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IMHO

We are excited to dedicate this issue of Vision's to the IACA meeting. The IACA has become the premier educational meeting in dentistry and by far, the best meeting I personally have ever attended. And I hear that from almost every speaker that has presented at the IACA too. It's not just the outstanding speakers, cutting edge presentations, or the diversity of concurrent lectures, which are critical so that everyone (team, hygienists, doctors and technicians) has something to see that they are interested in during every time slot. In reality it's "The Event"; the positive attitude of those in attendance and the enthusiasm of everyone involved. It is INFECTIOUS! People have commented that they almost learn as much in the halls as they do in the lectures because of the quality of the attendees.

The IACA is one of the few places that you can see the giants of dentistry present, as well as up and comers who will someday be the giants of dentistry for their generation of dentists. Many of the best presentations are given by people you won't see anywhere else because they don't fall into the "status quo" of accepted topics or information. Many meetings actively prevent controversial advances in dentistry from being presented, denying you the chance to make your own decisions. I guess the easiest way to put it is that the IACA is 10 years ahead of current dentistry… literally, what you will hear is the "future" of dentistry and those that jump on the train early will be light years ahead of other dentists in the field who only attend other meetings.

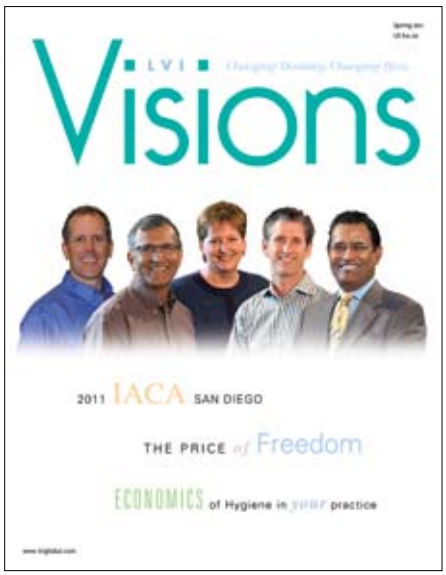
And lastly, the other thing I think is so wonderful about the meeting is the "family atmosphere" that is present. They seem to always pick great locations for dentists to bring their families with them for a vacation. San Diego is my favorite city with so much for people of all ages to do… not to mention the perfect weather. This is a great way to not only write off your vacation, but get the best of both worlds, a great vacation and a great education. As if it weren't already an unequaled experience, the ending celebration on the flight deck of the Midway aircraft carrier will be amazing! Don't be one of those people that every year after missing the IACA meeting and finding out how incredible it was from those that did attend, say; "I wish I would have gone"! I'm looking forward to seeing YOU at the IACA!

Love and Gratitude,

William G. Dickerson, DDS, FAACD, LVIM

San Diego is known as having the best climate in the US. San Diego enjoys beautiful weather year round with an average daily temperature of 70.5° (21.4 degrees Celsius).

contents



on the cover

IACA Past Presidents

Dr. Jim Harding
Dr. Sam Kherani
Dr. Anne-Maree Cole
Dr. Joe Barton
Dr. Prabu Raman

The Las Vegas Institute for Advanced Dental Studies (LVI) publishes LVI Visions. Please send any comments or suggestions to 1401 Hillshire Drive, Suite 200, Las Vegas, NV 89134. Telephone (888) 584-3237 or (702) 341-7978. Web address • www.lviglobal.com.

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Bill is the Founder and CEO of the Las Vegas Institute for Advanced Dental Studies (LVI Global). He is one of the most influential dentists in the world, by spanning the globe with Continuing Education for all aspects of dentistry. As an author, clinician and international lecturer, Bill has inspired dentists to Change Dentistry and to Change Lives.

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Mark is the Clinical Director at LVI Global and serves as an IACA board member. He is involved in teaching the Core 1-7 courses at LVI. His goal is to advance the understanding of the science behind Neuromuscular Dentistry.

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David is an author and lecturer. As a perpetual student himself, he knows the importance of education. His goal is to encourage dentists to NEVER STOP LEARNING.

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Jill is the Director of Hygiene at LVI Global. As a practicing hygienist, Jill brings the most current and modern materials to her students. Her training includes: molecular therapy and laser therapy.

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Peter is one of a handful of Registered Course Providers with the Academy of Laser Dentistry. His Neuromuscular, aesthetic general practice is in the California wine country!

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Tim is the President of Bent Ericksen & Associates. For over 30 years, the company has been recognized as the leader and most trusted name for human resources, products, services, and support for health care providers.

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Brad is a Clinical Instructor at LVI Global. He teaches courses in advanced procedures and protocols for Neuromuscular/Aesthetic doctors. His practice is located in Savannah, Georgia.

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Jay is the Director of Neuromuscular Orthodontics at LVI Global. Jay has clinically treated 1000's of patients using the principles of Neuromuscular Dentistry. He is recognized as one of the early innovators of NM functional orthodontics.

Arthur Weathers, Jr., DDS
"Kit" is the Director of Endodontics at LVI Global. He integrates humor and magic into his "Root Camp" to enable his audience to recall the techniques taught.

The Price of Freedom

By: Dr. David Miller

"The price of freedom is eternal vigilance," thus spoke Thomas Jefferson. He knew that freedom is always under attack on many fronts. Now our freedom to practice the best care possible for those who suffer from TMDs is again under attack by a small group of politically minded academics and researchers. They again seek to impose their beliefs on all other doctors. Jefferson foretold this also when he stated: *"The jaws of power are always open to devour, and her arm is always stretched out, if possible, to destroy the freedom of thinking, speaking, and writing."* The professional freedom that has been hard fought to achieve and maintain over the past 40 years is again under attack.

In the August issue of Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology (commonly called Triple o) was an editorial by Dr. Charles Greene entitled "Diagnosis and treatment of temporomandibular disorders: emergence of a new care guidelines statement." He presented the International Association for Dental Research/ American Association for Dental Research Guidelines for the treatment of TMD. In the September version of the Journal of the American Dental Association (JADA), Dr. Greene published the same IADR/AADR Guidelines. However, the accompanying explanations were markedly different in each publication. The JADA version, while full of unsubstantiated claims of support, was generic in nature, but staked out a position of authority claiming: "Therefore, the publication of this new TMD standard could be regarded as the closest thing to date to a true standard of care in this contentious field." While just the claim of establishing an SOC by Dr. Greene and the IADR should send tremors of concern down the spine of anyone familiar with their politics, the Triple o editorial showed the true nature of this beast. The initial target is stated clearly to a friendly Triple o audience: "The main subject of controversy within the diagnostic area has been related to the use of various electronic diagnostic devices, such as electromyography, jaw movement trackers, and sound recorders .... technological devices have failed to meet standards of reliability and validity. In other words, they do not satisfy the requirements for sensitivity and specificity that are essential for clinical diagnosis of individual patients." Here we are again fighting for scientific, intellectual and professional freedom to practice the best dentistry possible. The same old foe has come sneaking around again.

