THE PRACTICAL APPLICATION FOR CARIES MANAGEMENT BY RISK ASSESSMENT (CAMBRA) AND XYLOLITOL RESEARCH: A FRAMEWORK AND VISION FOR THE NEXT GENERATION PREVENTIVE DENTAL HEALTH CARE SYSTEM

CLINICAL RELEVANCE

Academic interest in Caries Management by Risk Assessment (CAMBRA) and xylitol research is vigorous. Innovative technology is emerging with new preventive dental health care products being introduced by biotech companies and commercial enterprises. Although the theory is embraced and a new preventive dentistry model is envisioned by professional dental organizations, the practical application of theory and products is anemic in private practice. The preventive dental health care system introduced in this article is evolutionary, relying heavily on the leadership of visionary preventive dental health care pioneers. The system is presented as a framework for a viable, next generation preventive dental health care system, serving as a catalyst for the practical application for CAMBRA and xylitol research. The system is easily incorporated into a traditional dental hygiene recare system and bridges the gap between theory and practical application. Developed fully it would serve as a resource to train dentists, their staff and patients in the science and art of CAMBRA and xylitol. In addition, it encourages evidence based preventive dentistry treatment recommendations with the potential to significantly improve preventive dental health care outcomes, energize dental hygiene departments, attract new patients, increase access to preventive dental health care and practice profitability through CAMBRA coaching.

SUMMARY

Dentistry as a profession is esteemed for its focus on the prevention of dental disease. The social conscience of the profession supports the common goals of increased access to dental care, reducing the overall cost of dental care, improving dental health care outcomes and updating and streamlining the delivery of dental health care. The preventive dental health care system introduced in this article represents the framework for a next generation model in the evolution of caries risk assessment and the practical application of existing theory and technology. It relies heavily on the groundbreaking theories, systems, product development and technologies introduced by preventive dental health pioneers including Drs. Featherstone and Young, Dr. V. Kim Kutsch, Dr. Ellie Phillips and Dr. Doyle Williams. The system continues to broaden the vision and scope of the current preventive dental movement and serves as a simple educational platform for dental professionals and the public. As the system is refined and developed it could provide the foundation for a preventive dental health database with the power to accommodate and unite the disparate interests of academics, public health advocates, venture capitalists, dental insurance companies and “wet-finger” dental professionals. The system is aimed primarily at improving access to the revolutionary new science of preventive dentistry (CAMBRA) for all; including faithful patients currently in a traditional hygiene recare system, the uninsured, the fearful, and those with limited financial resources. Its goal is to significantly reduce the overall cost of dental health care. Additionally the system is being designed to help dental health care practitioners improve preventive dental health care
outcomes as they expand and analyze their own practice specific and ongoing database, encouraging them to make custom, evidence based preventive dental treatment recommendations for each patient as they provide ongoing CAMBRA coaching. The new system updates and streamlines the traditional behavioral model of preventive dentistry with CAMBRA and xylitol research.

INTRODUCTION

In the United States, the traditional preventive dental health care system based on routine dental prophylaxis, topical and systemic fluoride, plaque control and regulation of dietary sugar has evolved as the standard of care since the introduction of water fluoridation for caries control in 1945. (1) It is a behavioral and mechanical model based on the theory that professional plaque removal in conjunction with meticulous brushing and flossing, less sugar and appropriate fluoride will result in optimal oral health. The system is sustained and vigorously supported by the American Dental Association, the dental insurance industry, public and private dental clinics, industry and the marketplace. Based on this traditional system, the report card for oral health in the United States is encouraging but not worthy of cum laude status. A comprehensive report published by the Center for Disease Control in 2001 on the results of 55 years of fluoride exposure on dental health in the United States concluded, “the prevalence and severity of dental caries in the US has decreased substantially” in the last 30 years. (2) On a scale of one to ten, an incremental decrease in the caries rate from ten to seven is admirable; however, the burden of dental caries on individual families and the public health sector as a whole remains staggering. The following public health data on oral health in the US confirms that the persistence and prevalence of dental caries could justifiably be labeled as epidemic in proportion:

