The JOURNAL of Cosmetic Dentistry

The Official Journal of the American Academy of Cosmetic Dentistry®

In This Issue

VOLUME 18 • NUMBER 1
SPRING 2002

American Academy of Cosmetic Dentistry®

Volume 18 • Number 1 *Spring 2002*

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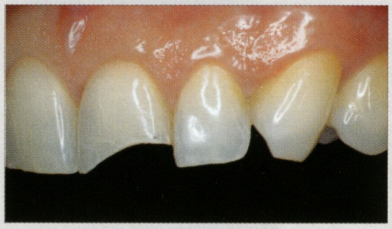
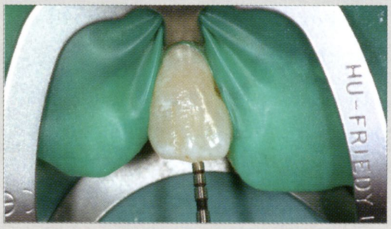
CLINICAL *science*





DIGITAL *photography*

CULTURAL *study*

PRACTICE *development*

DEPARTMENTS

The Journal of Cosmetic Dentistry, ISSN# 1532-8910, published four times a year, January, April, July, and October, $25 per copy, by the American Academy of Cosmetic Dentistry®, 5401 World Dairy Drive, Madison, WI 53718. 800.543.9220 or 608.222.8583. Periodicals postage paid in Madison, WI and additional offices.

POSTMASTER: send address changes to:
The Journal of Cosmetic Dentistry
American Academy of Cosmetic Dentistry®
5401 World Dairy Drive
Madison, WI 53718

Peer-reviewed articles are denoted with the following symbol ❖

From the Editor

The American Academy of Cosmetic Dentistry will come together for its Annual Scientific Session in May. The membership is producing talented individuals whose work continues to change the dynamics of our patients' lives. The goal of our Journal is to continuously expand the knowledge and information gained through our academy's membership in the field of esthetic dentistry. We are encouraged by so many wonderful supporters of the Journal, who recognize the importance of a commitment to excellence. The Journal continues to expand into different means of expression, forms of education, and changing technologies. Throughout the progression, our focus should be on delivering excellence to our patients. This issue will explore changing dynamics of communication brought about by digital photography, the challenges faced in understanding tooth color and value, as well as a number of other valuable contributions.

For the first time, we are recognizing not just one, but many contributors to the cover. We hope that this approach will encourage others to contribute their skills and talents to the Academy. Many thanks go to the staff at the AACD's Executive Office; without their energy and passion, we would not see the end results of such beautiful work. In addition, we will be soliciting your help in guaranteeing future journal successes; during our Annual Scientific Session, there will be opportunities for you to obtain more information on writing for and contributing to the Journal. Feel free to contact me or Tracy at the Executive Office for more information.

The field of dentistry has been blessed with many renowned educators, but none with such impressive credentials as Dr. Peter Dawson. I was very excited to have an opportunity to ask Dr. Dawson to share with our membership some of the philosophy behind his passion and love for dentistry. He has committed his life to clinical dentistry and education and continues to have an impact on both young and established dentists, striving to teach the fundamental principles of comprehensive exams and a strong dentist/ceramist relationship. Without his commitment, many of us would not have achieved the results that are possible in this era of modern dentistry. So it is with great admiration that we thank Dr. Dawson for his years of commitment and devotion to our field. As you read his interview, you'll see how many people contributed to the development of his philosophy, which has stood the test of time. The friendships and relationships that stemmed from his commitment to excellence have affected us all. I think we all would have enjoyed being a part of the creativity and brilliance that gave birth to some of the early philosophies of occlusion and rehabilitation.

Thomas F. Trinkner, DDS

Thomas F. Trinkner, D.D.S.

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About the Cover

An ADT Diode laser was used to expose more tooth structure to give this patient a fuller smile. Ten Empress™ veneers were placed to lengthen, whiten, and to close her diastemas.

Cosmetic dentistry by David S. Hornbrook, D.D.S. Westlund Dental Studio, Eden Prairie, MN, fabricated the ceramic restorations. Photography by Mark Lang, Lang & Associates, San Diego, CA.

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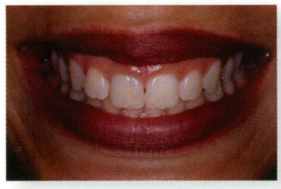

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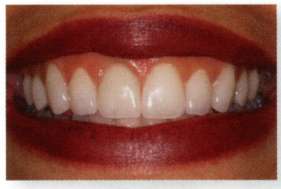


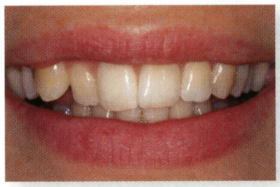
after

***About the Cover**, continued on pages 8 and 9.*

***About the Cover**, continued from page 6.*

This beautiful young woman was presented with misaligned maxillary anterior teeth. She declined a recommendation of orthodontic treatment. As an alternative, her goals were achieved with the placement of feldspathic veneers on teeth ## 4-13, aligning the teeth and building in the appropriate anterior guidance.

Cosmetic dentistry by Dr. Sue Wendling, Lake Oswego, OR; ceramics by Marvin Staggs, PDR Laboratory, Salem, OR; photography by Legacy Fine Portraits, Vancouver, WA.



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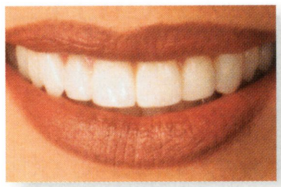


after

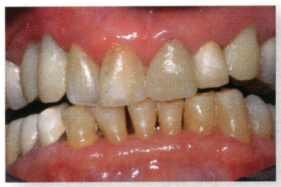
Male Patient

This patient presented with a deep overbite, severe anterior wear and fracturing, multiple carious lesions, and inadequate oral hygiene. Centric relation was established using a permissive splint and bi-manual manipulation. Vertical dimension was increased 4 mm at the anterior teeth to facilitate adequate functional and esthetic requirements. A retrievable maxillary-splinted bridge was placed over telescoping copings on teeth # # 3, 4, 8, 9, 13, 14, and 15. The lower teeth were restored with Empress™ full-coverage restorations on teeth ## 20-29. PFG restorations were placed on ## 18, 19, 30, and 31.

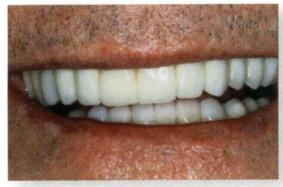
Female Patient (before and after photographs not included)

Eight posterior Empress full-coverage restorations replaced failing porcelain/metal restorations in this patient. Whitening with Discus Nite-White.

Cosmetic dentistry by Bradley Hester, D.M.D. Ceramist, Marvin Staggs, PDR Laboratory, Salem, OR. Photography by Fred Alexander, Sunriver Photography, Sunriver, OR.

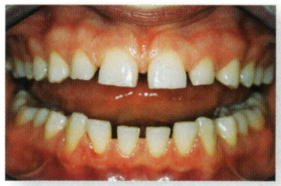


Male's before



Male's after

This patient was referred by an orthodontist who was unable to offer her any treatment. Due to the multiple diastemas and short clinical crowns, we needed to open her existing vertical dimension to allow room to restore her entire dentition (teeth ## 2–31). Her new vertical dimension was determined neuromuscularly by measuring her electromyography (EMGs) using Myotronics equipment, tensing her, and placing her lower jaw into a position that was compatible with her EMGs, her appearance, and her comfort. We restored her using crowns and veneers from MicroDental Laboratory, Dublin, CA (ceramist, Carol Schweizer). The occlusal equilibration and verification was accomplished with Myotronic equipment. Photography by American Photo and Imaging, Raleigh, NC. Cosmetic dentistry by James Harold, D.D.S.



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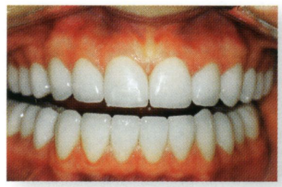
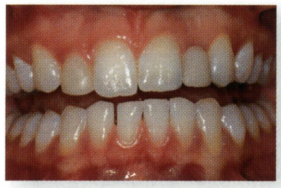


after

The patient had a bite problem that caused headaches and jaw pain. She was missing a front tooth and had an unattractive bridge. We restored ##4-#13 and #23-#26 in Empress™ pressed ceramic. Gingival laser recontouring was done on ##4, 5, 7, and 8. The patient's bite has been restored and she has a beautiful smile. The icing on the cake is that her headaches and jaw pain are now gone.

Cosmetic dentistry and photography by Rhys Spoor, D.D.S. Ceramist, John Lavicka, Dental Ceramics, Garfield Heights, OH.



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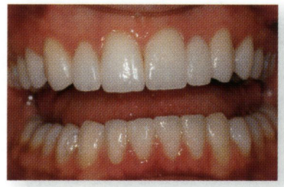

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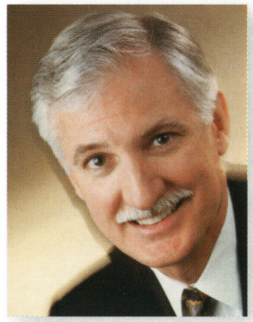
From the President



Some Thoughts on Practice Management

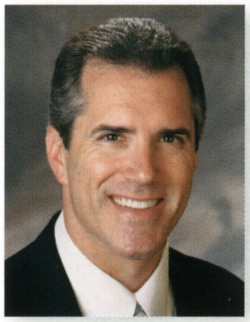
As we focus on issues of practice management, we often look to the best practices of small businesses and large corporations for ideas that can be adapted. And certainly, there are a plethora of business texts that claim to have the answer to the best marketing procedures, the best sales principles, or the best manufacturing processes. This is all well and good, but before understanding processes, it is necessary to understand vision and value. As author Jim Collins said in his book, *Built to Last*, "A visionary company articulates a core ideology... built on core values (which are) essential and enduring tenets, not to be compromised for financial gain or short-term expediency." In looking at the most enduring and successful companies, such as General Electric and American Express, we can see that their strengths have never been compromised, despite occasional financial and market challenges. It is their core values—established when the company was founded and adhered to unwaveringly—that distinguish visionary companies.

With his new book, *Good to Great*, Collins essentially has created a "prequel" to *Built to Last*. Core values and ideology are critical, but specific leadership qualities are what differentiate the merely good from the truly great. Collins states that, first, one needs to "get the right people on the bus (and) the wrong people off of the bus" before even considering vision and strategy. Second, one must establish a goal and a strong faith in that goal in the face of the great challenges one will face along the way (or as Collins calls it, "the brutal facts"). And last, one must transcend competency and explore new and innovative ways of keeping the business and the people involved in it fresh and vitalized.

Our 18th Annual Scientific Session, "From Solo to Symphony," will take place May 7-12, 2002, in Honolulu. During this conference, we want to explore the ways of moving beyond the "solo" to create a "symphony" by establishing relationships with doctors in allied fields, all in the name of better patient care and personal professional challenge. We can make this process even more meaningful by exploring what drives our practices and ourselves, or by understanding what core values we have established for our personal lives and our professional lives. More importantly, we might ask how well we have adhered to our core values. And as we continue to focus on practice management, take a look around your own practice. How apparent are your values in the operation of the office, in the people who help the office run smoothly, and in the challenge and the excitement that the staff feels as they approach their responsibilities? One can talk sales and marketing incessantly, but it is the values we create and the methods by which we manage and lead that will distinguish the good practices from the great practices.

Arthur Chal, D.D.S.

From an Editorial Reviewer



Prior to 1995, I had never heard of "Accreditation" or the American Academy of Cosmetic Dentistry. I had been practicing dentistry for nearly 10 years and thought my dentistry was better than average, yet always believed that I could do better, both from a clinical and a diagnostic standpoint. Since graduation, I had attended numerous continuing education courses to improve my dentistry. The results I achieved in cosmetic cases were impressive, considering I never really knew how much better they could be at the time. Then, after attending a continuing education course on cosmetic dentistry by Ross Nash, D.D.S., F.A.A.C.D., my personal and professional life forever changed. I "saw the light" and began to redirect my focus to the type of dentistry I wanted to do each day—I wanted to have a cosmetic-based practice, and believed it was possible.

In 1996, I attended my first AACD Annual Scientific Session in San Diego, California. After listening to many world-renowned clinicians and seeing the type of cosmetic dentistry I never knew existed but hoped was possible, I left the meeting energized and excited by the reality of what was truly possible to achieve, both for myself and for my patients. I was ready to go! While at the meeting, I had registered for Accreditation, not completely knowing what the overall process would involve, but knowing that I had 2 years to get ready. I thought, "2 years, five cases, no problem; I have plenty of time for this." Oh, how wrong I was! Little did I know that what was to follow over the next 2 years would open up to me a whole new world of increased professional growth and knowledge, lifelong friendships, and immeasurable personal success. The 2 years went by in the blink of an eye and I finished photographing my last case 1 week before I was to do my Accreditation presentation.

My quest to learn as much as I could as fast as I could led me to join my local chapter of the AACD, the Southwest Affiliate (now the Southwest Academy of Cosmetic Dentistry–AACD). There I met Cary Behle, D.D.S., an Accredited Member and then current Affiliate President. As a result of his educational guidance of and confidence in me, as well as my seeing his incredible dentistry, Cary became the first of my mentors in my path toward Accreditation. Thereafter, I met Joe Carrick, D.D.S., F.A.A.C.D., who became my Accreditation Consultant, and Lawrence Addleson, D.D.S., F.A.A.C.D., who showed me that porcelain can actually look like natural teeth. Through a concerted effort on the part of these three outstanding clinicians, as well as my friendship with Richard Masek, D.D.S. (also an Accredited Member), my dream of Accreditation was successfully realized in May 1999. Had it not been for these four individuals' belief in me, despite my not being successful after the first examination review, I would not be where I am today. To these four friends, I owe an eternal debt of gratitude.

The overall process of Accreditation involves many facets. First is the belief that your dentistry can reach new heights seemingly unattainable at the onset. The desired "zone of excellence" to reach Accreditation can represent many different things to each of us. At the forefront is the understanding that your patients are the ones that benefit most from your recognized level of expertise. To present your cases and have your dentistry examined by a group of your peers is an honor and should be viewed as such by all who pursue Accreditation. Regardless of whether you are successful, all who attempt Accreditation demonstrate a desire to be the very best at their chosen profession.

Support from those around you during the Accreditation process is essential. Encouragement from family and friends is crucial to help overcome the stressful times. Your team members become an integral part of your journey toward Accreditation and their response to your efforts and the dentistry you create are vital if you are to reach your ultimate goal. In the 3 years it took for me to reach Accreditation status, I was always surrounded by people who were completely supportive of my efforts and positive that I would reach my goal. It is important that everyone around you during this process offer moral support so that your focus remains fixed upon successfully completing Accreditation.

There is no greater feeling than being recognized by your peers as one

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of the best. Standing in front of the audience during the Accreditation Awards Ceremony was a moment I'll never forget. What made it even more special was to have my team members there to share it with me. Receiving the award made all the difficult and stressful times worth the effort and reinforced the commitment I made to provide all my patients with the highest level of care. I strongly encourage everyone to participate in the Accreditation process and experience the rewards of your accomplishment.

As an Accredited member of the world's most prestigious dental organization, I found my clinical and diagnostic skills elevated to a new dimension and my confidence level at an all-time high. The so-called "standard of care," as it previously existed, no longer was either "standard" or "average" in my eyes. From this point on, everything I did in dentistry now had to meet the "new" standard of care, the "Accreditation" standard of care. This was an unexpected change in my thinking from 3 years earlier; a change I welcomed completely and a challenge I will live up to for the rest of my dental career. My dental team would also benefit as a result of my Accreditation. No longer would they consider dentistry as just dentistry. Because they were such an important component in my evolution toward Accreditation, they would share in the accolades of the award, as do others—especially our patients, past, present, and future. They would become promoters of our profession and messengers of our mission and vision.

Since May 1999, the growth and success of my office has been phenomenal. This I directly attribute to the "aftershocks" of the Accreditation award, process, and experience. As a practicing dentist for close to 16 years, I truly look forward to each day I have the privilege of caring for my patients. I can't think of any other profession more personally gratifying and motivationally rewarding. The ability to create a smile in others is powerful. The power of being able to bring a smile to those who have never smiled is priceless.

My path toward Accreditation was inspired by numerous individuals. My story is not an uncommon one. Accreditation has renewed my passion for dentistry and has given me the opportunity to be more involved in the promotion of dentistry. I hope you are inspired to achieve this goal and to pursue higher learning. I am honored to be an Editorial Review Board member and to give my creative input in the growth and development of this fine journal. See you in Hawaii!

Nelson Y. Howard, D.D.S.
Accredited Member
Past-President, SACD–AACD

CALL FOR MANUSCRIPTS

The Journal of Cosmetic Dentistry wants to provide its readership with more clinical research articles. Whether you're a private practitioner, a university-based teacher and scientist, or a laboratory technician, we encourage you to put esthetic techniques and materials to the test. We want to see the results of your research! We also welcome case reports and articles relating to practice development.

The Journal of Cosmetic Dentistry is a peer-reviewed publication. Unlike some scientific journals, we publish color illustrations at no cost to the author. At this time, *The Journal of Cosmetic Dentistry* also offers a relatively short interval between manuscript submission and publication of accepted articles, allowing our authors to get their work into print rapidly.

Submit your manuscripts to:

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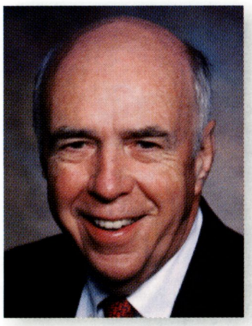
Interview with a Master



Dr. Tom Trinkner
Interviews Dr. Pete Dawson

Question (Dr. Trinkner)

Can you describe the young Pete Dawson and explain why you chose dentistry?

Answer (Dr. Dawson)

My dad owned a dental laboratory and when I was 13, he invited me to come to work in the lab as an apprentice technician. I started out delivering to the local dentists and cleaning up the lab but he soon had me pouring models, mounting cases, repairing vulcanite dentures, and all kinds of different jobs. After dinner, I'd often go back with him and he would show me how to make porcelain jacket crowns and shell crowns. He actually taught me how to design partial dentures when I was still a teenager! He was a perfectionist; I think his perfectionism rubbed off on me because I always thought that was the way dentistry should be practiced. I liked the lab work so much I told my dad I wanted to be a technician. He told me that if I wanted to be a technician, I had to go to dental school first and then, if I still wanted to be a technician he'd give me the lab. So I decided early on dentistry. I have loved it from the time I got involved and I seem to love it more every year.

Question

During your dental career, you have associated with some of the greatest teachers (both dental and non-dental). Who has inspired you, and why?

Answer

I'm so grateful for having come up in dentistry at the time I did. When I got out of dental school I went into the Air Force and was truly blessed to have a commanding officer (CO) who loved dentistry and believed in quality care. I was stationed in Japan for 2 years and, because of my laboratory experience, the CO made me a crown and bridge prosthodontist. I did crown and bridge dentistry for 2 years before going into private practice and I really thought I knew what I was doing. In my first year in practice I hired a full-time technician who worked with me in my office. It was my good fortune during my early practice years to meet Dr. Sig Ramfjord, who came down to St. Petersburg and met with me and three other dentists to teach us how to equilibrate the natural dentition. After I learned some fundamentals in equilibration, it became obvious how I could tremendously improve some of the crown and bridge work I'd done. As I went back and corrected the occlusions that I had thought were correct to start with, the response in the patients was so noticeable I could never go back to ignoring centric relation (CR) and occlusion again.

After that, I met L.D. Pankey and went to one of his first seminars in Miami. The chemistry was really great between us and he invited me to come back to Miami and join him and Clyde Schuyler, Henry Tanner, John Anderson, Gerry Courtade, and several other excellent dentists for a little informal 3-day session that L.D. had put together. L.D. not only influenced my dentistry, but he also influenced my life and I consider his friendship through the years as one of the most important things that ever happened to me. About the same time, I also was studying with Arne Lauritzen, Peter K. Thomas, Charlie Stuart, Harvey Payne, and Ernie Granger. I got heavily into gnathology with Stuart instrumentation and tripodization, and again realized that I was having to go back and equilibrate every case after completion. Through Clyde Schuyler's influence, I started spending more time on anterior guidance and then getting the back teeth so that they didn't interfere with either the condylar path or the anterior guidance; my results began to be so predictable that I knew that was the direction to follow.

In those years, we were shoving the jaw back as far as it would go for CR. I met and became friends with the great anatomist, Dr. Harry Sicher, who agreed to come to St. Petersburg to work with me and three other dentists to help us gain a better understanding of the anatomy of the temporomandibular joint. I had asked him to help me better understand why CR should be at the "most retruded" position. It was at that dissection that I realized that the condyles went *up* with normal muscle activity, so I changed my whole concept of occlusion to harmonize to the upper-most position. I realized that shoving the jaw back actually forced the condyles to go *down*, which created interferences on the most posterior teeth when the elevator muscle closed the jaw. It was from that enlightenment that I started to work on a better way to achieve CR. This resulted in the bilateral manipu-

lation technique and eventually, through a lot of cooperation with some key people, such as Alvin Fillastre, John Anderson, and Sig Ramfjord, we were able to change the definition of "centric" to get away from the "most retruded" concept. My great friend, Parker Mahan, also was a tremendous resource regarding anatomy and physiology, and as he was in agreement with me about CR and occlusion, he was a great help.

At this point I realized that we could make some major improvements on what we were doing with anterior guidance. So, I worked on developing a four-step process for what I called "customizing the anterior guidance," which enabled us to be very precise in finding not only the lingual contours, but also the precise incisal edges and the labial contours. That process still works today and has been tremendously important to me in the large number of restorative cases that I did and the esthetic results that we were able to achieve predictably. It certainly eliminated all the guesswork when we restored anterior teeth.

Question

Dentistry is overwhelmed with new forms of literature. How do we read with a sense of security and understanding to separate the good from the bad?

Answer

Now you are getting to one of my favorite topics, because I believe that a great deal of the literature, particularly that on temporomandibular joint disorder (TMD) and occlusion, has been horrendous. Some of it is very good and very useful, but much of it is not scientific and needs to be dramatically revised. The argument that occlusion has nothing to do with TMD is based upon the flawed literature to which I'm referring, which considers TMD to be a nebulous syndrome. Today we have the ability to be very specific in diagnosing and classifying every type of TMD, and we can also pin down very precisely the types of pain responses from other disorders that are related to or influence the masticatory system. Dentists must get a better education in total masticatory system anatomy and physiology so that when they get out of dental school they are better equipped to analyze the literature and understand that what we do as dentists can affect many different parts of the system. It has become a passion of mine to encourage dental educators to recognize that dentists today should be physicians for the total masticatory system. I'm happy to say that I see a number of educators who are trying to take dentistry in that direction; this can only be a good thing.

A major problem today is the profuse amount of hype and unsubstantiated claims put out on the Internet. Backing up the misinformation by a barrage of testimonials is so phony, but young dentists who don't know the facts get sucked in.

Question

Since your clinical retirement, what is the greatest change in dentistry you wish you had been able to utilize?

Answer

Well, I think we had a very good understanding of occlusion and the temporomandibular joint, and we concentrated on total masticatory system harmony as a goal. So I can truthfully say that the restorative cases that I did many years ago have held up extremely well and the patients, with rare exceptions, are still enjoying what we did years ago. However, I would have loved to have had the esthetic materials, the veneering materials, and the quality of the dental laboratory work that is available today. I'm proud to say, however, that a lot of the esthetic results that are being achieved today are following exactly the concepts that were worked out originally by Paul Muir in my office. Paul was my technician for almost 40 years and he developed the layering concept for porcelain restorations that put the color behind the outermost translucent porcelain rather than putting it on the surface.

I'm also excited about improvements made in adhesives and major advances in osseointegrated implants.

Question

Can you describe what balance *means to you?*

Answer

Balance is tremendously important to me, both in terms of dentistry and in terms of life in general. I believe that dentistry offers fantastic opportunities to live a balanced life. Even though I was extremely busy as a clinician, early on I made the commitment to my family to never let my career interfere with the joy of being a husband and father. I have four great kids and eight grandchildren and a very special, happy relationship with Jodie, my wife of 45 years; I'm very grateful for that. I also have a very strong faith in God, who has blessed me beyond measure. Frankly, I attribute the major part of my happiness and the family blessings to that faith. I know if I didn't have it, my life would really be out of balance.

Question

Can you discuss your feelings of being committed to mastering *dentistry versus* mediocrity?

Answer

I consider "mastering" dentistry to be a requirement of integrity. I believe that, as dentists, we owe our patients the very best we can give them and that even patients who have very limited funds deserve at least our time to complete thorough examinations and to help them decide on what's best for them. Many dentists confuse quality dentistry with what I refer to as "smell me" dentistry, in which they work only

on rich people. I don't buy that. I believe that every person who walks into our office deserves our full attention to help them make the right decision for them and if they can't, for one reason or another, opt for the most sophisticated dentistry, then we should work with them to make sure that they have every opportunity within their means to have the healthiest mouth possible.

Question

What do you think dentists today need to know to be successful and how do you see that changing, if at all, over the next 10 years?

Answer

Dentists need to understand that our job is to get mouths healthy. Let me expand, and say that our job is to get the *total masticatory system* healthy. Every dentist should be able to diagnose and treat toward that goal. That means they absolutely must have a thorough understanding of the temporomandibular joints and occlusion. As it's not possible to understand occlusion without first understanding the joints, it's an absolute must that they develop this understanding if they didn't get it in school. I see the trend toward esthetic dentistry growing, and I think this is a good thing. I consider the best esthetics to be the healthiest mouth, including not only the teeth but the gums and all the supporting tissues as well. I don't think you can properly design an occlusion or anterior esthetics without having an understanding of total masticatory system harmony—this is what every dentist should strive for. My concentration in the seminars I teach and the whole curriculum at the Dawson Center for Advanced Dental Study is to help dentists understand the principles and concepts of total masticatory system harmony. When they understand how all the parts of the system work together, techniques and materials fit into that realm…not vice versa.

Question

How can we minimize our clinical failures and maximize our successes?

Answer

Number one, it starts with a complete examination, and I mean *complete*. I think the biggest mistake that dentists make is to try to rush through 15-minute exams and try to see too many patients. Diagnosis should be the number one priority in dental schools, and it should be the most important thing that dentists do. The new patient exam is unquestionably the most important building block for an exceptional practice, and through an understanding of treatment planning, dentists can know exactly what is needed to bring a mouth to optimum beauty and comfort and to be very predictable about it. I think the principles involved also have to be combined with quality control procedures that enable the dentist and the technician to work together without confusion. One of the most important things I teach is dentist/technician communication. Through my years as a restorative dentist, I have developed numerous, very specific quality control procedures for every aspect of restorative dentistry, which can be used with great practicality. They will save a tremendous amount of time in every practice. When I walk into the typical crown and bridge dental laboratory, I am appalled at what the technicians have to work with. It's no wonder that patients have so many problems and dentists have to do so many remakes and reworks to try to get their dentistry to work. I think dentists waste so much time reworking their restorations that they think it s a normal part of dentistry. It doesn't have to be that way.

Question

Like you, two of my passions are golf and dentistry, both of which have humbled me in every way possible. How do you feel they relate and what can we learn from both?

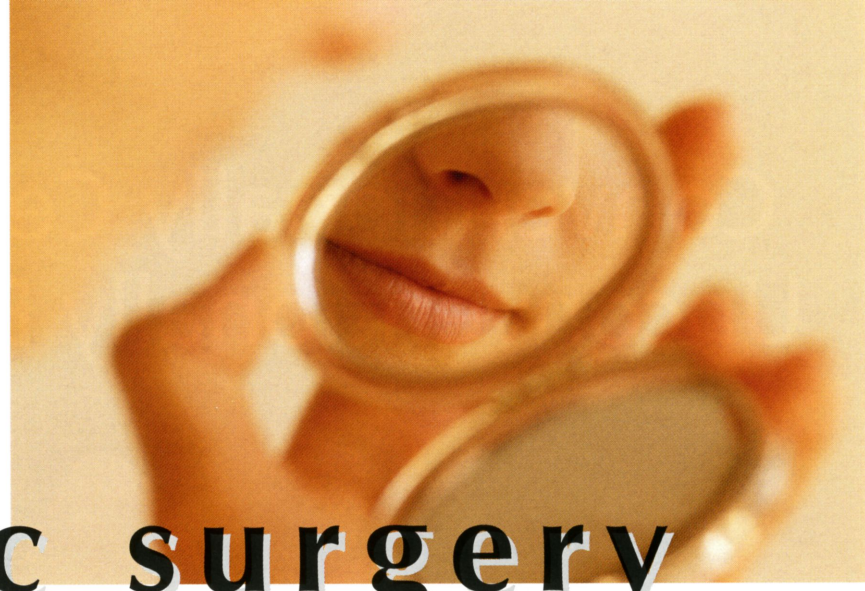
Answer

As you know, I love golf and I'm grateful that it takes 4 hours to play a round because I can get out and unwind and enjoy the beauty of the golf course, and enjoy the camaraderie. I love dentistry, too, and believe that it's the best hobby in the world. Being able to work with patients to develop beautiful smiles and comfortable mouths, and to enjoy the camaraderie because we get to know them very well through the years, is a wonderful way to earn a living. I always loved practicing dentistry, and now that I have more time to devote to teaching, I get a huge kick out of seeing dental practices and dentists' lives turn around as they start to enjoy dentistry as much as I do. I feel sorry for clinicians who don't love dentistry, because I know that they would if they could do it predictably. That's not an impossible goal. Trying to help dentists understand this is what I'm having fun doing right now.

"The AACD has a marvelous opportunity to elevate the dental profession to a higher level by embracing the idea that cosmetic dentistry falls short if it is not in harmony with function. The Academy will need to challenge opportunistic methods and false claims of superiority by being, first, physicians of the total masticatory system who put the patients first."

Peter E. Dawson, DDS

Peter E. Dawson, D.D.S.



plastic surgery corner

by
Brian Daly, M.D., D.D.S.

Dr. Brian Daly graduated from the University of California, San Francisco, Dental School in 1971. After completing a residency in oral and maxillofacial surgery, he attended Drew/UCLA Medical School and completed residencies in general surgery and plastic surgery. Dr. Daly is board-certified in both oral and maxillofacial surgery and plastic surgery, and he is currently in private practice in both disciplines. He is an assistant clinical professor of plastic surgery at the University of California, San Diego. Dr. Daly also enjoys serving underprivileged people through volunteer programs.

BLEPHAROPLASTY: A CLOSER LOOK AT THE EYES

Signs of aging often appear first in the periocular area, and people pay attention to the appearance of these "windows to the soul." Cosmetic eyelid surgery is the most common esthetic procedure performed by plastic surgeons.

Factors that can adversely affect the appearance of one's eyelids include sun exposure, habits (squinting, smoking), age, heredity, recurrent bouts of swelling (related to the menstrual cycle, systemic disease, etc.), unusual or asymmetrical eyeball size, and forehead/eyebrow sagging.

Blepharoplasty can make a person look more alert, attentive, and enthusiastic.

BENEFITS

Blepharoplasty improves dermatochalasis, more commonly known as "baggy eyelids." As we age, fat that used to be inside the bony cavity surrounding the eyeball moves forward out of the eye socket. This produces bulging "bags" above and below the eyelids. Excess skin in the upper eyelids can be removed, which makes this area appear more youthful. A lesser amount of skin can be removed in the lower eyelids, which results in some smoothing of the skin adjacent to the lower lid margin. Blepharoplasty can make a person look more alert, attentive, and enthusiastic.

POTENTIAL DRAWBACKS

Blepharoplasty alone does not necessarily improve wrinkled or baggy skin much below the level of the bony rim of the orbit. Eyelid surgery does not have a major effect on "crowsfeet," nor does it alter skin characteristics. Eyelid surgery cannot compensate for asymmetry in eyeball size or position, nor does it alter the bony contour of the orbit. When eyelid-related "bags" fluctuate in size, this is not improved—and may be worsened—by blepharoplasty. Interestingly, when a person's eyebrow position is low, their forehead (frontalis) muscle tone often increases, to prevent further lowering of skin and tissue onto the upper eyelid area. Then, when excess upper eyelid skin is surgically removed (with blepharoplasty), the person's frontalis muscle tone decreases. The brow often then descends, resulting in an upper eyelid appearance that is not very different from the person's preoperative condition.

CONTRAINDICATIONS

Relative and absolute contraindications to blepharoplasty include significant ptosis (drooping) of the eyebrows (see above), eyes that are prominent in relation to the lower and/or lateral bony orbital rim, lower lid laxity, systemic conditions such as excessive bleeding, and symptoms of "dry eyes."

"Dry Eyes"

There is a moist "tear film" over the eyeball, which has three layers. An inner layer of mucous (layer one) adheres to the eyeball itself; this mucous attracts and holds an overlying thin layer of the water-like tear liquid (layer two). (This water-like liquid is the component of tears that can run down the face during crying.) The outer layer is composed of oil (layer three), which slows evaporation of the tear film. A deficiency of any one of these layers results in "dry eye" symptoms. When the eye is irritated or dry, the large lacrimal glands reflexively secrete large amounts of the water-like liquid (layer two), which paradoxically can result in excessive tears, even when the person's eyeballs do not have a uniform protective three-layer tear film.

PREOPERATIVE WORK-UP

If the patient and doctor agree that the potential benefits outweigh the risks, a surgical plan is formulated. The goal is to provide maximal improvement while minimizing the risks. Sometimes, raising the eyebrows via a forehead lift (without blepharoplasty) is most appropriate. A forehead lift can be performed at the same time as blepharoplasty, or at a later date.

Patients usually are surprised at how much skin can be removed.