To an unsuspecting reader unaware of the major role Dr. Greene has played over the last 30 years in the political landscape of the TMD diagnosis and treatment, his statements might appear to be supported by good science. That could not be further from the truth. Dr. Greene claims that "the dental literature of the past 25 years has been rather clear in demonstrating that the use of so-called adjunctive diagnostic devices does not add much

Dr. Greene and his cohorts attempt to game the system trying to be **judge and jury** to what is acceptable evidence while ignoring the mountains of literature supporting NMD.

to the ability to correctly diagnose orofacial pain problems ... " First, the equipment does not make the diagnosis. The dentist makes the diagnosis by using information gathered from patient history and examination and, when appropriate, augmented by objective physiologic measurement data as well as other modalities including imaging technologies. To claim that neuromuscular technologies do not provide useful data as Dr. Greene implies is to ignore a significant body of the literature by Cooper, Kleinberg, Hickman, Widmalm, Mazzocco, Lous, Thomas, Tsolka, Sheikholeslam and many other respected clinicians and academicians who have published their studies in reputable peer reviewed journals. I have significant doubt in the objectivity of Dr. Greene and his AADR colleagues when the scientific literature in support of the efficacy of these devices has been conveniently ignored. Contrary to the unsupportable claims of Dr. Greene, these neuromuscular dental concepts and the accompanying instrumentation are used around the world with unparalleled success. It should be noted that what is conspicuous by its total absence from Dr. Greene's statements is any valid evidence-based scientific study describing and objectively documenting the success of treatment by Dr. Greene and those who support his position.

I am a full-time general dentist who has been treating TMD for almost 25 years, using Myotronics and BioResearch equipment for over 15 years, when appropriate, in the treatment of these problems. As a full time clinician I am judged by my ability to treat patients in a private practice setting where clinical success is paramount. Sonography, electromyography, computer assisted jaw tracking and low frequency, low amplitude Transcutaneous Electrical Neural Stimulation (TENS) are invaluable tools for clinical treatment and for objective documentation of clinical success. These are the tools that Dr. Greene would take away from thousands of doctors helping untold numbers of patients. All of this is because Dr. Greene and his fellow travelers want to promote their political agenda. The Science be damned!

The use of bioelectric instrumentation is commonly called Neuromuscular Dentistry (NMD) because their use is based on neuromuscular principles. The body of literature supporting the efficacy and use of neuromuscular dental principles is large and growing. These technologies are in at least 90 medical and dental schools in over 35 countries around the world from Argentina to the Ukraine. The devices are successfully used by 1000's of clinicians from around the world. Orthodontists in Japan must submit K-7 (jaw tracking IEMG/sonography) documentation, demonstrating clinical success in order to get paid by Japan's government insurance program. Dr. Greene states that his recommendations against their use" ... are based on the best current evidence and are almost universally accepted within the scientific community." Again, nothing could be further from the truth.

A small cadre of orofacial pain educators appears repeatedly in the efforts to stifle scientific advances that threaten their academic sinecures. Dr. Greene's sweeping pronouncements of his own group's efforts to proffer up the "proper approach to diagnosis and treatment of TMJ-related conditions" yields a rehash of the discredited efforts of AADR/IADR in 1996. In fact, Dr. Charles McNeill, Chair of the Department of Orofacial Pain at the UCSF Dental School and former editor of the AAOP's "Orofacial Pain: Guidelines for Assessment, Diagnosis and Management," states that Neuromuscular Dentistry is an acceptable treatment approach. He said this in his 1997 textbook, "Science and Practice of Occlusion."[5] This alone should negate Dr. Greene's claims of near universal support.

The politics of the fight against neuromuscular instrumentation and the science of its adherents are very interesting. From its origins in the 1960s, and for 20 years after that, the fight was primarily with some gnathologic camps. In 1986, the ADA Council on Scientific Affairs granted its Seal of Recognition to

> All that is necessary for the triumph of evil is that good men do nothing.

Myotronics equipment. Then the political battlefield shifted from occlusion to TMD. A small group from the AAOP, together with some occlusally-based doctors, began to put political pressure on the ADA to rescind its seal for the instrumentation. Dr. Norman Mohl was chosen to evaluate these devices for safety and efficacy. His 1988 draft report claimed that none of these devices "have the scientific evidence required for their recommendations." Myotronics submitted an extensive review of the literature supporting the efficacy of its equipment. After extensive investigation by the ADA, Myotronics devices were again awarded the ADA Council on Scientific Affairs Seal of Acceptance. The Mohl Draft report was exposed as a political attack, not an unbiased scientific assessment. The Mohl Draft report was rejected by the ADA Council on Scientific Affairs and designated "Draft Only, Not to be Referenced." However, the Mohl Draft Status Report appeared in some referenced journals over the next few years, primarily in articles written by Mohl himself and Dr. J.P. Lund, Examination of these articles shows a pattern of the authors constructing straw men and then knocking them down. Tasks are designed for the equipment that is outside the manner of their normal usage, condemning the equipment to failure of the tests. Yet these scientific articles appear repeatedly in anti-instrumentation writings. This handful of papers was published between 1990 and 1995. This was 15 to 20 years ago. Yet Dr. Greene claims to have the best and latest evidence on the subject. In fact, Dr. Greene and his cohorts attempt to game the system trying to be judge and jury to what is acceptable evidence while ignoring the mountains of literature supporting NMD.

Following their defeat by the ADA, the anti-instrumentation group improperly and illegally manipulated the regulatory process of the U.S. Government, subverting FDA employees between 1991 and 1994 to use the regulatory process to do what had failed through scientific enquiry at the ADA. According to a 1997 Congressional Panel Investigation[1] conducted by the Office of Inspector General investigating the FDA's misconduct, Dr. Charles Greene and Dr. Norman Mohl arranged and participated in a nonpublic meeting with the FDA officials in April 1994 to present the views of the IADR, regarding the "potential dangers" of jaw tracking; EMG and joint sound recording devices; and the "most important public health issue" they posed.[2,3] At the same time, the anti-instrumentation group organized a letter writing campaign to the FDA. Further, Dr. Greene invited his friends and longtime opponents of NMD, Drs. James Lund and John Rugh to provide their testimony to the FDA Panel.

Extending the group's attempted manipulation of the FDA, Dr. Norman Mohl, was appointed as the panel's FDA consultant and Charles Bertolami, the former competitor of Myotronics, who had brought an unsuccessful lawsuit against the company, was appointed as chairman. Further, the contents of Myotronics' presentation were leaked to Dr. Greene in advance of his testimony against the company.

