

Anti-Aging Medical Therapeutics

Vol. III

EDITORS

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Chapter 11

Anti-Aging Dentistry: An Overview of How Dentistry Relates to Longevity and Quality of Life

Ira Shapira, D.D.C.

We spend most of our time as dentists looking in people's mouths, and what we see very often is that physicians do the same thing, except they never look at the mouth. They look through the mouth at the tongue. They may see a few molars, and then they look down the throat. From medicine's point of view, it often seems like the mouth is just a hole that has been put there to see the throat. In truth, dentistry is at the center of the controlling infections that can cause heart disease, lung and upper respiratory infections, impotence, and more.

The mouth is not only one of the primary respiratory organs, but it is essential for nutrition, communication—both oral and unspoken—and your facial expression. It is used to show happiness, sadness, anger, and depression. The mouth is the primary method of child-to-mother bonding and is even responsible for hormonal changes in the mother after giving birth. The infant's suckling stimulates changes in the mother's system to release milk and to begin uterine shrinkage.

Sexual expression by the mouth via oral kissing and oral sexual practices is universal, and the mouth is an organ of sexual attraction. Painting lips with red lipstick has long been an accepted mating ritual in this country and around the world. There is always the effect of a beautiful smile and how people respond to it.

Symmetry is considered synonymous with beauty, and the teeth are a vital portion of this. Teeth are responsible for maintaining the jaw in proper position. They also facilitate breathing and maintain normal posture.

Thus, dentistry is at the center of health and longevity for many different mechanisms.

I am going to cover the effects of periodontal disease in the neuromuscular system as it relates to posture and sleep, among other topics. The relationship of periodontal health to general and cardiac health has been documented over many years, but it was only addressed in patients with known heart valve damage. Standard protocol in patients with heart murmurs has long been prophylactic antibiotics before dental work to prevent acute and subacute bacterial endocarditis—an infection of the heart.

valve where vegetative bacterial clumps accumulate and are released causing high fevers and lung infections. That was actually only the tip of the iceberg.

Before one can understand periodontal diseases, one must understand what healthy periodontia are. The teeth are suspended by fibers; they are not set in the jawbone like a stick in concrete. Because of that, there are spaces between the fibers. These spaces are very important because when you start to get periodontal infections, the spaces enable the bacteria to travel very rapidly down that area. The fibers are attached to something called cementum, which has a surface area like a sponge. Once the toxins get into the cementum, you can't get them out. That is periodontal disease. Bone loss occurs because the body recognizes the plaque or the toxins that have accumulated as a poison and it produces a protective response. It wants to get the poison out. If you get a sliver in your finger, the body pushes it out. It doesn't allow it to remain. If you have a foreign substance—a poison in your mouth—the body is going to push it out.

When I tell my patients about periodontal disease, what I tell them is that there are bacteria living in the mouth. Of course, they don't want to cause gum disease, they don't want to cause bad breath, they don't want to cause decay. They just want to raise their families, go to church, or whatever it is they do. What they like to do better than anything is eat. After they eat, they have little babies—they have billions of them—and then they go to the bathroom all over the place.

A moderate form of periodontitis occurs in over 40 percent of the population over 12 years of age, and the percentage increases in people over 65 years of age to 80 percent. The signs include gingivitis and periodontitis. The former is in the gum, the latter is in the natural periodontal attachment between the bone and the teeth and the tissue and the tooth.

While periodontitis is the main cause of tooth loss in adults, the real problems are the systemic effects of periodontal disease. The typical adult mouth has 28 teeth. If you were to draw a circle around each of them, and straighten all those circles out in one line and vector in the depth of the pockets—the equivalent of having a mouth full of gum disease or having an open pustular sore—it would extend from your ankle to your groin.

Now, if you don't think that can affect your health, after we use up a few of the antioxidants we talk about pumping in, think again. A recent paper showed that the risk of additional coronary events was significantly altered in patients with periodontal disease, diabetes, body mass index and by the number of previous heart attacks. Periodontal disease was in the top four. Factors that did not reach statistical significance included hypertension, smoking, total cholesterol, high-density cholesterol, triglycerides, social and economic status, sex, and age. Periodontitis was more important than any of those.