- 85% of US adults have experienced tooth decay (3)
- Employees lose more than 164 million hours of work a year due to dental issues (3)
- Tooth decay affects nearly 20% of 2-4 year olds, more than 50% of 8 year olds and more than 75% of 17 year olds (4)
- Dental disease is tied with heart disease as the second most expensive disease in the US (5)

Clinical experience among practicing dentists confirms that the impact of the traditional preventive dental health care system “has been uneven across the general population” (6) and perplexingly inconsistent even among the faithful. To a group of restorative dentists a renowned lecturer recently summed up what he implicitly understood to be our collective preventive dental conscience: “We all know that all of our fixed bridgework will eventually fail because of recurrent decay!” (Misch C, Key Implant Positions and Implant Numbers: A Biomechanical Rationale to treatment Planning, lecture for Seacoast Implant Study Club, Elliot, Maine, April 2011).

While restorative dentists engage in vigorous and sometimes passionate debate about restorative materials and the marginal integrity, longevity and beauty of conservative cast gold vs. tooth colored restorations, the standard by which all of our efforts are judged is a perfect, unrestored, virgin tooth.
“Operative dentistry represents a failure of preventive dentistry” (Matis, Bruce, personal communication November 2012 at Indiana School of Dental Medicine). Within any profession or discipline it is advantageous to have a gold standard by which our work is judged. Although prevention in general is the iconic standard of the dental profession, the current standards of preventive dental care are in transition. (4) New standards of preventive dental treatment are emerging as a result of CAMBRA and xylitol research.

In 2003 Drs. Featherstone, Young and their associates published landmark research in the Journal of the California Dental Association introducing new scientific evidence supporting a new approach to preventive dental health care called Caries Management by Risk assessment (CAMBRA). (16, 17, 18) Their research supports a “medical preventive dentistry model” focusing on the quality rather than the quantity of plaque biofilm, correlating the risk for developing dental caries with the bacterial infection characterized by an overabundance of acid loving/acid producing bacteria. The new science challenges the traditional preventive dental healthcare paradigm that all dental plaque is "BAD" and must be eliminated. The goal of strategically eliminating “BAD” oral bacteria and fostering a neutral or basic pH oral environment to encourage the colonization of “GOOD” oral bacteria is a radical paradigm shift from the current methods and practices that serve as the foundation for our traditional preventive dental health system. CAMBRA provides a new foundation for a preventive dental healthcare model with greater hope for predictable remineralization and a future of minimally invasive dentistry.

For centuries folk medicine has embraced xylose (wood sugar) to protect teeth. During World War II the Finnish Sugar Company was the first to commercially process and distribute xylitol for widespread use as a sugar substitute to replace scarce sucrose. (7) Following the war, anecdotal information from Scandinavia on the remarkable anti-carcinogenic effect of this natural sugar inspired biomedical research. Several large population studies in Finland (8) and Belise (9, 10) established xylitol as the new natural wonder drug of preventive dentistry. Biomedical research continues to add new evidence for xylitol’s place in a preventive dental health care system. (11, 12, 13, 14, 15)

Preventive dental healthcare pioneers like Dr. Ellie Phillips, Dr. Doyle Williams and Dr. V. Kim Kutsch have paved the way for this new model. Dr. Ellie has championed a preventive dental healthcare system that she developed for her patients based on the sequential use of a specific combination of commercially available products and xylitol (7) and introduced a self-help website with the goal of increased access to preventive
dental health for all.(19) Dr. Williams, former chief dental officer of Delta Dental of Massachusetts, has appeared on Good Morning America as the spokesperson for the ADA on emerging preventive dentistry topics. His stated goal was to develop a system that “Pays dentists to keep their patients healthy”. He championed a philosophy of preventive dentistry and coined the name “Preventistry” (20), fostered an alliance between commercial companies producing the new generation of preventive dental healthcare products and the dental profession, and initiated xylitol pilot studies in the private sector. Dr. Kutsch has patented a revolutionary medical device for the qualitative assessment of oral bacteria based on the detection of ATP through bioluminescence technology and is the founder of Oral Biotech which is pioneering new preventive dentistry products based on CAMBRA. Multiple caries risk assessment forms have been developed and are available (21,22,23); however, incorporating CAMBRA into a traditional hygiene recare system remains challenging.