It was no surprise that the outcome of the panel vote was to reclassify Myotronics' equipment in the same class as an implanted pacemaker that would have kept the company's products off the market indefinitely. The results of the panel appeared to put an end to NMD. But a Congressional hearing and an FDA Office of Internal Affairs inquiry resulted in an investigation by the Inspector General, Department of Health and Human Services. The two-year investigation that was chronicled in the Dickinson's "FDA Review" concluded that "the FDA's 1994 Dental Products Advisory Panel assessing Myotronics, Inc.'s dental measuring devices was indeed rigged."[4] The probe resulted in discipline and dismissal of certain FDA employees, resignation of Charles Bertolami, the panel chairman, and the FDA elected to not renew the appointment of Norman Mohl. This was another victory for truth and science.

When a new Advisory Panel was assembled by the FDA in 1997, the scientific literature and the testimony of the panel witnesses were assessed and subjected to scientific scrutiny. The efficacy of jaw tracking, EMG and joint sound recording technologies were reaffirmed by the FDA panel, and these devices were declared, once again, safe and effective for their intended use.[6] It is not surprising that Dr. Greene and the very same three colleagues named in his editorial-who had rigged the FDA panel of 1994-have continued their attempt for over 20 years to secure

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a policy statement from the IADR/AADR. It is clear to any astute observer that these four/individuals, led by Dr. Greene, have manipulated the ADA, the FDA, the dental literature and now the AADR in this latest effort to advance their political agenda.

For several years in the mid 1990s, the American Academy of Orofacial Pain, and later the American Academy of Craniofacial Pain, submitted essentially identical applications for specialty status in orofacial pain. Their applications enumerated a lengthy list of procedures acceptable for use in diagnosis and treatment of orofacial pains, including TMDs. Missing from this list was any mention of NMD and its instrumentation. If this specialty had been accepted, neuromuscular dentistry would have been isolated politically by a small group, intending to self-appoint themselves to be the ruling elite of the Orofacial Pain Specialty. Specialty standards would have ruled out NMD in favor of the psychosocial paradigm presented clearly in the 1996 AADR TMD Policy Statement and reiterated by Dr. Greene. Partially in response to the Orofacial Pain Specialty initiatives, the Alliance of TMD Organizations was born. This group of 10 national and state groups with TMD treatment interests was critical in opposing the specialty applications. And yet after twenty years of effort by the opponents of NMD, the clinical and scientific success of NMD is spreading rapidly across the United States and around the world.

The battle continues. In 2005, a trial took place in front of a panel of dentists and lay public members at the Royal College of Dental Surgeons of Ontario (RCDSO), who publish "Guidelines for Treatment of TMD," denigrating mandible advancement techniques, which were used to prosecute an Ontario general dentist, a member of ICCMO, who successfully relieved the pain and suffering of a patient with TMD by providing a mandibular advancement appliance. The same patient had been treated by the chief witness for the prosecution, Dr. David Mock, Dean and Professor of Oral Pathology at Toronto Dental School, who treated the patient unsuccessfully over a period of seven years by using a flat stabilizing splint in addition to other CR-based prosthetic techniques. The patient was referred for jaw surgery, which would have been undertaken but for the successful treatment by the neuromuscular dentist over a period of approximately six weeks. The dental panel appointed by the RCDSO found against the general dentist. The dentist then took the RCDSO before a higher court who found substantively against the RCDSO. In the summary for the prosecution the RCDSO lawyer, Ms. Rothstein (who subsequently resigned as counsel for the College), attempted to silence Dr. Norman Thomas, Professor Emeritus at the University of Alberta, who was the main defense witness, from any future trials involving NM dentistry. These are the kind of unscrupulous attempts being taken by our opponents to silence NM dentistry. As part of the prosecutorial case, a letter refuting neuromuscular dentistry was placed in evidence under the signature of twelve American and Canadian professors who represented the same IADR/AADR group that Dr. Greene now quotes. Dr. Thomas demonstrated that the study by Dr. Lund and colleagues in Montreal was poorly designed and abjectly failed to make the anti-NM case. The above summary is now open for public scrutiny in spite of Ms. Rothstein's attempts to have the proceedings sealed, along with gratuitous attempts to silence Dr. Norman Thomas. Yet, the RCDSO continues to hold to its position on treatment of TMD.[7]

Recently, the Royal College of Dental Surgeons of Saskatchewan (RCDSS) has proposed restrictions on general dentists treating TMD that are more onerous and draconian than those in Ontario. No general dentist would be able to treat a patient with more than a flat plane splint and palliative care. If symptoms persisted, a referral to a specialist (oral medicine, prosthodontist, orthodontist, periodontist or oral surgeon) would be required. These guidelines would essentially stop all treatment of TMD by general dentists in Saskatchewan. The six references cited all include Dr. Greene or the AADR/IADR positions. No dissenting voices need apply! The timing is suspicious and reeks of duplicity and organized action.

The neuromuscular equipment consists of a TENS unit, electromyography, jaw tracking and joint sonography. Only the TENS unit has a physiological effect on the patient, relaxing muscles through neural stimulation of the trigeminal and facial cranial nerves. The other units are inert measuring devices akin to an electrocardiogram or a pulse oximeter. Like the EKG or pulse-ox devices, Myotronics equipment provides real-time objective measurements of physiologic processes. These objective measurements

help document and improve the efficacy of the diagnosis and treatment of patients. Supreme Court Justice Benjamin Cardoza once stated: "If it can be measured, it is a fact. If it cannot, it is an opinion!" In the orofacial pain world, the Gold Standard is patient self-reporting of pain. Pain is entirely subjective. It cannot be objectively measured. As a Gold Standard, it is unscientific. Neuromuscular dentistry prefers to objectively measure physiologic activity as opposed to relying on unreliable and Subjective patient self-reports. Yet, Dr. Greene and his ilk would deny the use of this equipment because its concepts and science do not align with their philosophy of treatment.

Diagnosis and -patient care based on physiologic principles has been the primary basis for treatment of occlusal and TMD issues for almost 70 years. Since its beginnings in the 1960s NMD has withstood challenges from the gnathologic community, the orofacial pain community, political attacks through the ADA and FDA, misconduct by regulators, and attempts to legislate it out of existence. Neuromuscular dentistry has survived and grown, based on its adherence to scientific principles of anatomy and physiology. If NMD did not work, if its principles were faulty, it would not have survived the political attacks. But more importantly, NMD would not have survived and thrived over the last quarter century in the savage market place of scientific ideas and clinical efficacy. Dr. Greene and his fellow travelers, unable to win on the basis of merit would like to win on the basis of bureaucratic dictate. A small cadre of research and educational elite want to force their will on the great mass of clinicians and patients who only see clinical success and scientific validity in the use of neuromuscular concepts and instrumentation.