Important points to cover in the preoperative work-up include findings related to the above issues, family history of eyelid abnormalities, thyroid disease, tobacco use, and prior eyelid surgery. Visual acuity and eye movement is assessed. The surgeon looks for upper eyelid ptosis, symmetry of eyebrows and lids, and the position of the lacrimal glands and tear drainage puncta. Frequent blinking can be a sign of inadequate tears. Lower eyelid tone/elasticity is carefully assessed by pulling each lower lid forward and watching the speed of lid recoil; this is repeated after pulling each lower lid downward. Bulges of hypertrophic orbicularis muscle are noted, as these will be excised during the surgery. "Festoons" of muscle that droop toward the malar/maxillary areas are also noted, as they can be improved via plication and contouring.

PROCEDURES

Uper Blepharoplasty

The most common procedure that I perform is upper blepharoplasty with removal of excess skin and some excess orbicularis muscle. This can be accomplished in an appropriate treatment area under local anesthesia only. If the doctor is patient, knowledgeable, and methodical, the anesthetic causes very little discomfort. The amount and shape of the skin to be removed is very carefully drawn on the eyelid skin. The corner of the eye that is toward the temple is called the lateral canthus. The lateral end of the skin removal pattern usually extends 1 to 2.5 cm beyond the lateral canthus (but not as far if a forehead lift also is performed or planned).

Patients usually are surprised at how much skin can be removed. If there is not a large amount of excess fat (bulging) in the upper eyelid, this may be left alone, because there will be some fat loss with additional aging, and risks and recovery are affected by the removal of such fat.

Lower Blepharoplasty

The lower eyelid presents a unique challenge, because if the lid were to be pulled downward by the surgery, a "staring" appearance can result. This usually means that less skin can be safely removed than the patient may desire, and even fat bag removal can cause subsequent scarring, which can also pull the eyelid inferiorly. Thus, lower eyelid fat bag removal or repositioning often is performed via an incision in the conjunctiva. This fat can

be removed, repositioned back into the orbit, or brought down over the orbital rim to fill the depression beneath the "bag." It also is not uncommon to tighten the lower eyelid (canthoplasty) at the same time that blepharoplasty is performed. Several methods of canthoplasty are used. I most often use a technique of suturing the lateral canthal tendon upward and laterally to the periosteum of the lateral orbital rim at about the level of the upper edge of the pupil.

The recovery after blepharoplasty varies quite a bit between patients, even when similar procedures were used.

Despite appropriate care, some patients develop a sagging of the lower eyelid after lower blepharoplasty. This usually resolves spontaneously, but if necessary, there are a number of surgical options to improve this condition. After the above issues are addressed, wrinkled lower eyelid skin usually is still visible; this can be improved using a resurfacing technique, but not without all of the recovery and side-effect issues that resurfacing entails. Because of the above issues, lower blepharoplasty very often is performed under general anesthesia, which requires the use of an accredited operating room. The addition of these prerequisites influences recovery and dramatically increases the cost.

RECOVERY

The recovery after blepharoplasty varies quite a bit between patients, even when similar procedures were used. Sutures are removed within a week (makeup can be applied after the sutures are removed). The portions of scars that extend lateral to the lateral canthus are barely visible at first, becoming more red over the first 6 to 8 weeks, and then usually fade to nearly invisible. Few patients have enough pain to warrant more than about two doses of pain medication. Some patients are not quite able to completely close their eyes for the first few days, and special care is necessary to prevent corneal drying. I prepare patients for the "worst case scenario," which means that swelling can interfere with visual fields and bruising can last up to 3 weeks.

POSSIBLE COMPLICATIONS

In rare cases, a bruised appearance can last for a few months. In the very rare cases where blindness has occurred, it apparently has been due to bleeding that tracked posteriorly, interfering with optic nerve function. Infection also is rare, as is corneal injury. Ptosis can occur due to separation of the levator palpebrae aponeurosis (a sheet of fascia that connects the muscle that raises the eyelid to the rim of the eyelid). This is rare, but can occur, for example, in an elderly patient with pre-existing weakness of this structure. If ptosis is present preoperatively, it is difficult to obtain perfect symmetry; thus several techniques for postoperative adjustment are described in the literature. Very often, blepharoplasty improves upon a patient's pre-existing asymmetry, however, if some asymmetry persists for several months, a second "touch-up" procedure is easily done. Certain skin conditions, such as vascular telangiectasias, can be worsened by blepharoplasty.

This article highlights that the procedure of blepharoplasty itself is not extremely complex, but that patient evaluation and the judicious use of adjunctive procedures require some sophistication. You are now well on the way to a good understanding of the benefits and challenges of esthetic eyelid surgery.

❖

literature review

by
Bruce J. Crispin, D.D.S., M.S.
Director of Esthetic Professionals

Dr. Crispin is a diplomate of the American Board of Prosthodontics, a member of Omicron Kappa Upsilon, and an Accredited Member of the AACD. He is currently director and founder of Esthetic Professionals Academic and Technical Training Center, and a professor emeritus of UCLA School of Dentistry. He is also editor and primary contributor of the textbook, Contemporary Esthetic Dentistry Practice Fundamentals, *which has been printed in English, Japanese, German, and Spanish.*

THE "C-FACTOR" CAN BE A CURSE TO RESTORATIVE DENTISTS

CHOOSING AN OPTIMAL CERAMIC INLAY CEMENT

1. Gemalmaz D, Ozcan M, Alkumru N. A clinical evaluation of ceramic inlays bonded with different luting agents. *J Adhesive Dent* 3:273-283, 2001.

Ceramic inlays are a well-established treatment in contemporary restorative dentistry. The aim of this study was to evaluate the clinical performance of a fired ceramic inlay system using three different luting agents.

This study was an open assessment of 45 ceramic inlays (Ducera LFC, Ducera; Rosbach, Germany) placed in 26 patients. Forty were moderate-sized Class II restorations, two were four-surface extensive inlay restorations, two were Class I restorations, and one was an onlay. Three groups of 15 were cemented with two resin cements: Variolink high viscosity (Vivadent; Schaan, Liechtenstein) and Enforce (Dentsply Caulk; Milford, DE), and one polyacrylic acid-modified glass ionomer cement Geristore (Den-Mat; Santa Maria, CA). The restorations were evaluated every 6 months for the first year and yearly after that using a modified USPHS criteria; the margins were examined with a scanning electron microscope over a 4 to 46 month period.

Results: Seven inlays failed due to ceramic breakage. Five of those were luted with Geristore, one with Variolink, and one with Enforce. Marginal staining at 36 months was not noted for the two resin cements but was noted in 67% of the Geristore cemented inlays. The Geristore cemented inlays also had a higher percentage of underfilled margins at 1 year.

Conclusion: The success rate of inlays cemented with resin cements is higher than inlays cemented with a polyacrylic acid-modified glass ionomer cement.

Discussion: Resin cements remain the cement of choice for most ceramic inlays. Superior adhesive potential and physical properties result in reduced fracture potential and marginal deterioration.

THE C-FACTOR IS A "CURSE" TO POSTOPERATIVE SENSITIVITY

2. Yoshikawa T, Burrow MF, Tagami J. The effects of bonding system and light-curing method on reducing stress of different C-factor cavities. *J Adhesive Dent* 3:177-183, 2001.

Because light-cured composites cure faster than self-cured composites, higher stresses are developed in our direct restorations, which can lead to gap formation, secondary caries, and postoperative sensitivity. A major factor related to shrinkage is dependent upon the shape of a prepared cavity and is called the "configuration factor" (C-factor). The C-factor is calculated by dividing the number of bonded surfaces by the number of surfaces that are not bonded. Various techniques have been advocated to reduce contraction stresses in direct composites, such as a flexible adhesive resin layer or self-curing resins. The purpose of this study was to evaluate the effect of adhesive systems with different curing modes and the slow-start curing method in terms of marginal sealing and cavity wall adaptation of resin composite restorations with different C-factors.

Standardized preparations with C-factors of 2.3 and 3 were filled using three adhesives: Clearfil Photo Bond or Clearfil Liner Bond 2 (Kuraray; Osaka, Japan), or Super-Bond D Liner (Sun Medical; Shiga, Japan). All restorations were bulk-filled with Photo Clearfil Bright (Kuraray). The restorations were cured using a slow-start curing method with an initial light intensity of 270 mW/cm2 for 10 seconds at a distance of 10 mm, followed by a 5-second interval and then a 50-second cure at 600 mW/cm2 at a distance of 0 mm. The control group was cured for 60 seconds with a light intensity of 600 mW/cm2. Dye penetration techniques were used to measure marginal adaptation.

Results: Cavity-wall gap formation was significantly increased when the C-factor was increased form 2.3 to 3, except for Clearfil Photo Bond in the control group. The Super Bond D liner had significantly better cavity wall adaptation compared to the others, regardless of the C-factor. The slow-start curing method showed significantly improved marginal sealing and cavity wall adaptation for the C-factor of 2.3 for Clearfil Photo Bond and for both C-factors using Super-Bond D Liner.

Conclusion: It was concluded that the self-cured bonding resin, Super-Bond D Liner, in association with the slow-start curing method, showed improved adaptation of resin composite to the margins and floor of cavities regardless of C-factor.

Discussion: Super-Bond D Liner showed the best marginal sealing and resin composite adaptation to the cavity wall, regardless of light-curing method and the C-factor. It is believed that, due to the liner being elastic, having a high initial tensile bond strength, and being a self-cured bonding resin, it goes through an elastic phase. It is thought that this rubbery phase was able to absorb some of the shrinkage stresses that occur during the light-curing of resin composite. It also is believed that the slow-start technique may selectively initiate curing of the resin adjacent to the cavity walls, due to free radicals that already exist in the bonding resin.

If this technique holds up clinically, it may increase the potential to bulk-fill composites and decrease chair time.

POROSITY: AUTO VERSUS HAND MIXING

3. Covey DA, Ewoldsen NO. Porosity in manually and machine mixed resin-modified glass ionomer cements. *Operative Dent* 26:617-623, 2001.

Discs 76 and 800 microns thick were made from a resin-modified glass ionomer cement (Fugi II LC, GC America Inc; Alsip, IL) using hand-mixing and auto-mixing techniques. The thin RMGIC discs were examined using digital imaging software that determined the number and volume of the cement pores. Shear punch tests were conducted on the thicker discs.

Results: The number and total volume of pores in the manually mixed specimens were considerably greater than the machine mixed specimens. The shear punch test results were significantly higher with the machine-mixed group.

Discussion: While machine-mixed capsules cost more, the benefits may be worth it. If you take into consideration the indirect costs of using mixing pads, instruments, aseptic techniques, and the labor involved, the auto-mixing approach may even be less expensive. The author has used Fugi II and other RMGIC for many years for bases, liners, pulp caps, and as a filling material in high caries environments. The machine-mixed capsules offer many advantages. The main advantage of the hand-mixed material is the ability to vary the volume of the cement mixed.

HOW LONG DO YOU WAIT TO BOND AFTER HOME BLEACHING?

4. Cavalli V, Reis AF, Giannini M, Ambrosano GMB. The effect of elapsed time following bleaching on enamel bond strength of resin composite. *Operative Dent* 26:597-602, 2001.

This study evaluated the effect of different carbamide peroxide gel concentrations, using the mouthguard technique, on the shear bond strengths of resin composite at post-bleaching intervals of 1 day, and 1, 2, and 3 weeks. Materials used were: Opalescence 10% and 20% (Ultradent Products, Inc.; Salt Lake City, UT) Whiteness 10% and 16% (FGM Produtos Odontologicos; Joinville, SC, Brazil), Scotchbond MultiPurpose bonding agent and Z-100 composite resin (3M Dental Products; St Paul, MN). Human enamel was used in simulated intraoral conditions.

Results: There was no significant difference between the results from the various materials and concentrations for each time interval. There was a direct relationship between bond strength and post-bleaching time for the four post-treatments intervals. Statistical evaluation indicated a reduction in bond strength until 2 weeks post-bleaching, and the bleaching concentration did not affect the bond strengths. It took 3 weeks for the enamel to return to conditions that lead to normal bond strengths.

Discussion: If at all possible, delay bonding to enamel for more than 2 weeks (3, if possible).

FIBER-REINFORCED CROWN STRENGTH!

5. Behr M, Rosentritt M, Latzel D, Kreisler T. Comparison of three types of fiber-reinforced composite crowns on their fracture resistance and marginal adaptation. *J Dentistry* 29:187-196, 2001.

The aim of this study was to investigate the fracture resistance and marginal adaptation of single molar crowns made with three different fiber-reinforced composites (FRC).

Crowns made of TargisVectris (TV) (Ivoclar; Schaan, Lichtenstein), Sculpture/Fibrekor (SF) (Jeneric Pentron; Wallingford, CT) and belleGlass/Connect (bC) (Kerr; Pforzheim, Germany) were fabricated on standardized preparations .8 mm deep and bonded to human molars. The specimens were thermal cycled, mechanical loaded, and finally loaded to fracture.

Results: The actual fracture resistance was highest for the SF crowns, followed by the TV and bC crowns, respectively. There was no significant difference in the three groups and all exceeded the load that dental restorations must exceed in the molar region by a safety margin of 200 N.

Discussion: From a strength point of view, fiber-reinforced composite crowns seem to have enough strength to allow them to be considered an acceptable restorative option in the molar region. It was hypothesized that the reasons that the polyethylene fiber reinforced bC crowns were weaker than the glass fiber-reinforced other crowns may be due to a lack of a chemical bond between these fibers and the composite, and possible voids created during manual resin adaptation versus the preimpregnated glass fibers used in the SF and TV.

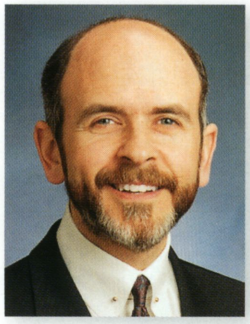
The ACCD is very sad to announce the death of

Michael J. O'Brien,

the founder of O'Brien Dental Lab in Corvallis, Oregon. Recognized as a visionary in the field, he leaves behind a legacy that has inspired many. The Academy extends its deep condolences to his family, friends, and colleagues.

The Michael J. O'Brien Scholarship Fund has been set up for a dental school scholarship at Oregon Health Sciences University. Memorial donations can be made at any Citizen's Bank branch or sent to O'Brien Dental Lab, 4311 SW Research Way, Corvallis, OR 97333.

academy gems



by
Tom Orent, D.M.D.

Dr. Tom Orent, a management consultant and practicing dentist, was a founding member and has served as the President of the New England Chapter of the American Academy of Cosmetic Dentistry. Dr. Orent has been a guest lecturer at Tufts University School of Dental Medicine, University of Nevada, Las Vegas, Brigham Young University, Illinois State University, New York University, New Jersey Dental School, and has been a member of the faculty at Boston University Graduate School of Dentistry.

Accredited by the AACD in 1990, Dr. Orent has served on the Ethics Committee and currently serves as an Accreditation Examiner. Dr. Orent also served as the Editor of the Journal of the AACD. Dr. Orent serves a member of the editorial advisory boards for The Profitable Dentist Newsletter, and The Practice Builder. He is also a frequent contributor to Success On-line Magazine.

Dr. Orent lectures internationally with "1000 Gems Seminars™." He created "1000 Gems™ in 1988, and has authored four books and numerous articles ranging from Esthetic Dentistry and Practice Management to TMJ and Extreme Customer Service. He has lectured in 46 of the 50 United States, and his publications have been sold in 20 countries. Dr. Orent practices esthetic dentistry in Framingham, Massachusetts.

Perceived Advantages—and Marketing Your Network

Among direct response marketing (DRM) experts, there's a well-known story of a brewing company that gained the lion's share of their market by ingeniously marketing a *perceived* advantage. What's a "perceived advantage"? The majority of brewing companies used an industry-wide standard process of manufacture, a "seven-step cold brewing process." One of the companies was savvy enough to boast to the world that *they* used this process. The public bought into the notion that *this* company's beer was better due to the "seven-step cold brewing process," not realizing that it was the same way that all brewing companies made beer! Did the others jump on the bandwagon and mention this in *their* ads? No—nobody wanted to play "second fiddle." So for more than a decade, the market-savvy company was the unchallenged leader based entirely upon the public's perception of their "proprietary" (not!) system.

Take the time to sit with your team and brainstorm some of the incredible services and techniques *you* offer. Remember, it doesn't matter if every other doctor does it the exact same way. What *does* matter is that the *public* may not be familiar with the process. Though I always caution doctors *not* to use dental jargon, this is one time when the use of a key dental phrase or two *may* be an advantage.

WHERE AND WHEN CAN WE GAIN THIS ADVANTAGE?

Marketing doesn't necessarily require *external* advertising. Although advertising can be a huge practice builder, marketing can be

entirely *internal*, as well. Internal marketing can be defined simply as increasing your patients' awareness of services and products you have to offer. Staying with internal marketing, there are *many* opportunities for us to enlighten our patients—chances to "seed" ideas for their future consumption. Here are some examples of opportunities we could use to consistently employ internal marketing:

THE HYGIENE RECALL VISIT

Your hygienist is in the perfect position to increase your patients' awareness of various services/procedures available in your practice. Every 3 months, select a new service or procedure you'd like to promote. Have your hygienist use the time during scaling to casually mention the procedure. Here are a few examples of how it might go:

- "You know, Mrs. Johnson, the doctor is *always* taking the latest continuing education courses…keeping ahead of the ever-growing mass of knowledge out there. Few patients are aware that *every* time he fixes a cavity, he does an extra, but *critically important* step. He uses a specially formulated solution that he paints down deep into the tooth, to be absolutely certain that there is *no* remaining decay. Sure, Mrs. J., you might say to yourself, 'Well, I've been seeing the doctor now for almost 20 years, and I trust that he's getting all the decay out.' But it's really *not* always the case. In fact, Mrs. Johnson, one of the leading research scientists in dentistry says that without this extra step, doctors routinely miss decay 42% of the time!"

The amazing thing about using the technique of the perceived advantage, is that *you* are now ever more firmly in the driver's seat. Sure, Mrs. Johnson has been with you for 20 years and will likely not go anywhere else soon. But what about all the patients who've been with you for only a short time, and *don't* yet have that same sense of commitment? *These* are the patients who need lots of reasons to feel confident they've made the right decision in choosing *you* as their dentist!

Take the time to sit with your team and brainstorm some of the incredible services and techniques you offer.

Each time you give them another piece of the puzzle, you've added another reason it would be *far* more difficult for them to *ever* see anyone else! Consider the patient on recall for just 3 years. Think of 3 years of 6-month recall as six chances for your hygienist to create a patient for life!

- "Mr. Worthington, I've got to tell you… I'm so proud to work for Dr. Stuart. He's always researching *the* best way to offer the leading dental advantages to his patients. I don't know if you've already heard about this, but he's using the Diagnodent diagnostic laser. The FDA recently completed rigorous clinical trials and found it to be *extremely* precise and accurate. It detects decay in areas *routinely* missed by visual *and* x-ray examination.

The more reasons they have never to leave your skilled care, the more likely you are to retain patients for life.

"The scary thing is that a research project in the Netherlands helped us all realize just how poorly equipped we used to be to detect cavities! In fact, they proved that when dentists use the pick or explorer, they miss biting surface cavities more than 76% of the time! I know that shocked *us*!"

This is yet another piece of the "patients-for-life" puzzle. The more reasons they have *never* to leave your skilled care, the more likely you are to retain patients for life. Remember the "seven-step cold brewing process"? Well, over a period of recall visits, *you* could easily build your own proprietary series of how incredibly well you do what you do. The funny thing is, you don't have to be the only doctor doing it that way!

- "Betty, did I ever tell you about the "liquid gold" the doctor uses when he rebuilds patients' teeth? It's incredible. A Japanese researcher, Dr. Fusayama, developed the original system back in the '70s. Of course, it's been refined and improved 10 times since then. One of the tiny bottles of special adhesive chemicals is *so* special, the doctor jokes that it's "liquid gold." This stuff costs over $60 for a 1/2 ounce bottle! Per gallon, it would cost $7,580! He ought to keep that stuff in the office *safe*!"

There are so many possibilities—think of just about any specific step or product about which most patients know nothing, and make that your topic of the month for patient internal marketing/education. Be sure to announce only *one* topic of the month. Then every 3 months, come up with something *new*.

THE "NEW PATIENT EXPERIENCE"

I've mentioned the "new patient experience" occasionally in seminars. It is one of *the* most important techniques available to you to differentiate your practice—this is your chance to make an incredible first impression! (The moment that Tom Peters calls the "'Wow!' experience.") You have

but one opportunity to make a first impression. Less than 1% of your colleagues vary off the "norm" on this one. What a *great* place for *you* to take advantage.

What *is* "the new patient experience"? It is a carefully orchestrated production, intended to *continue* to reassure patients they've made the very *best* decision by choosing *your* office. In most offices, the new patient is greeted, and then asked to have a seat and complete the paperwork. This **never** happens in *my* office!

By the time your new patient completes their first visit, they should have the feeling they've finally found the right dentist.

Our "corporate culture" is that of a team of concierges at a five-star resort—each and every patient is an honored guest, and will be treated as such! The very last thing we'd say to a new patient is, "Hi, nice to meet you, please fill this out and have a seat." It would take the next several pages to describe each and every carefully orchestrated step of the new patient experience. I've done that elsewhere (and would be happy to forward it to you if requested by e-mail). Suffice it to say that the new patient experience is yet *another* time during which savvy staff will seize the chance to make patients aware of the multitude of "perceived advantages" of your office.

One of my mentors in DRM, Jay Abraham, speaks about "redefining the buying criteria of your marketplace." Currently, you have little competition when it comes to creating buying criteria. Dentists are largely unaware of the existence of a set of criteria by which patients make their dental decisions. How can *we* redefine the buying criteria of our market? Next time you meet a new patient who asks only for a "consultation," consider trying the following: Tell them that you *welcome* their seeking another opinion and that you are most willing to help them with copies of x-rays, their chart, or anything else that would facilitate their ability to get a comparison opinion. However, be sure that you have first shown them *many* advantages that could be unique to your practice. If this has been done properly, they should feel that it would be pretty tough for them to find another place where each of these criteria could be fulfilled. And some advantages *are* real, not just perceived. For example, if you have the Diagnodent, you're one of only a *very* small minority; *that* is a true marketable advantage.

Dr. Peter Dawson was a master at defining the standards by which patients could measure all other dentists. He *encouraged* his patients to seek another opinion elsewhere... why? Because he was confident that his care, skill and judgment would present *so* different from the rest, that the patient would *have* to come back to him. And they did. By the time your new patient completes their first visit, they should have the feeling they've *finally* found the right dentist.

Messaging On-Hold Systems

There is no single way to be certain that every patient absorbs each and every important message you have to offer. Gum disease, whitening, Diagnodent, AACD affiliation (or Accreditation), air abrasion... the list is long. Rather than choosing just *one* mode to educate, use *multiple simultaneous media*. One of my favorite definitions of marketing came from Dr. Roger Levin many years ago: "Marketing isn't a new logo, or great business card. It's not a message they hear, nor a pamphlet they read... It's *all* of those things and more. Marketing is 40 simultaneous consistent positive messages."

Rather than stopping at just the new patient experience, or having your hygienist relate important information, consider using multiple consistent, simultaneous sources. Messaging on-hold is another *tremendous* opportunity. One of the nice things about using messaging on-hold is that it is consistent in a manner no human being could ever match. Like clockwork, every time a patient is put on hold, the system does its job, updating patients about interesting, useful things to make them healthier, happier, or more attractive.

It's not at all uncommon for us to pick up a line and be asked a question based upon something on our message on-hold system! In fact, I remember a funny thing that happened to *me* years ago: *I* was on hold during a call to Walter Hailey's Planned Marketing Associates. There was a *great* audio clip of Walter spinning one of his tremendous stories. I was absolutely 100% into the moment, listening intently to his story, almost at the punch line... when they took me *off* hold and asked if they could help me! "Sure," I said abruptly, "please put me back on hold, *now*!" Though I can't remember the story or the punch line, I'll *never* forget the only time I've ever asked to be returned to on-hold!

What would *you* like your patients to ask *you* about more often? There are many on-hold systems to choose from. The *very first* time a patient uses information from your on-hold to initiate a buying decision, you'll have paid for the system, *forever*.

Patient Newsletters

You can write your own newsletters, or hire someone to "turnkey" the entire monthly project; I do the latter. Regardless, there's *no* better way to maintain contact with the lifeblood of your practice. Done properly, a good newsletter will be a source of new patient referrals and will also encourage existing patients to utilize varied services. Our monthly newsletter includes special referral cards, which mention many of the techniques we'd like patients to ask us about...with an incentive for the new patient presenting the card.

DRM experts tell us that you can lose as much as 10% of your existing customer base each month that you don't correspond with them. Of course, those who return on regular recall wouldn't be included in that statistic. *However*, there certainly are a good number of patients we'd love to see regularly, who for one reason or another, just don't maintain a consistent schedule. *This* is the segment we're at risk of losing...10% per month. Wait a year without mailing or calling, and see just how many truly still consider *you* their dentist.

Your monthly newsletter can *solve* that problem, by giving patients a sense of "belonging." Even without returning to the office for a while, they know who their dentist is, and will be even more likely to refer patients to you—even if *they* don't come in regularly.

MARKETING YOUR NETWORK

There is still *another* advantage I've not yet mentioned. This one is not just perception, it's very real. As an AACD member, *you* are part of an enormous network of skilled cosmetic dentists from more than 30 countries.

So, just how does that help *you*?

If you've been a member of the Academy more than a couple years, there's a strong likelihood that you've reached out through the AACD for help from a fellow AACD member. Maybe your recent 10-veneer patient was traveling to the opposite U.S. coast and one of her veneers just *popped* off. While she was on the phone with your office, you found her help through your AACD referral network.

Done properly, a good newsletter will be a source of new patient referrals and will also encourage existing patients to utilize varied services.

You can either go online at www.aacd.com, or you can use your most recent membership directory. AACD membership is like an enormous fraternity. I have helped, and been helped by, dozens of AACD members from all over the world (often, at *no* charge to the patient). Most recently, I was in Phoenix for a 2-day in-office practice consultation. My staff called telling me about one of our favorite patients, who had an emergency—she'd just checked into her hotel in Austria, when one of her veneers popped off.

I've been able to get great referrals to nearby AACD dentists virtually 99% of the time. However, there were no members in Austria. So, I e-mailed a couple of AACD friends...and within 2 hours I'd received the name and contact information for one of the finest dentists in Vienna! We have an unmatched resource to benefit our patients—huge piece of mind. But *don't keep it a secret*! If you don't market what you have to offer, the only ones who'll know are those who seldom *need* the service.

We let *every* patient know what we can do for them. Not just through our dental care, but through the AACD world-wide network. It's *wonderful* that your emergency patients learn how you can help them out, just about *anywhere*.

Conclusion

Let your *entire* patient population know what great advantages *you* have to offer. That's the key. Choose multiple simultaneous methods of spreading the word. A well-educated patient is more likely to ask you intelligent questions, *and* follow through with treatment. An advantage perceived by your patient *is* an advantage, whether proprietary to your office or not. You offer an incredible array of services and products. *Tell* your world about the advantages—you'll *all* benefit immensely. AED

To receive Dr. Orent's FREE "1000 Gems e-letter," weekly clinical, practice management and marketing GEMS delivered by e-mail, sign up at www.1000gems.com, or e-mail orent@1000gems.com. Or, fax 508-879-4811 with your name and e-mail address, or mail requests to: Gems Publishing, USA, Inc., 12 Walnut St., Framingham, MA 01702. Just write, "Gems e-letter."

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questions & answers

by Paul S. Petrungaro, D.D.S., M.S.

Paul S. Petrungaro, D.D.S., M.S., F.I.C.D., F.A.C.D., D.I.C.O.I., graduated from Loyola University Dental School in 1986, and completed an independent study of periodontics at the Welsh National Dental School in Wales, U.K. He completed his residency in periodontics and has a specialty certificate in addition to a Master of Science degree in periodontics from Northwestern University Dental School. He is the former coordinator of implantology, Graduate Department of Periodontics, at Northwestern. Dr. Petrungaro has been in the private practice of periodontics and implantology since 1988, and holds licenses in both Illinois and Minnesota. He has given numerous seminars and lectures on advanced periodontal, prosthetic, and implant interrelationships, bone regeneration and esthetic tissue formation, the use of transitional implants, and the use of platelet-rich plasma in bone grafting throughout the U.S., Europe, Canada, Australia, and South America. In addition, he has authored numerous articles on all of the above, along with the topics of cosmetic bone grafting and implant procedures. He is also a fellow of the International College of Dentists and the American College of Dentists.

Interdisciplinary Challenges in Esthetic Dentistry

CLINICAL QUESTION:

What current surgical stent design will translate the parameters for esthetics in implant restorations to the surgeon from the esthetic/cosmetic dentist seeking esthetics and function for their implant patients?

SOLUTION:

Surgical stent design continues to be a topic of intense discussion in regard to the placement of implants throughout the oral cavity, and especially in the anterior esthetic zone.

The approach utilized by the author is incorporated into the immediate restoration procedure, which is ideal for establishing the foundation for esthetic soft and hard tissue contours supporting implant fixtures in the esthetic zone.

The surgical guide/provisional system discussion involves the use of the Master Diagnostic Model® (MDM®) (Valley Dental Arts; Stillwater, MN) waxing technique that allows for the esthetic and functional replacement of both the hard and soft tissue structures requiring alteration in the surgical and restorative plan, with one change: A removable tooth complex in wax, with supporting "wings" to add stability to the recreation for treatment planning purposes. Fabrication of an esthetic temporary restoration completes the temporary/stent portion of the TempStent™ method, developed by the author. The esthetic temporary restoration also serves as a surgical guide for the proper placement of the implants, and easily converts to an esthetic provisional restoration that will be seated at the initial surgical appointment.

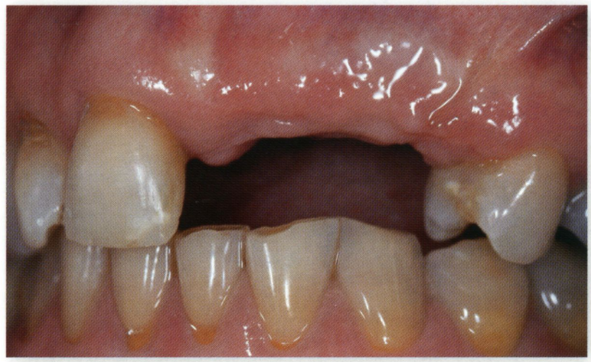

Figure 1: Preoperative view of the maxillary left anterior sextant.

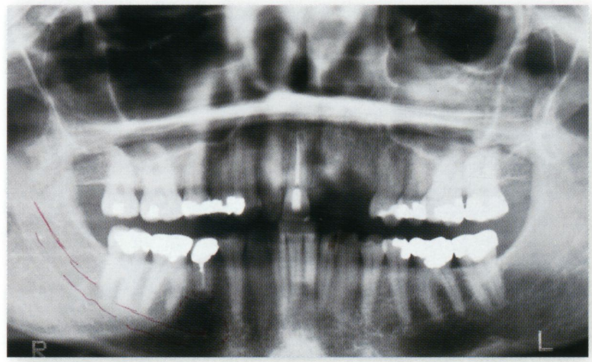

Figure 2: Preoperative panoramic radiograph.

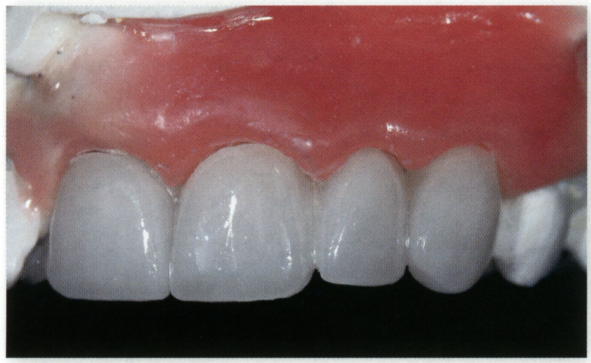

Figure 3: Master Diagnostic Model®.

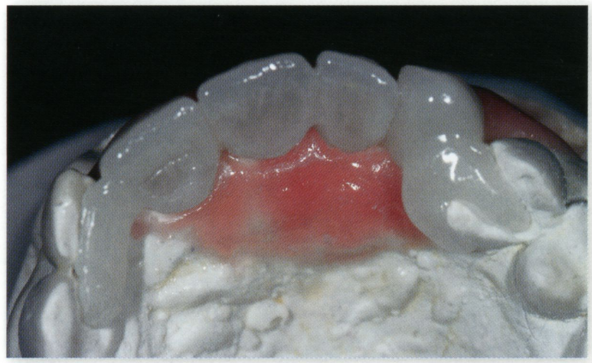

Figure 4: Occlusal view of the MDM® of the maxillary anterior sextant.

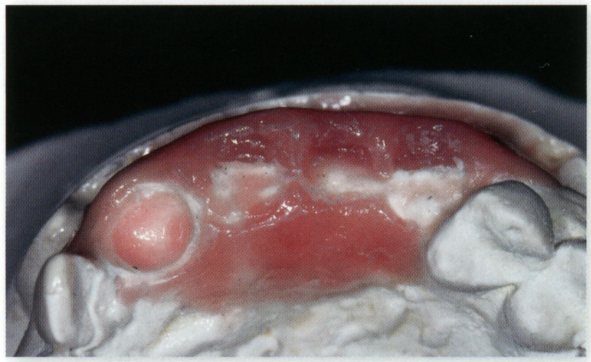

Figure 5: Occlusal view of the MDM after removal of the tooth component, depicting planned soft tissue contours.

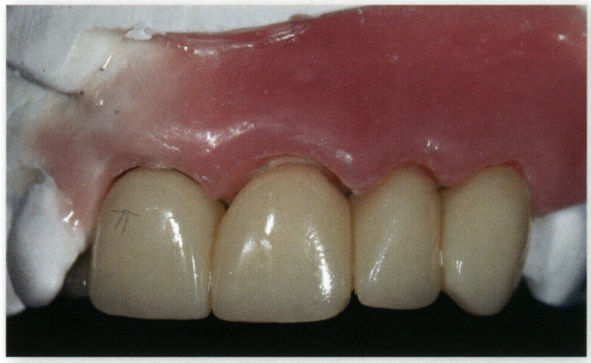

Figure 6: TempStent™ provisional/surgical guide.

