurrent or previous exposures to other toxic chemicals such as lead (Pb).<sup>x</sup> Could there be a link between a patient's restorations and disease?

One problem we often face as dentists in trying to treat recalcitrant periodontal problems, is the issue of biofilms. We know bacteria and fungi can hide within these fortresses and once the onslaught of drugs is removed, can multiply tenfold. Meanwhile, our intensive antibiotic protocols have successfully eradicated the healthy bacteria in the gut responsible for assimilating vitamins, minerals, and activating proper defense mechanisms in the rest of the body. Therefore, we greatly compromise the gut, immune, and nervous system. In addition, we enhance the compromised terrain which allows the microbes and toxins to propagate and wreak havoc on our systems. In April of 2019, an article published in Nature Magazine showed "putative periodontopathogens are present in health at low levels, but changes to the subgingival nutritional environment increase their competitiveness and drive deleterious changes to biofilm composition."<sup>xi</sup> From this knowledge, we must rethink the treatment of disease from eradication to instead enhancing the healthy bacteria by normalizing the environment in which healthy bacteria survive. There are several companies making oral probiotics and remineralizing toothpastes that try to recreate the healthy environment to prevent major oral disease with crucial vitamins, minerals, and prebiotics.

As clinicians we vow to do no harm. We must have a better understanding of how our treatments affect the overall body system and take a thorough history of a patient's medical background. Childhood illnesses and tendencies can be clues to the body's susceptibility to certain disease states. We must ask about diet, exercise, and sleep habits. We can no longer spout good oral hygiene and fluoride regimen as the most effective ways to treat oral disease. Dr Steven Lin writes in his book, *The Dental Diet*, it is poor nutrition and especially lack of fat-soluble vitamins and minerals like calcium, that underlie most dental problems.<sup>xii</sup> After all, a cavity in a tooth is due to the imbalance of remineralization and demineralization that takes place daily. It is a lack of enamel hardening minerals NOT the lack of fluoride. Our food supply has had a steady decline in necessary minerals over the last few decades.

In 2004, a team of researchers from The University of Texas published a study in the *Journal of the American College of Nutrition*. Their evaluation of nutritional data from the U.S. Department of Agriculture from both 1950 and 1999 for 43 different vegetables and fruits, found "reliable declines" in the amount of protein, calcium, phosphorus, iron, riboflavin (vitamin B2) and vitamin C over the past half century.<sup>xiii</sup> The researchers believe this declining nutritional content is due to interest in improving traits like size, growth rate, and pest resistance over nutritional aspects. These practices have led to serious deficiencies in our soil and therefore in our bodies.

One major mineral responsible for over 800 enzymatic reactions in the body and is often cited as being deficient in poorly rotated, over fertilized and overused agricultural plots is magnesium. Magnesium deficiency affects a disproportionate number of us. One reason is depleted food sources, another an increase in our food and water supply of fluoride and chlorine which bind up magnesium making it unusable, and of course, another is stress.<sup>xiv</sup> As dentists, we know magnesium along with calcium are the two major minerals in sound enamel. Without magnesium, calcium cannot solidify and therefore, cannot maintain mineralization and resist acid attacks. Our children suffer disproportionately with typical diets of refined grains, added sugars and bad fats. How can they possibly build healthy mouths and bodies without the necessary raw materials?

Dr. Weston Price, a dentist who traveled the world in the 1930s, is often cited for his incredible work in understanding caries and malocclusions only occurred in populations where industrialized foods and

lifestyles had been undertaken. In native populations eating their native diet, there was a complete absence of dental disease. However, once these populations were introduced to Western ways, they developed dental disease at the same rate as the rest of the population.<sup>xv</sup>

Like our physician colleagues, we learn little if anything about nutrition in our doctorate curriculums. Many of us are not equipped to counsel our patients on nutrition; however, we should be equipped to note inflammation, infection, swelling, malocclusions, narrowed airways, and dysfunctional occlusions. We should be educating ourselves about the root causes for these maladies and use our network of providers to direct our patients to the right practitioners to heal the underlying deficiencies and therefore prevent disease. We should recognize periodontal disease as an autoimmune attack as we know this disease is a result of the body's defense mechanism resorbing bone in response to endotoxins. Since all autoimmunity begins in the gut, if we are not equipped ourselves to treat gut issues, then we should be referring to health coaches and functional medicine doctors.

