



Complete Dentists are Gatekeepers for General Health

DeWitt C. Wilkerson III, DMD

Dental Health Total Health

The Complete Dentist's ever-expanding paradigm includes the role of **Gatekeeper for Systemic Inflammation & Total Wellness**.

The world of medicine is exploding with significant research about what is required to be healthy for a lifetime. Researchers agree that systemic **inflammation is a major source of chronic illness, disease, and premature death**. The Complete Dentist's team can provide an invaluable service by screening for several major sources of systemic inflammation, including: oral pathogens, sleep apnea, pro-inflammatory diets, toxins (smoking), lack of physical activity, and stress. The dental team can play a major role in the lives of thousands of people, enhancing their quality of life and longevity, through science based counseling and total wellness services.

We look forward to inspiring you to envision the potential you have as a team to change lives – **including your own**, by embracing a Total Wellness strategy, that will make you completely exceptional dental health professionals!



The Complete Dentist is committed to the total health of each patient.

Dentistry is a medical specialty, as is, for example, ophthalmology and otolaryngology. A Complete Dentist recognizes the oral cavity as a portal to the whole body. This portal connects the mouth to the bloodstream, through the vascular teeth pulps and periodontal tissues; the gastrointestinal/respiratory tracts, through the pharynx; and can manifest localized tissue changes that reflect systemic disease. The dental team is ideal for serving as a medical “gatekeeper” for several factors of total health.

Three primary areas of total health, in which the Complete Dentist can provide valuable medical input, include: Oral/Vascular/Systemic Health, Sleep Disordered Breathing and Whole Body Wellness. In each area, we will review the basic science, patient education, medical testing and therapy options.

Oral/Vascular/Systemic Health

Basic Science

For many years, the American Heart Association has provided guidelines for the usage of prophylactic antibiotics before dental cleanings, to prevent bacterial infections in the bloodstream, organs and post-surgical sites. It is recognized that bleeding of the periodontal tissues allows certain pathogenic oral bacteria to enter the bloodstream. These pathogens can lodge on artificial heart valves and cause a life-threatening endocarditis. They have been found in biopsies of failed artificial hip and knee replacements. These are examples of acute infections, traditionally thought to be preventable, through a single pre-treatment dose of an appropriate antibiotic. But is that the whole story?

Periodontal disease is one of the major causes of inflammation in the body. From ongoing studies, acute bacteremia is not the whole story of the impact of oral pathogens on systemic health. There appears to be a clear relationship between what is happening in the mouth and thickening of the carotid arteries. Research has shown that gum health improvement can slow down the progression of arteriosclerosis, or narrowing of the arteries, as observed utilizing carotid intima-medial thickness (CIMT) testing.

Bacteria from the mouth are thought to be associated with the progression of arteriosclerosis in several ways. They may trigger an immune response to an increase of the blood levels of inflammatory markers such as cytokines, Interleukin-1B, C-reactive protein(CRP), and Lp-PLA2. These may exacerbate the inflammatory component of arteriosclerosis.

The relationship between periodontitis and diabetes has been extensively studied. The high blood sugar levels associated with diabetes can cause both circulatory problems, as well as increased glucose availability to sugar loving oral bacteria. This can increase the risk of periodontal disease 2.5–3.5 fold. Diabetes is a major risk factor for developing periodontal disease. There is also another side to the story. The diabetic patient’s condition can be greatly exacerbated by the presence

of infection or inflammatory disease. Periodontal disease is both infectious and inflammatory, locally and systemically, when pathogenic bacteria enter the bloodstream. Hemoglobin A1c, an inflammatory marker for diabetes, has been shown to respond favorably to periodontal therapy.

Oral bacterial pathogens within the vascular system have been linked to heart disease, diabetes, strokes, cancer, autoimmune diseases and pregnancy complications.

Patient Education

The importance of understanding the destructive effects of harmful bacteria, both in the mouth and throughout the body, should be a very familiar story to every patient. Dr. Michael Schuster calls this doctor-patient discussion “The Dreadful Story.” Harmful bacteria ingest sugar, excrete acids, dissolve enamel, inflame gums and surrounding bone, cause bleeding and bone loss around teeth, eventually causing the teeth to be lost. But there’s more to this dreadful story. These bacteria also enter the bloodstream and cause havoc throughout the body.

The goal of our care is to destroy the harmful bacteria, through all means necessary, and control them throughout the patient’s lifetime. This promotes both dental health and total health.

Medical Testing

There are over 600 types of bacteria in the mouth and over 6 billion total! Most of these bacteria have a symbiotic relationship with the human body. The bacteria in the gastrointestinal tract play important roles in nutrient digestion, vitamin synthesis, energy metabolism and immune responses.