Pastor Martin Niemoller talked about passivity in the face of evil:

First, they came for the Communists,
and I didn't speak up because I wasn't a Communist.
Then they came for the trade unionists,
and I didn't speak up because I wasn't a trade unionist.
Then they came for the Jews,
and I didn't speak up because I wasn't a Jew.
Then they came for me and by that time
no one was left to speak up.

Dr. Greene's cadre is after Neuromuscular Dentistry today. But as the Saskatchewan Draft Guidelines suggest, any mandibular advancement could be targeted, reducing general dentists to mere referral sources for the dental specialists.

Philosopher Edmund Burke stated that "All that is necessary for the triumph of evil is that good men do nothing." If you value your freedom to use the best science, techniques and equipment available to help your patients and improve your outcomes, then everyone should contact the American Dental Association or the Canadian dental boards and protest this politically inspired attack on truth, justice and professional freedom. Our patients are counting on us!

David B. Miller, D.D.S.
Roseville, California

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San Diego has 70 miles of breath taking beaches along its coast.

Measuring How Your Practice Is Performing - **A Unique Tool**

Sherry Blair, CDA

The saying ***"you can't manage what you don't measure"*** may be especially relevant to the business of dentistry today. There are many performance metrics the dental team should be consistently tracking, discussing and utilizing to make critical decisions. The most obvious are case acceptance, patient retention, recall efforts and patient satisfaction.

Understanding the role of patient financing.

There are other metrics that may not be as obvious, but that can give the practice greater insight into improving existing processes or adding new systems to their daily routine. It's true that no matter how productive the practice is, there is always an opportunity to help more patients achieve their oral health goals. Payment options are important in achieving that goal.

One payment option the team can use to make it easier for patients to get care is with the CareCredit healthcare card. In successful practices, it is offered in addition to the other payment choices available. It requires no initial cash payment, and it breaks down a larger treatment fee into manageable monthly payments. Even if patients can pay with cash or bank credit cards, these days some may prefer to retain their savings and available household credit for other expenses and pay for dentistry with this type of payment option.

At the last IACA meeting, I was able to experience a new and valuable reporting tool, the CareCredit Practice Performance Review. The information this report provides is not often measured by a practice, but it can play an essential role and directly impact the other metrics dentists and their teams are measuring, especially those that help more patients get care. It provides clarity on how patient payment plans fit into the financial system of the practice, and more importantly, how they impact the practice financially.

For example, wouldn't you like to know which patients have purchasing power today? It also provides practice-specific information needed to assess how a payment option is being used in your practice, how your patients might have found you, how effective it is, and how your use of financing as a business tool compares to the performance of other similar practices using the program. Although the information sounds complicated, it's not. It only takes about 10 minutes to review the report.

With this type of information, the practice can put it to use to define goals and objectives and to share it with other experts who can help you focus on this information as well as other key areas such as managing overhead, minimizing failed appointments, marketing your practice, and enhancing recall and retention.

Measuring is merely step one.

Taking action is the critical next step. So use the Practice Performance Review to begin a healthy discussion and engage your entire team in the metrics and results. Because it's only through discussion and teamwork that your practice can grow and thrive.

> To take the first step and schedule a review, visit www.CareCredit.com/contact and select Practice Performance Review.

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The IACA Aesthetic Eye

By: Dr. Joe Barton • *IACA President 2005 / 2006*

As clinicians we sometimes don't see the talent that makes us the artist we truly are. We have the talent to not only create a smile but a life-changing experience. The predictability with which we are able to do this comes from techniques and talents we learn over the years. One resource for acquiring these skills is the annual IACA conference. The IACA conference provides an opportunity to share ideas and concepts with like minds; those who look past the routine procedures and envision the possibilities and differences we can make in our guest's lives.

Each of us has their own interpretation of beauty, but the ability to listen to our guest and truly understand their desires will ensure their satisfaction. This is where learning new skills and techniques can be a real benefit. Not only learning the structure of a smile through smile designs, but the ability to listen to our guest's concerns and interpret those into results is a lifelong lesson. The process of turning wants into reality is amazing.

As the founding president of the IACA and current board member the primary focus of the IACA has been consistently striving for the highest caliber of education available. We are extremely honored to have dentistry's most talented clinicians and technicians to provide some incredibly insightful lectures at this year's IACA meeting in San Diego. Mastering Posterior Composites presented by Dr. Ron Jackson, Developing Porcelain Masterpieces by Master Technician Mike Milne, and Material Updates by Dr. Mark Duncan are just a few of the lectures on the schedule.

The IACA Aesthetic Eye gives every dentist and laboratory technician the chance to showcase his or her talents. The Aesthetic Eye of the IACA features aesthetic photographs submitted by IACA members and is highlighted at the Annual Meeting. A panel of judges reviews the submitted photographs in each of three categories. Below are a few of the former winners showcased at previous IACA conferences and the categories in which they were presented.

Anterior Aesthetics

Before ***After***

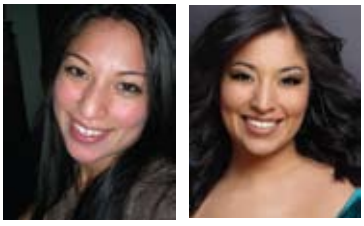
Dentistry by: Dr. Prabu Raman

Full Mouth Restorations

Before ***After***

Dentistry by: Dr. Ted Hadgis

Glamor Restorations



Before ***After***

Dentistry by: Dr. Jerry Hu

Join us in San Diego this year, submit your cases for the Aesthetic Eye, and give us a chance to admire your talents and the lives you have changed. For more information or to register for the IACA, please visit www.theiaca.com.

IACA *Past presidents*

Super Teams and the IACA

By: Dr. Jim Harding • *IACA President 2007*

Anyone who has ever looked closely at the most successful dentists will find some common threads. Some of the first traits which come to mind in order to describe these great dentists might be things such as does good work, has lots of continuing education, super personality, tons of experience. Of course these all might be true, but leading dentists will most assuredly share another perhaps more important trait in common. Super teams! It only takes a short time practicing dentistry to discover that we will never become our best without surrounding ourselves with awesome team members.

So why do some dentists always seem to have the best, most qualified and motivated teams and others, if not most, spend their entire careers with continuous "staff" turn-over or with teams that just don't seem to be on board with the dentist's mission? Most experts will tell you it is not the money or financial compensation that creates these "super-teams" but rather providing a proper work environment that cultivates growth, respect, responsibility and of course education. Teams that study together are much more likely to share a common goal or mission and desire to work as a cohesive unit. All dentists who attend continuing education courses, seminars and conventions on a regular basis have had the unfortunate experience of coming back to the office Monday morning excited about what they had learned only to realize the team does not share this same enthusiasm. The result is as predictable as the sunrise, within a week or so the dentist forgets about how fired up they were and slips back into the same old routine without ever implementing the new material. What is perhaps even more discouraging is that every single team member knew this would happen. They have seen it occur so many times in the past. I can hear the conversation in the break room on Monday at lunch: "just give doc a few days and he will revert to his old self and we can get things back to the old way around here!"

