

May 2016 Issue | Gerry Curatola DDS Rejuvenation Dentistry

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INTERVIEW TRANSCRIPT

Interview:

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Here we are back at the microphone with *Functional Medicine Update* and, boy, we're having fun with this new format in 2016 and our chance to spread our wings and flap globally here and hopefully touch on interests that people have as it relates to this emerging revolution that we're seeing in healthcare. We're really excited to revisit a topic that we've only really done in the 33 years of *Functional Medicine Update*, as I recall, twice before. It's an emerging very important area in healthcare and that's oral health and the oral microbiome and how that is in a relationship with systemic inflammatory disorders. We could not find a better person to represent this than Dr. Gerry Curatola. Let me give you a little background if you're not familiar with Dr. Curatola. He majored in neurosciences at Colgate University and after graduation he attended dental school at the NYU College of Dentistry. In 1984, the Upper East Side dentist returned to the faculty as an Associate Clinical Professor in the Department of Cariology and Comprehensive Care and continued his postgraduate studies at the Pratt Institute at Harvard Medical School's program in complementary and alternative medicine, as well as numerous programs in natural health, and he's a leader, really, in where the tire meets the road: how appropriate dental care, the technology of the emerging understanding of oral biology, can translate into improved comprehensive care, not just for dental health but for systemic health.

Link Between Oral Biology and Systemic Health: Numerous Examples in the Medical Literature

If you're not familiar with what I'm saying, let me just give you a couple of thoughts, quickly, about what the medical literature is saying about this important topic in 2016. I'm picking at random a few of the more recent peer-reviewed published articles: "Periodontitis and Cognitive Decline in Alzheimer's Disease," so here we have the first connection.^[1] "Periodontal Disease and Systemic Diseases: An Update for the Clinician," focused on the diabolical diabetes mellitus and periodontitis.^[2] Next, "Saliva as a Diagnostic Tool for Oral and Systemic Diseases," looking at systemic inflammation where the origin is in the oral cavity.^[3] "Obesity and Its Relationship to the Oral Microbiome."^[4] "Periodontics and Oral-Systemic Relationships," with a focus on both obesity and diabetes, a review paper.^[5] "Liver Cirrhosis and Chronic Periodontal Disease," again showing the liver cirrhosis connection to this inflammatory condition.^[6] "Chronic Kidney Disease Exacerbation with Periodontitis," another review paper.^[7] "Comparison and Prevalence of Periodontal Disease in Women with Polycystic Ovarian Syndrome versus Healthy Controls," again showing a correlation because of the systemic inflammatory connection that influences ovarian function.^[8] And the list goes on. I think you can get the drift that we're seeing and witnessing a virtual revolution in the understanding of how important oral health is in systemic health. This has been obviously a topic of my interest for now going on 40 years, since I first met Dr. William Fisher when I was a professor in the 70s and he was a preventive dentist and doing all sorts of work in systemic health from an oral health perspective and it really introduced me to this topic. So it is with this kind of broad range introduction that I am thankful that we have Dr. Gerry Curatola to be our representative in this important area.

Dr. Curatola, thanks so much for joining us on *Functional Medicine Update*.