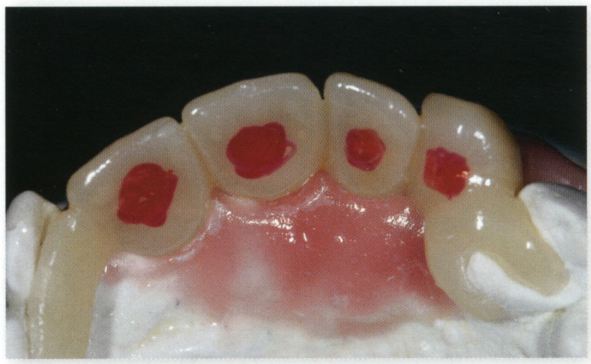

Figure 7: Occlusal view of TempStent™ marked for the appropriate coring sites.

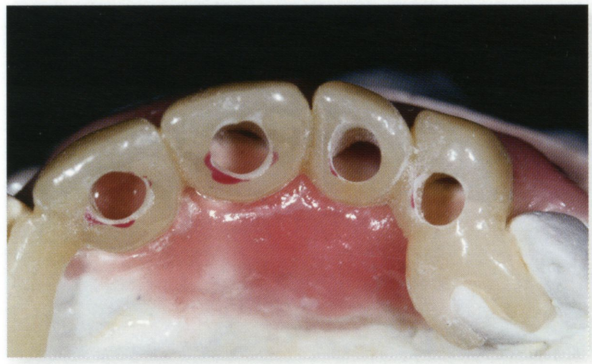

Figure 8: Occlusal view of the TempStent after coring the access opening.

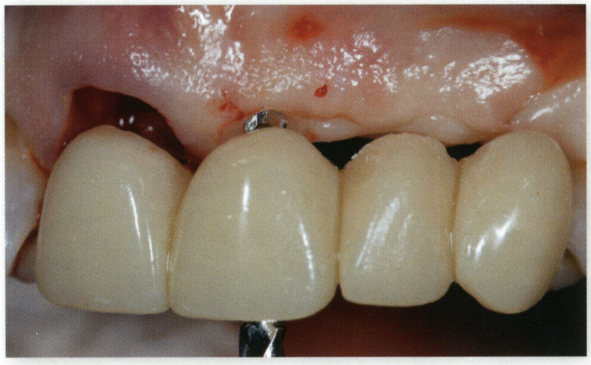

Figure 9: Confirmation of the TempStent clinically, and initiation of the drilling sequence.

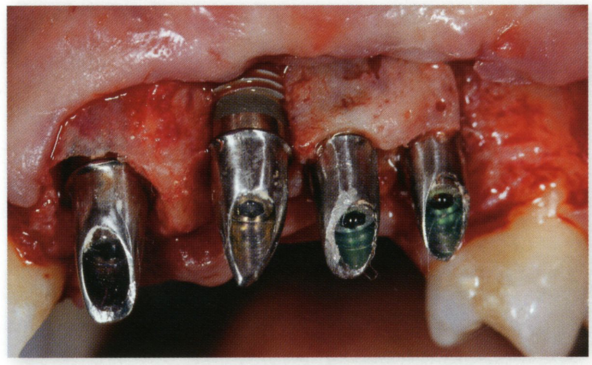

Figure 10: Prepared stock abutments prior to retrofitting the TempStent.

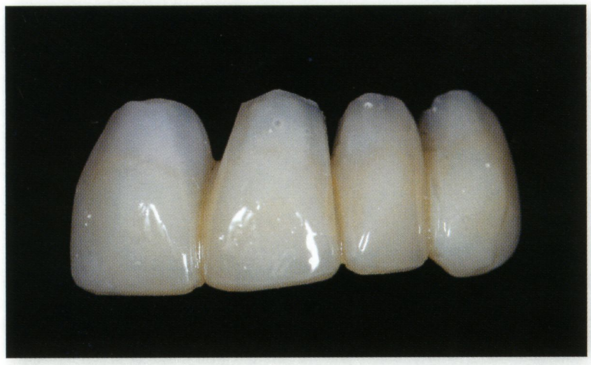

Figure 11: Converted TempStent surgical guide into the esthetic provisional restoration.

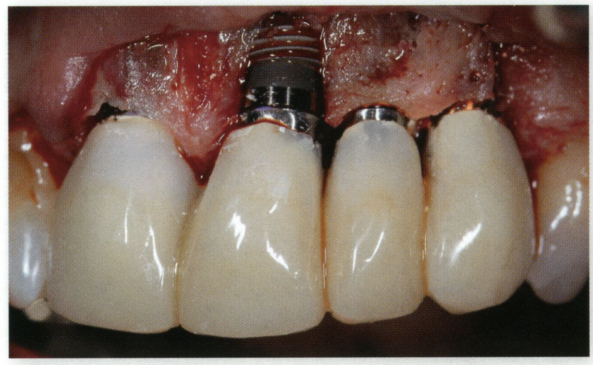

Figure 12: Cementation of the esthetic provisional restoration.

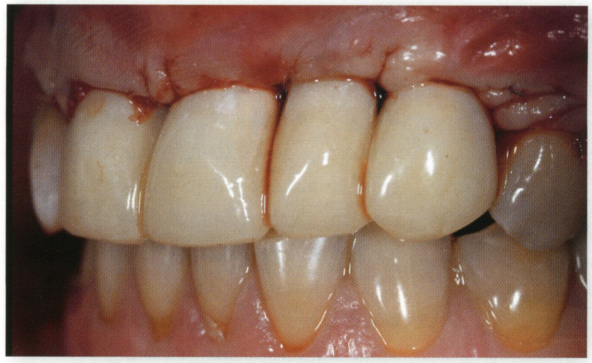

Figure 13: Immediate postoperative clinical view.

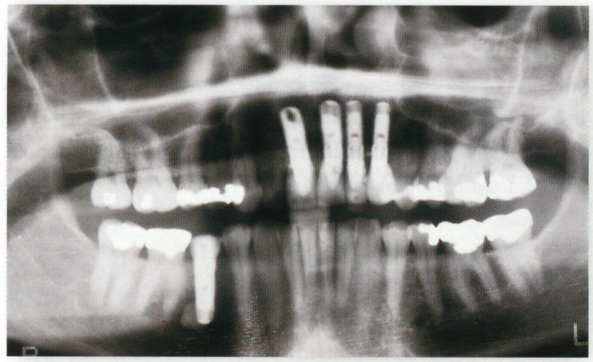

Figure 14: Immediate postoperative panoramic view.

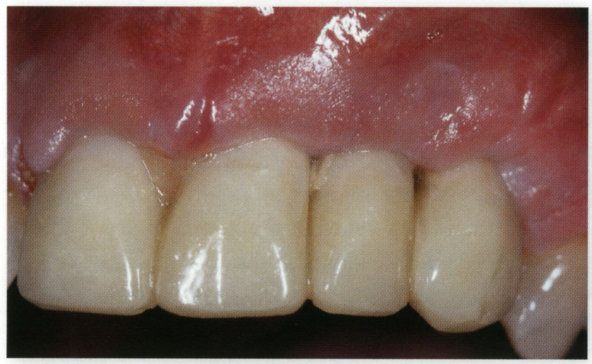

Figure 15: The 2-week postoperative view.

The following case report demonstrates the incorporation of the TempStent method into the immediate restoration procedure and how coordination of the pretreatment surgical and restorative phase has been clinically observed to simplify the esthetic implant restoration process. The technique also is applicable to conventional implant surgical and restorative treatment protocols with temporization completed at the conventional Stage II procedure.

CASE REPORT

A 44-year-old healthy non-smoking female presented for implant reconstruction of the maxillary anterior (Figs 1 & 2). The patient had undergone facial trauma, and also required the extraction of the endodontically treated central incisor. After a comprehensive consultation with her esthetic/reconstructive dentist, the patient opted for implant reconstruction in the anterior maxillae.

FABRICATION OF THE TEMPSTENT™

After maxillary and mandibular study models were obtained, a facebow transfer was taken using the KaVo Protar Articulator (KaVo America Corporation; Lake Zurich, IL). The articulated models were then sent to the lab, and a complete Master Diagnostic Model was obtained of the area to be restored (Fig 3), with the modification of the wax teeth being removable. Waxing of the full contour of the soft tissue to be replaced aids in the surgical planning (Figs 3 & 4), in addition to providing important information regarding emergence profile formation (Fig 5), placement of the implant collar, abutment preparation, and how these all relate to the transitional and final esthetic prosthesis. Fabrication of the transitional that mimics the waxing of the teeth (Fig 6), with the support "wings" added (Fig 7), provides for stability of the TempStent in its use as a surgical stent. Coring of the esthetic provisional provides for ideal fixture placement and allows for the prepared abutments to be retrofitted to the TempStent easily and efficiently.

After confirmation of the fit of the TempStent intraorally (Fig 9), the initiation of the coring procedure for implant placement is accomplished. The placement of four tapered screw-vent Paragon implants (Sulzer Dental; Carlsbad, CA) is followed by preparation of stock abutments. The abutments are then seated over the implants placed (Fig 10), and the TempStent is converted to the esthetic provisional restoration (Fig 11). After cementation with a strong temporary cement (Fig 12), (Improv, Nobelbiocare USA; Yorba Linda, CA) the buccal contours of the alveolar bone are veneered with a platelet rich plasma/graft complex, and the soft tissues augmented with a PRP/Acellular Dermal Matrix Graft (Lifecell Corp.; Branchburg, NJ) reconstituted tissue graft. Closure is then accomplished with 5.0 Monocryl sutures (Ethicon Inc.; Sommerville, NJ) (Fig 13). An immediate postoperative panoramic radiograph depicts the implant/TempStent complex and the results of the immediate restoration procedure (Fig 14). Figure 15 shows the 2-week postoperative clinical view.

The TempStent method for surgical stent-provisional restoration fabrication provides a guide that allows the communication between the esthetic dentist, surgeon, and dental laboratory to be easily transferred between the members of the dental implant team. Initial specifications as to the final contours of the teeth planned, in addition to the relationship of the bone and soft tissues and how they relate to the planned temporary and final restoration, can be determined and initiated at the first and only required surgical procedure. Additionally, the TempStent method allows for a user-friendly system for provisionalization of dental implants at the initial surgical visit.

If you have any clinical questions or dilemmas that are troubling you or your practice either on a routine basis, or relating to a specific case, please submit your concerns, with clinical slides or photographs, and our panel of experts will provide the best solutions. The panel will answer all submissions on a timely basis. Specific questions and their answers will be published on a significance basis in subsequent issues of the journal.

Please submit your clinical questions and dilemmas to:

The Journal of Cosmetic Dentistry
Interdisciplinary Challenges
in Esthetic Dentistry
5401 World Dairy Drive
Madison, WI 53718

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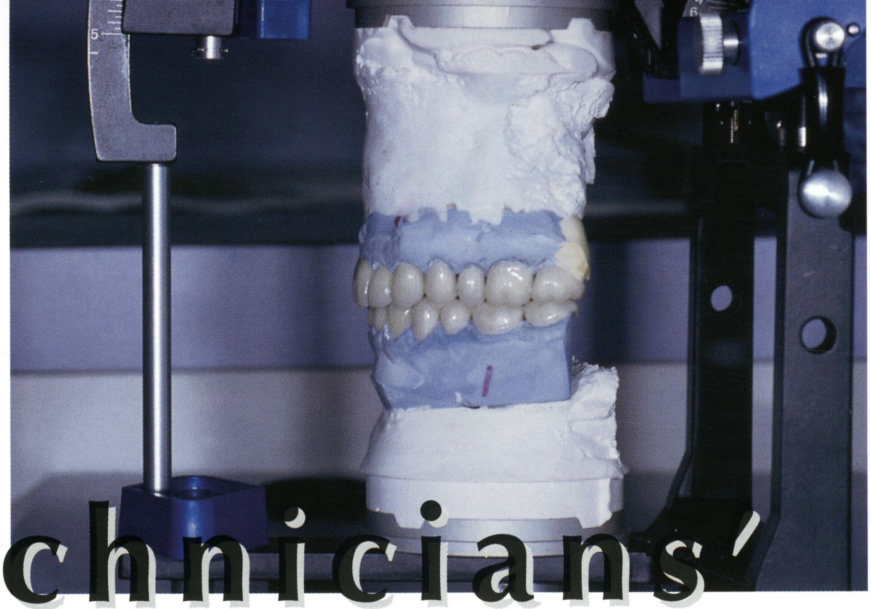
SILENT AUCTION! for GIVE BACK A SMILE™

The Give Back A Smile program, sponsored by the American Academy of Cosmetic Dentistry Charitable Foundation, Inc., provides free consultation and treatment to those in financial need, to restore the smiles and lives of survivors who have sustained dental injuries due to domestic violence. When a smile is lost due to unfortunate circumstances, it has not only a devastating physical effect, but it damages a person's self-esteem and social confidence as well. Give Back a Smile helps reinstate a patient's passion to live, self-confidence, and faith in the goodwill of others. The program represents how AACD members all over the world help change lives - one smile at a time. In July 2001, the AACD was one of eight organizations in the world to receive the Award of Excellence and the prestigious Associations Advance America Summit Award for the Give Back A Smile program. The American Society of Association Executives, in Washington, D.C., sponsors this yearly national competition to recognize the charitable organizations that make the most effort to advance American society.

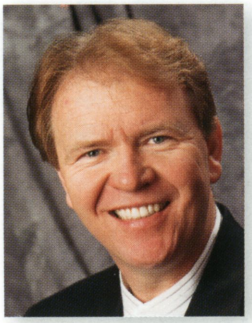
2002 SILENT AUCTION

The Give Back A Smile program will host its yearly Silent Auction event from Wednesday, May 8, through Friday, May 10, 2002, in the exhibit hall at the 18th Annual AACD Scientific Session in Honolulu, Hawaii. The silent auction features items donated by AACD members and private corporations to raise money for the program, and all proceeds gathered from the evening go directly to the aid of the survivors. To view the most up-to-date list of auction items, or for information on how you can participate in this worthy cause, please visit www.aacdhawaii.com. Here is a list of some of the exciting items that are already up for bid as of January 2, 2002!

***GBAS Silent Auction**, continued on page 47*



lab technicians' information



by
John Haupt, F.A.A.C.D.

John Haupt is an Accredited member and Fellow of the AACD. He has served on the Board of Directors, and is a faculty member of Orognathic Bioesthetic International. He owns a family-operated dental laboratory in Brea, California.

A Team Approach to Full Mouth Rejuvenation

An escalating interest in restoring anterior worn dentition seems to be the new "hot topic" among dental professionals. With the introduction of many different all-ceramic restorative materials that advocate less invasive preparations, it appears that clinicians are more willing to prep anterior teeth today than they were when only porcelain fused to metal were available.

Rather than looking for solutions with a "super strong" restorative material, perhaps the cause of the accelerated tooth wear should be addressed.

When the first porcelain veneers were introduced in the mid 1980s, they were used primarily for color changes or diastema closures, whereas today requests for all-ceramic restorations range from strictly cosmetic enhancements to restorative lengthening of teeth.

The strength of the ceramic material has not significantly increased from the "early days," but the strength that is now expected of the materials has increased beyond what one might consider reasonable.

Rather than looking for solutions with a "super strong" restorative material, perhaps the cause of the accelerated tooth wear should be addressed.

Harmonious long-term function and reliability depends upon the cohesive relationship between the anterior and posterior dentition, the dentogingival complex, the temporomandibular joints (TMJ) and the patient's neuromusculature system.[1]

This article attempts to define the roles of these elements and to demonstrate their rehabilitation through a unified team approach between the dentist and the dental technician.

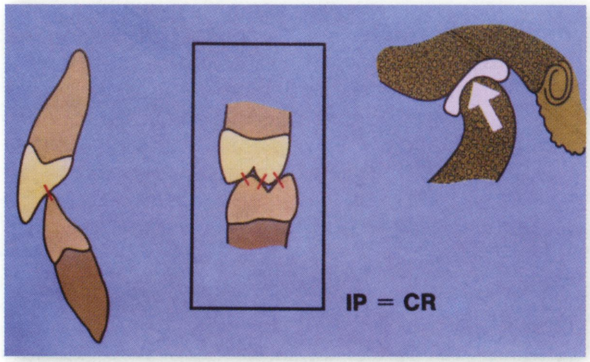


Figure 1: Ideally, all of the teeth should be hitting evenly when the condyles are in CR position.

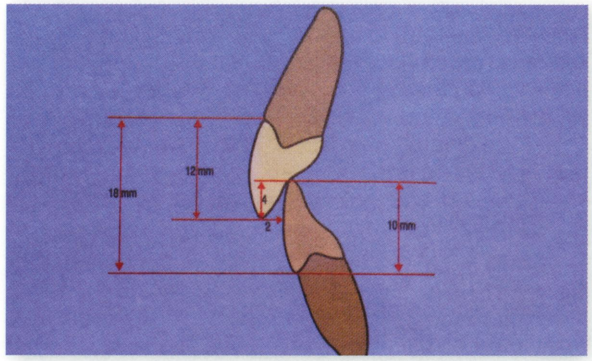


Figure 2: The length of the anterior teeth should be long enough to facilitate complete posterior clearance in protrusive guidance. This may be accomplished through proper axial inclination of the anterior teeth and through horizontal overlap of 2 mm and vertical overlap of 3-4 mm.

Figure 3: Severe wear and loss of vertical dimension.

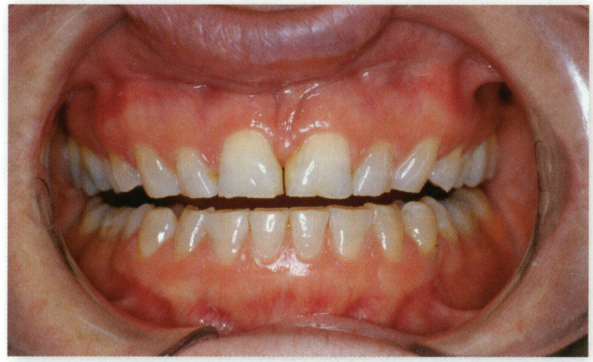


Figure 4: No cuspid guidance.

The success of functional and esthetic dentistry depends upon the clinician's and technician's understanding of natural tooth morphology, tooth position, and gingival contours; and the influence of these elements upon the dentofacial complexes.[2]

A full-mouth restoration should not be a mystical and difficult undertaking, but rather a methodical, step-by-step procedure. One should pay attention to how nature created the form of the TMJ, the form of the restorations, and the form of the smile. "Form follows function" or rather, "Form is everything."[3]

The functional goal of a full-mouth rejuvenation is to maximize anterior guidance and verticalize the posterior segment with the normal physiologic position of the condyles in centric relation (CR) (Fig 1). This anterior guidance will allow the technician to develop natural crown forms without eccentric occlusal interferences.[4,5]

The anterior teeth should be long enough to facilitate complete posterior clearance in protrusive guidance. This may be accomplished through proper axial inclination of the anterior teeth and through horizontal overlap of 2 mm and vertical overlap of 3-4 mm (Fig 2).[6,7]

Clinical researchers (Williamson, Lindquist) have found that the elevating activity of the temporal and masseter muscles can be reduced only when posterior disclusion is obtained

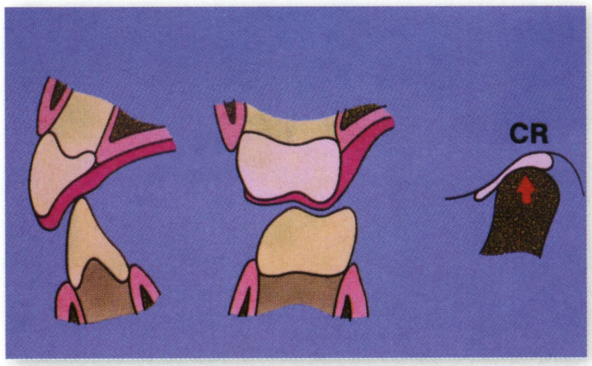


Figure 5: The role of the orthosis is to remove all centric and eccentric occlusal interferences and allow the condyles to reach their most superior position.

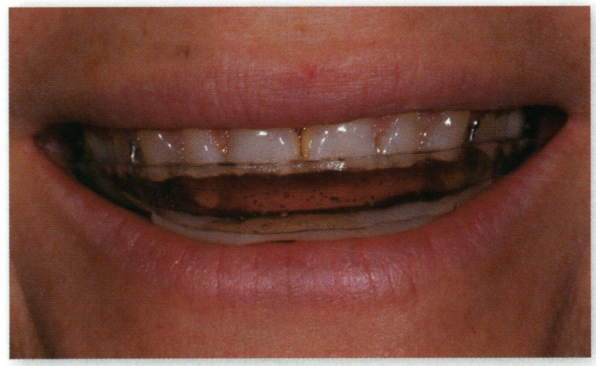


Figure 6: Phase II of condyle repositioning CR orthosis is accomplished by adding posterior occlusal contacts. Periodic adjustments may be necessary.

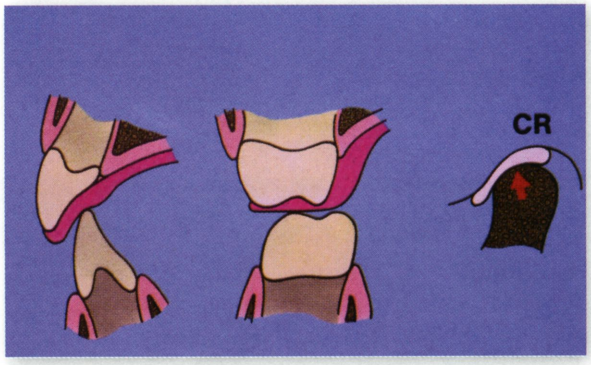


Figure 7: Maxillary anterior guided orthosis.

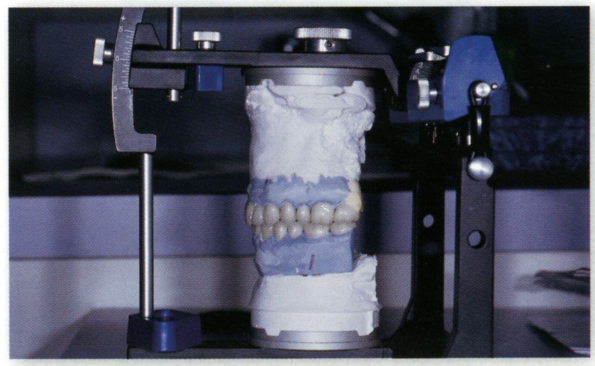


Figure 8: Full contour wax-up converted into provisionals.

with proper anterior guidance. These clinicians believe that the elimination of posterior interferences, rather than canine contacts alone, decreases the activity of the elevator muscles.[8]

CASE REPORT

A female patient presented with severe wear and loss of vertical dimension, for an extensive diagnosis of her stomatognathic system (Figs 3 & 4).

Diagnostic records consisting of centric bite records, and accurate study models mounted with a facebow transfer, were sent to the lab. A maxillary anterior guided orthosis (MAGO), was constructed to centric relationship, establishing vertical dimension of occlusion to 18 mm from cervical enamel junction to cervical enamel junction (CEJ), to CEJ.

...it is beneficial for the technician to meet the patient and get a personal image of the face and the smile.

The role of the orthosis is to remove all centric and eccentric occlusal interferences and allow the condyles to reach their most superior position (Fig 5).[3] The patient wore the MAGO 24 hours a day for 1 week at the new VDO (Fig 6.)

No discomfort was reported. Acrylic posterior stops were placed one week later and the patient continued wearing the splint for an additional 2 weeks without difficulty (Fig 7).

After confirming that a stable CR had been obtained, new models were taken, along with a facebow transfer. The models and data were sent to the laboratory, which then constructed a diagnostic wax-up on centrically mounted casts using an individually adjusted Panadent (Panadent, Inc.; Grand Terrace, CA) articulator. This type of wax-up is one of the most valuable steps in a full-mouth reconstruction process. The wax-up can be used not only for diagnosis, treatment planning, and patient education, but also to form plastic provisional crowns during treatment (Fig 8).

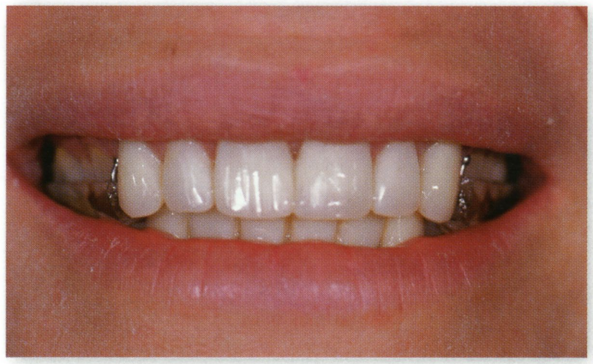


Figure 9: New vertical dimension with anterior provisionals in place.

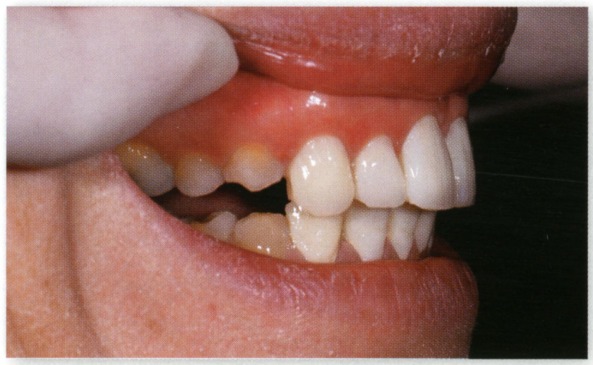


Figure 10: Establishing the smile line with the provisionals.

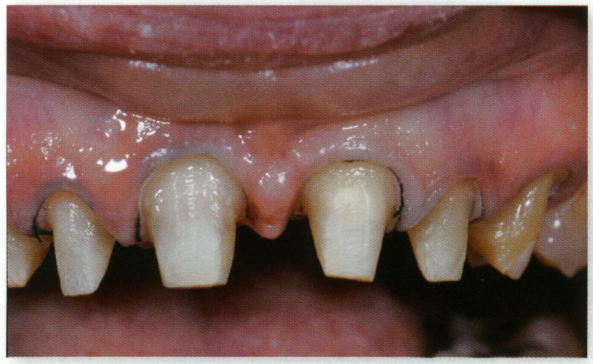


Figure 11: Preps for Procera crowns.

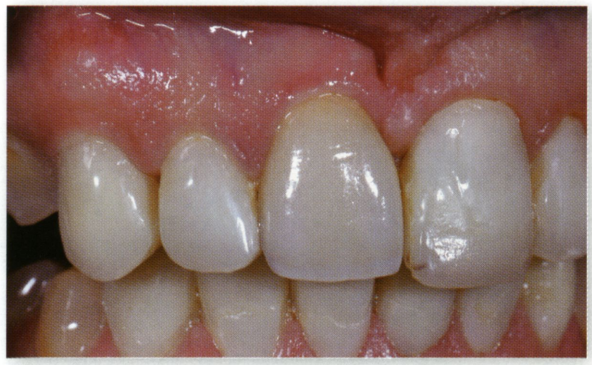


Figure 12: Single color test crown for patient's approval.

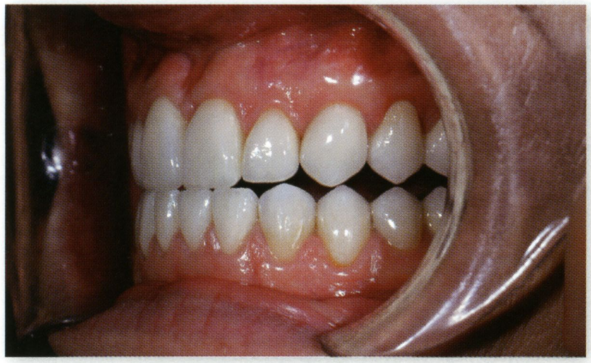


Figure 13: Laterals shorter than centrals to allow the lower cuspids room to pass through in protrusion.

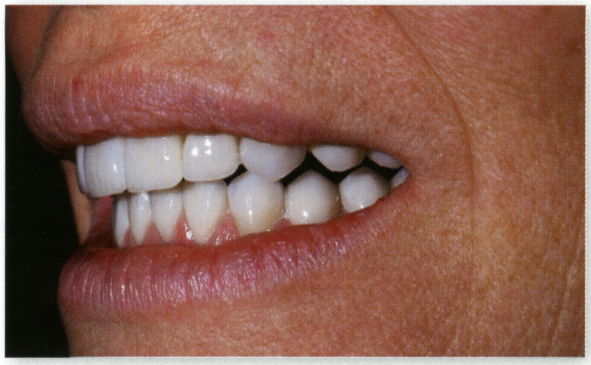


Figure 14: Cuspid guidance to clear all eccentric contact on both balancing and working side.

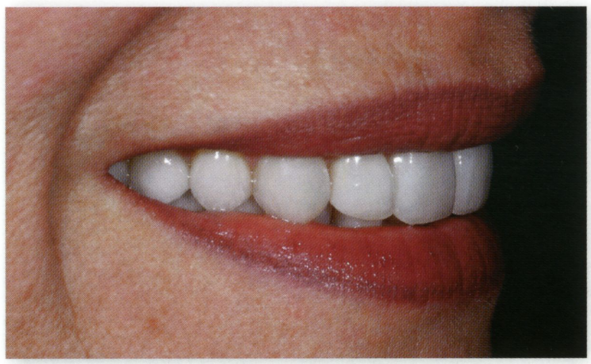


Figure 15: Posterior gradation to follow lip line.

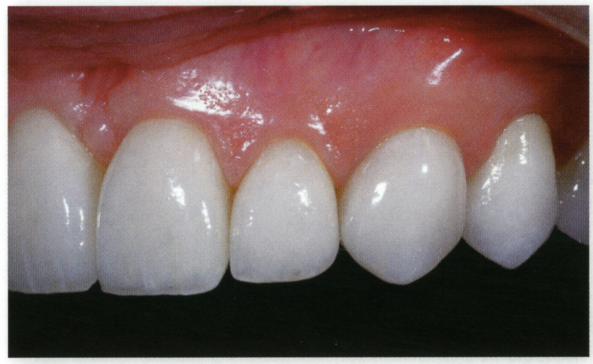
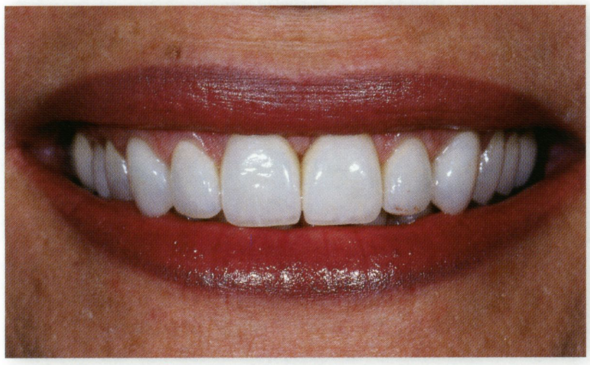


Figure 16: Embrasures progressing from the central incisor to the canine.



Figures 17 & 18: A great smile takes so little time but gives so much.

The dentist now has the opportunity to verify the correct esthetic facial and dental composition, and may add or subtract to provisionals as long as the form and functions are not violated. When the patient is completely satisfied with the form of the provisionals, a set of study models can be recorded for the technician to use as a guideline (Fig 9).

Some patients and clinicians might not be comfortable with prepping all the teeth in one appointment, as was the case with this patient. The clinician altered the MAGO splint by removing the anterior section, thus providing posterior overlay support. The new VDO was confirmed and established with the anterior provisionals. All of the guesswork has been removed and the dentist may now proceed with the posterior restorations (Fig 10).

LABORATORY

Photographic prints and 35 mm slides were taken for the case; however, it is beneficial for the technician to meet the patient and get a personal image of the face and smile.[3]

The restoring dentist prepped the teeth for full coverage. Procera (Nobelbiocare; Yorba Linda, CA) copings with Vita Alpha (Vident; Brea, CA) porcelain overlay were used for the restorations (Fig 11). A single "color test" crown was manufactured first, allowing the patient to see what degree of characterization she wanted. She decided on a lighter color with less chroma (Fig 12).

The crowns were fabricated on a Panadent articulator at CR with the predetermined 18 mm CEJ to CEJ. The condylar angle was recorded by the dentist at 42°. The Bennet settings were 1.5 mm.

The suggested tooth lengths for this patient were 11 mm for the maxillary central incisors, 10 mm for the cuspids, 9 mm for the mandibular centrals and lateral incisors, and 10 mm for the mandibular cuspids.

The length of the maxillary laterals was determined to be shorter than the centrals to provide space for the cusp tips of the mandibular canines in protrusion (Fig 13).

The cuspids were made long enough to provide proper canine guidance that would totally disclude the working and the balancing side posteriorly (Fig 14).[10]

The width of the anteriors was determined using the Golden Rule, negative lateral space, and the size of the mouth.[11] The posterior smile line must rise toward the Frankfort Plane, with the cusp tips and the gingival marginal crest converging as we move posteriorly (Fig 15).[3]

The embrasure between the maxillary centrals is about 1 mm, the lateral to the central 2 mm and the lateral to the cuspid 3 mm. (Fig10) The incisal edges of the maxillary teeth must be parallel to the horizon, and must conform to the lower lip line in a natural smile (Fig 16).[3]

CONCLUSION

Applying the procedures described above enabled the restoring team to reach a pleasing esthetic and functional result that follows the natural guidelines according to bioesthetic principles (Lee). These procedures are general guidelines that bioesthetically trained dentists usually follow. Sometimes these guidelines are altered slightly to focus on the bottom third of the facial configuration (the lip size and the smile line). By incorporating both esthetic and functional principles this patient will benefit for years to come.