Just think if there was a way to not only motivate dental teams to seek change, but perhaps even push the dentist and practice as a whole to become better. Well, those top dentists have figured out how to do just that!

We must have our teams become CE junkies just like the dentist. When we go to courses and meetings together we engrain this philosophy in the whole team, not just the dentist. Additionally, we need to pick courses and meetings which are designed to build this entire office learning. Just going to a local "mid-winter" meeting once a year which rehashes old and often times outdated material, will never achieve the goal of building that "super-team" we are all seeking. The dentist must find the right meeting to educate everyone on the latest techniques, but also one with the correct motivational environment.

As a Clinical Instructor at LVI and being involved at the IACA, I have witnessed firsthand the dentists who "get it" and incorporate the team into their continuing education. While most dentists are sitting around wondering why they can't find great team members, their colleagues are using these courses to build a successful practice and "super-team." One of the most fascinating things that happens each year at the IACA meeting is seeing teams huddled together at the breaks, lunch and over dinner discussing what they have learned and being truly excited about how this knowledge is going to be incorporated into their office when they return back home.

These impromptu team meetings are just one of the many amazing things that happen at the IACA. The meetings are so full of great sessions that it is normally necessary for the dentist and team to have to divide and conquer so that all of the information can be obtained by at least one team member. Not only do the teams get together at the breaks to discuss what they have learned, but the ever popular recordings of the meeting on the iPad or iPod become many months worth of educational tools for the office. This way you can relive all the excitement of the IACA over and over again!

I would be remiss if I also did not mention how much fun the IACA has become for dentists and team members alike. The IACA is definitely not one of those meetings where the attendees do not hang out and not socialize together. In fact, it seems more like a family reunion. The bottom line however is that when the doctor and team spend three days learning and having fun together, they will go back to work on Monday morning excited and motivated as a team to change and better not only themselves, but the entire office!

This year's IACA meeting in San Diego, our seventh annual conference and site of the first meeting back in 2005, promises to be the best yet.

The line-up of speakers and presentations is simply second to none in the dental world. Throw that in with one of North America's greatest cities and what you have is the perfect opportunity to bring your entire team to a meeting that will give them the inspiration to become that elusive "super-team!"

IACA *Past presidents*

Can a dentist turn a blind eye to Sleep Breathing Disorders in 2011?

By: Dr. Sam Kherani • *IACA President 2009*

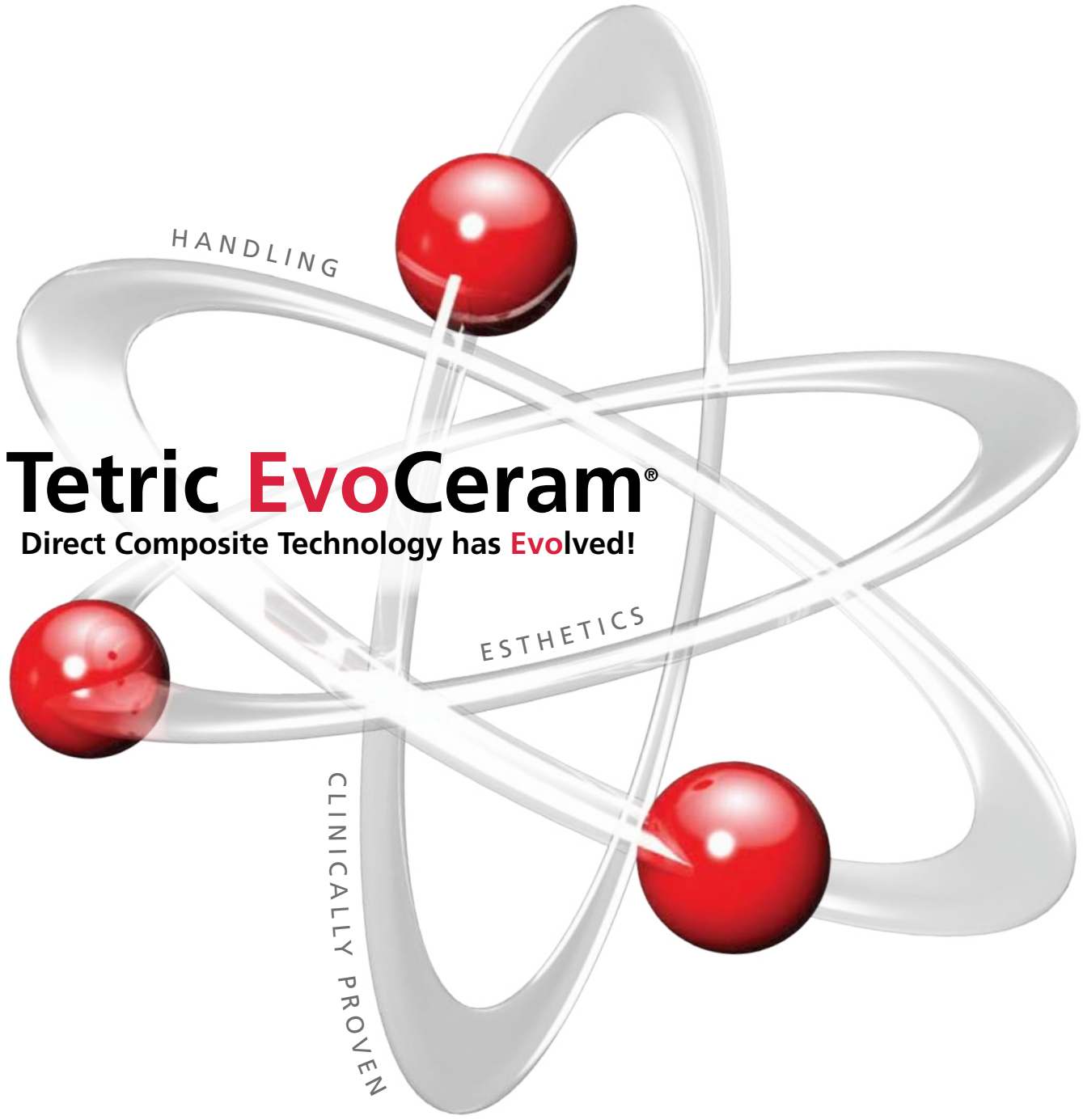
In the early 1980s, a dentist could just focus on the teeth, address the issue of tooth decay and periodontal disease and be considered a good dentist by a majority of his/her patients and colleagues. A forward looking dentist in those days was one who noticed malocclusion and referred the patient to an orthodontist or treated the patient himself or herself. Then came the notion of extracting impacted teeth for fear of further crowding or the future development of cysts around these unerupted teeth. Such evolution has been ongoing for quite some time and no dentist is exempt from it.