In material published in 1989, dental health was significantly worse in patients with a recent history of acute myocardial infarction when compared with controls (with 100 patients with infarctions and 102 controls), and this remained valid even after adjusting for age, social class, smoking, serum lipid concentration, and diabetes.

In 1993, the same author concluded, after evaluating 100 patients with angiography, that there was significant association in males between dental infection and severe coronary events. This was significant even after adjustments for age, serum lipids, body mass index, social class, and hypertension.

In 1993, DiStefano found a 25 percent risk increase in a study of 9,760 patients with minimal periodontal disease. It was a stronger risk in men under 50 years of age, with a relative risk factor of 1.72.

In 1995, Matollo showed in a seven-year study that only previous acute myocardial infarctions showed a bigger effect than chronic dental infection on future fatal and non-fatal coronary events and overall mortality.

In 1996, Beck examined the records of 1,147 men in a normative aging study in terms of dentistry and found that 207 developed coronary artery disease, 59 died of coronary artery disease, and 40 had strokes. This was after adjustment for established risk factors. The American Heart Association estimates that 58 million Americans, one in five, have cardiovascular disease and it is the number one cause of death in the United States.

Having established that periodontal disease is a severe infection that causes heart disease and death, one needs to ask what other effects does it have on the body, other than obvious social problems like bad breath? The most important may be an increase in premature and low birth-weight babies. Studies have shown a seven-fold increase in premature and low birth-weight babies in mothers with periodontal disease.

A study done at the University of North Carolina at Chapel Hill by Offenbacher concluded that 18.2 percent of all premature and low birth-weight babies could be attributed to periodontitis. They also showed a seven-fold increase in risk to mothers with periodontal disease. Other studies have cited premature or low birth-weight infants to be the single largest risk factor for heart disease.

This is sheer conjecture on my part, but maybe the risk factor is a direct result of periodontal infection and its effect on developing heart and blood vessels with a 40- to 70-year effect. Even if this is not the case, an indirect connection still has a 50-year tail, and you may be doomed to heart disease because your mother never flossed her teeth. What is really scary about this is that pregnant women are especially prone to periodontal diseases due to changes in hormones during pregnancy. There are more than five million neonatal intensive care unit days per year at an annual cost of \$5 billion.

About 25 percent of premature and low birth-weight babies have known risk factors. Known risk factors include tobacco use, genetics, drug and alcohol use, poor prenatal care, urinary tract infections, and nutrition. Interestingly enough, medical insurance does not cover periodontal prophylaxis and care. Dental insurance only covers two cleanings a year. Periodontal maintenance procedures were often denied or limited based on insurance company policies. In the early 1950s, when dental insurance came into existence, the average policy had a \$1,000 per year maximum. In 1998, the average policy still has a \$1,000 per year maximum plus a 96 percent reduction in real benefits.

Adult care for dentistry is not covered by Medicare or Medicaid in most states, even in cases of pregnant women. I won't even discuss what happens when you get involved in managed care where preventative care is not well covered. But I will tell you a story of why I am in private practice.

When I got out of school, I worked for an HMO and I was told that I was providing too high a quality of care for my patients, that these people didn't deserve it, and that if I would hurt my patients more, they wouldn't come in so much and we would make more money. Private practice is where I plan on staying my entire life. Luckily for dentists, HMOs have not hit us quite as bad as in medicine.

Respiratory infections are caused by aspiration of bacteria into the lungs. Imagine the bacteria load of an open sore extending from your ankle to your groin. Now concentrate that sore in the mouth—a small, moist environment—perfect for the formation of small droplets of infected material.

According to the National Center for Health Statistics, 4.2 million cases of pneumonia are reported per year. Studies are now showing the obvious: There is an increased risk of lung infections, abscesses, and upper respiratory infections in patients with gum disease.