METHOD AND SYSTEM DESIGN

As my staff and I began to teach our patients about the new science of preventive dentistry, we struggled to understand and develop appropriate treatment recommendations. It became clear to us that in the absence of a new universal preventive dental health care system that reconciles the merits of traditional preventive dentistry with the scientific advances of CAMBRA and xylitol research, our preventive dental treatment recommendations were at best haphazard, inconsistent and personality and product biased. The absence of a gold standard of preventive care compelled us to action. The goal of the system continues to be the practical application of all available researched based, scientifically sound and professionally accepted preventive dental health principles, products and theories. Based on this model the framework for this next generation preventive dental health care system will continue to evolve. The system has been developed and serves as a successful working model in a general dental office in Southern Maine. The system’s design incorporates the following components:

- Patient education about new preventive dentistry concepts
- Collection of risk factor data
- Computer assisted risk diagnosis
- Standard treatment protocols based on combination therapy
- CAMBRA coaching to produce a custom treatment plan for each patient

DATA COLLECTION

The data gathering process of diagnosing a patient’s caries risk level is organized into three distinct diagnostic modules which are labeled A, B and C.
Diagnostic Module A

Diagnostic module A is a patient survey comprised of 26 questions that are organized into five basic categories: oral environment, habits, dental and systemic health, family and heredity. The answer to each question is associated to a caries risk diagnosis with specific treatment recommendations based on the system’s standardized CAMBRA treatment protocols. The patient’s answers also provide vital information for subsequent CAMBRA coaching. The survey could be completed online or completed in-office in an interview format by a CAMBRA coach. We envision that module A could be linked to a practice specific web site or other commercial enterprises that will make available the best preventive dental health care products at the best price allowing patients the freedom to develop their own custom preventive dental health care plan based on their own product preferences.

Diagnostic Module B

Diagnostic module B is the clinical data on disease indicators. It includes information from a standard dental recall exam and records visible caries, abfractions and cervical erosion and radiographic evidence of caries and demineralization. Consistent with module A, each additional data point enhances the caries risk diagnosis, but could be used independently for patient education and treatment recommendations.

The system is designed to engage all of our professional colleagues and their staffs in the quest for the most effective preventive dental health care system available. Many dental offices have not yet incorporated the new science of CAMBRA or xylitol into their hygiene programs. If a patient has a long standing professional relationship with such an office but desires the preventive benefits of the new science, they could simply fill out module A online, have their traditional dental office fill in the clinical data from their recall exam on a form provided online and then complete module B with the clinical data provided. Using the information from modules A and B would provide a more accurate diagnosis for caries risk and the subsequent preventive dental health treatment recommendations would be more complete.

Diagnostic Module C

Diagnostic Module C is a qualitative bacterial assessment. Once the medical model of CAMBRA was established, biomedical research focused on finding a qualitative bacterial test to objectively assess caries risk at the bacterial level and objectively monitor the success of preventive dental treatment in managing that risk. A practical qualitative bacterial test that can be used routinely in the dental office represents a revolutionary breakthrough in the development of a new preventive dental healthcare system. In our experience the most practical and reliable qualitative bacterial test available to date is the CariScreen test (Oral BioTech, Albany OR). Their test is based on the detection of ATP through bioluminescence technology. With more widespread practical application of the new science of CAMBRA it is predictable that new qualitative bacterial tests and technology will emerge driven by market forces.