Dr. Weston Price: Oral Health Research Pioneer

GC: Thank you. Thank you, Dr. Bland. It's exciting to be on the show and it was really a pleasure to be with you at the Functional Forum recently. You know, for me oral health is the 800-pound gorilla in the room in the wellness movement. I was listening to what you were sharing and in 2016 alone there have been five major studies. I got one just this past weekend—another study recently published linking, basically, oral pathogens to everything from Alzheimer's to colon cancer. So we have one end to the other and you're saying, well, the problem is is that the oral systemic link has been well established now. In 1916, Dr. Weston R. Price, who everyone in the functional medicine community is probably familiar with—in 1939 he wrote a seminal book called *Nutrition and Physical Degeneration*—but in 1917 this man made a major presentation to the St. Louis Dental Society, then a fledgling part of the American Dental Association, on "The Present Status of Our Knowledge of the Relationship of Mouth Infections to Systemic Disease."^[9]^[10] And he went on to say in a subsequent paper, "Dental Infections and Related Degenerative Diseases," that the relationship between dental infection and degenerative diseases needs to be looked at as focal infections having effects far beyond the body.^[11] This was unheard of, and really not accepted, and discredited completely back in the early 1900s, and here we are today with study after study emerging linking gum disease to a 700 percent higher incidence of preterm birth, a ten times greater chance of heart attack and stroke, a seven times greater chance of adult type 2 diabetes, which is also even in type 3 diabetes—what we look at with Alzheimer's and neurodegenerative diseases as almost a type 3 diabetes. It's extraordinary, this avalanche of research. What the problem is with physicians, dentists, and

healthcare professionals alike is that most don't really know what to do with it and they know about the oral microbiome, but their solution is brush and floss, see your dentist twice a year, don't smoke, and a lot of dentists still support fluoridation and other things as preventative dental initiatives, which is as archaic as saying the world is square.

Cause or Effect? Exploring the Connection Between Periodontal Health and Systemic Disease

JB: Well, I think that's an incredible intro into this very, very important topic, so let me be a little bit, if I can, a naysayer just to get the spirited conversation going. I've heard some people ask the question as it relates to the connection between oral health and systemic disease as to whether it is a cause or an effect, and I've heard people say, "Oh yeah, your oral health is poor because your health is poor, and so when your health is poor, it causes, then, your oral health to be poor." Versus the other side of which is to say you oral health, when it's poor, then creates poor systemic health. How would you respond to that?

GC: Well, I think there is definitely a bidirectional component, especially in neurodegenerative diseases and in diabetes. So for example, people with diabetes tend to get more periodontal problems, they tend to get more dental infections and decay. Primarily in an unstable diabetic condition that's the case. However, what we've seen is—in the other direction—when you have periodontal disease it's more difficult to regulate blood sugar. So you do have this bidirectional thing going on, but we are now looking and finding periodontal pathogens in the lining of a woman's placenta. We're finding *Fusobacterium nucleatum*—it's a commensal bacteria, but in an unstable state becomes a very nasty, thuggish, gram negative anaerobic bacteria that actually carries even other bacteria past the blood-brain barrier. And you see all kind of, you know, *Porphyromonas gingivalis*, a very nasty periodontal bug (pathogen) that has been found to be related to a 67 percent higher incidence of pancreatic cancer in men. We see there are really three routes that periodontal pathogens to systemic disease, and I'm not discrediting the fact that certain systemic diseases cause difficulty in maintaining good oral health. So that does happen. I mean, I've seen HIV virus ravage someone's mouth, and not that their dental infection obviously related to HIV. As a matter of fact, in the 1980s when there was a case of a patient infected by HIV and they think it happened at the dentist, it was actually the dentist was an oral surgeon who deliberately infected the patient—essentially murder—with his own blood. But we find that saliva is amazing. It is incredibly protective. It actually brings nutrients to and from the oral microbiome and things like that. But again getting back to your question, there are three routes of access of dental infections to causing systemic illness. One is that bacteria in diseased gums actually permeate into the bloodstream, so in bleeding gums you have periodontal pathogens getting into the bloodstream, which triggers the liver to release C-reactive proteins that has inflammatory effects. So that's one route, is this CRP as an inflammatory response. Then we see the direct invasion of these pathogens causing havoc in all kinds of different organ systems. And the third route is we're really looking at the interleukin genes, and we're looking at how it affects the immune response and causes immunosuppression. So there are three different routes that dental infections cause terrible problems in systemic wellness.