A handful of the oral bacteria are opportunistic pathogens. These are the bacteria that need to be tested for, treated and controlled.

Medical testing is available to evaluate the presence and concentrations of pathogenic bacteria. The two most popular methods for testing include:

1. Oral rinses, that are swished in the mouth 30–60 seconds, then expectorated into a collection tube, providing a salivary sample. The sample is sealed and sent to a medical laboratory for analysis. A report is generated within several days. For more information visit www.mygenetx.com.
2. Paper points, like those used in endodontics, are placed strategically in the periodontal pockets of 4–5 teeth with the highest probing numbers.

After 20 seconds, the paper points are removed and placed in a sealed vial for laboratory analysis and reporting. For more information visit www.hain-lifescience.de/en.

Bradley Bale, M.D., co-developer of the Bale-Donnen Method for preventing heart attacks, uses a salivary sample for oral pathogens on every one of his high risk, cardiac care patients. If the laboratory results are above normal, he refers the patient to a dentist to evaluate and treat for periodontal disease. As a cardiologist, he has documented cases where he believes that periodontal disease and abscessed teeth have been significant sources of infection and inflammation, challenging the immune system, and associated with atherosclerosis and elevated risk for heart attacks.

Medical testing, through a simple fingerstick blood sample, collected in the dental office, is a means to evaluate the three systemic inflammatory markers most highly associated with cardiovascular

disease, diabetes and periodontal disease: hemoglobin A1c, C-reactive protein, and Lp-PLA2 (Plac test). When inflammation is observed locally in the mouth, this single test for all 3 markers can be run.

The author recently evaluated a new patient who had generalized gingival inflammation, bleeding on probing, and several areas of purulence, with no known medical complications. A fingerstick blood sample was collected and sent to the laboratory. The results revealed an elevated hemoglobin A1c, consistent with a diagnosis of diabetes. The patient was counseled and referred to an endocrinologist.

Testing is also available for the pro-inflammatory cytokine interleukin-1 (IL-1), a genotype marker for hereditary susceptibility to systemic inflammation. This test is recommended for patients with a family history of periodontal or cardiovascular disease, even before the signs of disease are clinically present.

Therapy Options

The traditional therapy for controlling periodontal disease-causing bacteria has been through:

- Mechanical removal of the bacteria, utilizing ultrasonic cleaning (cavitron) and hand instrument root planing and curettage (RP&C) below the gumline
- Home care instructions for flossing, brushing and oral rinses
- Periodontal surgery for elimination of persistent periodontal pockets around individual teeth, greater than 3-4 millimeters, following steps 1 and 2
- Several additional therapy options have proven to be very successful, when appropriately utilized. These include the selective usage of:

Lasers

Light energy sterilizes the site where pathogenic bacteria harbor beneath the gumline. It stimulates the production of new, healthier bone in the wound site and promotes healing of soft tissue.

Antibiotics

Antibiotics are site specifically placed in the infected periodontal pockets to kill the pathogenic bacteria directly. Antibiotics are also administered orally to selectively eliminate the undesirable bacteria. This should be preceded by testing for specific pathogens, using the salivary test or paper points. Specific antibiotic dosages and combination regimens are used depending on the test results.

Periodontal Trays

Customized periodontal trays are used to carry medicaments under the gumline to the pathogenic bacteria (www.perioprotect.com). One protocol uses a formulation of hydrogen peroxide, releasing a high concentration of oxygen into the wound site, promoting both wound healing and killing the anaerobic bacteria, which thrive in the absence of oxygen and die in the presence of oxygen. It has been reported that over 95% of the pathogens can be eliminated in 14 days.

Non-antibiotic Antimicrobial Agents

Antimicrobial agents have been developed to destroy bacteria, without the concerns associated with the use of antibiotics, that being the development of antibiotic-resistant strains of bacteria, so-called “superbugs.”

One example is a gel containing silver nanoparticles. The stable molecule contains silver ions which disrupt bacterial cells when they are in contact with one another. Used in wound care, burns and periodontal therapy, the silver molecules inhibit bacterial reproduction, while chemically bonding to degradate bacterial cell walls.

The dental team plays the primary medical role in treating the pathogenic bacteria that destroy the health of the teeth and their supporting structures, as well as the adverse inflammatory effects of these oral bacteria, challenging the immune system and total health.

Sleep Disordered Breathing

Basic Science

During sleep, air should move unimpeded in and out of the lungs through the mouth and/or nose, just as during waking hours. If the normal breathing pattern is disrupted while asleep, “sleep-disordered breathing” (SDB) occurs. This refers to several breathing disturbances, including snoring, respiratory effort-related arousal (RERA), hypopnea, and apnea.