Each diagnostic module is designed to be used independently or in any available combination to make a diagnosis of caries risk. If information module A is used alone to make a caries risk diagnosis it is implicitly understood that it is the most subjective source of data to make a preliminary diagnosis of caries risk. This protocol is in harmony with the CDC working group’s recommendation for assessing caries risk and determining appropriate preventive dental treatment in the absence of comprehensive data: “When classification is uncertain, treating a person as high risk is prudent until further information or experience
allows a more accurate assessment. This assumption increases the immediate cost of caries prevention or treatment... but reduces the risk for dental caries for groups misclassified”. (24) If diagnostic module A is the only available source of data for a patient and generates a diagnosis of extremely high risk, the preventive dental health products and treatment recommended would do no harm and serve to lower the patient’s risk. Escalating risk levels simply dictate a more aggressive and complex set of home care instructions and the use of more preventive dental healthcare products in combination. Using diagnostic modules A and B in conjunction would provide a more complete data set and result in a more accurate diagnosis of caries risk. Using all three would produce the most accurate diagnosis. Although assigning risk categories using A alone would initially be very subjective, analysis of the complex data base generated over time using all three diagnostic modules (A, B, and C) will lead to more accurate, evidence based diagnosis and treatment recommendations.

STANDARDIZATION OF TREATMENT PROTOCOLS BASED ON RISK DIAGNOSIS

Standardization of evidence-based treatment protocols in the system allows for consistency and will ultimately replace haphazard, and product or personality biased treatment recommendations.

The initial CAMBRA research introduced 3 risk categories: Low Risk, Moderate Risk, and High Risk. With the advent of qualitative bacterial assessment, patients can be identified as having the specific bacterial infection which would require a new phase of treatment focused on resolving that infection. This necessitated expanding the risk categories from three to five by adding a bacterial kill phase to the Moderate and High Risk categories. The five categories are now:

1. Low Risk
2. Moderate Risk
3. Moderate Risk Requiring a Kill Phase
4. High Risk
5. High Risk Requiring a Kill Phase.

The additional Kill Phase categories first appeared on the CariFree Risk Assessment Form. (22)

The system introduced in this article divides all preventive dental healthcare products and treatment recommendations into four basic categories:

1. Kill Phase
2. Oral Environment Control
3. Healing Remineralization
4. Xylitol Products

The treatment recommendations outlined here are based on professional judgment and were established using the best evidence-based information on preventive dental health (PDH) products and therapies available. The dental profession has a history of adopting new treatments based on professional judgment,
as was the case with the “off-label” use of fluoride varnish for caries prevention (31). Treatment protocols will be supported and improved through analysis of the system’s data.

The standard treatment protocols proposed in this article are based on a combination therapy model. In medicine the clinical application of combination therapy served as the critical turning point in the successful treatment of childhood leukemia.(25) Combination therapy in preventive dentistry has been researched and justified.(26,27,28,29,30) Escalating risk levels dictate a more aggressive and complex set of home care instructions and the use of more PDH products in combination. If the goal is to strategically eliminate “BAD” oral bacteria while fostering a neutral or basic pH oral environment to encourage the colonization of “GOOD” oral bacteria, then the indiscriminate daily use of bactericidal PDH products would be inappropriate. On the other hand a deep-seated chronic plaque biofilm infection might require an aggressive combination of multiple “kill phase” products for an extended period of time. Once the goal of colonization of “GOOD” oral bacteria has been objectively achieved, optimal maintenance therapy would dictate the daily use of a combination of PDH products including xylitol and other products supporting a neutral pH oral environment and active remineralization.

Figure 2 is a schematic outline of the standard protocols used in our working clinical model.

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<thead>
<tr>
<th>Risk Assessment</th>
<th>Products and Treatment Categories</th>
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<tr>
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<td>Kill Phase</td>
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<td>Low Risk</td>
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<tr>
<td>Moderate Risk</td>
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<td>Moderate Risk w/Kill Phase</td>
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<tr>
<td>High Risk</td>
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<tr>
<td>High Risk w/Kill Phase</td>
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Figure 2: The system’s standard preventive dentistry protocol.