A great smile takes so little effort but gives so much. It brightens the lives of all who receive it, while empowering those who give it (Figs 17 & 18).[1]

Acknowledgement

The author thanks Dr. Larry Addleson, San Diego, for allowing his case to be featured in this article.

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GBAS Silent Auction, *continued from page 40*

ITEMS UP FOR BID

VACATION GETAWAYS

- A 2-night stay at the downtown New Orleans Marriott Hotel, donated by New Orleans Marriott
- A 2-night stay for two in classic accommodations, including two rounds of golf each for two people, at The Broadmoor, a 5-star resort, donated by The Broadmoor
- Marriott Gold Weekend Award-Includes one Weekend Night, Breakfast and Dinner for Two, donated by Marriott International
- One United Airlines Certificate, donated by Burkhalter Travel & Cruise Shoppe
- A Weekend Stay for Two at the Atlanta Marriott Marquis, donated by The Atlanta Marriott Marquis

DENTAL COURSES

- Doctor and Team Member Tuition to any Program in 2002/2003, donated by genR8TNext
- Tuition to the AACD's 19th Annual Scientific Session in Orlando, Florida in 2003, plus a 2-night stay at the official conference hotel, donated by the American Academy of Cosmetic Dentistry
- $1000 Gift Certificate to be used towards a Course at The Amara Institute, donated by The Amara Institute
- Course Tuition for "The Digital Patient Consultation" for Doctor, Two Staff Members, and Spouse, donated by Dallas Dental Solutions

DENTAL-RELATED GIFTS

- Contra Disposable Angles, donated by Young Dental
- Image FX 4.0 Specialized Software, donated by SciCan, Inc.
- PoGo™ Starter Kit, donated by Dentsply Caulk
- Esthet-K® East Twist Syringe Kit, donated by Dentsply Caulk
- 2 One Porcelain Veneers, donated by Re-Creations by PUGA
- Optilux 501 Curing Light, donated by Demetron/Kerr Corporation

GBAS Silent Auction*, continued on page 70*

students' information

by
Simona Cuevas, D.D.S.

Dr. Cuevas is a graduate of the University of Texas Health Science Center, San Antonio. She is head of the Institute of Esthetic Dentistry in San Antonio, where she practices full-time.

Questions To and From Senior Dental Students

The AACD is committed to reaching people at all levels of dentistry, especially our rising graduates in dental schools. We enjoy the opportunity to see early efforts in esthetic dentistry and a search for the knowledge required to achieve excellence. Subsequently, we would like to dedicate this section to questions and clinical cases in early endeavors in esthetic dentistry.

The following four questions were posed by the *Journal's* editor, Dr. Tom Trinkner, and submitted to senior dental students. Here is a compilation of their answers:

Question

What kind of exposure to esthetic dentistry would benefit a dental student, and during what year?

Answer

The most important time to be exposed to esthetic dentistry is in the senior year of dental school. The reason is, that by that time, the stress of learning basic dental sciences has subsided, the students have a good grasp of dentistry and its various fields, and can begin to expand their thinking and apply esthetics to restorative and to crown and bridge procedures, as well as to the other fields of dentistry.

Exposure to magazines that are geared toward esthetic dentistry (i.e., *The Journal of Cosmetic Dentistry*) certainly would be beneficial. So too would esthetic dentistry courses—both theoretical and practical, structured like continuing education (CE) courses with great before-and-after case presentations to stimulate interest; and to teach techniques and practical applications, first in the labs on models, and then on patients.

Question

How supportive are the faculty currently having an impact on dental students, and are they members of the AACD?

ANSWER

Unfortunately, not all schools have departments, faculty, or courses geared toward esthetic dentistry. As of now, very few faculty, percentage-wise, are AACD members. It seems that the schools that welcome AACD involvement show support for the AACD and esthetic dentistry, whereas the schools without AACD representation show generally minimal—if any—interest in esthetic dentistry.

QUESTION

Occlusion and esthetic dentistry are equally important, so how does the young dentist search for sources of knowledge?

ANSWER

Although both are very important fields in dentistry, they are separate and can be connected. Occlusion can function without esthetics, but not vice-versa. A strong grasp of occlusion is paramount before one can build on it with esthetics. The young dentist can begin his or her search for knowledge mainly by taking CE courses that integrate occlusion into the explanation and direction of modern esthetics. Articles in well-established branch magazines also are a great source of information.

QUESTION

Upon graduation, how important is it to start your continuing education, and why?

ANSWER

Although it might seem very difficult to think about CE courses when one hasn't even graduated yet—and the thought of yet another lecture seems like a recurring nightmare—it is important to realize that a mind in practice is a mind that is used to learning things quickly and remembering them. The mind of a new dentist is still open—it has not yet been affected by everyday practice problems and ideas for shortcuts (remember the saying, "A mind is like a parachute—it works best when it's open"). CE courses offer positive reinforcement, and students can gain incredibly useful knowledge without having to worry about an exam at the end.

The following two questions were submitted by senior dental students:

QUESTION

Are there other disease processes that could clinically resemble periodontal and/or pulpal periapical pathosis?

ANSWER

Yes. The disease is called Langerhans Cell Disease (Eosinophilia Granuloma). This disease process represents a proliferative disorder of the Langerhans histocytes, which are clonal. This neoplastic process is generally asymptomatic, with chances of dull pain and tenderness in advanced stages. The disease can be fatal unless treated aggressively. Multifocal dissemination of the disease usually develops within 6 months of initial diagnosis. Orally, Langerhans Cell Disease resembles clinically periodontal and/or pulpal periapical pathosis. Differential diagnosis can be made once the patient doesn't respond to conventional treatment such as root canal therapy or periodontal pocket curettage. A high index of suspicion and referral biopsy are very important for non-responsive cases.

SOURCES

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QUESTION

What are Ceromer restorations, their restorative indications, and advantages for placement?

ANSWER

Ceromer restorations are made from reinforced polymers. Their indications encompass a broad spectrum of single-tooth and fixed partial denture restorations. The margins may be in enamel or dentin, and the restored teeth can be vital or non-vital. Single-tooth restorations are fabricated without glass fiber reinforcement and include inlays, onlays, and partial crowns. Fixed partial dentures (i.e., bridges) need to have glass fiber reinforcements. These materials are cost-effective and may be used in patients who are sensitive to metals. These restorations offer an expansion of tooth-colored treatment modalities in today's proactive esthetic environment.

SOURCES

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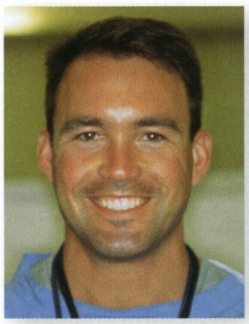
All students are encouraged to send in questions. Questions pertaining to all fields of dentistry will be accepted. All questions will be answered, and the most commonly posed ones will be published in upcoming issues of the Journal. Please submit questions to:

The Journal of Cosmetic Dentistry
Student Questions and Answers
5401 World Dairy Drive
Madison, WI 53718

❖

Achieving Excellence in the Pre-Doctoral Clinic: A Porcelain Veneer Case Report



by
Steven W. Charchut, Pre-Doctoral Dental Student
and Michael Ferguson, D.M.D.

Steve Charchut will receive his D.M.D. degree in June 2002 from the Harvard School of Dental Medicine. His interests include esthetic dentistry, growth and development, and orthodontics. He will begin a residency in orthodontics this fall at the University of Michigan. His research interests center around growth and development and include work done at Harvard School of Dental Medicine and at the Children's Hospital, Boston, in the departments of pediatric dentistry and otolaryngology. He is an active member of the American Student Dental Association, the American Dental Association, the Massachusetts Dental Society, and the Michigan Dental Association.

Dr. Michael Ferguson graduated from the University of North Carolina at Chapel Hill in 1984, and from Boston University's Goldman School of Dental Medicine in 1989. He subsequently joined the BU faculty as an instructor in the operative and prosthetic departments. Dr. Ferguson was appointed to the faculty of the Department of Restorative Dentistry, Harvard School of Dental Medicine, in 1996. He also serves as course director for dental anatomy and occlusion, and as a core clinical faculty member in the School's new "Problem-Based Learning" curriculum structure. His research interests include contemporary esthetics, bleaching, and dentin bonding, which are reflected in his clinical work at Harvard's Faculty Group Practice and his private practice in Boston. Dr. Ferguson is a member of the American Dental Association; the Academy of General Dentistry; the Academy of Operative Dentistry; and the University Congress of Cosmetic Dentistry (UCCD), created by the American Academy of Cosmetic Dentistry. Dr. Ferguson has lectured to dental students and faculty both nationally and internationally in his effort to revolutionize dental school curricula and contribute to the advancement of esthetics in dental medicine.

ABSTRACT

Full porcelain veneer cases can be highly technical procedures and often are discouraged in the pre-doctoral clinical setting. This article features a case presentation in which maxillary anterior teeth are prepared and temporized for the delivery of porcelain veneers. The steps and communication with clinical instructors necessary to achieve excellent esthetic and functional results by a pre-doctoral student are highlighted.

The multiple purposes that veneers can serve make them a fundamental restorative option for any practicing general dentist or prosthodontist.

BACKGROUND

Porcelain veneers are restorations commonly used in dental practice. Often seen as a conservative alternative to full crowns, veneers minimize tooth reduction and periodontal involvement while maintaining future restorative options.[1] Porcelain veneers can serve to rebuild functional tooth surfaces, modify tooth color, modify tooth position and contour, correct occlusal alignment, and restore function.[1-3] The multiple purposes that veneers can serve make them a fundamental restorative option for any practicing general dentist or prosthodontist. Given their importance, this option should be equally accessible to students treating patients in teaching institutions. The pre-doctoral clinical setting is an opportunity for student dentists to utilize professional instruction in developing good technical skills. Procedures requiring a higher degree of technical skill, such as full veneer cases, should be encouraged and should receive proper instructor supervision and demonstrations of proper technique. The purpose of this case report is to demonstrate how excellent results can be achieved in a full veneer case by a pre-doctoral dental student.

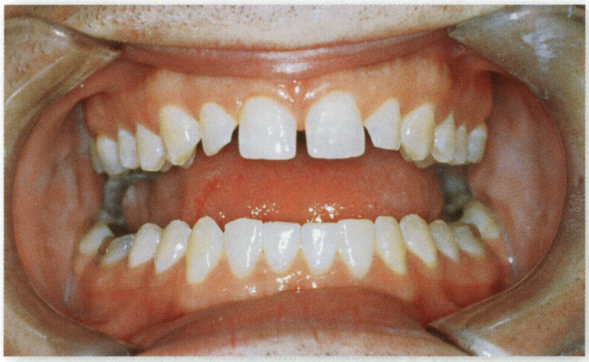


Figure 1: Pretreatment clinical appearance.

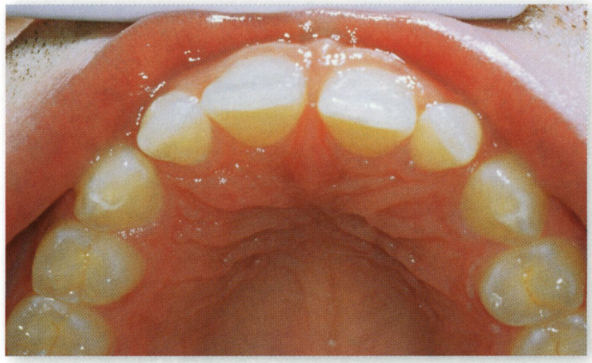


Figure 2: Pretreatment occlusal view.

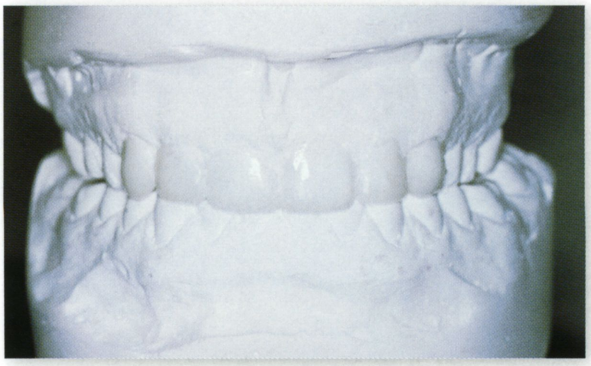


Figure 3: Mounted wax-up.

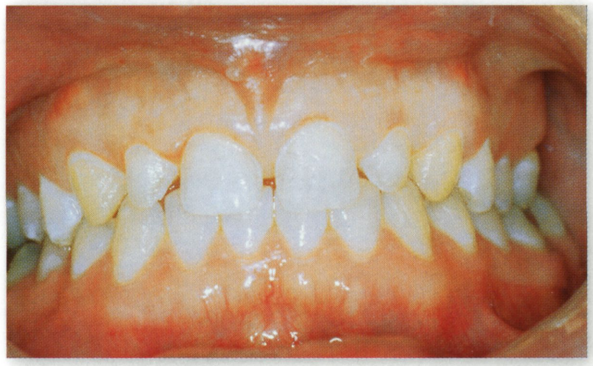


Figure 4: Prepared maxillary anterior teeth.

CASE REPORT

This 29-year-old male patient presented to the Harvard School of Dental Medicine student clinic, interested in improving the esthetics of his maxillary anterior dentition. The patient's teeth showed diastemata between all incisors bilaterally, distal rotation of the right lateral incisor, and misalignment of the incisors despite previous orthodontic treatment (Figs 1 & 2). The diminutive size of the maxillary anterior teeth contributed to their unesthetic state. A treatment plan was formulated that involved realignment with a removable orthodontic appliance, followed by porcelain veneers on the maxillary canines, and lateral and central incisors. However, the patient wished to forego the orthodontic treatment and restore form, function, and esthetics with the fixed prosthetics only. It was determined that this option could still achieve the desired results and the modification to the treatment plan was made.

MATERIALS AND METHODS

DIAGNOSIS AND TREATMENT PLAN

Prior to beginning restorative treatment on the patient, the student made casts from alginate impressions taken during the initial exam and mounted them on an articulator. Wax-ups were then made of the maxillary anterior teeth to be restored to approximate ideal esthetics and occlusion in centric relation (Fig 3). From this wax-up, a vacuum-formed stent was made using 0.05 in.-thick plastic to be used later in fabricating a provisional restoration. This thickness of plastic is rigid, so as to minimize excess flash and allow for reusability. Tooth shade also was determined prior to beginning the restorations.

VENEER PREPARATION

At the following appointment, the teeth were prepared for veneers using a flat-edge, semi-fine diamond bur; and

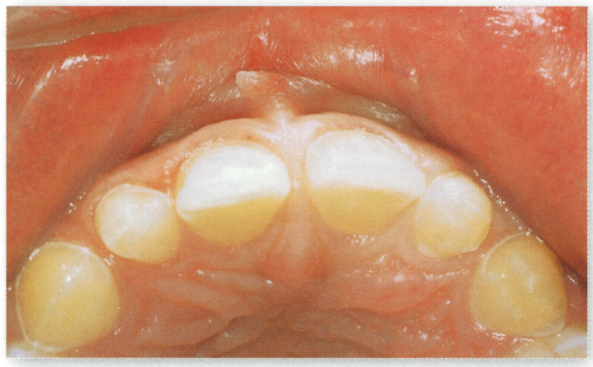


Figure 5: Prepared teeth, occlusal view.

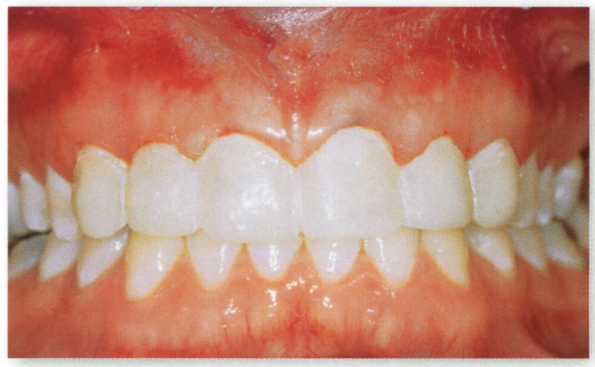


Figure 6: Finished provisional restoration fixed with Tempbond NE™ (Kerr).

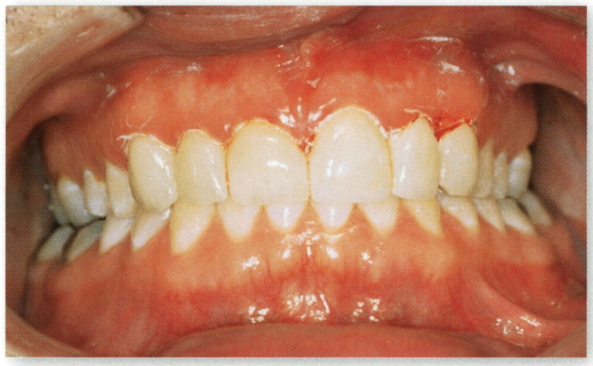


Figure 7: Veneers immediately after delivery.

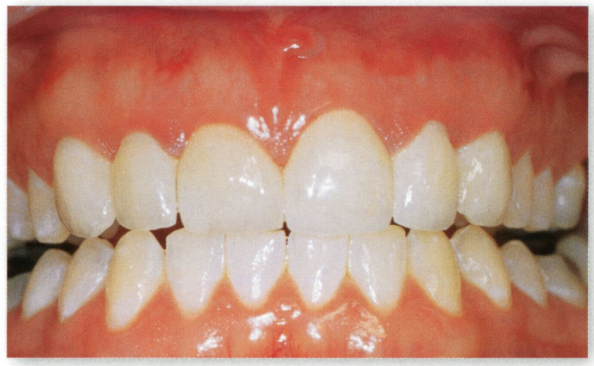


Figure 8: Case complete, 3 days after delivery.

finish lines were created even with the gingiva. The supervising instructor demonstrated the technique on one central incisor, and the student finished the preparations on the remaining teeth. The amount of reduction on each individual tooth was adjusted to correct for misalignment and to ensure an even contour across the anterior teeth mesiodistally (Figs 4 & 5). All preparations were kept in enamel, including the right lateral incisor, which required the greatest reduction to compensate for its rotation. The preparations were finished and defined using a fluted finishing bur. Immediately following the preparations, Ultrapak™ (Ultradent; South Jordan, UT) gingival retraction cord size 0 was packed around the facial surface of the prepared teeth and final impressions using Impregum™ (3M ESPE; St. Paul, MN) impression material were taken by the student, with the instructor's assistance.

TEMPORIZATION

The provisional restoration was fabricated following the preparations and impression. Although it is argued that this step is optional, it was deemed necessary in this situation to improve esthetics until the veneers were delivered. Protemp Garant™ (3M ESPE) composite material was loaded into the stent, placed over the prepared teeth by the student, and allowed to set. Protemp Garant is an auto-curing material and does not require visible spectrum blue light exposure, which reduces the risk of uneven or inadequate curing. Once fully cured, the provisional was removed with the help of the instructor and excess material was eliminated using fine diamond burs. The instructor demonstrated the proper contour of the provisional restoration's margins, and the student finished. The provisional was then reinserted and the margins were finished using a fine diamond point. Additionally, contours and embrasures were created interproximally to aid in cleaning and improve esthetics. The finished provisional was then polished using the Enhance® (Dentsply Caulk;

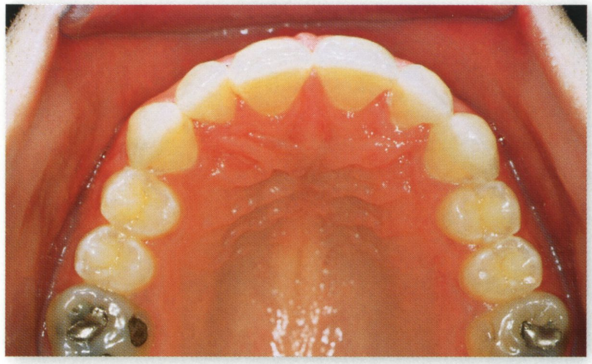


Figure 9: Case complete, occlusal view.

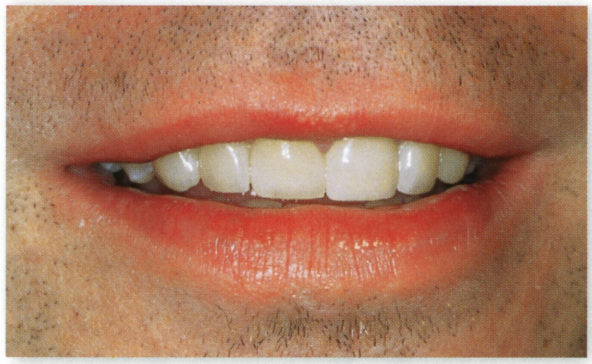


Figure 10: Case complete, clinical smile.

Milford, DE) polishing system and cemented using Tempbond NE™ (Kerr; Orange, CA) temporary cement (Fig 6).

Procedures requiring a higher degree of technical skill, such as full veneer cases, should be encouraged and should receive proper instructor supervision and demonstrations of proper technique.

VENEER DELIVERY

The veneers were fabricated in the laboratory using the IPS Empress™ system (Ivoclar/Vivadent; Amherst, NY), which consists of leucite-reinforced pressed ceramic. Prior to delivery of the veneers, the provisional restoration was removed and the prepared teeth were polished with fine pumice. Cord treated with Hemodent™ (Premier; King of Prussia, PA) was packed around the facial surface of each prepared tooth, exposing the finish lines. Each veneer was checked individually for proper fit with the instructor's supervision, and then together for proper contacts, shade, and esthetics. Minor porcelain adjustments were made at this time where necessary. The teeth were etched and coated with bonding agent in a dry field in preparation for delivery. The veneers were permanently cemented using the Nexus™ universal luting system (Kerr), and were delivered beginning with the central incisors and moving distally in both directions. The instructor demonstrated proper luting technique with a central incisor and then assisted the student with the remaining teeth. Mylar strips were placed interproximally as the veneers were being delivered to prevent adhesion to adjacent teeth. Once all veneers were in position, excess cement was cleared from the facial and lingual surfaces and the restorations were light-cured in place. The cord was removed and the margins were finished with a fine diamond point (Fig 7). The patient was recalled 3 days later to evaluate tissue healing and esthetics (Figs 8–10), and maintenance and cleaning instructions were given.

FOLLOW-UP

The patient was evaluated again in 2 weeks to re-evaluate tissue health and esthetics. Alginate impressions were taken at this time for the fabrication of an acrylic maxillary occlusal guard to be delivered 2 weeks later. After delivery of the occlusal guard, the patient's treatment was completed by placing him on a 6-month recall schedule.

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esthetic team

the wisdom of shared leadership

COMMUNICATION: THE WISDOM OF SHARED UNDERSTANDING

by
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by
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by
Mary Martineau, R.D.H.

Mary Martineau, RDH, is a graduate of the dental hygiene program at Sacramento City College. She has been practicing dental hygiene for 7 years and was a registered dental assistant for 14 years before that. She received her standard proficiency certificate for the diode laser in 1998 and currently teaches laser soft tissue curettage at the Center for Advanced Dentistry in Los Angeles. Ms. Martineau lectures regularly and has published articles on the use of lasers in dental hygiene. She owns and operates "High Tech Hygiene," a coaching program for hygienists. She can be contacted at maryanrdh@aol.com

This section of the Journal *is dedicated to the doctor/team partnership and is meant to stimulate dialog to create or grow a comprehensive esthetic restorative practice. It is our hope that these articles will be read and/or discussed at team meetings to inspire the doctor/team partnership to another level. A mind-set of team ownership can be developed only if the entire team feels that they are not only employees, but also partners in the practice.*

In our previous two articles, we discussed how important the development of a doctor/team partnership is to the success of a dental practice. We also discussed what "success" may mean to different individuals on the team, and talked about the importance of "shared vision" and "shared ownership." In this article, we want to discuss the wisdom of shared understanding...communication.

There is virtually nothing in life more important than communication; every single one of our relationships depends upon it. Actually, you might say that our very success in life is dependent upon our ability to communicate effectively. Many books have been written on the importance of emotional quotient (EQ) versus intelligence quotient (IQ). In other words, maybe more of your success is built upon your EQ than upon your IQ. So, could improving your ability to communicate also improve the quality of your life?

WHY DON'T WE COMMUNICATE BETTER WITH EACH OTHER?

Did you ever wonder why we all see life a little differently? Why is one person's perception of a situation or condition different from another person's? Why does one individual think a particular situation is funny, whereas another might find it sad? The truth is, we each decide what it means to us based upon our own experiences, values, and belief systems, or even upon our basic personality styles.

Quality communication begins with your openness and your heart.

Hippocrates first talked about the four basic personality styles; the concept is as true today as it was when he first introduced it. Many of you may be familiar with the DISC Personality Styles, one of the many ways that this concept is taught in courses today. For teams that have not yet learned the concepts or internalized the value of the concepts, we strongly encourage you to begin today.

Understanding the differences in people is an opportunity to create a significant change in the way we think and communicate. A person with a very analytical style personality, for example, may trust facts more than intuition; whereas another person, with a more intuitive style, may trust feelings more than facts. Obviously, if neither individual is aware that differences between them aren't right or wrong, they're just different, they may decide that the other person's thinking is "wrong." Not much quality communication transpires out of judgment. By the same token, some individuals are very competitive and driven toward success, while others may not like conflict or competition. It would be very easy for the driven person to judge the other as weak or lazy, while the more steady person might see the driver as insensitive and contentious. Take this a step beyond our working lives and you can see how this judgmental way of thinking can damage our relationships in any arena.

HOW CAN SHARED UNDERSTANDING IMPROVE OUR PRACTICES?

"Judgment" is a word with many meanings: It can be used in a legal sense, in a Biblical sense, as an opinion or estimate, or as *a criticism or censure of others*. How many times do we judge others on a daily basis? And, what do we judge them on? Is it the way they dress, their hygiene, their speech, their values and belief systems, or even that they think differently than we do? How many times a day do we judge other team members and our patients?

You telling them that it needs to be fixed is not the same as them seeing and wanting to fix it.

It has been estimated that only 7% of our communication to others is verbal. Do you really think that we can judge others in our minds and not let it show through our non-verbal communication? Therefore, part of the art of communication is learning to be more accepting of the differences among us. Quality communication begins with your openness and your heart. People can very often sense if you aren't sincere with them or are trying to manipulate them. This is true of patients, team members, family, and friends.

WHY DON'T PATIENTS "GET IT" WHEN WE TRY TO EDUCATE THEM ABOUT THEIR DENTAL NEEDS?

Many times patients don't "get it" when we communicate their needs because the wrong person is doing the diagnosis. When a patient comes in *wanting* to repair a broken tooth, they usually want to get an appointment

continued on page 58

continued from page 55

now... to get it fixed *now*. And, usually, cost is not the only factor. So why the sudden urgency, when you've been telling them for years about those old, broken-down fillings? The urgency comes because it is *their* diagnosis, not *yours*. The patient has done the diagnosis for you, has recognized that something is wrong. And now *you* need to fix it immediately...now the patient is an emergency in your office!

The difference between when *you* diagnosed it and when *they* diagnosed it is a case of "want versus need"; it's called *co-diagnosis*. You telling them that it *needs* to be fixed is not the same as them seeing and *wanting* to fix it. Did you ever notice that they don't cancel nearly as many appointments for bleaching? That's because they *want* to do it...(and by the way, whitening isn't covered by insurance).

Co-diagnosis is the process

- by which patients discover for themselves what disease looks and feels like
- of comparing health to disease in their own mouths
- by which patients determine whether they would like to treat the disease
- of taking responsibility to prevent further disease
- by which patients take partial responsibility for the actual treatment (co-therapy)
- of taking responsibility to maintain their health
- of determining whether they can afford or want ideal treatment at this time.

It is when *we* try to make those decisions for the patient that we get into trouble. It isn't our place to judge the patients...rather, our job is to express our concerns and then ask them what they would like to do about their problem. The reason we often feel so rejected is that we set ourselves up for it by telling patients that we are the experts and that they need to do this or that.

HOW CAN WE DEVELOP OUR ABILITY TO DO MORE CO-DIAGNOSIS?

We could develop more co-diagnosis if we look to other specialties that encourage the powerful use of communication in their practices. Think of how marriage and family counselors use communication as a tool for patients' self-discovery. Counselors and therapists don't give the right *answers*; they ask you the right *questions*.

Don't offer a solution until the patient realizes that they have a problem.

"How long have you had these old silver mercury fillings?" I know that *you* can look at them and see that they are old. But it isn't *you* that will make the decision to repair them...it's the patient. Therefore, asking the right question requires that the patient think about how old those restorations really are. If they've been there since their first molars came in and you ask them, "and how old are you now?" the patient should realize that the fillings have been in there for 30 plus years!

This is called "guided thinking" and is the process of creating the right dialog between you and the patient so that the patient is a partner in the diagnosis. This is when you begin using your intraoral camera and other visual aids to let the patients discover for *themselves* that they have a problem.

But, let us caution you here that this is not the time to tell them what they *need* to do to fix it. Don't offer a solution until the patient realizes that they have a problem. Offering a solution (especially a costly one) to a problem that the patient doesn't feel they have is one of the reasons that patients walk out the door without scheduling further appointments. Offer a solution only *after* the patient has acknowledged that they have a problem. Better yet, let them ask you, "How do we fix that?" And finally, please remember to ask, "what would *you* like to do?" Most cases don't get closed simply because we forgot to *ask*. So, communicate with your heart and don't judge others; instead, educate patients through co-diagnosis and then ask them what they would like to do. Not really so difficult, is it?

ARE THESE COMMUNICATION TOOLS ONLY FOR THE DOCTOR TO USE?

Absolutely not. Everyone on the team—hygienists, clinical assistants, treatment coordinators, and administrators—can use the same tools for communicating with patients (and with each other). Sit down and discuss some of these principles of communication at your next team meeting. If you feel that you could all benefit from more teaching in communication, then start planning today where you want to put your continuing education dollars this year; plan your continuing education around you needs. Create a strategic plan to make you the professional you want to be, and to make your team all that is possible. It all starts with you!

❖

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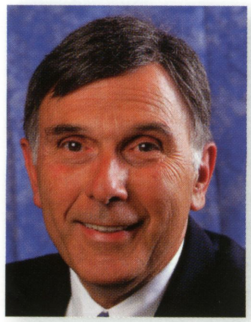

by
John A. Stratta, D.M.D.

Dr. John Stratta is a graduate of Fairleigh Dickinson University School of Dental Medicine, where is was elected into the OKU. He graduated from the New York University (NYU) School of Dentistry post-doctoral program in prosthodontics. He also served as a faculty member at the NYU School of Dentistry for 20 years. He has maintained a full-time private practice in New York focused on esthetic, prosthetic, and implant dentistry since 1965. Dr. Stratta served a 2-year tour of duty as a Captain in the U.S. Army Dental Corps as a prosthodontist. He has attained advanced training certification in gnathology, Schyler Panky Dawson traditional occlusion, implant prosthodontics, microdentistry, and esthetically based cosmetic dentistry, and is currently training in neuromuscular occlusion. He also maintains memberships in many professional societies, organizations, and academies.

Clinical Case Report: Complex Composite Resin Bonding

INTRODUCTION

The Class IV defect presents the cosmetic dentist with an esthetically challenging and restoratively demanding treatment procedure that requires insight into the following areas:[1-6]

- occlusal force distribution
- parafunctional habits
- coronal morphology
- material compatibility properties
- polychromicity
- texture
- finish line boundary camouflage
- shade selection analysis
- polymerization shade behavior shifts
- adhesive restorative materials
- polishability
- maverick colors.

The evolution of anterior restoratives from the archaic silicates and methylmethacrylate acrylics to the current generation of sophisticated composite resins and adhesives means that clinicians now have restorative materials with which to mimic the esthetic appearance of a natural tooth while simultaneously preserving, as well as reinforcing, the restored tooth.[7,8]

Treatment with such a conservative approach creates challenges in selecting and combining composite resins that chameleonize with the polychromicity of enamel and dentin. They also present an opacity challenge to simultaneously mask the existence of an internal restorative interface and the external restorative margin.[9]

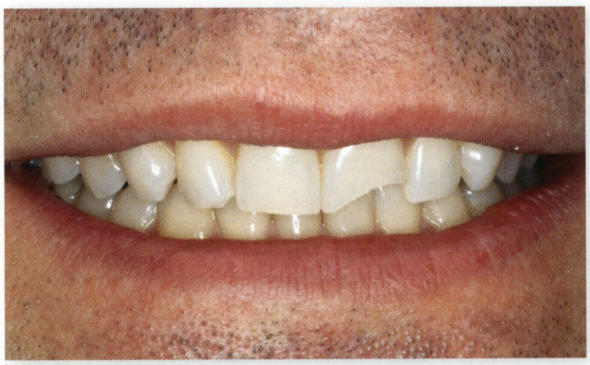

Figure 1: Before, full smile frontal view, 1:2 magnification, non-retracted view.

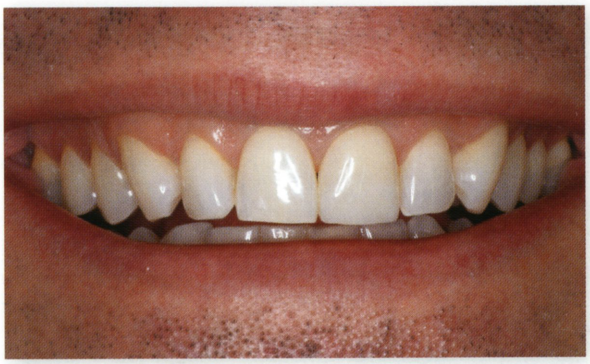

Figure 2: After, full smile frontal view, 1:2 magnification, non-retracted view.