Snoring occurs when air crosses a narrowed throat creating a turbulent, audible vibration in the region of the soft palate, uvula and tongue. This may produce hard breathing and even arousals or RERAs. If airflow slows significantly, but not completely, hypopnea (shallow breathing) may occur. If airflow ceases during sleep for greater than 10 seconds, it is called an apnea (apneic) event. Obstructive sleep apnea (OSA) refers to blockage of the upper airway, producing apneas and hypopneas in the throat region. It is important to recognize that OSA-like events can occur due to blockage of the nasal passages due to deviated septum, blocked nasal turbinates, and nasal polyps, in those who breathe through the nose while sleeping. Central sleep apnea (CSA) refers to apneas and hypopneas occurring due to failure of the central nervous system to generate a neurologic signal to breathe. Much less common than OSA, CSA typically occurs in the presence of serious health histories such as congestive heart failure, stroke and kidney failure.

Snoring is a sign of an airway obstruction and should be considered a clinical “red flag” for the presence of sleep apnea. Sleep apnea represents a very serious health risk.

Richard Bonato, Ph.D., inventor of the Medibyte home sleep recorder, refers to sleep apnea as “the wake up gasping, choking, die in your sleep disease”...and by-in-large, undiagnosed!

OSA occurs during the early onset of sleep, as the airway narrows. This is caused by relaxation of the soft palate and tongue, dropping to the back of the throat. Enlarged tonsils, adenoids, and excessive weight contribute to the obstruction. Snoring, RERAs, hypopneas, and apneas reduce airflow through the lungs. This results in hypoxemia (low blood O₂) and hypercapnia (high blood CO₂). When the oxygen saturation in the blood drops to a critical level, a “flight or fight” response

is stimulated – the person is choking to death. In response to this emergency, the sympathetic nervous system stimulates the pituitary and adrenal glands to release the stress hormones ACTH, cortisol and adrenaline (epinephrine). The heart rate rapidly increases, arousal from sleep occurs, the airway opens, there may be a gasp for breath, and then breathing normalizes... temporarily. Following correction through the neural response, muscles relax, sleep is resumed and the vicious cycle is repeated.

Chronic OSA has significant total health implications. It is associated with increased blood pressure, cardiac arrhythmia, Type 2 diabetes (cortisol increases blood sugar levels), metabolic changes associated with weight gain/obesity, gastric reflux (negative pressure in the airway, positive pressure in the diaphragm), daytime fatigue and sleepiness, poor mental sharpness, depression, fibromyalgia, chronic fatigue syndrome, restless leg syndrome, reduced libido, headaches, TMD symptoms, dental wear due to sleep bruxism, increased risk for motor vehicle accidents, heart injury and heart attacks, strokes, organ failure and death.

Reggie White, a member of the National Football League Hall of Fame, died at age 43, during the early morning hours, while sleeping. The medical examiner's report stated White most likely died from an inflammation of his lungs and heart, stating sleep apnea may have significantly contributed.

Patient Education

Snoring is an ideal topic to begin patient education. The fact that snoring is a significant “social disease” is helpful. The frustrated partner, who is losing sleep, and therefore sleeping in a separate

Every patient should be personally familiar with the signs and symptoms of sleep-disordered breathing.

bedroom, is very motivated to address the problem. This is a very common situation. If you laugh, the world laughs with you, if you snore, you sleep alone!

It is estimated 50–70 million Americans suffer from one or more sleep disorders, of which 18 million have OSA. Conclusion: there must be a lot of Americans (and elsewhere) sleeping alone!

Patients are asked pertinent screening questions, which we will review, introducing them to this important health topic. Obstructive sleep apnea is the most commonly undiagnosed, serious health risk, that is easily screened in a dental office.

Medical Testing

Every patient should be screened and appropriately medical tested for sleep-disordered breathing.

Screening involves a four step process:

1. History Questionnaire

The written history should include the **STOP tool**:

- S-** Do you Snore?
- T-** Are you tired during the day?
- O-** Have you been observed gasping, or stop breathing in your sleep?
- P-** Do you have high blood pressure?

Additional questions that may relate to sleep-disordered breathing include a history of: gastric reflux, diabetes, fibromyalgia, cardiac arrhythmias, restless leg syndrome, headaches, weight gain, depression, alcoholism (respiratory depression), sleep bruxism and TMD symptoms.

It is helpful to group these questions together on the health history form, observing for multiple positive responses that may be linked.