Smoking is associated with all the problems I have addressed, but smoking is also a major factor in periodontal disease. Perhaps a major mechanism of the problems caused by smoking is a direct result of the periodontal problems they cause. It has long been known that diabetics are at a high risk for periodontal problems and that an uncontrolled diabetic will store huge amounts of sugar—basically bacterial substrate—in their saliva. Current research is now showing that periodontal disease can actually exacerbate diabetes or predispose the patient to the condition. About 16 million Americans, or close to six percent of the population, have diabetes and as many as 1/3 are unaware that they have the disease.

Adjusting the statistics for diabetes—considering the just-stated correlation—you would have an increase in the net effect that periodontitis has on coronary artery disease. A newborn child takes its first breath after birth into a respiratory system that is normally sterile and void of microorganisms.

Breast milk supplies initial immunities to the infant via immune globulins. The mother also supplies the baby with many bacteria that ultimately inhabit the system. Recent research has shown that babies are immune to streptococcus until their first teeth erupt, and it has been reported that the bacteria that affect infants once their teeth do erupt are the mother's, not the father's. Apparently, there is a relationship between the bacteria and the immune factors passed to the child that only allow the mother's strain to be passed on. There is also a very short window of activity that once passed allows little future chance of infection.

You can eliminate the streptococcus from the mother so she can't pass it on to the child until the child is three or four years old—the baby will be immune to it. Periodontal pathogens do not become firmly established until about seven years of age, and unlike strep mutations that are responsible for decay, they can come from any adult. You can be infected at any time in your life, but usually by seven you already have it.

Current treatments are exploding, including the removal of all the abundant pathogens. Many of you have probably been to the dentist and had scalings and other procedures, possibly surgery, to remove the pathogens and the toxins they produce. You use antibacterial mouth washes like Listerine as well as some of the new products on the market. One of the latest is the Periochip—basically a delayed-release chlorhexadine that can be placed into the gingival pockets. It kills off the abundant pathogens and you hope that normal flora takes their place. It takes about a minute or two to insert a Periochip and it's 1/5 or 1/6 the cost of similar products. You can insert them in as many as six different pockets in a single visit. The advantage is that it's quick, fast, and easy.

Another product approved within the last few months delivers doxycycline in delayed release media that allows controlled subgingival release of the antibiotic. The indication is chronic adult periodontitis. You might also say that the indications are prevention of coronary artery disease, or prevention of lung infections, or premature births.

In dentistry, we can do a lot more than just stop disease, we can reverse it. Dentistry is reversing aging. We have been regenerating bone, regenerating periodontal ligaments, and cementum. We correct all kinds of damage and decay, we can use bioactive glass, we can use guided tissue regeneration. There are a number of things that are available now that are incredible. A few years ago, there was nothing we could do.

Twenty years ago, when I first began doing implants—which tended to put me in the position of being a quack, now it's standard treatment—the only way we could stop bone loss in adults, after the loss of teeth, was to place an implant. Today, we have many products that we can use for grafting. There is autologous bone, donor bone, animal bone, and many synthetic materials. The bioactive glasses are especially exciting.

A recent test can now link teeth lost to genetic predisposition. You can test for this; you already know periodontal disease causes all the problems I have been talking about. Therefore, a genetic susceptibility test for gum disease may be near; the genetic susceptibility for heart disease, and premature birth. A 2000-year-old jaw was recently found with a dental implant that apparently had integrated into the bone. I've been doing implants for 20 years—for the last six or eight years, implantation has actually been part of mainstream dentistry. But it was also being done 2,000 years ago.

The effect of healthy nutrition on a healthy mastatory system is also well documented. A recent study showed that dietary changes associated with edentulousness increased the risk of coronary artery disease. Patients who were edentulous had diets higher in cholesterol and saturated fats. There were increases in intake of fiber, carotene, antioxidants, fruits, vegetables and vitamin C. This diet would result in an increased risk of cancer and cataracts.

The man who first isolated vitamin B-6 and was responsible for the development of C- and K-rations during World War II, a real nutritional pioneer, spent the last several years of his life studying the effect of gustatory enjoyment and concluded that one could not get the full nutritional value of their foods without enjoyment. It is now routine in many dental offices to place implants to restore health and function as well as enjoyment. Eating with dentures, partials, or large areas of missing teeth is not the same as eating with your own teeth.