HISTORY

The patient is a 42-year-old male with no significant medical history. He presented with a traumatic injury to the left central incisor. The brother of a goalie for the New York Rangers, the patient had participated in a team practice session when he felt a sudden mild bumping, which would have gone unnoticed except for pieces of shattered tooth in his mouth. He experienced no pain and there was no injury to the lips or soft tissue. There was no bleeding and the tooth felt firm. His chief complaints were sharpness of the remaining tooth, a lisp when speaking, and concern for his appearance. The patient wanted to leave the office expeditiously with a natural-looking restoration.[10] The treatment option of choice was a direct resin-bonded Class IV restoration.

DIAGNOSIS AND TREATMENT PLAN

A complete examination and full series of radiographs were performed,[11] revealing five amalgam restorations, two molar porcelain-fused-to-metal crowns, the absence of carious lesions, the coronal fracture of #9, no root fracture, no periodontal ligament space thickening and a 0.5 mm thickness of dentin remaining incisally to the pulp chamber. Endodontic vitality tests with electrical, thermal, and percussive stimuli revealed positive pulpal vitality. Periodontal survey revealed a healthy periodontium.

The occlusal forces to the composite created during anterior guidance functional movements are best mitigated by directing the force vectors to the composite parallel to the remaining enamel rods.

Photographic documentation was made following the AACD Accreditation protocol with Kodak Ektachrome 100 EPN 35 mm slide film. Additionally, representative Vitapan 3D (Vident; Brea, CA) and composite shade tabs were photographed with Polaroid film for reference during treatment procedures (Figs 1–10). Maxillary and mandibular alginate impressions were made for pretreatment study casts. A Denar (Teledyne Water Pik; Fort Collins, CO) semi-adjustable facebow transfer with facial horizontal plane level allowed the casts to be mounted on a Denar semi-adjustable articulator in centric occlusion.[12] Definitive occlusal treatment was not feasible at this emergency appointment; however, an interceptive soft orthotic was possible.

The polychromicity of enamel and dentin was moderate, with the enamel being mildly opaque. This is consistent with bleaching, which has the tendency to soften and blend polychromicity.[13] The surface texture appeared smooth and worn, with slightly concave developmental grooves. There were vertical surface craze lines, which were positive to the explorer. There were multiple vertical internal enamel crazing lines of varying lengths and patterns in the left central and in the adjacent incisors. The combination of surface developmental grooves and dominant axial ridges, along with surface and internal crazing characteristics, provided a favorable condition to camouflage the external marginal finish line.[4]

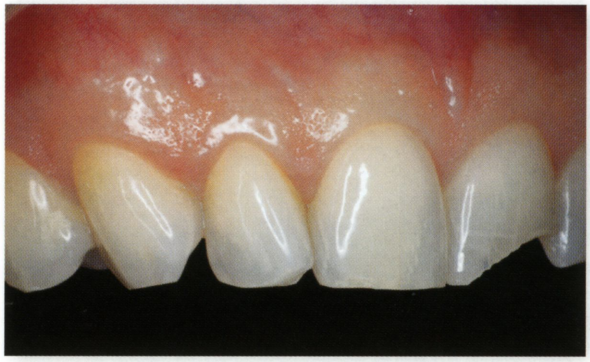

Figure 3: Before, right lateral view, 1:1 magnification, retracted view.

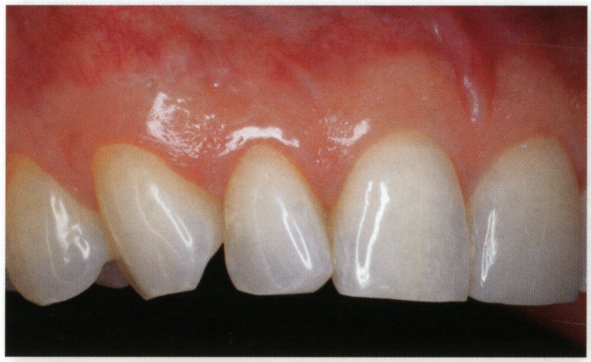

Figure 4: After, right lateral view, 1:1 magnification, retracted view.

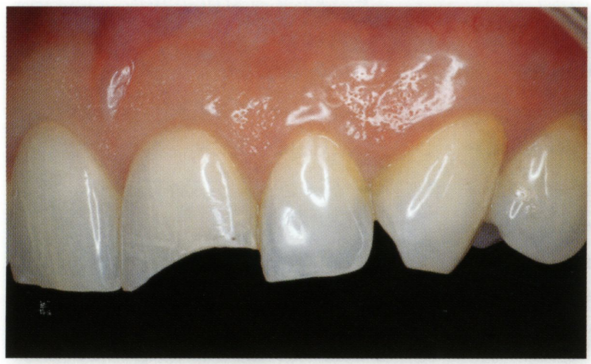

Figure 5: Before, left lateral view, 1:1 magnification, retracted view.

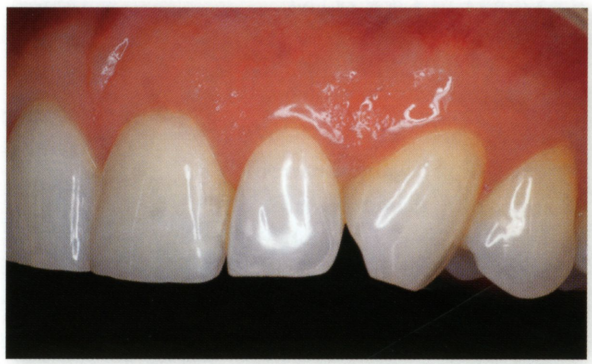

Figure 6: After, left lateral view, 1:1 magnification, retracted view.

An initial shade analysis was performed under various conditions using the Vitapan (Vident) 3D shade guide[14,15] and the chromatic chart (Fig 11) described by Vanini;[16]; and with custom, in-office fabricated tabs from several brands and types of composite with both polished and non-polished surfaces.[4]

Occlusal analysis for parafunctional effects such as wear facets, cervical and cuspal abfractions, gingival recession, exostosis development, and incisal guidance integrity revealed positive findings in a majority of these areas. There was the loss of canine-protected occlusion bilaterally with erosive posterior and anterior excursive contacts. There was slight labialization and rotation of the mandibular central incisors and left lateral which, when coupled with the parafunctional activity, could further compromise the restoration.

The occlusal forces to the composite created during anterior guidance functional movements are best mitigated by directing the force vectors to the composite parallel to the remaining enamel rods. This will be accomplished by developing the angle of the faciolingual inclination of the incisal edge so that the interface of the mandibular incisal edges with the restoration will be parallel to the rods. The lingual surface of the restoration will also be contoured so that the incline angle of the surface will similarly redirect the force. Interceptive methods will be utilized to neutralize the noxious effects of prolonged parafunctional habits. Canine-protected guidance will be re-established through the direct bonding of judiciously applied microhybrid composite to the guidance pathways of the maxillary and mandibular canines.[1] A removable occlusal orthotic will be fabricated for nocturnal bruxing protection and habit abatement.[2]

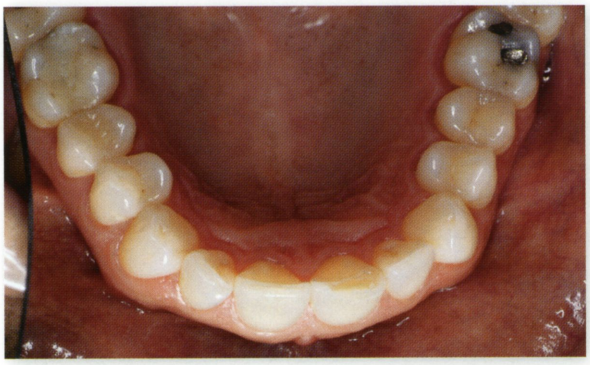

Figure 7: Before, upper arch occlusal view, 1:1 magnification, retracted view.

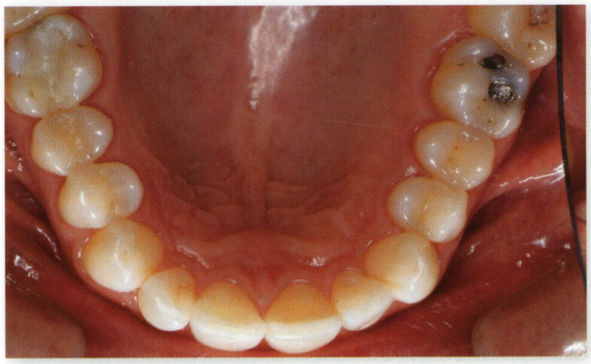

Figure 8: After, upper arch occlusal view, 1:1 magnification, retracted view.

ARMAMENTARIUM

- 37% Phosphoric acid etch Fortify (Bisco; Shaumburg, IL)
- Burs: black diamond 836-012, 849-014 (SS White; Lakewood, NJ); gold diamond 2878-313-014 (Brasseler; Savannah, GA); finishing diamonds 134F-014, 134EF-014, 134UF-014368UF-016, (Brasseler); 12 fluted ET3, ET6, OS1, OS2, carbide H282-102 (Brasseler)
- Vitapan 3D Shade Guide (Vident; Brea, CA)
- Vitalescence Shade Guide (Ultradent; South Jordan, UT)
- Composite resins: Filtek Z-250, B5, UD, A1D, IL (3M; Minneapolis, MN); Filtek A110, A1E, A2, B1 (3M); Esthet-X A-10 (Dentsply/Caulk; Milford, DE); Durafill B1, A1, A2 (Heraeus Kulzer; Armonk, NY); Vitalescence T1, PS, PF (Ultradent); Renamel Hybrid B-1, Microfill A-1 (Cosmedent; Chicago, IL)
- Articulating film (Moyco; York, PA)
- Composite placement instruments (Cosmedent): IPCL (long-bladed extra-thin), 8AL (long-bladed), Multiuse, IPCT (short-bladed extra-thin)
- Goldfogel contouring instruments (Hu-Friedy; Chicago, IL): straight -MG1, curved-MG3
- Brush #1, Resin Keeper, Flexi Buff, Enamelize (Cosmedent)
- Hollenbeck instrument, Wiedelstat chisel (Hu-Friedy)
- Ultrabrush Plus disposable brush, Jiffy brushes (Ultradent)
- Microbrush, regular, applicator tip (Microbrush; Grafton, WI)
- KolorPlus tints and opaquers (Kerr; Orange, CA)
- Creative Color tints and opaquers (Cosmedent)
- Boley gauge (Sullivan Shien; Melville, NY)
- Clearfil SE Primer and Bond (J Morita; Irvine, CA)
- Microsurgical scalpel knife (Microsurgery Institute; Santa Barbara, CA)
- Compostrips (Premier; King of Prussia, PA)
- Abrasive polishing brushes (Premier)
- Concepsis (Ultradent)
- Denar articulator, facebow (Teledyne Water Pik; Fort Collins, CO)
- Epitex finishing strips (GC; Alsip, IL)
- Sof-lex disc (3M ESPE, St. Paul, MN)
- Flexipoint cups and wheels (Cosmedent)

Manipulating composites, whether from a syringe or unit dose compule, may result in porosity.

RESTORATIVE TECHNIQUE

Special care and attention was given throughout all clinical procedures to scrupulously maintain hydration of the dentition. The teeth were supragingivally debrided of plaque, stain, and calculus with sonic scaling, powdered prophy jet, and rubber cup polishing with a slurry of Concepsis-moistened fine pumice.[3]

The initial shade selections were reconfirmed and several refinements were made. Numerous shade analysis

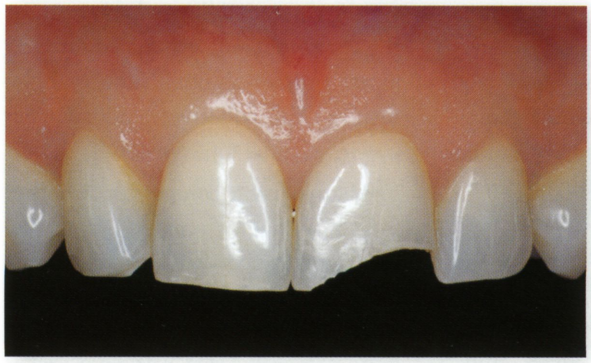

Figure 9: Before, frontal view, 1:1 magnification, retracted view.

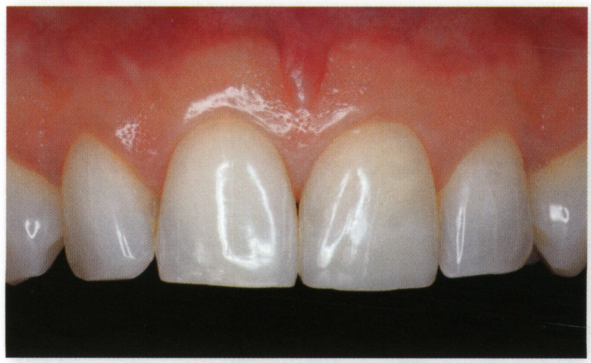

Figure 10: After, frontal view, 1:1 magnification, retracted view.

TABLE 1 - SHADE OBSERVATIONS

Vitapan 3D shade guide was recorded as:

Value: 1M1 Chroma: 1L1.5 Hue: 1/2 OM1 + 1/2 1L1.5

Chromatic Chart of Vanini provided numerous categories and visual representations of the five color dimensions within teeth.[16] This chart of selections resulted in a workable nicely layered mapping, which was recorded as:

Chromicity	1/2 OM1 to 1/2 1L1.5
Value	3 – Youth- High
Intensities	1 W small white stains
Opalescence	Type 3 comb like Grey B
	Type 5 triangle mid incisal, Low chroma amber
Characterization	Type 5 vertical crack white

The final observations were made with a variety of proprietary and custom composite resin shade tabs. This provided the ability to correlate the standard ceramic convention of color units into a corresponding composite color. This conversion fine-tuned the comparison of composite color to tooth color resulting in the composite selection listed:

Filtek Z-250 Hybrid B.5, B1, UD, A1D, IL
Filtek A110 Microfill A1E, A2, B1,
Renamel Hybrid B1
Renamel Microfill A1
Vitalescence TI, PF, PS
Durafill B1, A1, A2

systems exist that attempt to communicate the variety of colors present in vital teeth.[13] A combination of three detailed systems was selected. Each proprietary system provided an accompanying prescriptive form, which facilitated organizing and tracking the color findings. The observations made with these systems are outlined in Table 1.

The visualization of restorative color is influenced by the variables found between the single tooth, contralateral teeth, the palatal intraoral dark zone, the gingival tone, the lips, the skin, and the eyes. It is possible to create a "trompe l'oeil" illusion in color and in form which, when viewed at all angles, distances, and lighting will preclude any detectable evidence of artificiality.[17]

Historically, the creation of the dental ceramic restorative illusion has been accomplished through the "ordered stratification" (as described by Geller) of colors and materials into definite discreet layers with deeper internal opaque layers, followed by serially stratified layering of increasingly translucent and transparent materials. In an important revision to this technique, known as "ordered disorder stratification," Geller recommends the placement of more translucent layers under opaque layers, as well as placing multiple opacities, colors, and translucencies discretely throughout the layers of the restoration to develop a "color contrast effect." This

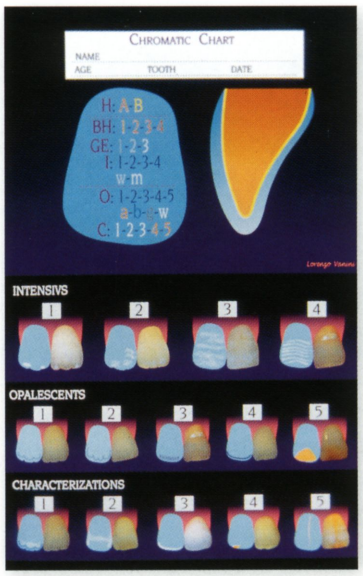

Figure 11: Chromatic chart.

facilitates the transmission of light inside the restoration, creating the real visual depth and illusionary depth characteristic of natural teeth. The objective, then, is to incorporate within the restoration a disorder of layers, hue, chroma, value, opacity, intensities, and characterizations to more closely approximate nature.[18]

Anesthesia was used and a double-layered modified rubber dam was abutted to the second premolars, exposing the teeth and gingiva while retracting the lips, cheeks, and tongue. The under-layer of rubber dam[19] was sealed to the mucosa for saliva control. The outer layer created a tension envelope between the layers to retain moistened gauze strips over the exposed non-operative teeth. These teeth were kept moistened to permit shade-matching verification during composite placement.

The unsupported enamel and damaged dentin were removed with a Wiedelstat chisel (Hu-Friedy). The distal contact was opened using a fine diamond bur and matrix band to protect the approximating surface. Anticipating the most advantageous area for creating a disappearing finish line was then evaluated. The intention was not to overstep the bounds of a Class IV and create a veneer, so a pencil outline of the intended margin was made, taking into consideration surface texture, grooves, ridges, and reverse heights of contours, which would camouflage the enamel-composite interface, reflect light into the enamel away from the visible path, and give the optimal accessibility for finishing and polishing.[3,4]

A modified chamfer-type bevel approximately 2.5 mm in width and graduating in depth from 2 mm at the fracture line to 0.2 mm at the margin, was made following the pencil outline. On the lingual surface, the margins were kept parallel to the enamel rods.

A Mylar matrix was placed to protect the adjacent proximal surfaces and 37% phosphoric acid gel was applied to the enamel for 15 seconds, to the dentin for 10 seconds, and then rinsed for 30 seconds. The excess water was absorbed by blotting with 2 mm square tissue sponges and #60 absorbent paper points, leaving a moist dentin surface. Self-etching primer Part A was applied for 20 seconds and light-cured for 20 seconds with an Optilux halogen light. The adhesive bonder Part B, a 10% filled resin, was applied and agitated with a Microbrush for 20 seconds, then air-dried for 20 seconds with a gentle dry air stream held 1 cm away. Attention was given to visually confirm the presence of a thin layer of adhesive and the absence of puddling. The Mylar matrix was removed to prevent a thick puddling of the resin at the margins and to maintain and intact the air-inhibited surface at the margin. The adhesive bonder Part B was light-cured for 20 seconds.

Manipulating composites, whether from a syringe or unit dose compule, may result in porosity. This was obviated by cutting the composite into very small increments, which were then vigorously rolled into balls on a coated pad with an alcohol-cleaned gloved finger. Inclusions such as gauze fibers, cotton dust, and other foreign bodies were also avoided. Brushes were not used to shape the composite because they increase the risk for the occurrence of inclusions, porosities, interference with the air-inhibited layer, and surface dilution by wetting agents.

The palette of composites was organized into the anticipated order of use beginning with the hybrids, followed by microhybrids and microfills. Each was arranged in a descending order of opacity, value and hue on the covered Resin Keeper (Cosmedent). The less viscous modifying opaquers, tints, and colors were arranged in the wells along with a crystal-clear unfilled resin for diluting purposes.

The initial 0.5 mm increment of high opacity and high value Z250 B.5 was placed at the pulpal floor for protection and polymerized. Additional small increments of the same hybrid shade were sequentially applied and polymerized, forming the central core of the restoration.[3,8] The core was approximately 0.7 mm in thickness, 0.7 mm short of lingual occlusion, and 0.5 mm short of incisal edge position. The lingual surface was concave inciso-gingivally to approximate the lingual anatomy, the incisal edge was

sculpted into an irregular anatomy to simulate mamelons, the facial surface had a straight emergence profile from the dentin at the juncture of the dentinal fracture line, and the internal bevel and slight hints of vertical mamelon-like grooves were sculpted. Care was taken to continuously observe the thickness and faciolingual position of the core through a mirror view to prevent overcontouring.

Throughout this operative procedure, the adjacent teeth were repeatedly referenced for value, hue, and shape comparisons by lifting the moistened gauze that maintained hydration.

Camouflaging the fracture line and raising the value of the hybrid core necessitated the use of opaquers. A thin dabbing of Creative Color A1-B1- LO Pink (Cosmedent) with a #1 brush was spotted over the tooth-composite interface and polymerized. KolorPlus A1 (Kerr) was then similarly spotted to create variation in value and chroma. These opaquers were not applied as total cover layers; rather, they were applied lightly and in a spotty manner and polymerized in multiple applications to mimic stratification.[3,4]

Esthet-X A1 (Caulk) was placed over the lingual of the Z250 central core and polymerized. The core was completed incisally with the addition of small increments of Vitalescence T1, PS, and PF (Ultradent), resulting in a mildly discernable incisal demarcation of the various shades. The high value PS shade of composite was placed at the linguo-incisal edge forming the incisal halo. The middle one-third of the opaqued core was then thinly layered with Z250 UD. Renamel Hybrid B1 (Cosmedent) formed the lingual half of the contact area. Small increments of Z250 A1 and B2 were placed, followed by another thin spotting of KolorPlus A1 opaquer. Observing the restoration from a mirrored incisal view revealed that it encompassed only one-half of the available facial lingual thickness.

The initial enamel layer was applied as a blend of Filtek A110 microfill A1 and A2 (3M), and a thin coating of Creative Color honey yellow tint (Cosmedent) was applied to the mid-incisal area. Small white intensity spots at the mesial and distal line angles were created by the application of diluted KolorPlus white opaque. The fine craze lines were created by forming an extra-thin groove in the cured microfill with a microsurgical scalpel blade, into which was placed a minute amount of diluted KolorPlus white and ochre tints. The surface enamel layer was created with extremely small pellet-like amounts of Durafill shades B1, A1, A2 (Heraeus Kulzer); and Filtek A110 shades A1 and A2E (3M), utilizing their differences in opacity and value to create a stratified effect.[20]

FINISHING

Throughout this operative procedure, the adjacent teeth were repeatedly referenced for value, hue, and shape comparisons by lifting the moistened gauze that maintained hydration. This made it possible to immediately predict the result of the restorative procedures by eliminating the necessity to wait for rehydration. The restoration was carefully examined, then extensive additional polymerization was accomplished to ensure maximum conversion of the composite resin.

The rubber dams and gauze strips were removed. First, centric occlusion functional contacts were developed using blue articulating film. Then protrusive functional slides were marked with red articulating film and adjusted into harmony with the neighboring anterior teeth. These adjustments were made with a 12 fluted OS1 bur (Brasseler). The facial surface was smoothed with 12 fluted ET3 and ET6 burs and the incisal edge was smoothed with a fine Sof-lex disc (3M ESPE). The composite surfaces extending 0.5 mm beyond the margins were etched for 10 seconds, rinsed, dried, and coated with a protective layer of Fortify (Bisco). To allow for complete development of the enamel/dentin bond strengths and for maturation of composite polymerization strength, the patient was instructed to return in 2 days for final finishing and polishing.

The first step at the finishing and polishing appointment was to contour the overall shape with the use of 12-fluted ET3, ET6 burs, as well as medium and fine Sof-lex discs. The second step followed with the careful shaping of the distal contact area to create adequate embrasure form and line angles. This was accomplished by placing a separating wedge and carving into the embrasure and proximal line angles with a microsurgical scalpel and a #12 scalpel. The wedge was removed and proximal stripping, shaping, and polishing was accomplished with an extra-fine metal strip followed by Epitex strips (GC) progressing from medium to superfine. The third step

involved the marginal interface of enamel to composite, requiring truly concentric rotary instruments free of chatter, sharp instruments, and keen observation of the existing anatomy. The locations of grooves and ridges were highlighted by pencil marks on the enamel and carved into the composite. The contouring and carving extending the anatomy into the composite was done with 12- and 30-fluted pointed, flame-shaped, and football-shaped carbide burs. Carbides were used because they impart characteristic subtle secondary facets in the microfill composite, which at the polishing stage will be made to resemble tertiary texture and provide light-reflecting surfaces.[4] Ultra diamond burs, which are more easily controlled, result in a more matted flat surface devoid of texture. In the fourth step, the primary anatomy (grooves and ridges), secondary anatomy (facets), and tertiary anatomy (texture, cracks, and crazes) are carried incisally from the margin into the body of the restoration. The same instrumentation was employed as was utilized in step three.

The fifth step addressed the incisal edge and lingual surface anatomical morphology. The final length adjustment to the incisal edge and embrasures was made by closely observing the contralateral central. The incisal edge was trimmed to coincide with the incisal guidance in a faciolingual inclination. A wear facet irregularity was located to reflect similar wear patterns on other teeth. In incisal mirror view, the facial surface anatomy was evaluated and the faciolingual width of the incisal edge was compared to the adjoining central and reduced from the lingual. The cingulum, lingual groove, and marginal ridges were carved and contoured with 12-fluted ET3, OS1, OS2 burs and were refined with ultra-diamonds.

Finally, the sixth step was polishing. The most common definition of polishing, yet the least desirable, is to obtain a high luster by developing a flat surface. True esthetic polishing results in multifaceted high-luster surfaces that maintain the subtle features of primary, secondary, and tertiary anatomy. The microfill surfaces were polished with Cosmedent blue and pink rubber points and cups, followed by a cylindrical goat's hair brush to reach the tertiary anatomy and enamelize paste on a felt-sided Flexi Buff (Cosmedent) run at a very high speed. The microhybrid which formed the lingual surface was polished with Flexipoint cups and wheels (Cosmedent), followed with a Jiffy polishing brush (Ultradent) for final high-gloss polish.

SUMMARY

Composite breakthroughs give the clinician state-of-the-art materials with which to create predictably functional and esthetic Class IV restorations. However, the ultimate esthetic result will not be achieved without implementation of a proper protocol. This case demonstrates a very specific stepwise method to implement a predictable methodology for the incremental application of varying composite resins and modifiers in a disordered stratification to transform a Class IV fracture into a final restoration that mimics nature and is in harmony with the total dentition.

For the cosmetic dentist, exquisite esthetics is a reachable quest.

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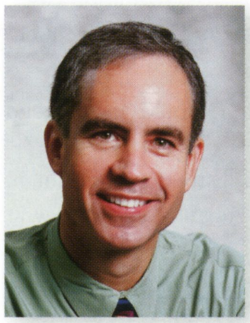


by
Corky Willhite, D.D.S., F.A.A.C.D.

Dr. Willhite has been in private practice since he graduated from LSU School of Dentistry in 1979. He quickly became interested in cosmetic dentistry and pursued hundreds of hours of continuing education. Many of these courses were sponsored by the A.D.A. and the A.G.D., organizations in which he still maintains membership. In 1990 he attended his first AACD Annual Meeting and hasn't missed one since. He achieved Accreditation and, as his slide collection grew, was asked by his colleagues to share his knowledge. One thing led to another, and he is flattered to have had the opportunity to lecture across the country and internationally, as well as publish articles on cosmetic dentistry. In the meantime, he has served in several positions of leadership in the AACD, as well as 2 years as President of the Louisiana Chapter. Since 1995 he has served as an Examiner for Accreditation and in 1999 was elected to the first Board of Governors. In 1997 he achieved his Fellowship and in 1998, he was invited to join the faculty in the Department of Prosthodontics at LSU, where he is an Assistant Clinical Professor. He believes in giving back to the community and regularly donates dentistry to those in need. Over the years, his practice has evolved to provide almost exclusively cosmetic and restorative services. Dr. Willhite lives in New Orleans with his wife and two "mostly enjoyable" teenagers.

Interview with the Candidate

Interview with John Stratta, D.M.D. by Corky Willhite, D.D.S.

Willhite

How long did it take you to complete this case?

Stratta

At the first appointment, the history, records, and photographs took about 90 minutes. Actual restorative treatment took about another hour and 10 minutes. Two days later, there was an additional 20-30 minute appointment for final finish and polish. The patient also had appointments 2 and 6 weeks after the treatment for his bite guard, postoperative check, and AACD photographs.

Willhite

Would you do anything differently if you were starting over?

Stratta

Not restoratively, but it would have been more ideal if he had accepted a truly comprehensive treatment plan, say with laminates, that would have made it possible to improve his occlusal problems, too.

Willhite

Did you give the patient any incentives to cooperate with the extra time demands of an Accreditation case?

Stratta

The patient was expecting a short procedure so that he could attend a business meeting. With the various diagnostics, his actual time in the office was about 2 hours. I've found that when the patient is told that the procedure will be photographed because of the high quality of the treatment, they are more than pleased to have us take extra time with them. Occasionally, the staff will give a patient a Sonicare or Oxyfresh kit as a special "thank you."

WILLHITE

Do you have any words of wisdom to candidates about to start working toward Accreditation?

STRATTA

Yes! Emphatically, the first is to be determined to succeed—110% effort is required. Then hang on tight and enjoy the personal growth, the wealth of knowledge, the honed skills, the clinical insights, the abandonment of mediocrity, and the rewards that will result. As you begin to practice your new skills, be sure to convert and retrain your staff; they'll help you to succeed. As you participate in the Accreditation process you'll find a support group of teachers, course instructors, and AACD members, as well as written manuals that will open doors to your success. Attending an AACD Advanced Accreditation Workshop, where your cases are critiqued, is unbelievably helpful. I attended the one at the Greenbrier® Resort and learned to see things in my own cases that I didn't know to look for before. Listen to the mentors' advice and critiques with an open mind, and you'll be amazed at how much you learn!

WILLHITE

You pulled together a tremendous amount of information to help you create a beautiful result. Were there any courses in particular that helped you understand how to achieve this?

STRATTA

Participation in hands-on courses was extremely helpful. These courses helped my understanding of dental esthetics and taught me the techniques needed to create a predictable result. Of course, just attending the courses wasn't enough to create instant esthetic masterpieces. Instead, it required an ongoing dedication to deliberately and meticulously apply what I had learned. I simply decided that in my daily practice, every restorative procedure, whether simple or complicated, would be a rehearsal for Accreditation cases. The keyword was and is: practice-practice-practice.

The courses I would recommend are:

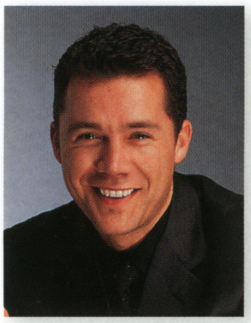
- Advanced Esthetic Continuum, Level II (Eubanks and Morley at LSU)
- Mastering Esthetic Anterior Composites (Fahl at LVI)
- Creativity with Direct Composite Resin (Terry at AACD Annual Scientific Session)
- AACD Advanced Accreditation Workshop (Greenbriar Resort)
- Advanced Anterior Esthetics (Dickerson and colleagues at LVI)
- Innovative Composite Materials (Mopper at AACD Annual Scientific Session)

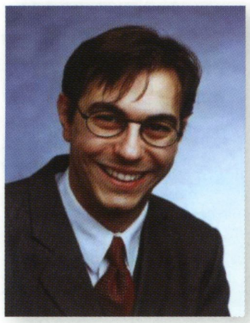
NEWLY ACCREDITED MEMBER

Jenifer Wohlberg

Jenifer Wohlberg is a Master Ceramist and heads the training program for the ceramics department at Valley Dental Arts in Stillwater, Minnesota, where she has worked for 12 years. Thanks to Valley Dental Arts' belief in education and excellence, Jenifer has been fortunate to study with many world-class ceramists, including Enrico Steger, Lee Culp, Claude Sieber, Pinhas Adar, Taki Nishihata, Matt Roberts, Thilo Voch, and Willi Geller. Jenifer realized early on that her passion for dentistry was within the cosmetic arena. Beginning in 1992, she spent nearly 8 years under the instruction of Dr. Robert Nixon in a number of hands-on seminars. In 1998, Jenifer participated in a live-patient series through PAC-Live, working under the instruction of Dr. David Hornbrook and Master Ceramist Matt Roberts. Jenifer has been a member of the American Academy of Cosmetic Dentistry® for 3 years.

Non-Vital Tooth Bleaching with a Carbamide Peroxide Gel





by
Markus Lenhard, D.D.S. and
Germán Gómez Serrano, M.D., D.D.S., Ph.D.

Dr. Markus Lenhard is clinical manager, ICDE, Ivoclar/Vivadent, in Schaan, Liechtenstein. His previous positions include director, Vivadent Training Center Vivadent Ets and product manager, Ivoclar AG, both in Schaan; visiting dentist and lecturer, and assistant professor in the Department of Restorative Dentistry and Periodotology, University of Heidelberg, Germany. Born in Heidelberg, Dr. Lenhard is an active member of IADR, lectures internationally, and has been published in national and international journals.

Dr. Germán Gómez Serrano is manager, Professional Services Latin-America, for Ivoclar-Vivadent. He earned his medical and dental degrees at the University of Tübingen, Germany, and did his doctoral thesis in oral implantology. He also lectures on physiology and anatomy at the school of nursing in Friedrichshafen (Germany) and is a guest-dentist at the University of Munich (Germany). An active member of the IADR, he has given more than 100 lectures in 17 countries on cosmetic, restorative, preventive, and adhesive dentistry.

Non-vital tooth bleaching was first described in the nineteenth century. For decades, it has been and continues to be a well-used method to treat discolorations of root-filled teeth. Provided it is used within the limits of its indications, non-vital tooth bleaching is a valuable completion to the spectrum of esthetic treatments. Nevertheless, some risks are involved and the esthetic long-term potential is limited. This article will describe a method to effectively bleach non-vital teeth using a carbamide peroxide gel.

REASONS FOR TOOTH DISCOLORATION

Discoloration of non-vital teeth is associated with dental trauma and pulp necrosis. In addition, many instances of discoloration are due to iatrogenic reasons. These "dentist-caused" discolorations include false access to the root canal, bleeding during canal instrumentation, endodontic sealers within the coronal part of the crown, and restorative materials.

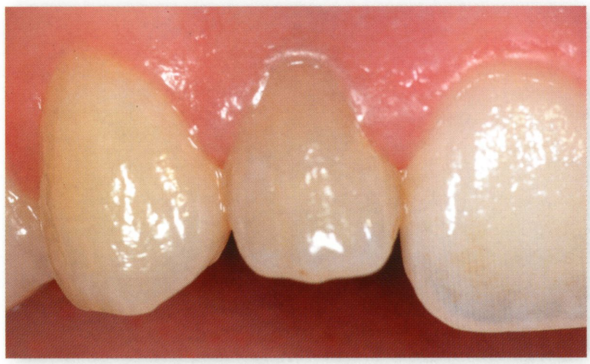


Figure 1: Initial situation.