2. Written Screening Tests

Sleep physicians routinely use the popular **Epworth Sleepiness Scale (ESS)** to screen for a subject's likelihood to doze off or fall asleep in eight common daytime situations. An example would be sitting and reading. A self-scored response for each situation has a range of 0–3: 0 = would never doze, 3 = high chance of dozing. If the sum total for the eight responses is 9 or higher, the subject is considered to have a sleep problem that should be tested further. The ESS can be found on the internet and downloaded. As of the time of this book, I am using the ESS in my private practice to educate and screen for sleep disorders. My patients are administered the ESS before routine dental visits as a quick survey and **I have found it to be a very effective tool to introduce the topic of sleep-disordered breathing with our patients.**

Another excellent screening test is the **Berlin Questionnaire**, which includes 10 questions about snoring, fatigue and blood pressure. It can also be found and downloaded online.

3. Clinical Screening

Dentists and hygienists are the ideal health care providers to clinically screen patients for possible airway obstruction. Following a thorough screening history, clinically screen the following visible risk factors:

A) Neck circumference

A thick neck may narrow the airway and may be an indication of excess weight. A neck circumference greater than 17" for men and 16" for women is associated with an increased risk of obstructive sleep apnea.

B) Mallampati Classification

Anesthesiologists use the Mallampati classification to predict the ease of intubation. The Mallampati score is assessed by asking the patient, in a sitting posture, to open his/her mouth and protrude the tongue as much as possible. Depending on the size of the tongue and the extension of the uvula and soft palate in the back of the throat, a score is visually classified 1–4. Class 1 represents a clear view of the whole soft palate/uvula, while class 4 represents total visual obstruction of the uvula. A high Mallampati score (class 3 or 4) is associated with a higher incidence of sleep apnea.

C) BMI

BMI or Body Mass Index, measures body weight divided by body height. Charts are available online to use BMI as a relative measure of overweight. For example, a BMI of 30 or greater is considered obese.

In adults, the most common cause of obstructive sleep apnea is excess weight and obesity, which is associated with enlargement of the soft tissue of the mouth and throat.

D) Severe tooth wear

Bruxism is a subject that is very complicated, with a multifactorial etiology. Malocclusion, CNS disorders (e.g., Parkinson's), and sleep-disordered breathing are etiologic factors to consider. When a patient presents with severe tooth wear, sleep apnea should be a critical consideration. Sleep studies have recorded extreme jaw movements and bruxism during apneic sleep events. Bruxing in young children is widely considered an issue of primary airway obstruction. Children who have their tonsils and adenoids removed often cease bruxing. The same consideration of airway obstruction should be given to adult bruxers. When restoring a damaged dentition, management of a potential airway disorder should be the top medical priority.

Sleep-disordered breathing should be readily identified when the Complete Dentist routinely includes a thorough history and clinical screening on every patient.

4. Home Testing

When preliminary screening reveals signs and symptoms associated with sleep-disordered breathing, more extensive testing is appropriate. Historically, the next step includes referral to a board certified sleep physician, for evaluation and polysomnogram (PSG)/overnight study in a sleep laboratory.

AHI interpretation

Apnea-Hypopnea events avg/hr:

<5 Normal

5-15 Mild Apnea-Hypopnea

15-30 Moderate Apnea-Hypopnea

>30 Severe Apnea-Hypopnea

Home sleep recorders provide much of the detailed information obtained from a PSG, with significantly less expense and in the comfort of one's own bed. Dentists can use home sleep recorders for screening snoring events, hypopnea, apnea, blood oxygen saturation, respiratory effort, body position, airflow and pulse (Medibyte, Braebon Corp). The software for the overnight study can generate a summary report, including the subject's AHI (Apnea-Hypopnea Index). **AHI** represents the average number of apnea-hypopnea events, per hour, throughout the study. The number reported provides a screening summary of the severity of the airway obstruction and respiratory distress. This information is helpful in determining the next appropriate step.

We are very careful to use the word "screening" when discussing a Dentist's role in evaluating sleep disordered breathing, including interpretation of overnight home studies. **Dentists can not legally diagnose or prescribe treatment for sleep apnea. Due to the diverse and serious nature of the pathophysiology of sleep-disordered breathing, a sleep physician should be the primary diagnostician in these cases.**

Case Example:

A 45-year-old male patient reports loud snoring every night and his wife sleeps in another bedroom. He feels rested in the morning and wants to know if he is a candidate for a "snoreguard." His health history is excellent, Epworth score = 0, neck circumference = 15.5, BMI = 22 (normal), Mallampati = Class 2, home sleep recording AHI = 1.