The numbers and symbols in each “Product and Treatment Categories” box represent a minimal dose of a specific PDH product taken at one time. Therefore the numbers and symbols prescribe the timing and dose of each PDH product recommended. Each “**” equals a dose of a pH neutralizing PDH product taken at a time other than the patient’s normal morning and evening home care routine. Each “+” represents a professionally prescribed PDH product containing additional fluoride, calcium and phosphates. Each “!” equals a dose of time-released xylitol to be applied at bedtime.

Therefore, the standard PDH treatment protocol for a patient diagnosed with a low caries risk would be 2x2x2 indicating an adequate dose of oral environment control, healing remineralization and xylitol twice a
If a patient chooses to use a single mouthwash containing adequate sodium bicarbonate, .05% sodium fluoride and a minimum of 3 grams of xylitol / 10 cc, then their custom PDR treatment would prescribe swishing with 10 cc of that mouthwash twice a day for maintenance.

On the other hand if a patient is diagnosed with a high risk requiring a kill phase then the prescribed treatment requires a more aggressive and complex set of home care instructions and the use of more PDH products in combination.

CAMBRA COACHING AND TREATMENT PLAN PERSONALIZATION

The failure of a preventive dental healthcare system has psychological as well as physical consequences. For patients schooled in the traditional preventive dental healthcare model, the curriculum is limited and self-incriminating. As a result, the emergence of dental decay is often accompanied by feelings of shame and embarrassment based on the notion that improved brushing and flossing, better nutrition with less dietary sugar and more frequent tooth "cleanings" would have prevented the problem. Dental professionals become judge and jury with a sure verdict of “guilty as charged”. In addition, the average annual cost of preventive dental care in the United States is $308.92 which covers two adult prophys, two periodic oral exams, and four bite wing radiographs. (36) This expense often leaves those with limited financial resources little hope of access to the system.

In the context of this next generation preventive dental healthcare system, the concepts of CAMBRA coaching and personalized treatment planning were developed to change the preventive culture of guilt and to significantly lower costs and improve access to preventive dental health for all. CAMBRA coaching is philosophically a “no fault” system. Although personal habits have an influence in increasing the risk for future dental caries, most of the factors influencing caries risk are outside of the patient’s control. In addition, each patient’s oral chemistry is unique and the specific nature of their oral bacteria is not static but rather dynamic. Data gathering, diagnosing risk and generating a standard preventive dental treatment recommendation is generic; whereas, teaching, counseling, encouraging and negotiating a unique preventive dental healthcare treatment plan with each patient and providing an objective way to evaluate success inspires change and compliance without guilt.

CAMBRA coaching does not require advanced dental training beyond the ability and certification to take bite wing radiographs. Technological advances that objectively evaluate occlusal caries and the extent of interproximal demineralization and cavitation could help provide the required clinical data for diagnostic module B without advanced dental education. A certified CAMBRA coach could accomplish a comprehensive caries risk assessment with treatment recommendations and quarterly follow ups for less than $100, a 60% cost savings over the average cost of traditional preventive dental healthcare.

It is important to understand that the state of the oral environment and the specific nature of our oral bacteria is not static but rather dynamic. Living away from home, medications, systemic disease, pregnancy, age, stress and a host of other factors affect the pH of the oral environment and can lead to bacterial changes and the bacterial infection that increases the risk for future dental caries. Routine qualitative bacterial assessment can intercept changes with CAMBRA coaching and appropriate PDH treatment to achieve and sustain a low risk profile.
THE SYSTEM’S CLINICAL FLOW

The overall flow of the system merits observation.

1. The patient is invited to complete Diagnostic Module A, the patient survey. It can be filled out online or in office with the assistance of a CAMBRA coach.

2. The patient receives a clinical exam and clinical data on disease indicators and a qualitative bacterial assessment is accomplished. The data is entered into the database.

3. The computer generates a caries risk diagnosis based on the survey and clinical data collected.

4. The computer generates a standard PDH treatment recommendation based on the standard protocol for the diagnosed risk level. The standard treatment protocol is displayed on the computer screen for the patient and CAMBRA coach to view.