In 2011, patients demand that the dentist not only deliver aesthetic dentistry, but deliver such an end result in a manner that provides comfort to the patient via good adhesion, sound occlusion, relaxed muscles and pain free temporomandibular joints. Things have changed a lot in 30 years. Your patients have access to information that is global in nature. Let me elaborate.

It is estimated that 20% of the population suffers from Sleep Breathing Disorders and the majority of them are disorders due to obstruction of the airway and therefore is termed "Obstructive Sleep Apnea", the most common acronym being "OSA".

It is also estimated that 90% of these cases have not been diagnosed yet. Just think what the future holds for this area where we have to provide care for our patients. In CPR training, the health professional is taught using the acronym "ABC": where "A" stands for the airway since the airway is of utmost importance if the patient is to remain alive. This leads to the popular term "If Airway is King then the Tongue is Queen". Further to this is the fact that many times we place plastic or acrylic devices (dentures, orthotics, retainers, etc) in our patient's mouths that further takes away tongue room. This leads to the exacerbation of the Sleep Apnea due to further obstruction of the airway. Now think about our patients who do not have proper development of the arches leading to a retruded mandible. The list goes on.

Physicians have been treating OSA for quite some time now and the American Academy of Sleep Medicine does grant an accredited status on those physicians who have taken the extra training and proven they can treat such patients. Unfortunately, the gold standard for the treatment of OSA is the continuous positive air pressure device (cPAP). The problem is that the compliance rates are very poor (over 60% of patients who have a cPAP do not wear it regularly). Dentists have been developing mandibular advancement devices that allow further opening



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of the oro-pharynx and therefore, help with OSA. Since the physicians are the only health practitioners who can legally diagnose OSA and they are having poor success rates with the cPAP, they have asked the dentists to help by providing mandibular advancement devices (MAD). It behooves us to work in tandem with the physicians and provide the oral appliance therapy (OAT) so the patient can be the beneficiary of the end result that improves his/her health by reducing the co-morbidity factors such as hypertension, stroke, diabetes, GERD, etc.

There is also compelling evidence that many TMD symptoms are also due to OSA and so the treatment of TMD with NM philosophy may in some cases not take care of all of the patient's symptoms.

Incorporation of the treatment of OSA along with a relationship with a sleep physician is a very important aspect for a dentist practicing from 2011 onwards.

Needless to say, OSA, TMD and Dental Occlusion are all tied in whereby each situation affects the other. Also important is the relationship with a sleep physician that is of paramount importance.

Therefore, the dentist in 2011 and beyond cannot turn a blind eye to Sleep Breathing Disorders. Furthermore, the fact that the dentist has to work in tandem with a sleep physician means the dentist has to set himself/herself apart from the other dentists who have not learned much about treating Sleep Breathing Disorders. It is highly recommended today's forward looking contemporary dentist obtain education in SBD that is in harmony with Neuromuscular dentistry so the patient's needs are addressed, whether they are issues with Occlusion, TMD or SBD since they most often overlap.

Dr. Brian Allman gives a three (3) level SBD Continuum at LVI which leads to a Diplomate in Clinical Dental Sleep Medicine. Such accomplishments make sure you have all the information necessary to help your patients and at the same time allow the physician community to confirm such a dentist is highly qualified to treat SBD and thus deserve their referrals. LVI's SBD continuum is the only one that is in harmony with Neuromuscular Dentistry and is also in harmony with the fact that dentists are not allowed to diagnose OSA and therefore need to develop a working relationship with a sleep physician.

At the 2011 IACA this July in San Diego, there will be a panel discussion with Dr. Brian Allman and a few sleep physicians pertinent to the practice of Sleep Breathing Disorders in a contemporary dental office. Dr. Brain Allman will also be giving a separate lecture to elaborate on this very important contemporary topic.

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IACA Past presidents

TMD – Dentists Are in the Driving Seat

By: Dr. Anne-Maree Cole • *IACA President 2010*

TMD is a psychosocial disorder according to many but try telling that to someone suffering this debilitating condition. Sufferers want nothing more than to get their life back – to be normal again. And dentists are in the driving seat to make that happen. Education and an open mind is the key.

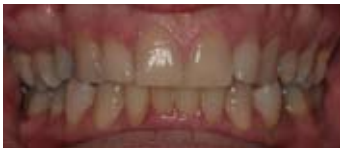
Pain is the over-riding #1 symptom reported by TMD sufferers – pain in the head and neck, headaches, migraine, facial pain, pain behind the eyes, in the sinuses and pain in the ear in the absence on infection. Other ear symptoms include congestion, blockage, tinnitus, decreased hearing, vertigo and dizziness.

Functional problems such as clicking, popping and grating in the TMJ, decreased range of motion, poor chewing capacity, tooth sensitivity, difficulty swallowing and poor sleep are also commonly present.

Years of compensatory damage manifest themselves clinically – compromised cranio-facial anatomy including high, narrow palate, a retruded mandible, deep overbite, poor occlusal planes (figure 1), cross-bite, discrepancies between arch sizes, crowding, missing teeth, evidence of clenching such as bony exostoses (figure 2) and grinding, causing wear and tear (figure 3) with facets and abfractions, along with inadequate room for the tongue and a poor swallow (figure 4), all compromise structural integrity and balance.

Radiographically, common signs especially evident with dental CT, include the TMJ in a superior, and/or retruded or lateral position in the glenoid fossa, bony degenerative changes (figure 5) of the condyle such as beaking (figure 6), bending of the neck and surface breakdown, ante-gonial notching, off-set in the Atlanto-occipital joint, forward neck posture with either hyper-lordotic or kyphotic cervical spine, loss of patency of the nasal airway and narrow pharyngeal airway (figure 7), to name just a few.