The neuromuscular and ^{postural}~~postural~~ effects of the mastatory system are harder to quantify, but their effect on the quality of life can be assessed. The peripheral nervous system consists of the spinal cord and 12 pairs of cranial nerves. About 80 percent of the input into the brain comes from the cranial nerves and only 20 percent from the spinal column. Of the 80 percent input to the brain from the 12 cranial nerves, 70 percent—or 56 percent of the total—comes from the trigeminal nerve. If you do not have a healthy trigeminal nervous system, you do not have health. More than half of all the input to the brain, where it does go to the nerves—enervates the teeth, the jaws, the sinuses, the mastatory muscles, and the joints. The majority of all proprioceptors in the body are in the trigeminal nervous system.

A study published this year in *Cranium* by Dr. Shimshaft showed that patients with TMJ dysfunction syndrome are much greater utilizers of health care across the board—increases in utilization of 300 percent or 3:1 for both inpatient and outpatient care in all major categories, including nervous, respiratory, circulatory, and digestive systems. There was a higher utilization of medical costs in all diagnostic areas except pregnancy and childbirth, which had lower utilization. Now, this is not necessarily a good thing because most of the patients with TMJ disorders are women of childbearing age and who want kids. These figures did not include any of the costs covered by dental insurance.

One must question whether patients with TMD have higher medical costs or is it that greater utilizers of medical services have TMD problems? I believe that both are true. There are systemic diseases that predispose patients to TMD problems, and there is also excellent evidence that TMD problems increase utilization across the board. Another study in *Cranium* this year compared 132 females—20 to 42 years of age—to patients who were missing one or more first molars. Out of 28 to 32 teeth in the mouth, they were missing between one and four teeth only, and it resulted in dramatic differences in the

percentage of patients with symptoms. About 16 percent of the patients missing first molars were symptom free compared to 38 percent who were missing no first molars. Approximately 40 percent who were missing one or more molars had headaches, compared to 21 percent who were not missing any molars. Ear aches 13 percent—missing between one and four molars—versus 6 percent. Sinus pain was 21 percent versus 11 percent; jaw pain was 15 percent versus 6 percent. This is with minimal loss of teeth. It showed a dramatic increase in symptoms, and this study excluded patients with systemic diseases, a history of trauma, an intake of medication that affects the neuromuscular system, oral functions or extended dental work.

The most common symptoms of TMD problems are TMJ pain, headaches, cervical pain, ear congestion, limited mouth opening, parasternal problems, and paresthesia of the fingertips. Other frequently included symptoms are vertigo, tenderness, dysphagia, Bell's palsy, trigeminal neuralgia, nervousness, insomnia, and nonspecific facial pain.

In talking about longevity, we must also consider the quality of life. Treatment of these disorders with medication often causes more problems than they solve. I would strongly recommend that you become involved in diagnosing temporomandibular disorders or neuromuscular disorders in your patients.

The International College of Craniomandibular Orthopedics is comprised of members very familiar with neurovascular dentistry and the treatment. The idea behind neuromuscular dentistry is to restore normal physiology. Patients swallow 2,000 times a day. In a normal swallow, a patient closes his teeth together and then pushes the food back with the tongue. It starts the entire gastrointestinal reflex and you do it 2,000 times a day. If the teeth don't fit right when you do it, then you have to accommodate it. If you have to accommodate something 2,000 times a day, seven days a week, 52 weeks of the year, you get a repetitive strain injury, and that is what most TMJ disorders are—a repetitive strain injury. And, as you try to correct one injury, you kind of flop into the next.

I have several chiropractors and osteopaths that I work with and a lot of them are now working with cranial manipulations. They say the base of the head must be free to move so that we can get movement of cerebrospinal fluid. They never forget to tell you what the cerebrospinal fluid movement does—a few of them have told me respiration.