5. The CAMBRA coach then discusses the overall treatment recommendation, specific products and treatments available and “negotiates” a custom treatment plan that the patient feels comfortable with. If the patient chooses not to include any of the PDH treatment recommendations in their home care but commits to do a better job with brushing and flossing, then their custom treatment plan would be recorded as “Brushing and Flossing” which is included in the system under the category “Oral Environment Control”. Every patient has a custom treatment plan recorded.

6. A custom PDH treatment plan is printed and given to the patient and the patient and CAMBRA coach decide on an appropriate date to return to the office for the next qualitative bacterial assessment. A three-month timetable is recommended for patients diagnosed with Moderate Risk with Kill Phase, High Risk and High Risk with Kill Phase.

7. The cycle continues when the patient returns for their qualitative bacterial assessment. Module A is updated, what the patient actually did at home is recorded, a new qualitative bacterial assessment test is accomplished and the CAMBRA coach uses all of the information to help the patient develop a new custom PDH treatment plan. The CAMBRA coach’s conversation could range from “Good job. You’ve graduated to simple preventive maintenance” to “Not there yet. How can I help?”

DISCUSSION

This article details the preliminary application of this next generation preventive dental healthcare system. Prior to our initiative to computerize the system, paper tracking of data proved to be awkward and limiting. The computerized model that has emerged simplifies the process and has given us the tools to practically apply caries risk assessment and CAMBRA as the new standard of preventive care for all of our patients. The interactive data gathering process and personalized CAMBRA coaching has helped us reach the goal of engaging and educating both patients and staff. Our local success gives credibility to a broader application of this system, which could provide the foundation for a universal preventive dental healthcare
Our vision is that all existing dental patients and people who have been excluded from the current dental system will be able to benefit from the new science of preventive dentistry.

There are three common reactions to the standard preventive dental healthcare treatment protocols outlined in Figure 2. All three should be addressed.

The most common reaction is that it is far too complex and involves too many products to expect reasonable patient compliance. This could be the viewpoint of anyone in the low risk category; however, in my own clinical experience I have observed that patients who have lost hope and are mired in a chronic cycle of debilitating recurrent caries see the treatment with different eyes and are motivated to succeed.

A second common reaction, especially among patients with limited financial resources, is that the list of products required is too expensive. It is recognized that this is a valid concern and poses a potential limitation in the universal application of this system. There are two solutions to the cost issue. One provides immediate relief and second is more futuristic but historically sound. Immediate relief is a direct result of establishing a system culture of developing and recommending the least expensive, most effective and most accessible PDH products available. It is our goal to include within the specific PDH product lists, generic alternatives to proprietary products as well as “home recipes” to reduce costs. If a patient chooses to use a “home recipe” instead of a commercially available product, the tradeoff is the additional homework required to purchase and mix the essential ingredients compared to the convenience of purchasing a readymade commercial product. Generic 0.05% sodium fluoride rinse is far less expensive than the proprietary alternatives and mixing baking soda and crystallized xylitol in appropriate concentrations provides a 50-80% cost savings. The FDA has recently approved .3% sodium hypochlorite as an effective oral antimicrobial (32) and oil of oregano and other essential oils have been used for their therapeutic antimicrobial effects for centuries (33). The power of this system is that if a patient chooses to use any combination of the alternative PDH products available, systematic qualitative bacterial assessment would validate or invalidate their use with objective data. In the long term the data documenting effectiveness will provide preventive dental health providers with the resources to make more effective, individual, evidence based preventive dental treatment recommendations. The importance of such documentation was highlighted by the US Preventive Services Taskforce’s statement: “Documented effectiveness is the most basic requirement for providing a health care service and an important prerequisite for preventive services” (34). The futuristic but historically sound solution is grounded in the assumption that as this PDH system is used and our patients become more informed, they will demand better products and services and competition in the preventive dental health industry will respond with innovation and mass production of effective PDH products which will ultimately lower costs and improve access.