Based on this information, he does not screen positive for sleep apnea and would be a candidate for a snoreguard for his social disease. If on the other hand, his AHI was 5 or greater, a sleep physician should be consulted for both a diagnosis and treatment prescription.

Therapy Options

Obstructive Sleep Apnea (OSA) is most commonly treated by sleep physicians through prescription of a CPAP machine (continuous positive airway pressure). CPAP is referred to as “the gold standard,” because it will effectively normalize AHI and oxygen saturation levels in the blood. CPAP therapy does have major challenges, in that many patients are “CPAP intolerant”. Possible side effects that discourage full compliance include nose, eye, skin and throat irritations; mask discomfort; claustrophobia; tubing interferences with sleep; headaches; noise of the machine; air volume, etc. Therefore, practically speaking, CPAP is not the gold standard for all patients.

Are there effective alternatives to CPAP for sleep apnea?

The answer lies in a thorough diagnosis of the causes of the sleep-disordered breathing. For example, if obesity and sleeping in a supine position are the major causes, then losing weight and sleeping on the side would do wonders for the problem. In cases of upper airway resistance due to obstruction of the nasal passages/adenoids/tonsils, surgical intervention may be appropriate. Central sleep apnea (CSA), in which the brain’s respiratory control centers are imbalanced during sleep, should be managed by a sleep physician.

The Complete Dentist should be acutely aware of the potentially serious medical implications of snoring. It is inappropriate to initiate treatment for snoring without proper medical screening and diagnosis. Just as it is critical to have a neurologist evaluate patients with migraine headaches before initiating occlusal splint therapy, it is equally important to include a sleep physician’s diagnosis before initiating oral appliance therapy for patients who screen positively for both snoring and sleep apnea. We would not want to make an oral bruxism appliance for a patient complaining of headaches, only to find out later they have an undiagnosed brain tumor. Similarly, we would not want to make a “snoreguard” for a patient complaining of snoring, only to find out later they have an undiagnosed severe OSA or CSA.

*Are intraoral sleep appliances effective alternatives to CPAP for sleep apnea?
Yes and No.*

Oral appliances help prevent the collapse of the tongue and soft tissues in the back of the throat, keeping the airway open during sleep and promoting adequate air intake. Intraoral sleep appliances may be a treatment option in several scenarios.

- 1. Simple snoring** – determined through screening, including a home sleep monitor study: resulting in normal heart rate, oxygen saturation and AHI.
- 2. Mild to moderate sleep apnea** – determined through screening, including a home sleep monitor study: resulting in an AHI > 5. The study should be reviewed by a sleep physician, who will determine the diagnosis. The physician prescribes the intraoral sleep appliance.
- 3. Severe sleep apnea with CPAP intolerance** – determined through screening, including a home sleep monitor study: resulting in an AHI > 30. The study should be reviewed by a sleep physician, who will determine the diagnosis. The medical standard for sleep apnea treatment is to prescribe a CPAP machine. This optimally reventilates the patient’s airway during sleep, if they can tolerate it. If the patient is CPAP intolerant,

the physician may prescribe an intraoral sleep appliance to dilate the airway.

In all cases, it is recommended that the home sleep monitor be used periodically overnight to evaluate the status of the airway during sleep, while wearing the intraoral sleep appliance.

The Complete Dentist should be aware of the common side effects of sleep apnea on the status of the teeth and masticatory muscles:

- Tooth abrasion wear due to sleep bruxism. In a “fight or flight” crisis, oxygen takes precedence over occlusion
- Sore muscles and TMJ symptoms
- Morning headaches due to sleep bruxism and oxygen desaturation
- Tooth erosion wear due to gastric reflux

The Complete Dentist is a gatekeeper for total health, screening every patient for sleep-disordered breathing.

Whole Body Wellness

I must introduce this discussion with a personal, lifechanging true story.

“Aging is a process that you can control. Research has demonstrated that lifestyle choices and behavior have a far greater impact on longevity and health than heredity.”

I have been interested in nutrition for years, but not sure which “diet” was best. I have had high total cholesterol levels, hovering ominously around 300, for many years. I’ve taken two statin prescriptions for several years, which have made my muscles feel weak. I have had four surgeries on my right knee over the past few years, which have provided a great excuse not to exercise. My dear wife threatened to not take me back if I had a heart attack due to lack of exercise! Furthermore, my father died from leukemia, at the young age of 63. Did I inherit a cancer gene? All this left me worried and with no real, solid answers.