JB: I think that's a really superb overview of a tremendous amount of literature and very, very well stated. You know, it's interesting. As I'm listening to you I'm thinking we have a lot of concentration on the gut and the microbiome now on what's called "leaky gut"—kind of euphemistically this break down of the paracellular junctions. And yet we also recognize that that there are leaky membranes at every cellular level of the body, so you could have leaky gingival tissues, you can have leaky gums, and you can have leaky synovia, and you can have leaky brain, so all of these tend to conjoin themselves together. When you treat a patient, I guess the first question is how do you know what patients to treat when you have them sitting there in your chair, and secondly, once you identify the need to treat, what do you do?

Evaluating Dental Patients as a Physician of the Mouth

GC: Those are great questions. I have a protocol. I set up a very interesting new model for dentistry called rejuvenation dentistry. What you didn't say in my background is I was an art minor. When I was in college I actually was a sculptor and still am a sculptor, and so the thing that I gravitated to dentistry about, it wasn't just science, it was also art. I enjoy doing reconstructing smiles and things like that, but at the same time, when I graduated dental school I didn't want to be a drill 'em, fill 'em, and bill 'em dentist. I was really interested in being a physician of the mouth and I saw myself as part of a team, and I consider myself a vital part of the team now. I actually consult and work with a lot of functional medicine physicians: "Gerry, I'm sending a patient over. I don't know what's going on. Their blood sugar is this. There's that, but the mouth is a mess." So the first thing I do when I bring in a patient is I do a thorough intake on everything: diet, lifestyle, medications, medical history, dental history, including what their past dental experience is and dentistry has been like. Dentists tend to be extremely myopic. It's part of being in a profession, working in a 2" by 2" cube that's called the mouth. You know, we're really doing microsurgery every day and a lot of dentists tend to focus on the hard tissues, meaning teeth and bone and things like that. But really with periodontal tissue the tone of the tissue, the tone of the tongue, what's going on on the palate, and soft tissues of the mouth can show everything from leukemia to lymphoma to diabetes to candida infections. All kinds of things show up in the mouth, and I have a book that's coming out later this year called *The Mouth-Body Connection*. It's being finished right now. This mouth-body connection really looks at how people can self-assess and look in the mirror. Even Chinese medicine looked at the tongue as being a very vital diagnostic tool.

So the first thing we do is we do a thorough intake, thorough oral examination, intraoral/extraoral diagnostic photos, and then we get what is a footprint, periodontally, to check periodontal pockets, and there are nine different specific barometers we use when evaluating the gums. And then from that, you know, I have all kinds of transelimination. We try to limit exposure to patients of dental radiographs, although dental radiographs show a vital amount of information. We use digital radiography, but I'm using more transelimination, which eliminates the hard tissues (teeth in the mouth), and we can actually see a cavity without even to take an X-ray. So the diagnostic tools we have are absolutely spectacular. The cameras we use and everything else. Just even doing an upper GI or a lower GI, gastrointestinal guys will always tell you how we have diagnostic abilities that are far beyond what we could even do five years ago with the resolution of cameras and things like that. But from that—from this thorough intake and this thorough examination—we can then put together a treatment plan, and what I look at—foundational—is

diet. So the first thing I look at. This is why, for example, fluoridation, which to me was an absolute disaster (public health disaster). We know it does nothing to remineralize teeth, drinking fluoridated water. It's a poison, and it is something which is now responsible for major systemic issues, including skeletal fluorosis and dental fluorosis being widespread and epidemic, especially children and adolescent children now have 41 percent (over 4 out of 10) have teeth damaged by fluoride, making them more prone to decay. So fluoridation was never the answer to dental decay. To me the answer to dental decay is what Weston Price wrote back in the book on nutrition and physical degeneration. We have to look at diet and the amount of refined carbohydrates and sugars that people take in. It's not that sugar goes on the teeth and causes a cavity, it's the imbalance in the oral microbiome, and that is really the essence. So we have equally been focused on nuking—you know, the scorched earth policy—in the mouth. Products that kill germs on contact. Products that even put pesticides in them. The number one leading toothpaste in America has triclosan, a polymer, a known toxic, non-biodegradable substance which has done nothing to reduce the epidemic incidence of gum disease in this country.