What I know about dentistry tells me that when somebody swallows normally, they have to fix their mandible. When they fix their mandible and swallow, the medial head of the condyle presses against the sphenoid bone and causes it to displace medially, and 2,000 times a day it is going to cause a pumping action for cerebrospinal fluid.

Although there are many different factors involved in treating TMD problems, I am going to limit my discussion to one main factor: vertical dimension. I would like you to imagine that you are looking at your patient's eyes. Look at her neck. Now imagine that you have provided a different set of dentures and her vertical dimension has been changed. In the same person, you can see how the vertical view of the neck and eyes and mouth has changed. If you ignore the vertical dimension, forget anti-aging—you can't do it.

How many of you grind your teeth at night or have been told that you are wearing your teeth out? If you are wearing your teeth out, you are losing vertical dimension. When you lose vertical dimension, every millimeter of vertical dimension lost leads to approximately 1 cm of forward head position. A weight lifter who was interested in increasing the weights he could lift and was having severe headaches came to me. This man had no idea he had a forward head posture. He thought he was in terrific shape. He thought he ate right, he exercised, he worked out. We changed his vertical dimension and we brought his jaw position forward. Basically, what we did was

change the vertical dimension by adding an appliance between his jaws. We also brought his jaw forward.

What happens is the head weighs 10 to 20 pounds, depending on how big you are. If you have a patient with osteoporosis and you take this big heavy head and you place it in an anterior position, that patient with osteoporosis is going to develop fractures in the spine and a dowager's hump or overcurvature in the back. That same patient—with good posture and with no forward head posture—may still have osteoporosis, but he will not have the osteoporosis damage in the back that could lead to a broken hip.

It is a question of forces and where the force focus is located. Your head should be well centered over your shoulders. The position of the jaw determines the position of the head, and a lot of times people don't understand that. Doctors who work with pain patients understand there are a ton of muscles that go up and down the back of the neck and shoulders to hold the head in position. It is a very delicate balance, and if the balance is off, the head position changes.

When I work with patients, I love to use the description of the weight scale you all have in your offices. You move the little slide over until you get it perfectly balanced. That is what neuromuscular health is supposed to be. Now, move it a little off and you find out what happens when you are not in balance. What are the effects of an improper posture of the head and neck, the effect on breathing, the effect on change of position in the hyoid bone? It changes the shape of the breathing apparatus.

Fifteen years ago, I was doing research on sleep apnea patients at Rush, actually measuring how much vertical dimension or vertical freeway space they had on male apneic patients. At the time, I had never seen a female apneic patient—I wasn't even sure they existed. What struck me was that every time I looked at male apneic patients, they had very similar findings to what I found in female patients I saw with TMJ disorders. Unfortunately, at the time, I wasn't nearly smart enough to understand the significance. TMJ patients, neuromuscular problems if you are not aware, chronic pain, referred pain syndromes (whether it be headache, neck ache, or sinus pain)—95 percent of all pain comes from muscles and it's like it doesn't matter where you go in the body. These are just a few examples in the head and neck area. Once you start to change a patient's posture, the muscles get changed as well.

When you start to look at head postures, when the head position is forward, you start to get narrowing of the airway. When you talk about sleep apnea, you hear a lot of talk about UP3s and CPAP and laser surgeries. When you look in your mouth and you see the tongue, you only see about 20 percent of it. The other 80 percent is buried below—you are not actually looking at it. As your mouth closes, you get less breathing space.

There have been a lot of reports recently on drowsy driving. If you are tired, you don't stay awake when you drive and you have a car accident. It will definitely have a negative effect on the longevity of life. Driver alert. Studies find that habitual snorers get into more accidents. How many of you snore and haven't done anything about it? Maybe it's time to do something. Sleep apnea is common, dangerous, easily recognized, and treatable.

Obstructive apnea is a type of apnea that I deal with and the primary obstruction is the tongue. Tongue position is controlled to a great extent by jaw position and by head posture. When you lay down, that still holds true, and the upper airway is still under a great deal of control of the jaw position. When you get apnea, what basically happens is that your neuromuscular compensation that you are able to maintain when you are awake is lost, apnea ensues, and you awaken from sleep.