A third common reaction is hesitation. It is understandable that the dental profession as a whole would be reluctant to aggressively pursue a new clinical standard for preventive dental health. Academics, dental researchers, commercial interests, the dental insurance industry and practicing dentists all have a unique perspective on the process and the evolving system. The new preventive healthcare system outlined in this article has as its foundation the principles of applied prevention and has as its goal to stimulate a preventive dentistry movement that brings all the parties and pieces together.

**CONCLUSION**

At the conclusion of their extensive complete mouth physical, I share with my new patients what I have observed in my dental patients over the last thirty years. The discussion serves as an introduction to CAMBRA and xylitol. As an office culture, we have always been passionate about preventive dentistry. My
staff excels at inspiring our patients in the art of dental flossing and brushing and we have always taken pride with our colleagues in being part of a profession esteemed for its social conscience and focus on the prevention of dental disease. In the early years of building a dental practice, I was confident that my expanding dental hygiene recare system would resolve my faithful patient’s dental decay problems. However, I remained in the same location without the prospect of “geographic dental success” and after a decade, unexpected decay problems began to emerge. Some young patients, including my own children and grandchildren experienced some significant decay problems and many of my older patients began to struggle with chronic root caries. The decay problems were often perplexing, indiscriminately affecting some of my most well motivated patients. Although there were many patients that remained cavity free, the decay failures were unsettling and I was uneasy with the predictability of a cavity free future for my patients, their children and grandchildren. In his prologue to the book “How will You Measure Your Life” world-renowned innovation expert Clayton M. Christensen articulated a philosophy worthy of emulation concerning the teaching, application and evolution of his groundbreaking theories on innovation (35). This next generation preventive dental healthcare system is modeled after Christensen’s philosophy. Simply stated and paraphrased from his original statement: the system strives to engage dental staff, patients and professional colleagues in the “quest” for the most effective preventive dental healthcare system available. The system is based upon the most current theories of dental caries and helps to explain the anomalous incidence of dental caries in clinical practice and seems to accurately predict what the caries activity will be in the future and provides practical preventive strategies to lower the risk.

It is my hope that my professional colleagues everywhere would study and understand the new science of CAMBRA and xylitol research and “put on” this next generation preventive dental healthcare system “like a set of lenses” to test the new theory in clinical practice and provide the foundation for a universal preventive dental health data base.

To date, there have been many significant advances in the science of preventive dentistry that have shaken the prevailing traditional preventive dental health paradigm. Many preventive dental health products and techniques have been developed and will be developed that have the potential to greatly improve the dental profession’s preventive dental health outcomes. This next generation preventive dental healthcare system is designed to be universal, comprehensive, evidence based and to reconcile the old with the new. It utilizes emerging products, techniques and treatment plans and provides evidence-based, real-time data as a foundation for the most effective preventive dental health treatment recommendations possible.

“Et pourquoi pas?” is an old French saying that applies to bold or unconventional ideas. The English translation is “And why not?”. Why not develop a new universal preventive dental healthcare system that reconciles the merits of traditional preventive dentistry with the scientific advances of CAMBRA and xylitol research? Why not take all of the existing preventive dental healthcare pieces and arrange them into a complete whole? Why not develop a new, practical, user-friendly, interactive caries risk assessment? Why not standardize preventive dental healthcare treatment protocols and products? Why not develop a comprehensive “wet-finger” dentist generated data base where analysis of the complex data generated over time would lead to the most accurate, evidence based diagnosis and treatment recommendations possible? With the concept of a next generation preventive dental healthcare system outlined in this article we, as a profession can develop a preventive dental healthcare system that meets and exceeds all of these goals. The system is designed to be adaptable. It is easily incorporated into a traditional dental hygiene recall system and has the potential to energize dental hygiene departments, to attract new patients, and to increase practice profitability through CAMBRA coaching. The system could also be used independently as a new access portal into dentistry for those outside of the current system. The system is designed to be expansive, not expensive, and global in its reach across all socio-economic striations and situations.
Because the system is principle rather than product based it will encourage and embrace new technology, biochemical advances and market forces producing a vast array of new preventive dental health products. This system is currently being used successfully in my practice, producing real, measurable benefits to hundreds of patients.
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