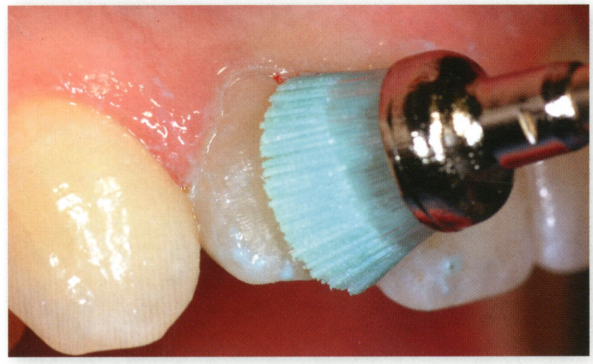


Figure 2: Professional tooth cleaning with an abrasive paste removes extrinsic stains.

TRAY USE

Using a tray to deliver the bleaching agent is a popular modification of the walking bleach method. The tray is manufactured as for vital tooth bleaching. However, facial aspects of the tray are cut out in the area of the adjacent teeth, leaving a full cap only for the tooth to be bleached. The second possibility (Fig 4) is to manufacture only a single tooth tray. As for the walking bleach procedure, an endodontic cavity is prepared. For the bleaching session, the endodontic cavity is filled with the bleaching agent. The custom-made tray is filled with bleaching agent as well, and is placed over the tooth. After the bleaching session the tray is removed and the patient must rinse the cavity with the aid of a syringe with a blunt cannula.

It is important to ask the patient whether the discolored tooth has sustained a traumatic injury.

The advantage of this method is that the tooth is bleached both externally and internally, therefore accelerating the procedure. However, the patient must be extremely compliant in keeping the endodontic cavity meticulously clean and rinsed after every meal.

NON-VITAL BLEACHING WITH CARBAMIDE PEROXIDE

STEP BY STEP

First appointment

- **Patient information**

  The patient must be informed about the following:

  1. Treatment plan, alternatives, and costs.
  2. Possibility of insufficient color change.
  3. Possibility of color remission.
  4. Enhanced fracture risk during bleaching procedure.
  5. External resorption.
  6. Restorations do not change their color and may be have to be redone after bleaching.

- **Medical history**

  It is important to ask the patient whether the discolored tooth has sustained a traumatic injury. Traumatic injuries can be associated with external root resorption. This information, together with the patient information might become of forensic importance later on.

- **Clinical and radiographical inspection** (Fig 1)

  The patient should not have active carious lesions. Furthermore, active periodontitis is a contraindication to bleaching. If the tooth that is to be bleached shows insufficient, leaking restorations, these must be sealed or replaced by a temporary prior to bleaching. Clinical symptoms of apical inflammation must not be present. A current radiograph must not indicate any signs of root resorption or apical inflammation. The root canal treatment must be in accordance with national standards.

- **Professional tooth cleaning** (Fig 2)

- **Color registration**

  A photograph would be the ideal way to document the initial discoloration. Shade guides usually do not offer a color that matches the discolored tooth, and are therefore inadequate. However, color registration is not that important, as the patient can easily check the bleaching progress by comparing the tooth color with the adjacent teeth.

- **Impression taking**

  Simple alginate impressions of the upper and lower jaw will do.

- **Stone models**

  The area of interest is the tooth. Therefore the base of the model can be trimmed into the muco-labial fold. To enhance adaptation of the

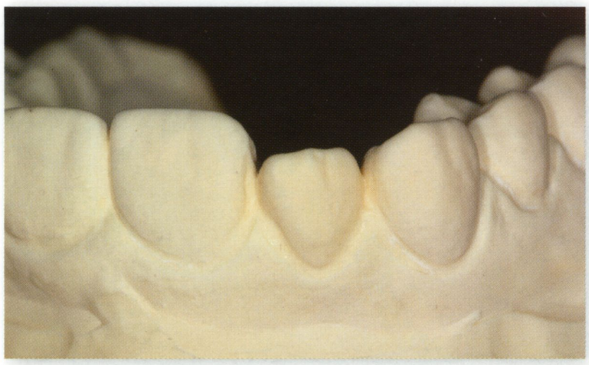


Figure 3: Shallow grooves will enhance the adaptation of the tray.

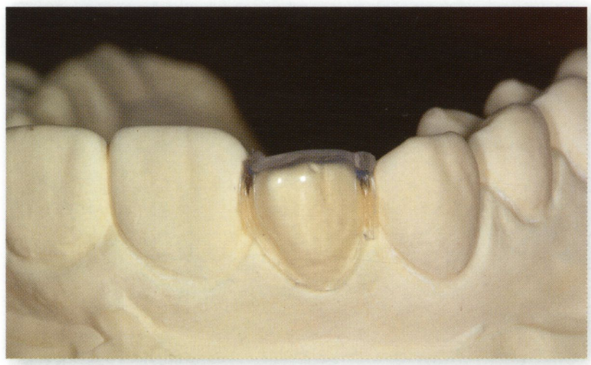


Figure 4: Finished tray.

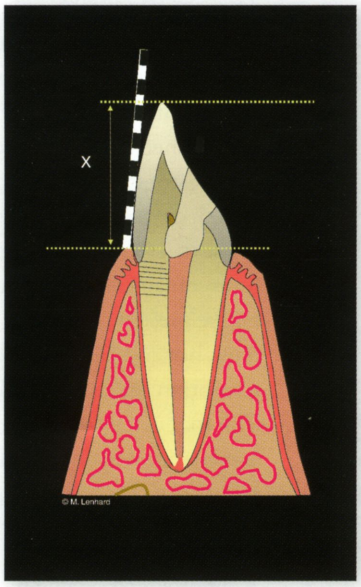


Figure 5: The facial length of the clinical crown is measured.

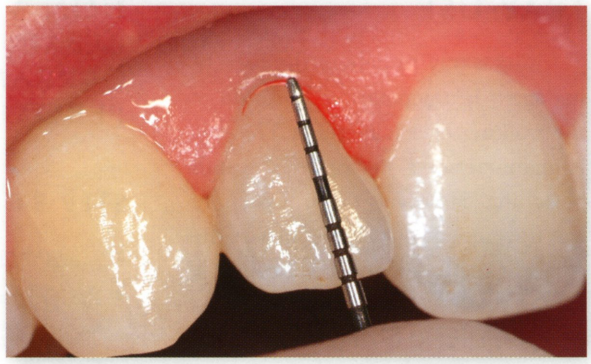


Figure 6: The length is measured using a PCPUNC 15 periodontal probe.

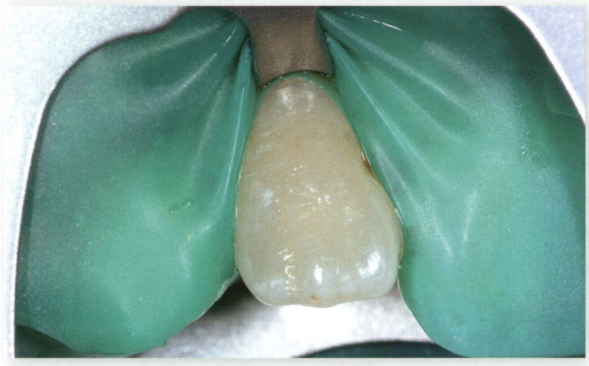


Figure 7: Single tooth isolation with rubberdam.

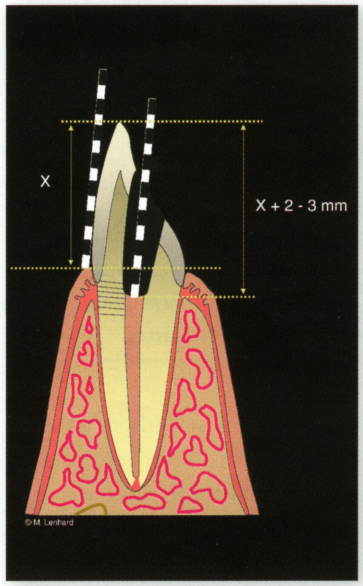


Figure 8: Determination of the depth of the endodontic cavity.

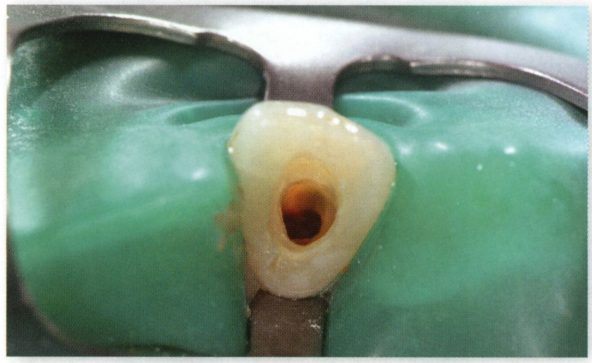


Figure 9: Endodontic cavity.

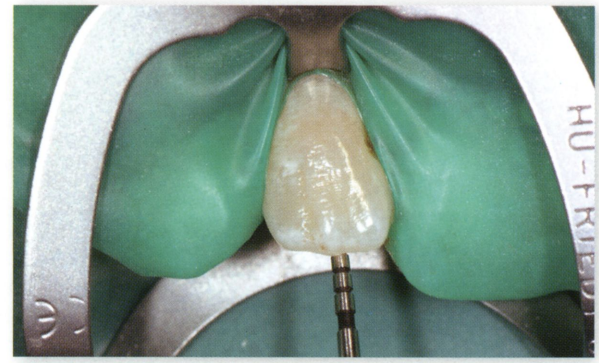


Figure 10: Checking the correct depth of the cavity.

tray, a shallow groove can be drilled in the cervical area along the marginal gingiva, but without removing the gingiva (otherwise there is a risk of gingival retraction during the treatment). Shallow grooves also may be prepared on the interproximal facial aspects of the adjacent teeth in order to enhance the adaptation (Fig 3)

It was often described that a block-out material should be applied to the labial surfaces of the teeth, before the tray was formed; the idea was to create a reservoir for the bleaching agent in the tray. It was believed that the higher availability of bleaching agent in the tray would speed up the whitening process. Nevertheless, it was shown that a reservoir does not give any additional value.[1] Therefore, it seems that reservoirs will only lead to a waste of material.

- **Tray manufacturing**

  The tray is manufactured in a vacuum former. After the forming process, it is helpful to highlight the cervical groove with a ballpoint pen. This facilitates cutting out the tray. The tray may not exceed the gingival margin of the tooth, so as to avoid direct contact of the gel with the gingival tissue (Fig 4).

Second appointment

- **Check fit**

  The correct fit of the tray must be checked meticulously, not only on the model but also in the patient's mouth. This is to prevent the material from flowing out of the tray so that the patient swallows as little material as possible. Sharp edges and over-extension are a common source of gingival irritation and inflammation.

- **Measure**

  Measure the length of the clinical crown from gingival margin to incisal edge (Figs 5 & 6). This is most easily done using a periodontal probe with a millimeter scale (PCPUNC 15).

- **Place rubberdam** (Fig 7)

- **Prepare endodontic cavity**

  The depth of the endodontic cavity can be determined by adding 2–3 mm to the length of the clinical crown and transferring this into the cavity (Figs 8–10).

- **Place base material**

  This is probably the most important step of the procedure. The correct positioning of the base is as crucial for the esthetic result as it is for avoiding external resorptions.

On the facial aspect of the cavity, the base material should be placed up to a level that is 1 mm below the facial gingiva margin (Fig 11). Again, this must be controlled by measuring with a periodontal probe. Hence, the distance from incisal edge to base equals the length of the clinical crown plus 1 mm (Figs 12 & 13). More material can be placed at the oral aspect of the endodontic cavity, as the oral aspect of the crown is not of esthetic concern.

Again, it must be emphasized that the position of the base should be controlled most carefully. If the base material is placed too far coronally, the dentin tubules that lay under the cervical enamel will be sealed. This will obstruct the penetration of the bleaching agent in the cervical area and result in a compromised esthetic result (Fig 14). If the base is placed too far apically, hydrogen peroxide might penetrate through dentinal tubules into the periodontal ligament and trigger an inflammatory resorption (Fig 14).

The best way of handling the positioning of the base material is to apply a surplus of material, which can afterward be reduced to the correct level using a small round bur, while repeatedly checking with the periodontal probe.

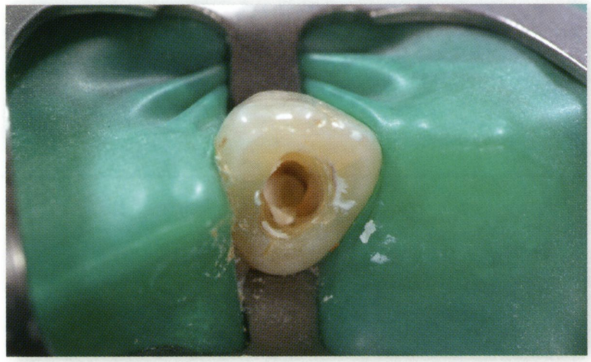


Figure 11: Base material. Note that the base extends to a higher level on the lingual aspect.

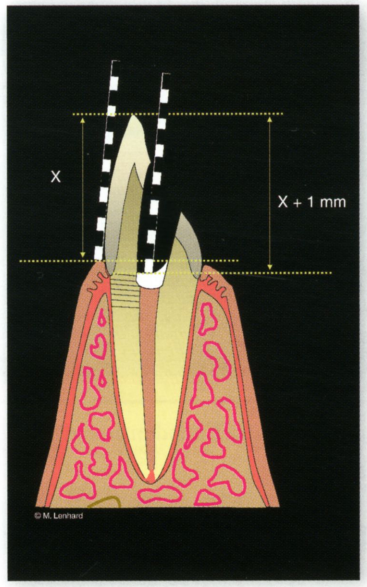


Figure 12: Determination of the correct position of the base material.

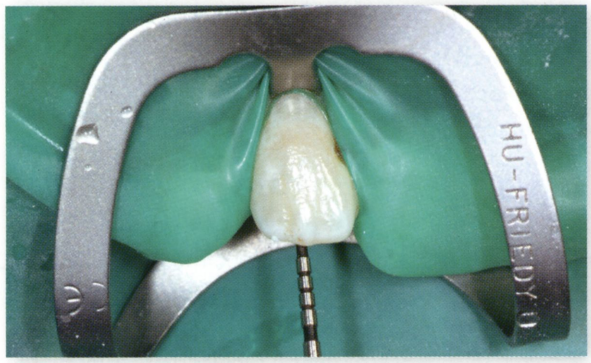


Figure 13: The base is located 1 mm below gingival margin.

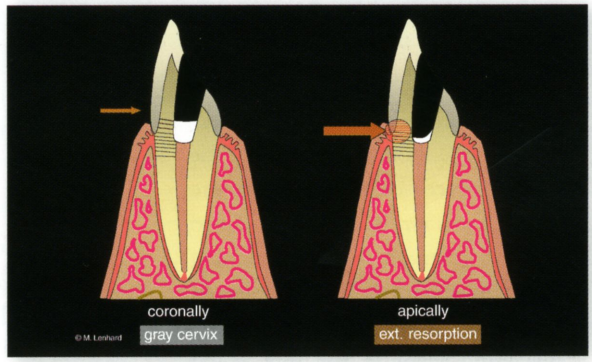


Figure 14: False position of base material.

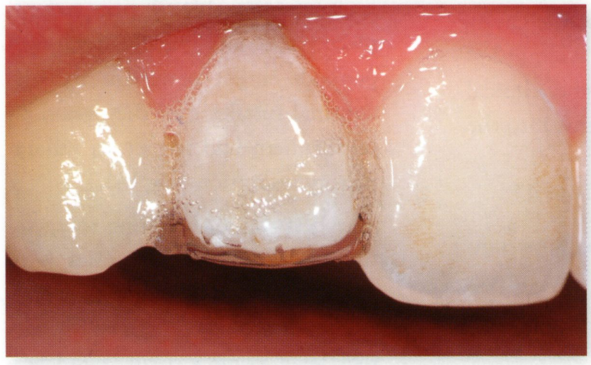


Figure 15: Tray in place with a 10% carbamide peroxide gel.

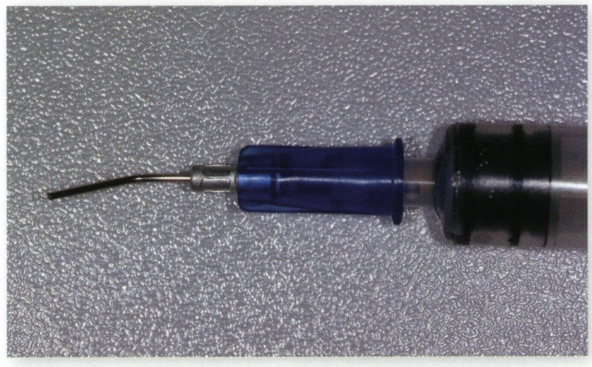


Figure 16: The patient has to keep the cavity clean by means of the syringe with a blunt cannula.

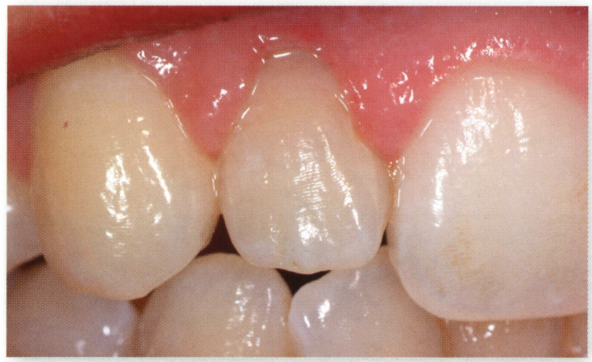


Figure 17: Situation after 1 day.

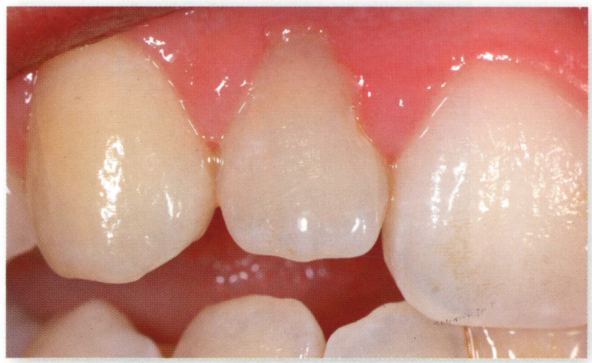


Figure 18: Situation after 3 days. Note gingival inflammation. The patient did not dare to brush the tooth. Consequently the patient was advised one more time to brush and floss all teeth.

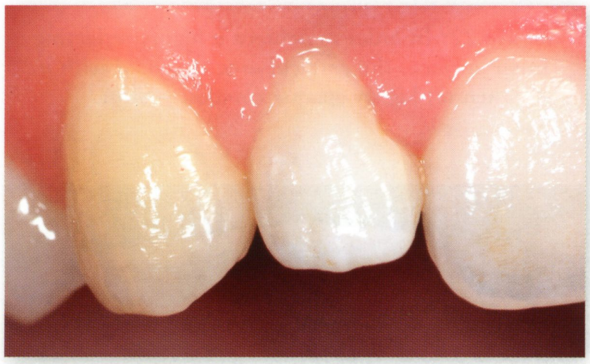


Figure 19: Situation after 6 days. Gingival inflammation is virtually gone.

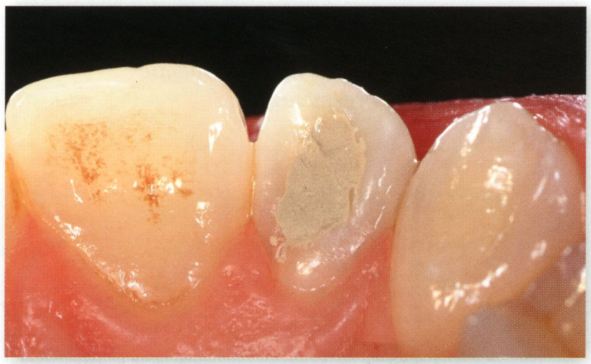


Figure 20: Temporary restoration.

The correct positioning of the base is as crucial for the esthetic result as it is for avoiding external resorptions.

Choice of base material: Research has shown that there is no material that seals the root perfectly.[2] Although adhesive resin base materials would probably result in the best seal, they are not the material of choice because the application of the dentin adhesive would seal all dentinal tubules, thereby hampering the penetration of the hydrogen peroxide into the dentin. We prefer a zinc-phosphate cement or a fiber-reinforced zinc-oxide-eugenol cement.

- **Acid-etch cavity with phosphoric acid for 5–10 seconds**

  This will remove the smear layer and open dentinal tubules, thus facilitating the penetration of the bleaching agent into the dentin. With this last step, the tooth is ready for the bleaching procedure.

- **Patient instruction**

  The patient must be shown how to use the bleaching system. The first application should be done in the office by the patient under the dentist's supervision. The patient must be able to apply the carbamide peroxide gel in the endondontic cavity, to fill the tray, and to place it on top of the tooth (Fig 15). Excess gel must be removed with the fingers or a toothbrush. The patient also must be able to rinse the endodontic cavity with water by using a syringe with a blunt cannula (Fig 16).

  Patients should be advised to bleach the tooth every day for 2 hours. Patients also must be instructed as to what they should avoid during the treatment period (e.g., citrus fruits and beverages, smoking, coffee), and how long this period is going to last (usually 6–8 days).

Figure 21: Light will be reflected at the light, opaque resin surface.

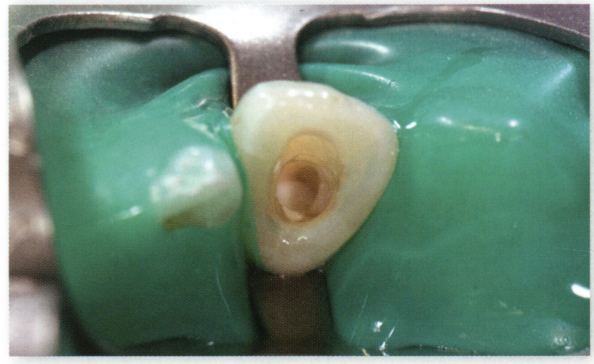


Figure 22: In order to achieve a highly reflecting inner surface, the cervical area is coated with a white, highly opaque composite stain.

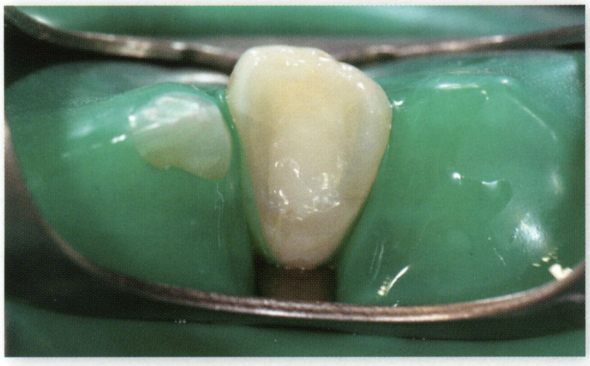


Figure 23: Restoration done in incremental technique, using a very white and opaque composite.

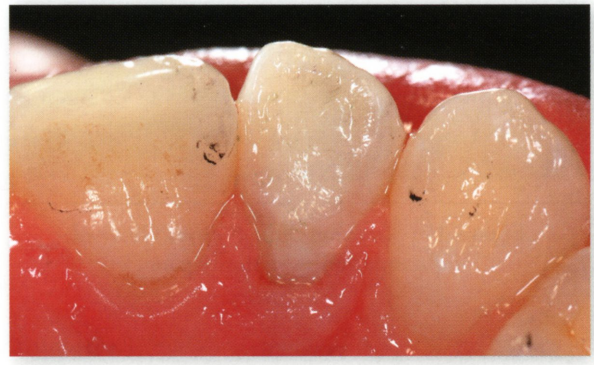


Figure 24: Finished restoration.

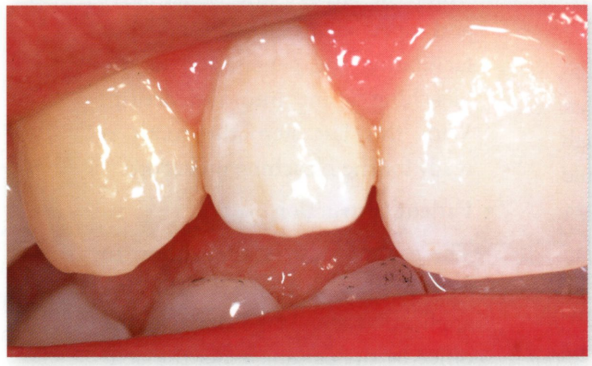


Figure 25: Final situation.

- **Recall the patient regularly**

  Check the patient's color change and gingival health. We usually ask the patient to come back on the third and sixth day, or whenever the patient experiences side effects or thinks the color change is adequate (Figs 17–19).

Final bleaching appointment

Usually, one can see some slight color remission after the first week after bleaching is finished. It therefore is a good idea to slightly overbleach the tooth.

If the color matches the desired esthetic result, the bleaching agent is removed, and the cavity is restored with a temporary restoration (Fig 20). The final restoration should be done in the total etch-total bonding technique using composite resin materials. However, due to interactions between residual hydrogen peroxide and adhesive resins, the final restoration must be postponed for 1 week after the final bleaching appointment.

Final restoration of the endodontic cavity

An adhesive restoration done in the total etch-total bond technique is the treatment of choice to stabilize the tooth. Endodontic cavities have an unfavorable C-factor, resulting in high shrinkage stresses caused by the polymerization shrinkage of the composite resins. Therefore, it is helpful to place the material in an incremental technique using more—but thinner—increments than usual.

As some color remission can be expected, it might be helpful to use a light-colored, opaque composite shade. More light will be reflected from the restoration, giving the tooth a lighter appearance (Figs 21–25).

SUCCESS RATES

Initial success rates of internal bleaching are reported to be in the range of 83–91 %.[3-5] However, within 1 to 6 years after bleaching, the success rates drop to 35–50%.[3-7] Therefore, as with external bleaching, internal bleaching is usually not a permanent solution. After a certain time, there is a high probability that re-treatment will be necessary. Re-treatment, however, does not necessarily include the preparation of a new endodontic cavity and internal bleaching. When the restoration is adequate (light, opaque color; no marginal leakage) and factors that can cause ongoing discoloration can be excluded, re-treatment can be performed by external bleaching exclusively. This way, there is no further loss of tooth structure.

SIDE EFFECTS

The reported side effects associated with internal bleaching are limited; however, some of these are severe and can include:

- enhanced fracture risk
- reduced bond strength
- external root resorptions.

Usually, one can see some slight color remission after the first week after bleaching is finished. It therefore is a good idea to slightly overbleach the tooth.

ENHANCED FRACTURE RISK

Based upon observations and reports of anecdotal nature, it was believed that bleaching with hydrogen peroxide would enhance the fracture risk of teeth. It was reported in-vitro that bleaching with carbamide peroxide reduced the fracture toughness of human enamel.[8] However, this result could not be confirmed for internal bleaching.[9] Clinically, no evidence can be found that supports the hypothesis that bleaching procedures per se, whether external or internal, enhance the fracture risk.

Nevertheless, more teeth that are bleached internally do fracture. This phenomenon, however, seems to be associated with excessive removal of stained dentin by the dentist and is not a consequence of the chemical bleaching process. Furthermore, during the internal bleaching period the tooth with its endodontic cavity lacks a stabilizing restoration, making it more prone to fracture.

REDUCED BOND STRENGTH

Interactions between residual hydrogen peroxide and radicals formed during radical polymerization result in reduced bond strength. This is an effect that is limited in time, so that after 1 week the usual bonding procedures can be applied.[10-12]

EXTERNAL ROOT RESORPTIONS

This is the most severe possible side effect of internal tooth bleaching, and may lead to tooth loss. It is believed that penetration of hydrogen peroxide through the dentinal tubules into the periodontal ligament, associated with a drop of the pH-value, may trigger an inflammatory resorption in the cervical area of the roots. The process is usually asymptomatic.[13]

It has been shown that cervical areas with cementum defects demonstrated greater penetration.[14] However,

the condition of the dental hard tissue in the cervical area is unpredictable and irregular for any type of tooth and on any one individual tooth.[15]

Certain risk factors for external root resorption have been identified. Some of them, such as trauma or orthodontic treatment, do not relate to bleaching.[16] Others are associated with internal bleaching, like the use of high concentrations of hydrogen peroxide, thermocatalytic techniques, and the lack of a base material.[16-18] The use and the correct position of the base material on top of the root canal filling seems to be of special importance.[14,18]

The recommendations to minimize the risk of external resorption can be summarized as follows:

- Do not use thermocatalytic techniques.
- Avoid high concentrations of hydrogen peroxide.
- A base material should be placed with reference to the attachment level in all cases.
- Teeth that suffer from active periodontitis should not be bleached.

Although bleaching should be a safe procedure when following these guidelines, the patient must still be informed about the risk of external resorption.

Even so, external resorption might still occur, as it also can result from traumatic or idiopathic reasons. Therefore, the occurrence of a cervical resorption after bleaching might simply be just an unfortunate coincidence. However, as it is afterward impossible to identify the real reason of the resorption, the dentist is put in a difficult position.

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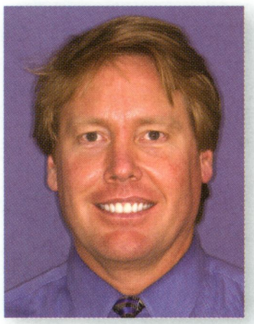
The Digital Patient Consultation: *Completely Digital and Crystal-Clear*



by
Gregory M. Lutke, D.D.S.

Dr. Gregory M. Lutke graduated from Baylor College of Dentistry in 1985. His practice in Plano, Texas, is limited to cosmetic dentistry. Dr. Lutke is founder and CEO of Dallas Dental Solutions, a company that assists cosmetic practices with imaging technology. As a member of the AACD, Dr. Lutke's course centers on "film-quality digital photography" and the simple user skills necessary to prosper with this exciting communication technology.

THE PREMISE

Converting all of our patient treatment opportunities into patients who are willing to pay for their treatment in advance was once just a dream. The digital patient consultation (DPC) is the path to making this dream a reality. Historically, dental consultants have taught dentists and their staffs to use verbal skills to sell their cases. This approach leads to a certain level of success, especially in non-cosmetic dental treatment. The DPC is completely visual, however, exactly like the treatment we provide to our patients. If our product is visual, it should be presented visually.

Stunning digital photography clearly presented with Microsoft® PowerPoint® is the whole premise. A potential patient actually seeing a presentation of slides completely about them—their present condition, as well as accurate imaging of their potential cosmetic result, is *the* communication necessary for case acceptance. With words we can communicate only so much, but with photographs we communicate *results*. Regardless of how we think patients buy cosmetics, they are results-focused. Give them an accurate result, based upon the wonderful advancements in cosmetic care, and they will commit their funds, time, and energy to achieve the result. It is said that "a picture paints a thousand words." Save the thousand words and, instead, communicate clearly with pictures!

If our product is visual, it should be presented visually.

THE PATH

The game is *user skills*. The skills necessary for a DPC are non-clinical, and new to most dentists. These communication skills are not taught in dental schools, but must be mastered to effectively illustrate our *clinical expertise*. The new skills are:

- capturing images of patients with a professional-grade digital camera
- making these images film quality in Adobe® PhotoShop®
- presenting these images in Microsoft PowerPoint.

These presentations must be displayed on appropriate computer hardware. Most dental practices have adequate computer systems in place and shouldn't need an additional investment.

We must strive to upgrade our user skills to the level of our dentistry; excellence is mandatory for results.

The development of user skills is critical. Remember, the presentation is stunning digital photography. Our computer monitor must be able to display these pictures effectively. Only after we perfect our user skills should we consider upgrading our hardware. We must strive to upgrade our user skills to the level of our dentistry; excellence is mandatory for results.

THE RESULT

Patients who are clear about their cosmetic results will accept treatment. Simply put, the quantity of your patient acceptance will equal the quality of your communication. In the process of preparing our presentation, we study all of the patient's digital photographs; we believe this is the major component of the diagnostic process. Sometimes we see the cosmetic answer for the first time during preparation—the pictures show us the result, just as it will show our patients.

It takes just a moment to understand the premise of digital case presentation. The path to learning the user skills, however, requires several months. The results will transform your practice.

Imagine the opportunity to practice in a manner that concentrates on the patient and not on the business of selling dentistry. Congratulations in advance—your digital success will excite you and make your dream possible!

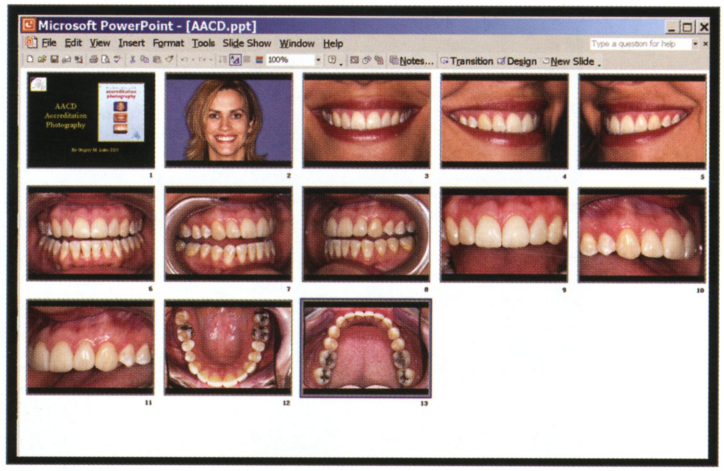


Figure 1: 12 AACD Accreditation Series, Dentist-to-Dentist or Dentist-to Lab views.