Figure 1



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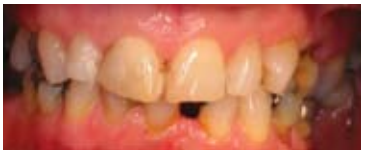

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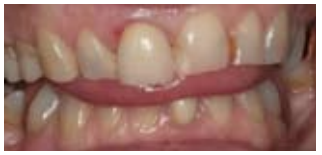

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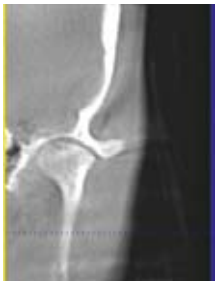

Figure 5

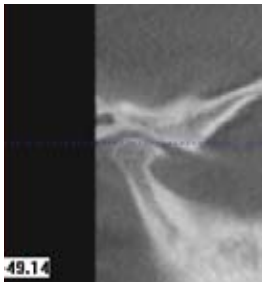

Figure 6

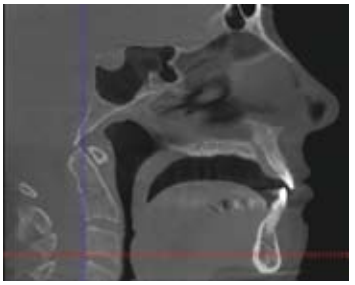

Figure 7

Posturally, reflex compensation leads to discrepancies between the planes of the body. For physiologic economy and best function, the planes of the body including eye, occlusal, shoulder, pelvis, knee and ankle should be parallel to the Earth's gravitational field. Anything outside of that leads to stress and strain that will manifest elsewhere in the body. To quote Roger Sperry PhD winner of the Nobel Prize for brain research: "Better than 90% of the energy output of the brain is used in relating to the physical body in its gravitational field. The more mechanically distorted a person is, the less energy available for thinking, metabolism and healing." Correcting these postural compensations by correcting the cause of the compensation is key to successfully quietening down the system, getting rid of the sympathetic overload and allowing the person 'to get on with their life'

How can the way the teeth fit together have such a profound affect upon the health and wellbeing of the human body?

50% of the volume of all of the cranial nerves comes from the Cranial Nerve V - the Trigeminal Nerve. A huge amount of sensory and proprioceptive input is fed into the central nervous system every time the teeth are put together, relating the body's position in space. The CNS then processes this information and automatically adjusts the posture according to the feedback. When everything is aligned, the system quietens down. When it is not, there is a reflex cascade of muscle compensations that are made to maintain the balance of the body upright in space.

These compensations are automatic and immediate; it is controlled by the autonomic nervous system. As a temporary compensation, the human body is elegantly and exquisitely designed to handle this, but when the noxious feedback causing the compensation does not go away, the system goes into overload and the manifestation of the signs and symptoms of TMD begin to appear. The human body is eminently adaptable but it is not ultimately adaptable.

Charles Lindbergh flew off from San Diego on May 9, 1927, in the Spirit of St. Louis, headed for New York, and then non-stop to Paris.

Because a change in body posture will alter the way the teeth fit together and vice versa, TMD can be either primary or secondary. But it is still TMD and the symptoms will still manifest in the head and neck as discussed previously. The important thing is to diagnose the root cause of the TMD, correct it and if necessary, support the structural defect longterm to prevent the recurrence of symptoms. If the problem is diagnosed and corrected early enough, intervention is minimal and less costly for the patient. If the problem is long-standing due to a delayed diagnosis or seeking help, the teeth can not only be the cause but also become the victim of the underlying structural problem and may require longterm rehabilitation once the TMD symptomology has been corrected.

In closing, these signs and symptoms are just the tip of the iceberg of the complexity with which a patient may seek care. To believe that someone presenting with these manifestations makes TMD a psychosocial issue is naïve at best, but arrogant at worst. To think that a lifetime of drugs and pain management classes is the best we can do for sufferers is a sad indictment upon the medical and dental professions. The reality is we are in an excellent position to take care of many of these structural defects that has led to the manifestation of the syndrome of TMD.

I encourage all true dental professionals to develop their understanding of TMD and how it can be helped through the application of the principles of neuromuscular dentistry, anatomy and physiology and dental sleep medicine.

LVI and the IACA are at the cutting edge of bringing all these disciplines, and more, together for the best outcomes for your patients. If you truly are a professional, not trapped by the dogma of other people's thinking, a whole new world is about to open up for you.

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The Value of Continuing Education for Dentists

By: Dr. Prabu Raman • *Current IACA President*

When I received my license to practice dentistry in 1983, I had just started a scratch practice in Kansas City. The Missouri Dental board did not require any continuing education to maintain that license. Once one learned "all there is to know" in dental schools to pass the boards, there was no further mandated requirement to learn. However, continuing education programs were offered to meet the needs of those that wanted to improve their knowledge. A large number of dentists, however, did not take any CE since they were not "required" to do so. The statutes changed a few years later requiring 75 CE units every 3 years.

But even in 1983, there were some dentists that regularly attended Continuing Education programs. Who were these dentists that took CE when they were not "required" by the state and why did they do that? What was the common denominator? Why did I join these dentists and take 100 CE units or more per year as a start up solo-practitioner? The answers are just as relevant today as they were nearly 30 years ago. These dentists looked at their license to practice dentistry as a "license to learn." They had the reputation as the "best dentists" and it was natural for me to "model" them since I wanted to be the best at what I do.

Dentists are famous for falling for investment schemes that promise unbelievable rates of return on their investments.

The best advice that I ever received on investments is to invest in things that I understood rather than esoteric 'investment vehicles'.

What do we, as dentists, understand better than our own profession? What is the highest value asset all of us have in our own portfolios? It is our ability – our knowledge – to deliver the highest value dental services and produce a high level of income year after year, of course. How do we increase that ability besides continually taking more quality continuing education?

You could think "Why bother learning advanced techniques because there is not a market for those services in my town." In this "new economy" with around 10% unemployment, "routine" dental care is often postponed. But care related to solving or preventing TMD pain symptoms is a different story. You might be surprised to know that if you have the ability to provide complex services that are life changing, people find a way to pay for it even when there is no insurance coverage to help them. Dentists from small towns to big cities are successfully providing these services.

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You could say that even if there is a demand for advanced services, I am not likely to do it all the time. René Daumal said "You cannot stay on the summit forever; you have to come down again. So why bother in the first place? Just this: What is above knows what is below, but what is below does not know what is above.... There is an art of conducting oneself in the lower regions by the memory of what one saw higher up." Once you have learned to treat complex cases, then you approach all cases from an improved perspective.

Once you decide to adopt this attitude of "constant and never ending improvement" as Tony Robbins describes it, how do you decide on the source of this continuing education? There are many factors to consider.

One that many think of first is the dollar cost of the courses or training. While this is a valid consideration, is it possible to focus on the "price" instead of the "quality" or "return?" 19th century English author, John Ruskin said, "There is scarcely anything in the world that some man cannot make a little worse, and sell a little more cheaply.

The person who buys on price alone is this man's lawful prey." So it is important that "quality" and not "price" is the primary consideration in choosing where to get your CE.

The original idea of the four people who founded SeaWorld San Diego was to build an underwater restaurant.

Another consideration is congruent and comprehensive offering of courses. Does the CE meeting provide courses in fundamental practice and occlusion philosophies? How about courses on Practice Management, Team Development, Orthodontics, Adhesive Dentistry, Cosmetic Restorative Dentistry, Implants, Lasers, Periodontics, Endodontics, Temporomandibular Dysfunction, Sleep Disordered Breathing, Physical Therapy, Chiropractic, Anatomy & Physiology and more? Most importantly, what about the communication skills to match the high level of technical skills? If the patient does not perceive the value for your skills through high level communication, all the technical capabilities would not be put to use. If you get CE from so many varied sources with different philosophies and try to mold together to make it work in practice, it is a challenge, at best. In reality, such a hodge-podge of techniques and methods without a congruent core practice philosophy yield disappointing results.