In June 2012, I was invited by my dear friend, Dr. John Tucker, to attend the meeting of the newly formed American Academy for Oral Systemic Health (AAOSH), held at the Cleveland Clinic. The message, presented by the physicians overseeing the world-renowned Cleveland Clinic Wellness Institute, was loud and clear: **you can take control of your own health through your lifestyle choices.**

Michael Roizen, M.D. stated emphatically, *“Aging is a process that you can control. Research has demonstrated that lifestyle choices and behavior have a far greater impact on longevity and health than heredity.”* He pointed out that though our genetic makeup is important, DNA research is showing that nearly 80% of the genes act like “switches” that turn on or off the other 20% of expressive genes that cause disease. He explained these switches are largely controlled by diet, physical activity, stress, and smoking (toxins)...So it’s not all about our parents!

Caldwell Esselstyn, M.D. reviewed **the epidemiology of coronary artery disease, establishing it as a foodborne illness.** He examined the method and result of a lifestyle nutrition change that may halt and

reverse coronary artery disease. He spoke of one patient who had undergone 20 arterial stent procedures, quadruple bypass surgery, and was experiencing angina so severe he couldn't walk to the kitchen without being exhausted. He was not a candidate for further surgery because his vascular system was literally collapsed. He was a dead man walking. He enrolled in a pilot program at the Cleveland Clinic run by Dr. Esselstyn, described in his book, *Prevent and Reverse Heart Disease*. Evidence showed that a diet rich in plants that produce nitric oxide when digested, dilate the arterial system and shrink plaque. The patient is still alive and thriving today, 20 years later. This was great news!

Brad Bale, M.D. explained the oral/systemic link based on the connection between vascular health and **inflammation**. Heart attacks and ischemic strokes are triggered by an inflammatory process that can be initiated and exacerbated by periodontal disease, as well as poor diet, inactivity and stress.

Anthony Iacopino, DMD, Ph.D. reviewed recent evidence that supports **systemic inflammation** as the most reliable link between periodontitis and various systemic diseases/conditions, such as diabetes and cardiovascular disease. Diabetes and periodontal disease have similar effects on systemic inflammation. **Inflammation is a key theme in chronic disease.**

Mladen Golubic, M.D., Ph.D. explained that **the root causes for the development and progression of type 2 diabetes in most people are lifestyle factors, that is, poor diet, lack of physical activity and unmanaged stress.** Lifestyle interventions for this reversible disease positively impact health of all tissues, including that of the oral cavity... Our diabetic patients need this information!

The two days I spent at the AAOSH meeting in Cleveland forever changed my understanding of true health and provided solid answers.

Soon after, I sought out **Steven Masley, M.D.**, former medical director of the famed Pritikin Longevity Center in Miami, and author of *Ten Years Younger*. I underwent a day long comprehensive evaluation in his clinic. Exactly following his prescription of diet, supplements, exercise and stress reduction dramatically improved my total wellness. Within weeks, my total cholesterol dropped below 200, my knee pain improved 90%, my energy level was much higher, my memory improved significantly, my testosterone levels tripled and my blood counts normalized. Most significantly, based on carotid intima-media thickness testing (CIMT) used to diagnose the extent of carotid atherosclerotic vascular disease, my carotid artery showed an increase of 13% lumen diameter after one year... I'm getting younger! The worries about heart attacks, strokes, and cancer have turned into excitement, which I share with anyone remotely interested in their own health—and who isn't?

Basic Science

Our society is facing a major health crisis that has the potential to destroy not only our quality of life, but also bankrupt our great nation. Americans are actually less healthy, across their entire life spans, than citizens of 16 other wealthy nations. Americans consume nearly 4,000 calories a day on average — more than anyone else in the world.

According to analysts, this hasn't always been the case. Over the past 20 years, the consumption of high-calorie foods, refined sugars, and other causes of obesity has increased dramatically in the United States, compared to other countries.¹

Obesity increases the risk of developing conditions, such as diabetes and heart disease. The rate of obesity in adults has doubled in the last 20 years. It has almost tripled in kids ages 2–11. It has more than tripled in children ages 12–19.²

Average healthcare costs for someone who has one or more chronic conditions is five times greater than for someone without any chronic conditions.³

Chronic diseases cause 7 out of every 10 deaths. Chronic diseases such as diabetes, cancer and heart disease are the leading causes of disability and death in the US.⁴

Mladen Golubic, M.D., Ph.D., Medical Director, Center for Lifestyle Medicine at the Cleveland Clinic, summarizes the subject of whole body wellness as follows:

“Poor lifestyle choices, such as smoking, overuse of alcohol, poor diet, lack of physical activity and inadequate relief of chronic stress are key contributors in the development and progression of preventable chronic diseases, including obesity, type 2 diabetes mellitus, hypertension, cardiovascular disease and several types of cancer. Even though doctors encourage healthful behaviors to help prevent or manage many chronic medical conditions, many patients are inadequately prepared to either start or maintain these appropriate, healthy changes. Most patients understand the reasoning behind a healthy lifestyle even if they don’t understand the disease processes that can occur when they don’t maintain healthy habits. Despite an understanding of what constitutes a healthy lifestyle, many patients lack the behavioral skills they need to apply everyday to sustain these good habits. Nevertheless, healthy lifestyle modifications are possible with appropriate interventions, which include nutritional counseling, exercise training, and stress management techniques to improve outcomes for patients at risk and those who already have common chronic diseases.