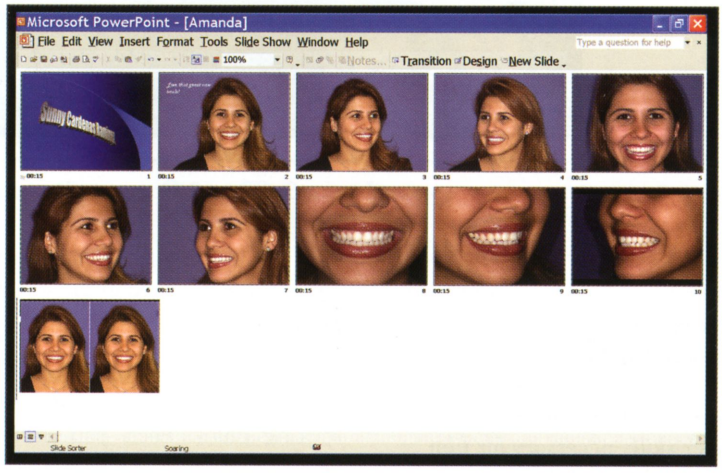


Figure 2: 10 Digital Patient Consultation Series, Dentist-to Patient views.

THE PHOTOGRAPHIC SERIES

AACD Accreditation Series

The choice of which standard series of patient photographs to use depends upon the audience viewing the images. The 12 AACD Accreditation views are clearly the series choice if other dentists or lab technicians are your intended audience (Fig 1). These views clearly outline the cases from a dental professional's point of view. The retracted and occlusal views add valuable information necessary to fully understand these cases.

Digital Patient Consultation Series

On the other hand, if your intended audience is a potential cosmetic patient, then the standard series is completely different. These views are chosen to relate to how patients see themselves in everyday life. No retract-

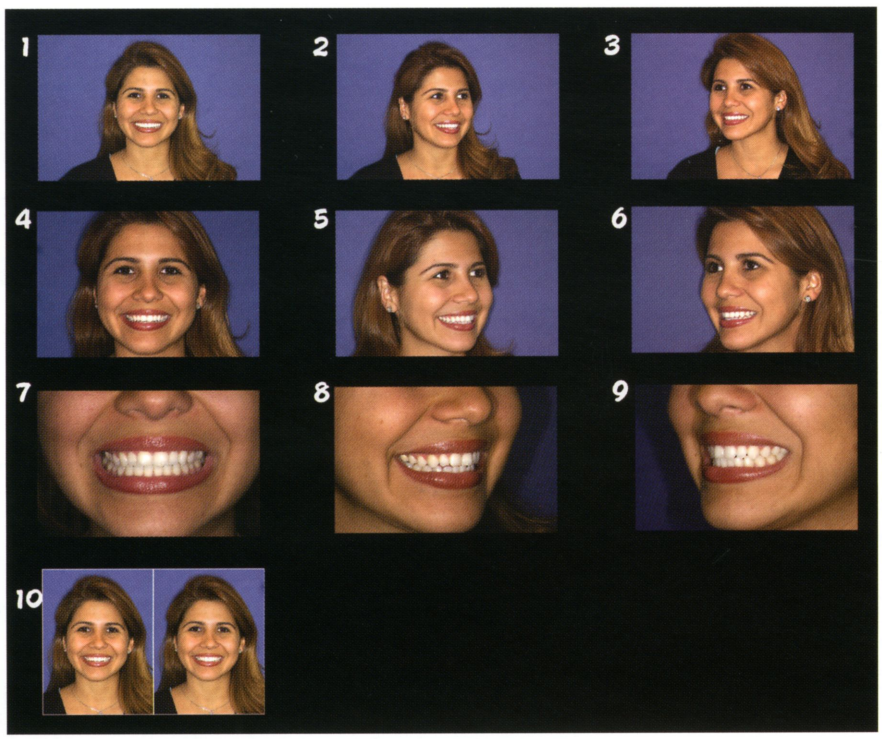


Figure 3: The 10 Doctor-to-Patient Views.

ed or occlusal views are used. The standard views of the DPC concentrate upon how patients see their own face, especially their smile (Figs 2 & 3).

The user skills necessary for film photography are altogether different from the skills a dentist uses for digital photography.

The 10 views of the DPC are both simple and calculated. A simple progression from far to close with front and lateral views, 7 of the 10 views show the patient's whole face and eyes; these views are calculated in that they display the important information regarding cosmetic decisions. These include sloping smiles, canting midlines, and proportional tooth size from the front views (the lateral views are necessary in calculating the number of total teeth that show in the patient's natural smile). Six-unit cases turn into 10–12-unit complete cases when patients are involved in this diagnostic procedure.

As powerful as they are, the 10 standard views of the DPC are simply a starting point. Each patient has, of course, individual facial aspects that require additional photos to communicate their case.

COSMETIC IMAGING

The final view in the slideshow can be a cosmetically imaged photograph. The imaging is independent of any commercially available product, as any brand will work. Advanced users of Adobe PhotoShop can do all the cosmetic imaging without purchasing costly dental imaging software. Cosmetic imaging must show the dentist's clinical skills. We do not recommend pasting other people's smiles on your patients during imaging (commercial smile libraries), as these pasted smiles can easily mislead patients about their own possible result.

You can easily turn 30 pictures into 30 individual slides, ready to present.

Simply show patients your cosmetic dental skills. Care should be exercised in showing exactly what can be delivered with veneers, porcelain crowns, and other clinical tools. Special care must be taken with the buccal corridor, as some imagers can show a result that would require a surgical solution. The same care also should be applied to gingival height corrections that might require surgical solutions. Remember that ethical cosmetic imaging is a powerful tool, possibly the single most important tool in communicating results.

Figure 4: An example of a point-and-shoot camera.

Figure 5: A popular Prosumer grade SLR camera from Olmpus.

THE TOOLS

Digital Camera

Digital cameras are like any other piece of dental equipment; you can buy a camera at the price point that fits your needs. Digital photography has to be divided into two distinct groups.

- **Typical digital photography**—Use any grade of digital camera to instantly put images on your computer screen; it's fast and fun. These images vary in quality because of the many "mysteries" surrounding this new technology. Digital photography creates a certain level of patient trust because patients feel their doctor is keeping up with the times!
- **Film-quality digital photography**—Use a professional-grade digital camera to systematically create a patient database of film-quality images. These images, which are primary in the cosmetic professional's diagnostic process, show consistency between patients and capture dates. The system is completely predictable with exposure, color balance, and image sharpness. Film-quality digital photography creates an astounding level of patient trust.

Figure 6: A second popular Prosumer grade SLR camera from Olmpus.

Let's also divide the digital cameras into three main groups based upon cost and capability:

- consumer "point-and-shoot" (Fig 4)
- prosumer single lens reflex (SLR)
- professional SLR.

An example of a consumer "point-and-shoot" is the Sony Mavica. This camera is simple to operate, fun for beginners, and the digital image is copied onto a floppy disk or mini CD. The camera processes the image to automatically improve the exposure and sharpness. However, this in-the-camera processing is based upon an average digital image, which rarely is ideal for dental images that are captured indoors on human subjects. This camera group therefore is unacceptable for dental professionals.

Cameras in the second group, the Prosumer SLRs, are the overwhelming choice in most dental offices (Figs 5 & 6). This group, which includes Olympus models C-2500-L, E-10, and E-20, also has in-the-camera processing to improve the exposure and image sharpness; their good-to-excellent image quality makes for great digital patient consultations. Cameras in this group, however, lack the capability to capture macro images in the 2:1 and 1:1 range consistently. Although a great choice for dentists, this group will never replace film-based dental cameras.

Figure 7: Nikon D1 family.

Figure 8: Fuji S1 camera.

Figure 9: Canon 1D camera.

The third group of cameras is the professional-grade SLR (Figs 7-9). These cameras capture excellent-to-remarkable images that are potentially film-quality. Examples of this group include the Nikon D1X, Fuji S2 Pro, and Canon 1D, as well as many new entries. Professional-grade SLRs replace dentists' need for film-based models (the notable exception is a dentist going through the AACD Accreditation process, in which slide film is mandatory). The single most important feature in this group is the capability to capture images using *aperture-priority*. Remember that with digital cameras, the game is exposure control. Aperture priority allows the dentist to rotate a simple wheel to change to f-stop on the fly. Close (macro) photography on patients typically will reflect too much light back to the camera, resulting in overexposure, the "kiss of death" for digital images. The aperture wheel allows for instant adjustments as follows:

- The dentist previews the image on the camera's liquid crystal display (LCD) screen, notes the overexposure, spins the f-stop higher (thus closing the diaphragm), and reduces the amount of light entering the lens. The dentist can then capture the perfect final shot.

These cameras produce very fast, perfect exposures every time. Consistent images and reproducible results mean happy dentists and patients! These images are stunning!

The professional-grade cameras also allow images to be captured in TIFF format at 300 dpi (dots per inch), which generally is regarded as film quality. They do not have in-the-camera processing; this is an important distinction from the other two camera groups. The raw (unprocessed) image allows the digital-experienced dentist to fully control the correction process in Adobe PhotoShop, which is the road to film-quality or better-than-film-quality images.

Computer Monitor

Due to their resolution limit, typical monitors can display only 25% of the digital image information that a Nikon D1 captures. As digital dentists develop their user skills, the need for better display hardware becomes a reality—great images require great monitors (Fig 10).

Figure 10: This monitor has a native resolution of 1600 X 1024. This is a relatively high screen resolution. In general, the higher the resolution, the more true-to-life the digital photographs appear.

In general, the best display monitors are those that have:

- LCD flat-panel monitors (as opposed to the TV-shaped CRT monitors)
- digital connections (DVI) to the computer instead of analog connections (VGA)
- native resolution of 1280 X 1024 or better.

USER SKILLS

ADOBE PHOTOSHOP, "THE SECRET TO GREAT IMAGES"

Adobe PhotoShop is image-editing software. The tools in PhotoShop allow us to see the stunning brilliance of our digital photographs that, in their raw state, would be hidden. *Film-quality* digital photography requires the use of Adobe PhotoShop. Digital cameras, even those of professional-grade, need image correction quality to equal the quality we achieve with film. The user skills necessary for film photography are altogether different from the skills a dentist uses for digital photography. Film is very forgiving of the quality of the exposure; it therefore can be slightly over- or underexposed and still produce good results. Digital cameras need a perfect exposure for good results. Even the perfectly exposed images captured by our professional-grade digital cameras are still not as good, when they are straight from the camera, as they can be—we need to correct the images with PhotoShop. This process is referred to as the "digital dark room." The tools in PhotoShop bring alive the quality of our images. Although Adobe PhotoShop is one of the largest and most complex software programs ever written, we luckily need to do only three simple things to improve our dental images:

1. ***correct the exposure*** to give the image a full tonal range
2. ***correct the color*** to improve the flesh tone
3. ***correct the image softness*** to give the image film-quality sharpness.

It's as simple as that!

Digital photos taken indoors with flash support rarely have a full tonal range; that is, they look a little dull. Our human subjects are flesh-toned and their teeth are variations of white—not exactly the most colorful and contrasting subject matter. We can overcome this handicap by understanding how PhotoShop can make the image appear as our eyes believe that this subject matter should look.

With regular use, Adobe PhotoShop is easy-to-use software. Its power in the communication process should not be underestimated. Its power is film-quality.

The images in Figures 11 and 13 are a classic example of exposure control and correction with PhotoShop. The detail of digital images is captured on the darker side of the digital camera's CCD chip. The lighter side of the CCD chip tends to "blow out" the whites. The game in digital photography is exposure control. In this example, the image is deliberately captured slightly dark. Then the image is "stretched" across the visible spectrum to achieve a "full tonal range." This is followed by both color and softness correction. The final image (Fig 13) appears completely lifelike. The skin tone is perfect and the teeth show all the detail we see with our eyes in patients in our office. Adobe PhotoShop uncovers the quality hidden in our raw images.

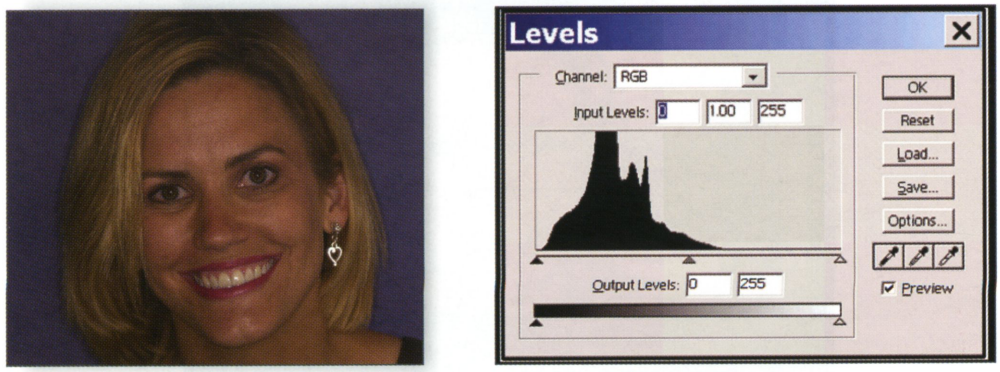


Figure 11 & 12: Raw image and raw histogram.

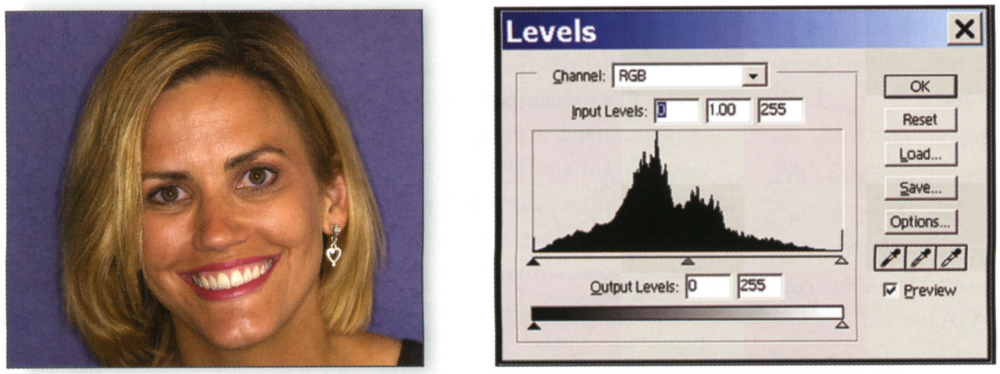


Figure 13 & 14: Corrected image and corrected histogram.

Figure 15: Corrected image brought into Microsoft PowerPoint.

Microsoft PowerPoint, "Let the Pictures Tell Their Story"

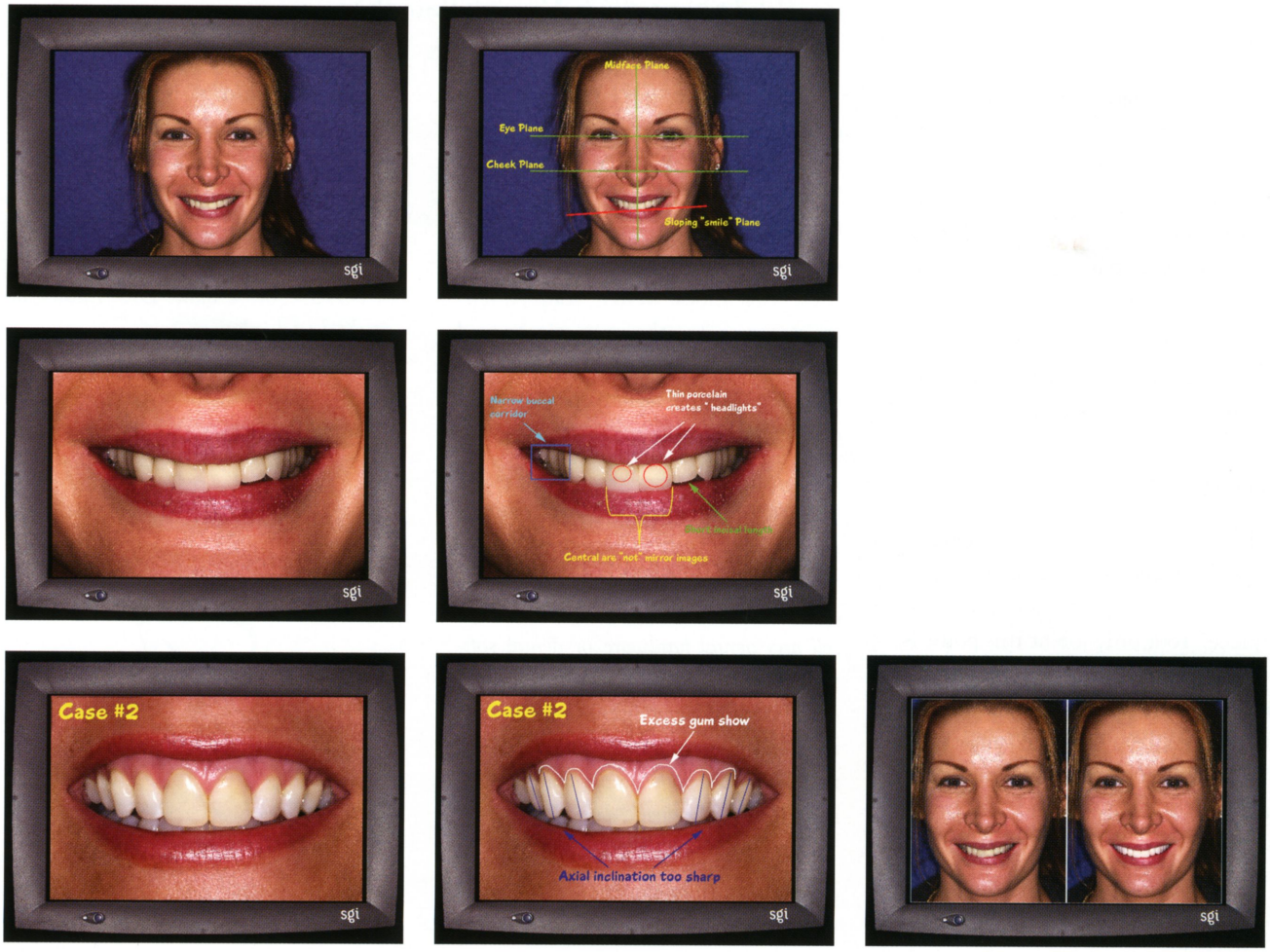
Microsoft PowerPoint is simply slideshow presentation software. After we have captured and corrected our patient picture series, we then import the whole group into Microsoft PowerPoint (Fig 15), which allows us to import a folder full of images with a single fast command. You can easily turn 30 pictures into 30 individual slides, ready to present. A single mouse click will forward you through the presentation, one slide per click.

Our patients know all too well their cosmetic smile problems, but stunning photographs speak for themselves; when your patients intently watch a slideshow completely about them it is a powerful experience! Like Adobe PhotoShop, PowerPoint has the power to create complex, broadcast-quality presentations for professional speakers. Luckily for us, the simple tools we use to create patient slideshows can be mastered in just 2 days.

It's not necessary to point out their cosmetic problems—they will do a more-than-adequate job themselves.

Custom animation: Sometimes we must demonstrate to patients a point on the photograph that is not otherwise apparent. PowerPoint allows us to add lines, arrows, circles, and text to help make points that are missed by viewing the pictures alone (Figs 16-22). Such custom animation brings the slides alive—it is your tool to communicate any point you feel is missed with the photograph alone. Too much custom animation should be avoided, however, or perhaps should not be used at all for straightforward cases.

On the other hand, great custom animation finishes your case presentation. You can highlight key diagnostic points, or even teach classic smile design with this powerful tool. You also may want to add stock "before and after" slides of previous cases. You can make slick presentations, almost music



Figures 16-22: PowerPoint allows you to add lines, circles, text boxes, and other educational objects. You introduce these objects with custom animation. This feature can add an organized flow to the presentation.

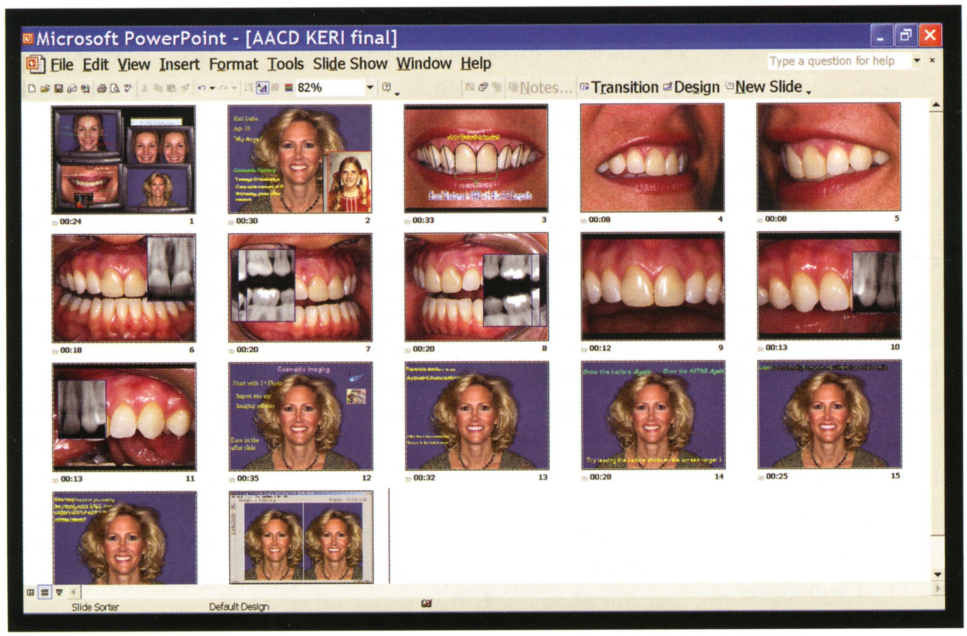


Figure 23: Completed presentation in Microsoft PowerPoint.

videos, if you feel this perspective is right for a particular patient. Personal taste and experience will guide your direction, either way—playing with all the easy options is fun! PowerPoint XP (2002) version has powerful custom animation tools, while PowerPoint 2000 has a more limited array.

Adding custom animation to your patient slideshow is the final step!

SHOWTIME!

The work is complete, the patient has arrived, and now the show begins (Fig 23). Sit back and enjoy your masterpiece! Your only job at this point is to click the presentation forward, one slide at a time. Slowly. Watch your patient display powerful emotions, even blush or become uncomfortable with their current image. It's not necessary to point out their cosmetic problems—they will do a more-than-adequate job themselves. No more words are needed.

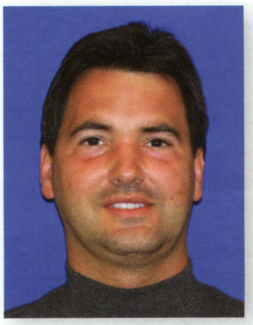
The final slide can be a *cosmetically imaged* slide of the potential aftercase. After showing the imaged smile, go back one slide to the "before" view, without cosmetic imaging. You can slowly flip back and forth between these two slides. When your patient insists on seeing the cosmetic imaged view only, your communication is complete. Congratulations—job well done!

Dallas Dental Solutions is a company that assists dentists in attaining the user skills necessary for the "digital dental office." Dallas Dental Solutions does not sell any dental hardware or dental software. We have no relationship, nor do we accept any financial incentives from dental companies. Our only product is the user skills, for both dentist and staff, as they relate to the digital dental office.

Dr. Lutke offers hands-on courses for dentists about film-quality digital photography as used in the digital patient consultation.

"Digital dentistry" is personal, emotional, and spiritual. Our clients consistently remark how these non-clinical skills have recharged their minds and energized their practices. To achieve the user skills for your digital transformation, call 972-801-9733 or e-mail Dr. Lutke at gregl@dental-solutions.com.

Digital Portrait Photography



by
Tony Soileau, D.D.S.

Dr. Tony Soileau is a general dentist with a practice in Lafayette, Louisiana, which focuses on restorative rehabilitation and cosmetic enhancements. He lectures nationally and internationally on the use of digital photography and computer assistance for diagnosing, treatment planning, and performing comprehensive dental procedures. Dr. Soileau is a faculty member of, and teaches hands-on digital photography at the Institute of Oral Art and Design (IOAD) in Tampa, Florida, and the Pacific Aesthetic Continuum (PAC~Live) in San Francisco. He also is a member of the advisory board for genR8Tnext seminars and is a consultant for several technologies-based dental manufacturers.

PORTRAIT PHOTOGRAPHY AND MARKETING

It takes a combination of several elements—a talented, knowledgeable dentist; friendly, caring staff; and comfortable, inviting office—to create a successful dental practice. Photography can help to bring these components together and communicate them to your patients. Portrait photography, along with "before-and-after" shots, can be a simple yet powerful tool to showcase your office. A beautiful portrait says many things to your patients: It shows how confident other patients are in your talents, it conveys the personality of your office, and it allows others to evaluate your skills and to open a conversation about them.

DIGITAL CAMERAS

Recent advances in digital cameras have simplified their use, but with professional results. Dentists with little or no background in photography no longer need professional photographers to supply them with beautiful portraits of their patients; this now can all be done by the dentist and staff. Several major advances in digital cameras have enabled cosmetic dentists to easily use this technology.

SIMPLICITY

Digital cameras are simple to use. Because digital cameras have, by definition, a computer inside them, many of the functions are automated—the focus, aperture, speed, and lighting settings are done for you. These cameras are, for the most part, "point and shoot." You then can instantly view and evaluate the images on the camera or a computer monitor. Waiting for film to be developed to find out if the images are of sufficient quality is a chore of the past.

RESOLUTION

The second advancement is resolution or image size. This means that the images are of sufficient size and clarity to print out to 8" x 10" or even larger without losing quality. Several cameras are available today with these

Figure 1

characteristics. The Nikon 880, 950, and 990, and the Olympus 2500 are good cameras for dentists at the lower resolution and cost end; the Canon D30 and Nikon D1X are incredible cameras at the high end. My personal choices are the Nikon 950 and the Canon D30. For portrait photography, I believe that the Canon D30 is the best on the market in terms of simplicity, image size, and image quality. Other competing cameras are entering the market every month. The best camera for each dentist is, of course, a subjective choice. My advice is to look at several different models before you invest in one. Also decide who will be taking the images, you or your staff, before choosing the appropriate camera. Although I prefer the Canon D30, my staff prefers the Nikon 950 (they are not comfortable with the size and weight of the D30, while the Nikon 950 fits in the palm of your hand). The images from the Nikon 950 are not suitable for printing larger than 8" x 10," however.

VERSATILITY

An often-overlooked advantage of digital cameras over traditional 35 mm cameras is the versatility of what can be done with the image after it is captured and stored on your computer. The image can easily be manipulated in limitless ways to enhance its effect, from adjusting the quality to dramatically changing the overall appearance. This could range from lightening and cropping the image to converting it to black-and-white... the only limit is your imagination. Remember that digital cameras don't use film—they use a reusable disk, so you can take as many images as your computer has memory for, save the ones you like, and delete the rest.

EFFECTS TO CONSIDER

There are several aspects of portrait photography that need to be considered in order to capture professional-quality images. These effects will depend upon each dentist's preferences and how he or she wishes to display the image to the public.

Dentists with little or no background in photography no longer need professional photographers to supply them with beautiful portraits of their patients.

POSE

The first thing to consider is how you want your subject to be posed. I use a variety of poses, from looking straight back at me, to looking up or down, to not looking at me at all. As you take more and more portraits, trying to come up with different "looks" can be frustrating. To help expand the range of my portraits, I look through magazines, including *Glamour*, *Vogue*, *GQ*, and *Men's Health*, and then cut out the images of models with great smiles in poses I like and place them on a Post-it® sticky board. This allows

Figure 2

Figure 3

Figure 4

me to show the patient what I am looking for (it also is a nice touch to compare the patient to a professional model) (Fig 1). Some people may choose not even to use formal poses. Some of the best images I have seen are candid shots taken when, for example, a patient sees his or her new smile for the first time; or when a patient is laughing. Just remember to have your camera ready with charged batteries and free memory on the card.

Lighting

Lighting is the next effect to consider. This of course will depend upon how you pose your patient. While it is true that the image can be edited to account for any type of lighting, having sufficient and properly placed lighting from the initial capture stages will make life easier. For optimum results, you will need lighting from several directions, each illuminating different parts of your subject. Some of the lighting will highlight certain areas such as the smile or hair, whereas others will be used to eliminate shadows, such as those around the borders of the head and under the chin. The set-up I prefer is two umbrella lights placed on the right and left side of the patient and a small hair light from above. Each of these lights is synchronized with the camera to go off when I take the image. The two umbrella lights create a diffuse lighting so that there are no shiny spots reflecting off the patient's face. The small hair light is placed directly above the patient to highlight certain parts of his or her hair. To illuminate under the chin, a deflector screen can be placed below the patient with the light directed to this area. You can be as creative as you like with lighting. Every photographer has their own unique style and effect; yours can be as simple as just using the flash off the camera, or as complex as using multiple types of lighting with filters and deflectors.

Background

You will also need to consider the background for your image. Deciding where and how you want to display the portrait will help you decide on the background. Blues usually look best for color portraits, and I prefer silver for black-and-white. But there are no rules—you can be as creative as you like. Remember that the background's focus level also can be adjusted. Because digital images are saved onto a disk that can be reused, I take as many different backgrounds as I can imagine, ranging from blue, black, silver, and tan to setting-type backgrounds from within and around my office. You can purchase professional-grade backgrounds if you wish, but these can be expensive and hard to manage because of their size. I prefer to use expandable car windshield visors for my backgrounds. They are very inexpensive, come in multiple colors, can be folded up, and can be placed behind the patient if I want to take the image while the patient is still in the operatory chair.

The image can easily be manipulated in limitless ways to enhance its effect.

POST-PRODUCTION

Editing

Once the image is captured, the editing begins. This can be done by the camera, computer, or by the printer. You can really have fun at this step. There are several easy editing programs to choose from, including

Thumbs Plus, Image FX, Dicom, and Digident; each of these has a very small learning curve, but can create some dramatic results and simplify the printing process. Start by editing the quality of the image, and then edit the overall look. The contrast, brightness, saturation, cropping, and focus can be adjusted with a few mouse clicks, and then the image's rotation and horizontal and vertical aspects can be adjusted. After these steps are accomplished, the overall effect can be edited. Once again, you are limited only by your imagination.

A simple effect is to change the image to black-and-white (this can be done using the gray scale function). You may want to adjust the brightness again after this step. You also may want to go back and replace parts of the black-and-white images with color—this technique is quite trendy now and is used in many ads. Placing "before and after" shots within the image also can be a powerful way to showcase your work to your patients. All of these editing functions can be accomplished in minutes, even by those with very little computer skill. Adding text to the image is another way to enhance its message. I like to put my logo and "Dentistry and Photography by Dr. Tony Soileau" on every image—this lets patients know that this is truly my work of art, both the dentistry and the photography (Figs 2–4).

Printing

Printing your images is easy, but there are some things of which you need to be aware. The resolution of an image that looks great on your monitor is probably not enough to achieve the same quality when it is printed. For an image to look great on a monitor, it needs to have a resolution of only 72ppi. For the image to have the same quality when printed, however, the resolution needs to be 300ppi. This is why actual images have to be very large to still look good when printed at a large size. I print up to 17" x 36" when I am using the Canon D30.

Printers come in as many different types and models as cameras. Most inexpensive ink-jet printers today do a good job of printing up to 8.5" x 11.5" (assuming that the image is 300ppi at this size). Few models can print to larger sizes. My favorite is the Epson 1280 ink-jet printer. When it comes to the quality of a printed image, printer paper makes as much difference as the printer. The chroma of the paper's whiteness, as well as how the ink sits on the paper, can greatly affect the final print quality. My favorite paper is Olmec 260grm Satin Finish from digitalartsupplies.com or Kodak Medical printer paper.

When it comes to the quality of a printed image, printer paper makes as much difference as the printer.

Displaying

After you print the images you need to display them. A very professional-looking method is to mat the images and frame them. A simpler and cheaper way is to mount them to 1/4-in. poster board with rubber-based glue; I then cut them out with a scalpel and a straight-edge and mount them on all the walls. I prefer this method because the frame and matting don't compete with the photography for the patient's attention. Let your imagination be your guide.

SELECTING CASES

Deciding which cases to photograph and display is easy—choose all of them. Patients are not nearly as critical of our work as we are. You should not eliminate a case just because it didn't come out exactly as you planned. If you feel good about your dentistry, so will your patients. Also, patients like looking at others who are similar to them. So displaying portraits of both females and males, young and old, will encourage a wider range of patients to consider having their smiles redone.

The last thing to remember is the most important: Have as much fun as you can in your practice and it will show through in your photography!

❖

REMINDER!

Please take note of the following deadlines for future issues of *The Journal of Cosmetic Dentistry*. Manuscripts must be submitted by these dates:

Fall 2002 Issue

due July 1, 2002

Winter 2003 Issue

due September 15, 2002

Tooth Color in Japan: *A Cultural Study*

by
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INTRODUCTION

Several studies in Japan have recognized that tooth color reflects cultural belief and practices. Mitumasa Hara studied the custom of black teeth with regard to adornment of the body in his work, *A Study of 'Ohaguro.'*[1] However, very few attempts have been made to support the idea that tooth color is part of culture.

In the twentieth century, the idea of culture changed to the concept called signification; with this, the meaning of culture shifted from "What is culture?" to "How does culture work?"

Graeme Turner states that, "culture, as a site where meaning is generated and experienced, becomes a determining, productive field through which social realities are constructed, experienced and interpreted."[2, p.14] Historically, in Japan, there was a custom, called *ohaguro*, of dyeing white teeth black. The custom of *ohaguro* disappeared with the influx of foreign culture during the Meiji Era (1864-1912). Today, it is fashionable not only to restore discolored teeth to their natural color, but also to make them even whiter.