So I don't know if I went too far for you, Jeff...

JB: No, I think that's the story we're really looking for because it's a landscape, it's a...

GC: Terrain.

JB: Yes, thank you. That's a great word. It reminds me when you're talking about the mouth, at the Institute for Functional Medicine, Michael Stone and his colleagues there have put together a nutritional assessment program so that the phenotypic signs of nutritional inadequacy can be better identified. This is kind of a lost art in clinical diagnosis, and one of the major portions that they teach is the mouth—the tongue, the soft tissue, the hard tissue, the gingiva. So I think what you're talking about is right in the core of what a well-trained functional medicine provider would start to understand.

American Dental Association Recognized Periodontitis as a Microbiome-Mediated Disease

GC: Sure, and the sad part about this is that I'm trying to...you know, I lectured to 500 dentists just a couple of months ago. These, by the way, are biologic dentists, holistic dentists. Unfortunately an accurate understanding of the microbiome is just starting to take root in the dental profession. It is still very far off. I spent 17 years researching the oral microbiome, and I came up with a rational application to the epidemic incidence of gum disease as far back as 2003, I believe. *The Journal of the American Dental Association* stated periodontitis (gum disease) is a classic example of a microbiome-mediated disease (a biofilm-mediated disease). You know, the term microbiome was just coined in 2002 by Josh Lederberg,

but prior to that we used to call it biofilm. These ecological communities were biofilms: skin, respiratory, gut, etc. The American Dental Association has finally recognized that periodontitis is a microbiome-mediated disease. In other words, it's a community or a terrain, it's not one bug. So more rational therapies got thought of, but even calling it that, many dentists still think...I lecture to dentists and I said, "What do you guys think of dental plaque as a biofilm?" They said, "Plaque is a biofilm of many different bacteria." I said, "Well how should we manage it?" And they were all like, "Kill it. Kill plaque. Eliminate plaque." You know, they were parroting what they hear from the major consumer products companies. Two major consumer products companies really sort of run the ADA and the messaging is still archaic, even though they funded a lot of the microbiome research in the mouth.

JB: I think isn't there a connection, also, I notice fairly heavy use of antimicrobials in dentistry to manage what is the presumed cause rather than looking systemically.

GC: Yes, that's my point. It is that the dentists still are in this kill plaque mentality when I try and teach them that plaque—dental plaque—is really an unhealthy expression of the oral microbiome. So in other words, that thick, smelly film that you wake up in the morning and it's on your teeth is really an unhealthy expression of the oral microbiome. What we find now is that the terrain that is healthy—a healthy oral microbiome—is a thin, odorless film on all of the teeth and soft tissue and mucosal tissues in the mouth, and it plays a vital role in three things. It aids in digestion and is a very close cousin to the gut microbiome. As a matter of fact, bacteria are shared, and oral bacteria are constantly swallowed, going down. There are bacteria in the mouth called persistors that actually secrete a protein shell and make it through the hydrochloric acid in the stomach. There are an amazing variety of 600 different species of bacteria that we know of, and there could be 6 to 10 billion at one time in the mouth, but there is a broad diversity. I compare it to when I was a boy and I used to watch Jacques Cousteau's underwater adventures. Jacques Cousteau invented the sport of scuba diving, but once we could stay underwater and look at the biodiversity that exists in our oceans it's amazing. That biodiversity exists in our bodies, and so we're on this Jacques Cousteau journey right now because we have some really great new tools that have enabled us to study the oral microbiome in its natural habitat, and these are confocal laser microscopy, metomic microscopy, which gives us a great 3D map, and even fluorescent probes. These types of tools enable us to study the microbiome and what we found is that, oh my goodness, you don't want to kill it. You want to rebalance it. You want to promote microbial homeostasis. Because nuking it is actually not only ineffectual but harmful.