Medical studies show that adults with common chronic conditions, who participate in comprehensive lifestyle modification programs, experience rapid, significant, clinically meaningful and sustainable improvements in biometric, laboratory and psychosocial outcomes.”⁴

The Complete Dentist appreciates the impact of lifestyle choices on both dental and whole body wellness.

¹ Knox, Richard. “U.S. Ranks Below 16 Other Rich Countries In Health Report.” NPR. Accessed January 9, 2013. <http://www.npr.org/sections/health-shots/2013/01/09/168976602/u-s-ranks-below-16-other-rich-countries-in-health-report>.

² Centers for Disease Control and Prevention. Overweight and Obesity. Centers for Disease Control and Prevention Web site. Available at <http://www.cdc.gov/nccdphp/dnpa/obesity/trend/index.htm>.

³ Partnership for Solutions. Chronic Conditions: Making the Case for Ongoing Care, September 2004 Update. Partnership for Solutions Web site. Available at <http://www.partnershipforsolutions.org/DMS/files/chronicbook2004.pdf>

⁴Centers for Disease Control and Prevention. Chronic Disease Overview: Costs of Chronic Disease. Centers for Disease Control and Prevention Web site. Available at <http://www.cdc.gov/chronicdisease/overview/index.htm>

Patient Education

Who will educate patients in the future regarding oral health, whole health and lifestyle decisions?

Our physician colleagues are tremendously burdened by insurance, paperwork and overloaded schedules. Internal medicine interns spend an average of eight minutes per patient visit.⁵

Dental teams spend more quality time with patients than perhaps any other health professionals. This puts them on the front lines in educating and motivating their patients to a better quality of whole health.

Let's discuss an example of educating patients on whole health. Diabetes is a prevalent chronic disease, present in 8% of the population in the U.S. In 2011, 79 million Americans were estimated to be prediabetic as determined through fasting glucose and hemoglobin A1C (we have a fingerstick test for this).

High blood sugar levels, due to diabetes, act like shards of glass on the one-cell-thick endothelial lining of the vascular system. Sugars weaken the protein "grout" between the cells. This can cause a possible tear in the thin lining. LDL cholesterol is brought to the site to repair the damage before a tear occurs. This is how atherosclerotic plaque begins to build up. When high blood sugar levels persist (along with saturated fats), inflammation increases and may eventually cause a rupture in the vessel wall. This creates a cascade of platelet aggregation, clotting factors and red blood cells filling and possibly blocking the vessel lumen. All cells downstream from the blockage are oxygen deprived. Depending on the location of the blockage, this can result in heart attacks, strokes, impotence, wrinkling of the skin, memory loss, etc. These all relate to poor circulation. Breakdown of the vascular integrity can lead to nerve pain/diabetic neuropathy, vision loss/diabetic retinopathy, poor peripheral circulation/digit amputations, etc. Dentally, high blood sugar levels in diabetics fuel the pathogenic bacteria that cause periodontal disease.⁶

A number of lifestyle factors are known to be important in the development of type 2 diabetes including: obesity, physical inactivity, diet, and stress.⁷ In addition, excess body fat underlies 64% of cases of diabetes in men and 77% of cases in women.⁸

A number of dietary factors such as sugar sweetened drinks and the type of fat in the diet appear to play a role.^{9, 10}

⁴ Golubic, Mladen, MD, PhD. "Lifestyle Choices: Root Causes of Chronic Diseases." Cleveland Clinic. January 14, 2013. http://my.clevelandclinic.org/health/transcripts/1444_lifestyle-choices-root-causes-of-chronic-diseases.

⁵ Pauline W. Chen, MD. "For New Doctors, 8 Minutes Per Patient" NY Times Blog. May 30, 2013. <http://well.blogs.nytimes.com/2013/05/30/for-new-doctors-8-minutes-per-patient/>

⁶ J Contemp Dent Pract. 2001 Nov 15;2(4). The relationship between periodontal disease and blood glucose level among type II diabetic patients. Almas K, Al-Qahtani M, Al-Yami M, Khan N. 18-25.