Color in fashion changes with time. It sometimes has been influenced by the culture of other countries. In order to have a deeper understanding of the cultural specifics of "representation" (the practice of making meaning by using signs and language, and their meanings with regard to the color of teeth), it is necessary to look back on the changes of conceptions of color. This article discusses tooth color as a cultural form in relation to the following topics: Culture, identity, and globalization. I will explore applications of these topics to the specific cultural practices of *ohaguro* (tooth-blackening) and tooth-whitening.

WHAT IS CULTURE?

The concept of culture has changed over time. According to Raymond Williams, the word's original meaning was "the idea of the tending or cultivation of crops and animals."[3, p.87] During the Enlightenment Period, the words *culture* and *civilization* were used to describe the process of human development. *Civilization* was added because the upper-class societies thought that they were more civilized than the lower class.

During the nineteenth century the concept of culture changed further. Under the influence of the Romantic movement, it changed from the idea of "civilization," to ways of life of particular groups, peoples, nations, or periods. In the late nineteenth century, "culture" referred mainly to refinement associated with the arts, philosophy, and learning. The word is still used in this sense today when "culture" is used to refer to the "higher" arts; this is different from the "popular" or "mass" culture.[4]

"Things" do not have meaning until they are placed into societal context.

In the twentieth century, the idea of culture changed to the concept called *signification*; with this, the meaning of culture shifted from "What is culture?" to "How does culture work?"

According to Williams, "culture is a description of a particular way of life which expresses certain meanings and values not only in art and learning but also in institutions and ordinary behavior."[5, p.19] The study of culture, if we follow this definition, is to describe a lifestyle that is not exclusive, but ordinary. Its objects of analysis are orders in people's ways of life in which they produce meanings by symbolic operations. Williams' definition emphasizes that, "Culture is closely connected with the role of 'meaning' in society."[4, p.11] That is to say, social practice is organized through meaning.

"Things" do not have meaning until they are placed into societal context. Today, the concept of "culture" has expanded to include everything from society to politics to the economy. It has changed from a singular meaning to a plural one.

TOOTH COLOR AS A CULTURAL FORM

Human beings have the ability to think of things that are not present at the moment. This is made possible by constructing a representation of that thing in the mind.

The cultural context of whitening is put into the minds of people unconsciously through advertisements. All models' teeth are white. What do their white teeth represent? The objects of analysis in cultural studies are regularities in people's ways of life in which they produce meanings by symbolic operations. Social practices are organized through meanings. Meanings are not just 'sent' by producers and 'received' by consumers; rather, meanings are actively made by consumers, through the use to which they put these products in their everyday lives. Things do not have meaning until they are represented by social practices.

I will now elaborate on the concepts of *signification* a little further in relation to advertisements. Advertising practices show the processes of signification clearly. It follows from what has been said thus far that advertising could also be said to work by fitting a "signifier" to a "signified," "both cooperating with and intervening in the semiotic process. Advertisers typically deploy a signifier, already conventionally related to a mental concept they wish to attach to their product as a means of providing their product with that meaning."[2, p.20]

Tooth-whitening advertisements aim to translate the meaning through using a "code" system. Most people today would prefer to have dazzling white teeth like those of young models and actors seen on magazine covers, on television, and in the movies. Consumers see these glamorous people and think, "I want to be like them." Consumers unconsciously try to identify with young models in advertisements by whitening their teeth. Because young models who appear in advertisements already signify images such as purity, health, beauty, and youth, they can, in the code system, be used to advertise whitening. Thus, if they did not have such an image, the relation between their faces and whitening would be meaningless. In the code system it is the images of their perfectly beautiful faces, not their actual faces, that is important.

THE ESTHETIC SENSE OF TOOTH COLOR: HISTORICAL BACKGROUND

Color has become a symbolic expression in a society. Even the way we "see" the world is "determined by the cultural conventions through which we conceptualize the image we receive."[2, p.13] Colors have been conceptualized during the history of human development and have been used symbolically in society. A *symbol* is a concrete material thing that stands for an abstract entity. For example, a dove is often used as a symbol of peace. This link is constructed through the process of *symbolization*, which connects an abstract entity with a material thing that is in some way thought to be related to the symbolized. Note that the relation between the two is not necessarily in terms of meaning; an associative relation is enough.

The symbolism of colors also holds true for the color of teeth. Historically, in Japan, the esthetic preference for tooth color has changed from black to its opposite, white. The color of teeth reflects the social perceptions of beauty, social status, and age. Connotations of a color depend up on esthetic senses, nature, and the social situation. The esthetic sense of color in Japan has been influenced by Buddhism;

thoughts from ancient times; and the Yin, Yang, and five elements combination theory.[6, p.220] According to Nagasaki, the esthetic sense of color started from one person's simple impressions when they saw natural phenomena, and human beings represented their impressions about such natural phenomena using color.[6, p.34]

Figure 1: Hina-ningyo: Doll for the Girls' Festival.

Ohaguro as Culture

The Japanese word *kuro* is connected with night; it expresses darkness after the sun sets. In ancient times, night was considered to be the time when evil spirits were rampant. Black was a bad omen and hated as a color. In the Buddhist faith, however, black is considered the "unchanging" color, which cannot be dyed with another. Its visual weightiness was believed to represent "robustness" and "dignity," which is why the high-ranking Samurais were fond of using it.

The representation of things is different from culture to culture, even from period to period within a particular culture. The impression that the color of teeth gives changes in each era depending upon its customs. It may be helpful to consider the fashion of *ohaguro* in terms of some other important factors of culture.

Tooth-whitening is a cultural act because it has been constituted by society through a range of meanings and practices.

According to Hara, black teeth were an esthetic symbol from ancient times.[1, p.190] In the Heian Era (794-1192), *ohaguro* became popular among males, especially court nobles and commanders.[1, p.131] Among samurais, the custom of *ohaguro* was a proof of loyalty, indicating that a samurai does not serve two masters within a lifetime. The custom is said to have ended among men around the time of the Muromati Era (1558-1572).[6, p.234]

It was thought that black teeth made a woman look beautiful,[1, p.190] and so the practice came to be followed by young women, who first blackened their teeth as a way of enhancing their appearance when they were ready to find a husband. As a result, the custom of *ohaguro* spread throughout the country, especially during the Edo Era (1603-1867). From this time, *ohaguro* became the symbol of married women.

Darkness and Black

In Junichiro Tanizaki's *Ineiraisan*, one of whose themes is the traditional Japanese esthetic sense, the reason why a married woman practices *ohaguro* is to emphasize the *oshiroi* (white powder) that she wears. During the Edo Era, women of the middle class lived in dark houses; only candles lit the rooms. The room was dark, a woman's kimono was also dark, as were her teeth. And women applied *oshiroi* to their faces in order not to show their expression.[7, pp.46-48] It was thought that *ohaguro* effectively created an expressionless face. The black of *ohaguro* was in sharp contrast with the *oshiroi*, and had the effect of emphasizing it. We see in Figure 1 that the doll shows a women's face after makeup has been applied. By shaving her eyebrows and dyeing the teeth black, changes of feeling do not appear in her expression—expression is extinguished. Therefore, one may say that *ohaguro* is the culture that hides expression.

Ohaguro came to distinctively represent age, occupation, and marital status. This meant that a woman became obedient as a subordinate to her husband, because black cannot be dyed with other colors. It is clear from this that black has a deep connection with the idea of fidelity.[1, pp.97-98]

'Whitening' as Culture

The Latin word *candidus*, meaning white, comes from the Sanskrit *candro*, which means *light*; the English *white* also is related to light.

The Japanese word *shiro* comes from the state in which the form of a thing is clearly seen when the day breaks; it is related to sunrise. White is the color that represents purity and innocence. Therefore, it is thought to be a sacred color. In the era of Empress Suiko (554-628), a white flag was used on the battlefield as a sign of surrender. This is a representation of "the clean heart."

In Japanese, there is an expression, *Meibo Koshi*, which emphasizes white teeth. It translates in English to "Bright eyes and pearly teeth." *Meibo Koshi* comes from the poetry of Tu Fu, a famous poet during the Tang Era in China. This expression is used to describe Yang-Kuei-fei, one of the most famous beauties of China.

According to John Tomlinson, "culture can be understood as the order of life in which human beings construct meaning through practices of symbolic representation."[8, p.41] Tooth-whitening is a cultural act because it has been constituted by society through a range of meanings and practices. It is "culture" because we have constituted it as a meaningful object and it connects with social practices that are specific to our culture or way of life. It is also cultural because it is associated with certain kinds of people, such as young women.

At first, dentists (producers) advertised tooth-whitening as treatment to lighten discolored enamel and dentin. However, consumers gave whitening a different meaning. They want to make their teeth white to give the impressions of purity, health, beauty, and youth. Tooth-whitening is the easiest way to obtain a beautiful smile. At the moment, white teeth is the fashion for people who want to look beautiful, so many practices have been created and commercialized. Whitening as culture has turned into something that is bought and sold. Therefore, one may say that whitening is a part of culture that shows one's expression clearly.

IDENTITY

The Advertisement of Whitening Using the Code System

According to Judy Giles and Tim Middleton, "Identities and differences can shift over time and in changing circumstances and places."[5, p.54] Our identity often changes as our surroundings change. Identity is the self-definition, "Who am I?," and is self-proof of a person's existence. The identity of a person is essentially "what is inside," but is determined by many outside influences. These influences include language, meaning, and relationships with others.

One of the most important functions of advertising is to establish an identity between the consumer and the product. An advertisement reflects our lives and also helps us to live our lives. Social practices are organized through meaning. Meanings are not just sent by producers and received by consumers; rather, meanings are actively made in consumption through the use to which people put these products in their everyday lives. We are unconsciously influenced by advertisements in the media.

"We signify ourselves through the signs available to us within our culture; we select and combine them in relation to the codes and conventions established within our culture, in order to delimit and determine the range of possible meanings they are likely to generate when read by others."[2, p.17]

One of the most important functions of advertising is to establish an identity between the consumer and the product.

Here, the idea of a *sign* may be useful. A sign can be a word, a color, a tooth, a face, a gesture. The sign has been divided into its constituent parts, the *signifier* and the *signified*. According to Williamson, "the Signifier is the material object, and the Signified is its meaning."[9,p.17] Turner also states that the signifier is "the physical form of the sign: the written word, the lines on the page that form the drawing, the photograph, the sound." The signified is "the mental concept referred to by the signifier."[2, p.17]

"Language is the use of a set of signs or a signifying system to represent things and exchange meaning about them."[4, p.13] We live in a linguistic society in that our social relationships are often determined on the basis of language. This whitening advertisement is using the sign system. This appropriates a relationship that exists between the signifier (white teeth) and the signified (health, beauty, and youth).

Esthetic dentists, in trying to sell the product (whitening), try to build an identity between the consumer and tooth-whitening through advertisements. Through advertising, whitening is represented as a device for purity, health, beauty, and youth. Thus whitening becomes a metaphor, a signifier, of "youth."

Fashion and Identitty

White teeth may be thought of as a fashion in present-day Japanese society in that some choose to be a member of a group of people who are viewed as healthy or youthful.

According to Giles and Middleton "Social and material effects follow from the symbolic marking of one group as different from another."[5, p.54] The authors also state that identity is organized through classification systems that divide social relations into opposing groups, in that if you belong to one you cannot, by definition, belong to the others. Each person belongs to a specific culture, and that culture plays an important role in the formation of a person's identity. A common identity is forged among those who have a similar culture, therefore a common identity forms a group, though there may be contradictions within identities, both at the collective and the individual level.

Since the Meiji Era, fashions in Japan have derived from the desire to be like Westerners. Consider the latest fashion in Japan, of dyed hair. Japanese people have black hair. A study of 500 women aged 20 through 59, conducted by Tokyo Survey Research, Inc. in 2000, showed that 74.2% of them have dyed their hair. The fashion in which young people dye their hair yellow or brown evolved because of a yearning

to emulate Europeans' lighter hair. Those who dye their hair yellow or brown do so because they want to show that they belong to the group marked by that style. The same can safely be said of white teeth, which did not become popular until the Westernization of Japan began.

Culture plays a central role in shaping an individual's identity. In other words, culture is the basis on which its members' identity is built. Those who share an identity form a group, and its members draw a distinction between themselves and those who do not share their identity label. Thus, at the core of group identity is the notion of difference from others. In the case of fashion, an identity is based on identification with the leader of a group, which brings about the sense of belonging to, and therefore sharing the same fashion with the other members of that group. This sense makes them feel distinct from those who don't belong to the group and who therefore, in their eyes, are not sophisticated in terms of fashion.

"Identity is clearly defined by 'difference' that is by what it is not."[10, p.2] Identities are frequently constructed in terms of oppositions. That is, identity depends more on what it *is not* than what it *is*. We can no more have a will or desire without relating to others than we can define our identity without contacts with others. People have the desire to be different from others: That is, they want to be unique.

At the same time, however, people also want to look similar to others. For example, in the case of fashion, there is a tendency to imitate the appearance of men or women who appear in the mass media. If the fashion leader's way of dress, makeup, and manners changes, the public tries to imitate it, so that they are not different. In the Meiji Era, the general public saw the aristocracy's trend, and gradually came to stop wearing *ohaguro*. This change is discussed further below.

GLOBALIZATION AND REGULATION

Globalization and Identity Crisis

According to Anthony Giddens, "Globalization is the process in which human activities are integrated and being shared to the extent that the planet is becoming 'one world.'"[11, p.77] Globalization standardizes and homogenizes the local products and cultural forms. In the process of globalization, the indigenous cultures of particular localities become homogenized. Global economic integration breaks down borders between cultures and thus puts cultures in constant change. Globalization permeates and changes local economies, cultures, and orders, which are restored by local people to something different from what they used to be. Herein lies the crisis of vanishing local identities.

Actually, Japan during the Meiji Era went on to adopt not only science and technology but also literature, fine arts, and ways of life as well, thus losing some of its identities. The custom of *ohaguro*, which was one of the identities of Japanese society then, dropped out of fashion as a result of the adoption of Western ways of life.

European culture came to Japan in the last stages of the Edo Era. In the Meiji Era, Japan went through a profound change in terms of education, thought, and culture, for example the abolition of the topknot, the importation of Western clothes, and educational system reform. In these circumstances, the influx of Western culture accelerated.

Cultural imperialism is understood as Western dominance, which is 'Westernization' of world culture. Western culture has a profound influence over other cultures through such evident cultural instances as teeth whitening. Uniform Westernization is progressing under the name of globalization. The Europeans considered that Japanese culture was inferior to theirs at the end of the nineteenth century. The West's dominant culture oppressed Eastern culture; this oppression produced an inferiority complex among Eastern people. Cultural imperialism is understood as the relationship between "the West and the Rest."[12] When the Japanese came into contact with Western culture, they were overwhelmed and fascinated by it, losing confidence in their own cultures. With the foundation of their identity shattered, they faced an identity crisis, which led to the worship of Western culture, which has continued up until now.

Ohaguro continued until the late 1800s. The idea that *ohaguro* was not so civilized spread, and the custom disappeared. That is, the idea that *ohaguro* was outdated circulated among young women, and it then became stylish to have white teeth. Here, one of the identities was lost.

Each person belongs to a specific culture, and that culture plays an important role in the formation of a person's identity.

There is a tendency for all countries to have the same ideas about fashion and beauty. Besides having a chewing function, teeth have a very important role in giving the impression of beauty and youth to others. Now the whitening culture has been introduced to Japan, with the same values as in

America, white teeth are beautiful. This is an example of the Japanese ways of life being Westernized.

Regulation and Power

I earlier mentioned that the public tries to imitate fashion leaders. If a person does not follow a fashion when it becomes dominant in a society, the common reaction is to try to exclude him or her. Regulatory forces work against those who are left behind the fashion.

In the process of globalization, the indigenous cultures of particular localities become homogenized.

This is the kind of regulation or power described by Michel Foucault, who explains the concept of power as follows: "Power is everywhere; not because it embraces everywhere, but because it comes from everywhere." He also states that power is not an institution but comes from below."[13, p.476] He explains that individuals exert power on each other in their everyday lives. That is, power exists as a relationship between individuals. What he means by the term 'power' is that someone tries to control others' courses of action and at the same time he refuses or chooses to be controlled by them.

Douglas argued that human societies require classification systems that symbolically mark the differences among categories in order to construct boundaries between what is acceptable and what is unacceptable.[4] For example, it is 'out of place' for young people today in Japan, where brown hair is in fashion, to have black hair. The same thing may be said of whitening. Those who do not have white teeth are excluded as 'out of place', as Douglas says.[14] Hall states that identities emerge within the play of specific modalities of power, and thus are the product of the marking of difference and exclusion.[15] People feel that they have to keep up with the fashion of white teeth so that they will be the same as their friends.

Ohaguro, was banned among aristocrats in the Meiji Era. There were some who did not follow the regulation; they wanted to have their own identity. The tradition of *ohaguro*, which had continued for so long, could not be easily abolished. It was not until the Empress Shouken appeared in public without *ohaguro* and women followed suit that the custom died out. She succeeded in spreading the idea that *ohaguro* was not so civilized, and the custom disappeared.

CONCLUSION

This article has discussed tooth color as a cultural form in relation to the following four topics: culture, identity, globalization, and regulation. The color of the era is a mirror which reflects its culture. The color of teeth is 'cultural' because we have constituted it as a meaningful object, and it connects with social practices which are specific to our culture or way of life. From what has been discussed above, we can conclude that tooth color is a cultural form.

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Building the Esthetic Team

by
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Dr. Levin is one of the most widely recognized and sought-after speakers in dentistry, lecturing more than 100 days every year to general dentists and specialists on practice profitability and business systems. In 1985, he founded the Levin Group—the nation's leading dental practice management consulting firm. The Levin Group is dedicated to helping dental practices become highly productive, profitable, and efficient businesses, allowing dentists and staff members to achieve financial success while enjoying the practice of dentistry.

INTRODUCTION

As a member of the American Academy of Cosmetic Dentistry, it's only natural that you would want to know all the secrets of building an esthetic practice. Over the years, I have been able to offer information about many of these secret "pearls"—systems and strategies that have helped many dentists move closer to reaching their cosmetic practice goals. Some of these pearls include systemization of case presentation, asking for commitment, having four financial options, and having consistent internal marketing programs.

... unless the team becomes intimately involved in the quest to build an esthetic practice, your long-term results will be significantly decreased.

What has not been discussed sufficiently, however, is building the cosmetic practice's culture and the esthetic team.

EVALUATE YOUR TEAM

This is not an article about theory. My goal is to present practical steps to increase your team's awareness of building an esthetic practice and then turn that team into your most valuable resource and support system.

Let's begin with hiring and training. Most dental practices hire team members based upon a quick desire to fill a spot. In most cases, a team member has to be on the "wrong side of terrible" before we dismiss them from a practice. Why? Because the aggravation of finding and training someone new far outweighs the inconvenience of keeping a less-than-ideal team member.

On the other hand, what is "ideal"? Answer these questions:

- Have we fully trained our team in every necessary skill set in our practice?
- Have we explained the practice goals and objectives to our team?
- Does the team embody the philosophy and feeling of building an esthetic practice?
- Does the team want to participate in the building of an esthetic practice?
- Have you as the leader created a culture for an esthetic practice?

Most practices cannot answer "yes" to most of the above questions. That's because even though the desire to build an esthetic practice may come from the dentist, he or she unfortunately has very little time to train, communicate, and grow the dental team with the same desire. Unfortunately, unless the team becomes intimately involved in the quest to build an esthetic practice, your long-term results will be significantly decreased.

WHERE TO BEGIN

The desire to build a cosmetic practice is a fantastic quest. It is invigorating, exciting, and keeps dentists extremely motivated. It's what keeps you from becoming the 52-year-old dentist who is bored and tired of doing the same things day in and day out, but has not put away enough money to retire. You don't want to be the dentist who spends the bulk of your career simply trying to accumulate enough money to be able to do something else.

So if you are truly excited about cosmetic dentistry, how do you begin building and growing your team?

CREATE AND LIVE A VISION

Every dentist should have a vision. In fact, every business owner should have a vision for their business. A vision is a written statement that reflects where you want your practice or business to be in 3 years, 5 years, 7 years or longer. Once you have written this vision statement, it is essential to share it with every team member. Talk about it as much as you can. Read it at the beginning of every morning meeting. Discuss it at staff meetings. Set goals to achieve the vision that include the team members' participation. Make sure your team understands that the practice is being oriented toward cosmetics, what that means, and why you are so dedicated to helping people with their cosmetic enhancement.

EDUCATE THE TEAM ABOUT COSMETICS

Make sure everyone on the team has cosmetic knowledge. Train your front-desk people in clinical procedures and your clinical staff in cosmetic communication. Ensure that everyone has a full understanding of every available cosmetic service, when those services should be used, and how the patient will benefit. Bring your front-desk people into the clinical area to see intraoral camera or diagnostic imaging work-ups. Bring them back to see the final case. Let them begin to appreciate the wonderful change in a patient that they don't normally take the time to notice at the front desk. Let them believe in your results.

TRAIN YOUR FINANCIAL COORDINATOR

Financial coordinators typically are front-desk people who are given a set of policies to follow in presenting fees to patients. The truth is that 95% of all practices have never spent time or money training financial coordinators to present these fees. Simply knowing what the office policies are is not sufficient—there should be a written script for every financial option in the practice and how those options are to be presented.

One of the biggest problems in building a cosmetic practice is trying to include high-end dentistry in an office that has medium-end systems.

Financial coordinators should be measured by the number of presentations they make and the level of case acceptance. They should further be measured by the size of the cases that are presented and their success rate. Many financial coordinators are highly successful at working out the financial options for a single unit crown, but have a terrible close rate when it comes to $4,000, $6,000, or $10,000 cases.

Why is this so important? Because doctors do not close cases. We present the overall case and patients are generally excited. However, a dental case is not closed until a financial option has been accepted. The dentist should not be presenting the financial options. A highly skilled person able to negotiate with the patient in a win-win situation should be the one presenting them.

Many practices, however, have the case acceptance fall apart at the financial coordinator level. What's needed is someone who can give the patient the proper time, attention, and enthusiasm. The financial presentation should take place in a quiet setting with no interruptions, with the patient feeling wonderful about their decision to accept treatment.

EXPOSE YOUR TEAM TO OUTSIDERS

No matter how good we are as doctors or leaders, the truth is that being in the practice with our team every day diminishes our ability to motivate and have an impact on them. This is not to say we cannot do a great deal to keep our teams excited and growing, but an outsider is often a tremendous help in motivating teams. You need to expose your team to outside experts through audiocassettes, videos, live seminars, or other means on a regular basis. Invest in materials about esthetics and use parts of them at different staff meetings. In my experience, most team members do not get as excited about reading cosmetic dentistry articles as they do about the opportunity to interact with a live presentation. Take your team to hear speakers not only on cosmetic dentistry, but also on team-building, motivation, and management.

DOCUMENT YOUR SYSTEMS

I cannot say this often enough: system documentation is the most fundamental aspect that you must apply to customer service. Before we discuss customer service, it is essential to realize that without written, step-by-step defined systems for current and new staff members to study, you will never provide great customer service.

The fact is that systems prevent practice breakdown, patient dissatisfaction, or unhappiness. Believe it or not, a patient who accepts a $5,000 or $10,000 case may become disenchanted and cancel if they could not get the right appointment time or were not spoken to in the right way. Once again, it is not the doctors who are the points of contact for scheduling or patient communication—it is the team.

DEVELOP AN "OUTRAGEOUS" CUSTOMER SERVICE CULTURE

When you are building a cosmetic practice, you want patients to be WOWED! This is not as easy to achieve as it might sound. I can't go into all the details of customer service here, but I can tell you that it is absolutely necessary to create a culture where dentists want to do as much as they can for the patient.

The reality is that people do not buy porcelain or composite; they buy and value the experience.

Patients are the recipients, not only of cosmetic care, but also of the entire experience and feeling that goes with it. In fact, a great deal of new literature on customer service focuses on the patient or customer experience rather than on the technical product. A great set of veneers doesn't make up for poor scheduling, miscommunication, or disappointed patients who don't believe that you are worth your fees. A great experience, however, may compensate for a perceived less-than-perfect result.

The reality is that people do not buy porcelain or composite; they buy and value the experience. In a recent seminar, I mentioned that practices should offer coffee in the reception area. A very young woman raised her hand and informed me that that was a terrible idea—the practice was not in the hospitality business. One thing is certain—with that attitude, that office will never build a high-end cosmetic practice. You may not want to be, but you'd *better* be hospitable!

The dentist in that practice came up to me later during a break to tell me that her comment was exactly what he was battling and that his practice had been flat or declining for the past 4 years. I think the objective answer for most of us is obvious, but when you work with people every day, it is sometimes difficult to focus on helping them grow. Now, you may be thinking that you would simply terminate this individual so you wouldn't have to deal with this type of attitude. However, the goal should be to build the culture, drive the vision, and work with this individual so that she understands that yes, you are indeed in the hospitality business.

You would be amazed by how many staff members are able to grow into a new culture when it is properly presented to them through both culture and documented business systems. For practices that don't believe their staff will ever be able to convert, keep in mind that when you change any employee, you are simply changing your problems.

STAY THE COURSE

One of the other major problems I see in regard to building cosmetic practices is that the dentist often is inconsistent. One month, he or she is highly focused on cosmetics due to some course recently attended, but the next month they are back to regular dentistry and don't even mention the word "cosmetics." Staying the course is a critical business skill that will allow you to patiently build just about anything over time.

If you talk about it, focus on it, get your team excited, get them involved, solicit their input, and ask for their recommendations, you will gradually build exactly what you want. If you suddenly forget about cosmetics and

the next week are focused on TMJ, occlusion, the stock market, or the NFL, the team will not continue to grow with the cosmetic culture. Decide if this is what you really want and, if so, find hundreds of little ways to continue letting everyone know cosmetics is an major focus of your practice.

PROVIDE AN INCENTIVE

The fact is that people do what they are paid to do. If you pay someone to assist, they will assist. If you pay someone to schedule, they will schedule. If they think their goal is simply to fill the schedule, that is what they will do. If you truly want to build a cosmetic culture, then reward your team.

There is no statement more important than putting money on the table. Set up an incentive program with benchmarks and, if those benchmarks are achieved, reward the team with certain bonuses. Determine the what, how, or where of the bonus. Should it be money? (Probably.) Or what about a trip? (Only if everyone really wants to go together.) Or should it be time off? The point is that you have to let people know what is important by rewarding them accordingly.

SUMMARY

If your major new vision is to build an esthetic practice, then you have to include your team in that process and coach, train, and motivate them. For those of you who think incentives don't work, it usually means that the team has not bought into your vision. Follow the steps outlined here and your team should become as motivated as you are about making cosmetics a practice priority.

The Relationship-Based Practice, Part V: *Foundations of Patient (Customer) Service—A New Attitude*

by
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You know where "Martha and Jim Swenson" went on their last vacation, and you know where they work. You might even know their golf handicaps! But does this social, superficial level of knowledge about your patients translate into the kind of patient (customer) service that really matters? Indeed, patients feel good when you know these things about them—it helps them feel good and creates an enjoyable social bridge. In today's dentistry, however, it simply is not enough. At the end of the day, if your relationship with a client is really more that of a social acquaintance, it will not provide the foundation necessary to help you and the patient through the challenging situations you are likely to encounter as real-life decisions about dental care are made.

Although many dentists lament the reality, more and more patients approach dental care decisions with the same frame of mind with which they approach other, more commodity-based decisions. The "consumer mentality" has taken hold and patients are behaving more like customers all the time. Whether you like it or not, you and your team must become prepared to work with patients in this way. What you know about your own expectations and tolerances as a consumer can guide you in determining how to provide the best patient (customer) care in your practice. The goal is to move beyond fluff to substance—those things that matter to your patients.

The "consumer mentality" has taken hold and patients are behaving more like customers all the time.

Think about any time you went out to dinner, ventured into a shop, or took a flight. As a consumer, you likely would have been annoyed had you been ignored by a waiter or had the chefs mishandled your order; surly staff and lost luggage are intolerable under most circumstances. If service is slow or if the sales person is unable—or worse, unwilling—to explain the features of a specific product in ways you can understand, you are more likely to leave the store without making a purchase. You may take note of incompetence and make a conscious choice to take your business elsewhere.

Take a mental inventory of the services that matter to you and you likely will also be creating a list of the things that matter to your patients. Here are those things that get translated into dentistry in the three most important areas of patient concern.

THE ULTIMATE QUALITY OF THE DENTAL CARE YOU PROVIDE

Does it improve the patient's appearance? Does it restore function? If cared for properly, is it likely to last? Does it contribute to long-lasting dental health? Although patients cannot immediately determine the quality of your work, they often develop opinions about your clinical skills based upon what they *can* assess. They will look at the cleanliness of your facility and make inferences about your attention to detail at the chair. They will gauge your gentleness as an indication of your care about other aspects of their treatment. They will expect you to get it right the first time and will find re-dos (for whatever reason) annoying and inconvenient.

Patients have a right to—and will expect—that your clinical care will be high-caliber and that you will take into account those things that will affect the treatment they receive. While they may not have heard about and might not be able to relate to occlusion, for example, they will expect *you* to know about it, as well as about all the other elements that contribute to a satisfying solution. That is your job. As a clinician, you are responsible for five major categories: examination, diagnostics, prognostics, treatment planning, and delivery of care.

Patients want you to be thorough in your examination and to not cut corners that are important to them. They want you to be a careful and skilled diagnostician, able to learn both the nature and the cause of their problems. They want your serious opinion about the future they are facing and the likelihood of successful treatments for problems that will impede their quality of life. They want you to be complete in your treatment planning and offer as many options as possible within your standard of care, advising them of the relative pros and cons of each option. And, of course, they want you to be skilled and focused when you deliver treatment, as well as diligent in supervising those who provide auxiliary and ancillary services. And they want all of these things even in the face of the resistance they may sometimes put up. Like medicine that is good for them yet tastes bitter, they want you to take each of these obligations seriously even when they make it hard for you to do so. That is your job. If given the choice of expedience versus a better quality of care, few would choose to dispense with the latter.

THE WAY YOUR SYSTEMS WORK

Do you make things as convenient as possible for your patients? Do you attend to details that matter to them? Are your records, documentation, and accounting systems accurate? Do your working relationships with colleagues, labs, vendors, and referring practitioners run smoothly and predictably? Do you have reasonable contingency plans for unexpected events?

Very few patients will tolerate system breakdown for long. They believe, and rightly so, that part of your job is to run your business so that their affairs are handled with attention to detail and a concern for their well-being. They want to know that their personal details are kept private, that their medical information is kept confidential, and that their financial records are accurate. They want to be able to trust your office to handle business details wherever possible, because they most likely feel unable to deal with entities such as insurance companies entirely on their own. They expect you to communicate and collaborate with specialists and laboratory providers in a timely manner. Regardless of how costly it may be for you, they would always prefer that you handle as many of these issues as possible and make it easier for them to navigate through a system that is foreign to them. They're not being "difficult" for wanting these things; they're being normal.

Very few patients will tolerate system breakdown for long.

Because they are the customer, they want it to be able to see you with little or no inconvenience; they want your hours to fit reasonably into the rest of their busy lives. They want to have reasonable access to you and your staff. While they will tolerate voice mail and perhaps even an answering service, they will expect calls to be returned as quickly as promised and that knowledgeable staff will handle their questions and concerns. They expect that you will have procedures in place to see them when unexpected events require your care—even if it is because they have delayed treatment longer than you suggested. And while patients generally hope for all of these things, none really expects you to be open 24 hours a day or to see them at the drop of a hat. While patients are high in their expectations, most are quite reasonable in their demands.

THE WAY YOU AND YOUR STAFF RELATE TO YOUR PATIENTS AND THEIR CARE

Do you know what they are hoping to achieve through your care? Do you know their concerns as well as hopes, their wants as well as needs, their hang-ups as well as the ways in which they are easy to work with? Have you made it "safe" enough for them to tell you the truth when things change? Do you give them a break when they are crabby or withdrawn? Do you understand and respect them? Do you always tell them the truth—even when you think they might not want to hear it?

Sadly, more patients leave dental practices because of the way they are treated outside the operatory than because of the way they are cared for clinically.

In most practices, as in most businesses, this is the arena that requires the most attention, for it is more about attitude than anything else. Most customers go elsewhere because they are treated with indifference by those who they rightly believe are there to serve them. Stores with good merchandise, restaurants with great food, and businesses with superior services go under each day. Sometimes it is because their business models are poorly planned, but most often it is because those whose job it was to provide a high caliber of customer service didn't do so.

In dentistry, customer service isn't just helping a patient with finances, for example. It is doing so with a real desire to help even when it takes a bit of work, an extra effort, and the patience of Job. It is not allowing the minimum required to become the new standard of performance. It is not ever making the patient regret having asked a question about an issue of importance. It is not allowing the paper to become more important than the people—the task more important than what the task is designed to accomplish.

Sadly, more patients leave dental practices because of the way they are treated *outside* the operatory than because of the way they are cared for clinically. Sometimes it's the little things, like the frustration and confusion that comes with staff turnover, or rarely getting a knowledgeable person on the phone. At other times, it is about big issues like being treated with understanding and respect. Too often, staff members express their annoyance when patients get in the way of their work, with statements such as, "I didn't get a thing done today. The phone rang off the hook." These attitudes get conveyed to patients whether you realize it or not. And they have a huge impact on how patients feel about the practice as a whole; they can determine whether patients will bother to adjust to even the minor inconveniences you may ask them to tolerate.

Every member of the team is responsible for ensuring that the customer service your practice delivers is as meaningful to each patient as it is consistent. Attitudes such as, "That's not my job" or "Oh, no, Mrs. Jones again," must not be allowed even in thought, much less uttered; these sentiments must be banished in order for respect and understanding to take hold. A relationship-based practice requires everyone to pull in the same direction and focus on the patients rather than on themselves. By simply applying to your own work those criteria by which you judge those who serve you, you and your team can go a long way toward establishing a stable, productive, and successful practice for your patients... and yourselves.

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