Basically, how sleep apnea works is that first you fall into a deep sleep. You are so deeply asleep that your body does not know that it has to keep you breathing. So you quit

breathing and your body says, "Gee, I'd better wake up." Patients can have indexes of 20, 40, 60; I have seen patients with indexes of 120. What that represents is how many times their sleep is disturbed per hour in the course of a night. If your sleep apnea index is 60—the equivalent of waking up once a minute all night long—you certainly are going to have more car accidents during the day.

So the consequences of excessive daytime sleepiness include more motor vehicle crashes, increased work-related accidents, poor job performance, depression, family discord, and decreased quality of life. It has been reported that there is a seven-fold increase in automobile accidents in patients with apnea. That would actually make you a bigger risk for having an automobile accident because you have apnea than if you had been drinking alcohol. If you mix the two, it's even worse.

There are also cardiovascular consequences, including hypertension, cardiac arrhythmias, myocardial ischemia, cerebrovascular disease, and pulmonary hypertension. The known risk factors for apnea do not include decreased vertical dimension. I believe they should. You can track the lifetime development of craniomandibular disorders as a flow-chart starting with allergies as an infant all the way to apnea and death. The flow-chart is important because it emphasizes that this is a process that can be interrupted or reversed. It also emphasizes that if you are going to do anti-aging medicine, it does not start with baby boomers—it starts at birth or even before birth.

Recent studies have shown that short-term memory loss associated with apnea can be reversed with treatment. That's great, but one of the major markers of aging is short-term memory loss. That is the good news. The bad news is that if you delay in treating the apnea, the short-term memory loss becomes permanent, a major sign of aging.

Treatment of sleep apnea with CPAP is the standard. However, there is only about a 30 percent compliance rate. Treatment with intra-oral appliances is highly effective and has a much better compliance rate and fewer negative side effects. If you have less oxygen, everything works much less efficiently. Vertical dimension causes forward head posture, decreased airway, and increased apnea. There are behavioral interventions as well as medical interventions. Most of them are oral appliances.

Oral appliances basically hold the tongue forward. Despite the narrowing, a lot of people are having UP3s or laser surgeries on their soft palates. What that does is make them silent apneics. You take away the symptom of snoring—you take away the thing that makes people seek treatment, but you leave the airway obstruction and they die. You can move the jaw forward; you can cut and slice the jaw any way you want. You can move the hyoid bone forward. All you are doing is moving the tongue forward.

Somebody real smart once told me that there is practically nothing known to mankind that can't be made worse by sticking a knife into it. My feeling about surgery is that it is at the bottom of the list. Sleep apnea appliances include a tongue retaining device invented by a psychiatrist, Dr. Samuelson, who wanted to cut off the soft palate. He said, "I've had it with me for 85 years, I'm not ready to do that quite yet." He actually made his first one out of beeswax.

Regarding pediatric apnea: If they have big tonsils, they can't sleep. It may be attributed to lots of different causes, but maybe it's because they can't breathe. When my son was three, four, five years old, he had problems. We held him back before he started kindergarten. He had a short attention span. The pediatrician basically said ignore the tonsils, they will go away. The problem is what is going to happen to him in the meantime?

He had his tonsils and adenoids removed. He had an apnea index of 60. We removed his tonsils and adenoids, and he recovered. In kids with allergies, you see the dark circles

beneath the eyes. The open, gaping mouth predisposes them to problems as adults. You see how the chin is back, the head forward. They all look the same. The kid wasn't sucking his thumb—he was just using the fingertips to maintain the airway.

Lots of people are having their wisdom teeth removed at a young age. We have developed a procedure that allows us to take out the bone marrow when the wisdom teeth are removed and store it for future use in the treatment of cancer. It is always a perfect match. You don't have to worry about immunosuppressant drugs, and it may possibly reverse aging. If you get 15-year-old bone marrow and you re-implant it later, it has only had a limited amount of cell division. It is still young, healthy, and it hasn't been assaulted by 50 years of environmental damage. As for amalgam, if it's not safe in your backyard, do you really want it in your mouth? ∞