⁷ Williams textbook of endocrinology. (12th ed. ed.). Philadelphia: Elsevier/Saunders. pp. 1371–1435

⁸ Peter G. Kopelman, Ian D. Caterson, Michael J. Stock, William H. Dietz (2005). Clinical obesity in adults and children: In Adults and Children. Blackwell Publishing. p. 9.

⁹ Malik, VS; Popkin, BM, Bray, GA, Després, JP, Willett, WC, Hu, FB (November 2010). "Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis." Diabetes Care 33 (11): 2477–83

¹⁰ Risérus U, Willett WC, Hu FB (January 2009). "Dietary fats and prevention of type 2 diabetes". Progress in Lipid Research 48 (1): 44–51.

In one study, those who had **high levels of physical activity, a healthy diet, did not smoke, and consumed alcohol in moderation** had an **82% lower rate of diabetes**. When a normal weight was included, the rate was 89% lower. In this study, a healthy diet was defined as one high in fiber, with a high polyunsaturated to saturated fat ratio, lower trans fats consumption, and a lower mean glycemic index.¹¹

Medical Testing

Medical testing, through a simple fingerstick blood sample collected in the dental office, is a means to evaluate the three systemic inflammatory markers most highly associated with cardiovascular disease, diabetes, and periodontal disease: **Hemoglobin A1c, C-reactive protein, and Lp-PLA2 (Plac test)**.

Blood pressure measurement should be taken on every patient prior to any clinical procedure. Normal blood pressure is considered under 120/80. Many wellness physicians consider normal blood pressure to be 115/75. **When blood pressure rises over time, it is a sign of increasing vascular problems.** Prehypertension is present with readings of 120–139/80–89.¹²

The Complete Dentist should develop strategic relationships in the local medical community. Each community has a group of health professionals who are committed to the preventative model of care. Physicians, osteopaths, naturopaths, chiropractors, nurse practitioners, physical therapists, and nutritionists are all possible resources for the formation of a wellness team. These relationships can be a key to developing a whole health dental medicine practice.

Therapy Options

When a type 2 diabetic comes into the office of a Complete Dentist, it would be appropriate to ask if they have been counseled regarding the effects of lifestyle on their disease. If not, consider making available resources to educate them. Explain that studies show that almost 90% of type 2 diabetics can return their blood sugar levels to normal, without drugs, through five lifestyle steps:

- 1. Physical Activity** – Start with a pedometer and walk 10,000 steps a day!
- 2. Healthy Diet** – Provide copies of *The End of Diabetes*, Joel Furhman, M.D.; and *Ten Years Younger*, Steven Masley M.D.
- 3. Lose Weight** – Print a BMI (Body Mass Index) Chart, available on the internet. The goal is to get in the mid-normal range.
- 4. Stop Smoking** – This will require enrollment in an effective program.
- 5. Reduce Alcohol** – One glass of wine, beer, shot or none/day.

Additionally:

- 6. See a Wellness Physician** – for professional guidance and monitoring.

The same lifestyle principles that effectively heal many diabetics also apply to patients with other chronic health concerns, such as high blood pressure, atherosclerosis, high cholesterol, obesity, memory loss, fibromyalgia and other systemic inflammatory conditions, and some cancers. The same lifestyle principles are also preventative in nature.

¹¹ Mozaffarian D, Kamineni A, Carnethon M, Djoussé L, Mukamal KJ, Siscovic, D (April 2009). "Lifestyle Risk Factors and New-Onset Diabetes Mellitus in Older Adults: The Cardiovascular Health Study". *Archives of Internal Medicine* 169 (8): 798–807

So where do we start if we want to incorporate whole body wellness into the dental practice setting?

Do you remember Dr. Dawson's **W.I.D.I.O.M. Rule** for making treatment recommendations to patients? "Would I Do It On Me?" If the answer is "Yes," then it is easy to share that recommendation with those we serve. In this case, we must ask, "Would I Do It For Me?" Am I personally committed to my own health and wellness? If "Yes," then it's important to eat well; exercise daily; drink less alcohol; stop smoking; lose excess weight; strengthen muscles; take time to relax; mediate and pray; get more sleep; develop loving relationships; and see a wellness physician for a thorough examination/consultation.

It is our commitment to our own personal wellness lifestyle that produces the greatest impact in the lives of our family, dental team and patients. The Complete Dentist is fully committed to creating a total wellness practice model. When we express genuine excitement about being healthier, others will naturally follow. After all, dental health and total health can never be separated!