JB: I think that is an incredible message because I believe that often we jump to simple-minded conclusions. We see something associated with something else and we assume the way to manage it, then, it to get rid of it, right? And then you get resolution. Interesting you had cited earlier in your discussion the arthritis-periodontal connection and I note reading recently a paper out of the *New York State Dental Association Journal*—I think this was last summer actually, in 2015—of rheumatoid arthritis and periodontal disease in which the authors suggested oral health parameters should be more closely monitored in patients with rheumatoid arthritis and the suggestion is that intervention in perio will

improve joint health.[\[12\]](#)

GC: Absolutely. As a matter of fact, the study that came out this weekend found that—and you were talking about this bi-directional thing, too and we’re looking at the bi-directional effect of the oral microbiome with the other communities. You know, you have the gut microbiome, you have the respiratory microbiome, genitourinary microbiome, skin... We’re looking at this bi-directional effect, but a paper just published—February 2016—on the relationship of periodontal bacterial in synovitis and juvenile idiopathic arthritis.[\[13\]](#) I continuously get updates on new studies that are emerging, but it’s fascinating. This is juvenile idiopathic rheumatoid arthritis.

Documented Link Between Periodontal Disease and Risk of Pancreatic Cancer

JB: I think that that again mirrors the systemic effect that we’re talking about, and you had also mentioned pancreatic cancer, and I think there was just recently, in January 2016, a very interesting epidemiological study in a journal called *Pancreas* titled “Investigating the Association Between Periodontal Disease and the Risk of Pancreatic Cancer” showing a significantly positive association between periodontal disease and the risk of pancreatic cancer.[\[14\]](#)

GC: Absolutely.

JB: I think we’re still searching.

GC: Yes, it was actually Harvard University in 2006, the first to show the correlation between chronic periodontitis, chronic gum disease, and a 67 percent higher incidence of pancreatic cancer in men.

JB: Yes, and I find this paper very interesting because they did quite a bit of work to remove other independent risk, such as diabetes, hyperlipidemia, allergies, hepatitis, peptic ulcer, pancreatitis, obstructive pulmonary disease for cigarette smoking, and alcohol-related conditions as a proxy for alcohol drinking. Independent of all of those was this fairly strong association. Again, I think we need to be cautious not to jump to a conclusion of cause and effect, but...

Prebiotics May Be the Future of Oral Care

GC: No, no, no. Exactly, you hit the nail on the head. These studies emerge and you see correlations, but definitely the mechanism is one of which...and I've described three different mechanisms in the mouth with direct infiltration or various inflammatory routes and responses caused by periodontal pathogens. But we really need good science continuing to explore this. But the one thing that I do know is that our approach and the types of oral care products that are being used right now drove me to develop a prebiotic formulation which I'm about to introduce next month. I received three patents for the work on this. It is called Revitin and revitin.com. If you go to the website you'll see the whole microbial science. We have a slogan, "Make peace with your microbes."

JB: That's good.