As experts of the mouth, we should be able to diagnose color changes in the oral mucosa, tongue and oropharynx. One way to familiarize ourselves with the connection of the mouth to the rest of the body is to understand the Chinese meridian system. The Chinese mapped out 12 different pathways of energy that connect the entire body. These pathways cannot be detected by any western means but have been verified by recent studies and are how and why acupuncture is so effective for multiple maladies. Dr Jerry Tennant, an ophthalmologist, who became extremely ill with encephalitis, eventually brought himself back to health by understanding the working of every cell. We, like everything on Earth, are energetic beings. Our heartbeats and brain waves can be measured today. Without the proper frequency and voltage of energy throughout our body, minerals cannot travel through cell membranes and our organs cannot communicate with each other. Dr Tennant believes every tooth acts as a circuit breaker for each of these 12 meridians. For example, an upper first molar lies on the breast meridian, so an infected #14 in a woman with a BRCA gene should be counseled about the connection. Dr Tennant has collaborated with multiple oncologists and found in over 90 percent of cancer patients, there was an infected tooth along the same meridian of the cancer.<sup>xvi</sup> Remove the infection and we remove one obstacle to ideal health.

Dentistry is the only medical profession that keeps necrotic tissue in the body by way of root canals. Infections or dead tissue anywhere else in the body is treated or cut out. Many holistic and biologic dentists adamantly oppose root canals. They can cite various studies which prove 100 percent of root canaled teeth harbor some form of toxins even in apparently "healthy" looking root canals evidenced by radiographs. Dr. Tennant believes each root canal can decrease the energy in the circuit by 60 percent. Therefore, and especially in otherwise healthy individuals, not all root canals cause problems for the patient. It is when a patient becomes ill or lives with a chronic illness that we must look at the mouth and decide if there is anything that could be contributing to the illness and remove the obstacle so the body can heal. I keep a laminated copy of the tooth meridian chart in every operatory and use it to educate my patients about how things may be related in the body and how we can uncover the root of their issues.

What about the tongue? Chinese and Ayurvedic medicine also link illnesses to the status of the tongue. We are trained as dentists to look for oral cancer, but what about discoloration of the tongue, fissures, teeth marks, size? Deep fissures in the tongue often represent digestive weakness, many cracks signify dehydration. Teeth marks also indicate digestive problems due to a swollen tongue. The dental community often cites teeth marks as a sign of apnea.

Airway has become a hugely hot topic in dental circles today. We know apnea can cause or is caused by numerous health problems like acid reflux, stroke, heart attack, etc. But what we are just learning is the problem of small airways and malocclusions can be caught early and corrected in our children. As mentioned previously, 90 percent of children have at least one sign of disordered breathing. The

alarming rates of ADD/ADHD, depression, and anxiety are on the rise. Could it be connected to the lack of oxygen our children are getting while they sleep? Did you know bedwetting could be a sign of poor oxygenation? Children paradoxically become hyperactive when tired, and it has been assumed for years this behavior is psychological and must be dampened with medication. Imagine correcting a tongue tie, tongue thrust, improper swallowing and narrowed airways while a child is growing? A side effect: properly proportioned jaws allow the natural, straight eruption of teeth. I see insufficient jaws in almost every child I treat. What is the cause for this? Epigenetically, our nutritionally poor diet and habits are contributing to this trend. Our children are soothed with pacifiers and bottles way too long. Our children's first foods are soft and now come in handy squeeze pouches, both which prevent the proper development of strong jaws and proper lip support. If we can recognize these signs of improper development, we can intervene early on in a person's life and have a dramatic effect on health in the long term. There are several companies like Myobrace, Healthy Start and Vivos which understand the implications of these problems and can help dentists to intervene and treat them.