GC: The most effective way to promote oral microbiome homeostasis, or the most effective way to get your mouth healthy again, is to take...what we found in our research is that taking a prebiotic approach, not a probiotic approach, because I started to say that the oral microbiome does three very, very important things. One, it protects you from deadly viruses and bacteria in the environment around us. So we know that there are a lot of bad bugs out there. What we have is a community of organisms. Our resident bacteria protect us in the mouth, especially because it's a front line of defense. And I always say if your oral microbiome is healthy, you have a good chance of your sister microbiome, the nasal, the respiratory microbiome, also being healthier, and the gut microbiome, which the oral microbiome is connected to, having a more synergistic relationship. So the oral microbiome makes it very inhospitable for other bacteria from the outside to set up shop. I kind of get a chuckle out of seeing the attempt to drop in *S. salivarius* and *Lactobacillus* in the mouth and thinking that probiotics, well if we drop in more good guys, you know, they'll outnumber the bad guys, and it was like this good guy/bad guy thing. And I try to help people understand that the same bacteria, like a *Fusobacterium nucleatum*, in a balanced oral microbiome these are commensal bugs, they live there. They live there, they didn't invade your mouth, set up shop, and go and attack the rest of your body. They live in the mouth. My research started in 1997, and I really was taking a nutritional approach. For me, toothpaste and most oral care products were invented by soap makers. A hundred years ago we had tooth powders and then we had basically flavored soap for the mouth. You know, you use soap on your skin. We put soap that was palatable in the mouth with strong mint oils, which by the way—peppermint oil and many other essential oils have strong antimicrobial effects that are disturbing to the oral microbiome. So I said to myself, "Gee, we've got to get out of the soap business and start promoting organic gardening in the mouth." I was on Martha Stewart's show about eight years ago and I said, "We need to start doing organic gardening not just outside our bodies, but in and on our bodies as well, because have this wonderful community of organisms we live with called the microbiome." Like Rodney King said after the LA riots, "Can't we all just get along?"

JB: I think that's a really great metaphor: organic gardening in the microbiome. It's interesting because Dr. Marcel Roberfroid from Catholic University Louvain in Belgium was the gentleman who actually coined the term "synbiotics" and he had worked extensively on probiotics over the last 35 years

and his group included Patrice Cani and Nathalie Delzenne, who are really carrying forward this whole concept of the microbiome as it relates to diabetes and obesity. His comment was that if you really want to establish the appropriate community you need prebiotics as your principal approach because that's where they're going to take their message, from the food that their eating. It's interesting how history reinforces itself in different disciplines.

I really want to thank you. I think what you're doing is absolutely at the cutting edge of whole-body health. I know you've got some things you're going to be doing in the media here soon to help broadcast this better. Tell us a little bit about that.

GC: That started awhile back. I had an opportunity over the past 15 years to be an oral health expert to various networks and shows, and made three or four appearance on Dr. Oz. The producers were like, "There is such a need for the information that you're speaking about to get out there. We really want to talk about doing a show." And that started this PBS program that is going to be airing later in May of 2016 called *The Dr. Gerry Show*. They couldn't come up with a name so I go by "Dr. Gerry" so they came up with *The Dr. Gerry Show*, which my wife then said, "It's been the Dr. Gerry show for all the years of our marriage." I guess there's Dr. Phil, Dr. Oz, Dr. Laura, and now there's Dr. Gerry. The Dr. Gerry Show is focused on the latest science and has a science component on technology, but takes a unique look at the oral systemic link as well. We're very, very excited to bring a lot of the microbiome research forward with some great people on the show. We've got Marty Blaser from NYU who has done an exhaustive amount of work on the human microbiome.

JB: Yes, we had the chance to interview Dr. Blaser about his book and he did a fantastic job in giving us our first primer in the microbiome.

GC: We love that. We're looking at toxicity, we're looking antiaging. I guess if you could sum it up we're really solidly planted in the middle of the functional medicine world and I'm looking at the show as a means of bringing all of us together in a way to communicate effectively to everyone around. So whether it is Mark Hyman or yourself who has been father of functional medicine for so many years. You know, Jeff, I have to tell you one of the things I really enjoyed hearing you say is you actually had a little background in dental research yourself.

JB: Yes, that's actually how I got started in this whole area with Dr. Fisher back in the 1970s. He was a prominent dentist at the time in the Seattle community. Well, Dr. Curatola I want to tell you how much we appreciate this. This is a great step off for us in 2016 with *Functional Medicine Update*. It opens the field of discussion to a greater extent to where we want to be. We wish you the very best and we'll

keep in touch with you. It sounds like your advocacy is really going to create some great positive change in the field.

GC: Well, thank you so much and I really appreciate the invitation to be on. I enjoy doing these so much and it's really a pleasure and honor to be with you as well.

JB: Likewise and we'll talk soon. Be well.

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