But what about adults? The CPAP machine is still the gold standard for sleep apnea, but many dentists argue dental devices can be as good if not better in some cases of apnea. The main issue lies in the narrow arches, retruded mandible and often swollen tongue. By trying to either force air down the airway or pull the mandible forward, we are still not addressing the issue of the box itself. Are there ways to increase the arches in adults? Yes, and if we genuinely want to get at the root cause for apnea, we need to be looking to expand the arches, train our patients to breathe through their noses and strengthen the airway itself through voice exercises. One simple tool is to use microfiber tape while you sleep. This encourages nasal breathing which we know is crucial to produce the nitric oxide necessary to dilate blood vessels so oxygen can be properly escorted throughout the body. Nitric oxide, a crucial molecule for cardiovascular health, is produced during nasal breathing with the help of oral bacteria. So, if we eradicate oral flora with harsh mouthwashes and antibiotics, are we negatively affecting our patient's cardiovascular health?

I was writing my first draft of this article on an airplane and as we prepared to land, I felt a tap on my shoulder from a woman behind me. She said, "I couldn't help reading your paper." How she could see between a 2-inch gap in an airplane seat is beyond me, but she went on to tell me she had always had an extremely healthy mouth and recently was diagnosed with periodontal disease. She was so confused and upset and went on to mention she was also recently diagnosed with diabetes. No one had made the connection for her until she read my paper. She profusely thanked me for enlightening her of the whole-body connection and hoped I would publish my article to help many more like her. So, I ask all of you reading, if I can help one woman educate herself about her own health journey by squinting to read a rough draft of a plea to dentists, in size 11 font, and dramatically alter her life, what can you do?

## References

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- <sup>i</sup> Centers for Disease Control and Prevention. Therapeutic Drug Use. Health Table 79 2017.
- <sup>ii</sup> Hales Craig M, Carroll Margaret D, Fryar Cheryl D MSPH, Ogden Cynthia L. Prevalence of Obesity Among Adults and Youth. United States 2015-16. NHCS Data Brief No 288 October 2017.
- <sup>iii</sup> National Institute of Dental and Craniofacial Research. 2018. Dental Caries in Children Age 2-11.
- <sup>iv</sup> Stevens Brooke Bergersen Earl O. *Sleep Disordered Breathing*. JAOS Winter 2016 p24-28.
- <sup>v</sup> Centers for Disease Control and Prevention. Oral and Dental Health. Health table 60 2017.
- <sup>vi</sup> Presidents Council on Sports Fitness and Nutrition. US Health and Human Services Department 2010. *Healthy People*.
- <sup>vii</sup> Dawson Pete. *Functional Occlusion From TMJ to Smile Design* Mosby Elsevier 2007.
- <sup>viii</sup> History of Medicine. 2017 Louis Pasteur and the Myth of Pasteurization. Wellness Journeys.
- <sup>ix</sup> World Health Organization. *Mercury in Health Care*. 2005.

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<sup>x</sup> **FACT SHEET ON HUMAN HEALTH RISKS FROM DENTAL AMALGAM MERCURY FILLINGS**

Prepared by the International Academy of Oral Medicine and Toxicology. 2016.

<sup>xi</sup> Monika Naginyte, Thuy Do, Josephine Meade, Deirdre Ann Devine & Philip David Marsh.

*Enrichment of periodontal pathogens from the biofilms of healthy adults*. Nature Magazine 2 April 2019.

<sup>xii</sup> Lin Steven. *The Dental Diet*. Hay House Carlsbad CA 2018.

<sup>xiii</sup> David Donald PhD FACN, Epp Melvin PhD, Riordan High D MD. *Changes in USDA Food Composition Data for 43 Garden Crops, 1950 to 1999*. Journal of American College of Nutrition. Vol. 23, No. 6, 669–682 (2004).

<sup>xiv</sup> A Machoy-Mokrzynska. FLUORIDE-MAGNESIUM INTERACTION (Guest Editorial) (Institute of Pharmacology and Toxicology, Pomeranian Medical Academy, Szczecin, Poland) Fluoride (J. of the International Society for Fluoride Research), Vol. 28 No. 4; November 1995, pp 175-177

<sup>xv</sup> Price Weston. May 1999. *Nutrition and Physical Degeneration*. Keats Publishing Originally published 1939.

<sup>xvi</sup> Tennant Jerry MD MD(H), Psc.D. 2013. *Healing is Voltage*.