While WalMart and Nordstom's are successful businesses, the facility, sales associates, packaging, communication are NOT inter-changeable between them. One is not necessarily better or worse, but they are simply different.

ask Heidi

Q

Dear Heidi,

What is a must see attraction in San Diego? I realize there is so much to do there, but what do you suggest that my family would enjoy?
Thank you for your suggestions,

Dr. Delgato
Ohio

A

Dear Dr. Delgato,

That is a tough question since there are so many different things to do and see in San Diego. Because I do not know your personal interests, ages of your children, etc. - I will just share my favorite places. Seaworld is always amazing for the young and the old alike. I never tire of seeing the shows and checking out the behind the scenes tours. The San Diego Zoo and Wild Animal Park are also amazing. Rated as one of the top zoos in America, it is a lovely way to spend the afternoon. An excellent way to see the entire city is to take an Old Town Trolley Tour. You can hop on and off at any of the stops and see so many areas of this fun city! Also, check out one of the many beautiful beaches San Diego has to offer! For more ideas surf the web on www.101sandiego.com. Have fun sightseeing!

Heidi

Q

Dear Heidi,

When my team and I attend a dental meeting we come back all fired up about what we have just learned. After a week of being back in the office, I find we just go back to normal and almost forget about implementing what we have just learned. Our intentions are good, but the business of "work as usual" kind of keeps us at a standstill. Can you please make some suggestions as to how we can incorporate things we learn after a meeting in a timely manner?

Thank you for your feedback,

Dr. Rosenblume
North Carolina

A

Dear Dr. Rosenblume,

This used to happen to me all the time. I'd take my team to a lecture, we'd talk about all the great things we wanted to do when we got back into the office, and then Monday morning hit and we never 'got around' to utilizing any of the things we just learned. Here are some tips I have learned thru the years that might help you:

1. Divide and conquer. Decide what lectures are the best for each individual team member to attend and split them up so you learn as much as you can from a meeting.
2. Every team member needs to take lecture notes on important things they have learned and want to share with rest of the team.
3. After returning from the meeting have a set time in your schedule (I'd suggest a 2 hour lunch in the office), and have each team member present what they have learned.
4. Decide what you want to integrate into your office, delegate tasks on how to achieve these things and then give your team the A-OK to get things rolling.
5. In future team meeting, follow-up on the status of these projects.

Hope this gets the ball rolling for you,

Heidi

Q

Dear Heidi,

Every year my team and I come up with an incentive to reach our yearly production and collection goals. Our 2010 incentive was to attend the 2011 IACA in sunny SAN DIEGO! Suffice it to say, we reached our goals, in fact we surpassed them (which is huge in this economy!) so we are headed out West! I know your column is used to ASK/ANSWER questions, but I just wanted to write and say THANK YOU for everyone involved in the IACA! It has given us a fun way to challenge ourselves and we plan on having a great learning experience together as a team.

Dr. Kimbal
New York

A

Dear Dr. Kimbal,

As this issue of Visions is focusing on the IACA and the importance of continuing education, I thought your comments would fit right in! Thank you for sharing the fun way that you incentivize your team. Not only will you have an awesome time... in one of my FAVORITE cities, but you will all learn so much from the excellent lectures. I hope to see you and your team there!

Heidi

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THE VERBAL AND CLINICAL TOOLS TO DIG THEIR WAY OUT.

BLOODY PROPHIES, TIME MANAGEMENT, CASE PRESENTATION,
AND CLOSING SKILLS ALL HAVE FLASHING **RED** LIGHTS AIMED AT YOUR **HYGIENIST.**

HYGIENISTS LIVE IN PERIO-LAND RIMMED BY **RED** VALLEYS IN THEIR PATIENTS' MOUTHS.

Jill Taylor, RDH

Their reality is they are trying to fix the patient's disease in their allotted hour, but with little success. They barely have time to clean teeth during that blood bath of an hour and then think to themselves that "next time I will remember to talk about that old metal mercury filling". The patients leave believing they are healthy, meanwhile their restorative work is still pending and the perio department is now running at a loss.

Hygienists are good clinicians, but can they become GREAT clinicians? Take a closer look at the insurance billing of the prophy code 1110 and the root planing code 4341 for the last year and the reality will be clear. By charging out only 5-10% of the codes as therapy, the hygiene department is running in a **RED** scenario.

"You are only bleeding a "little bit" and "Go home and floss more and we will check you in 6 months", are the typical comments I hear when I am in an office coaching for a more focused perio philosophy. If the hygiene department is billing over 20% of it's procedures as a 1110, the patient is leaving thinking they are healthy when statistics show they are far from it. In 2006 the ADA reported more than 80% of the adult population has active periodontal disease. When a hygiene department is helping to fight this disease process proactively, 4 out of those 8 hours of hygiene at least should be spent doing therapy! By diagnosing more perio, there will be an increase in healthier, value driven patients. These patients show up for their appointments once they are finished with therapy, since the hygienists have time to further educate them in maintaining their disease in remission. *They are now "In the Pink" with tight, sexy gums!*

Keeping hygienists in a practice involves a huge overhead, and is the largest salary besides the dentist. If the dentist has pre-blocked their schedule to meet their bottom line, what would be the goal for the hygiene department? I have seen practices billing out 7 prophies in 8 hours. This can't even meet the minimum needed to support the hygienists' salaries. Having well-trained hygienists and team to discover the active perio in a practice is key to leveraging the practice to meet economic demands in today's economy. I recently worked with a dentist that has two well-trained hygienists and is now seeing 22% perio therapy, significantly up from 5% last year. He had to take out a loan the prior year to cover his overhead and payroll costs, and now finds that his perio department is helping cover the day to day costs of running his practice.

Once hygienists have more advanced verbal and clinical skills, they can climb their way out of seeing **RED**. Active therapy allows the hygienists to discuss restorative needs specific in the area they are working on, which will contribute to the overall health of both the patient and the practice. In a bloody prophy, it's hard for the patient to see the value of replacing that old gold crown which appears to be functioning fine, that is if the hygienist even has the chance to bring it up! If the patient is *"in the Pink"*, the hygienist has time to show them the gold crown is the culprit because it's the only area in the mouth that continues to bleed and therefore needs to be replaced. With healthy tissue, they have more time to assess and suggest more aesthetic restorative treatment out of their hygiene room. Hygienists are much more apt to "see" Restorative-Land when their Perio-Land is *"in the Pink"*. Their restorative discussions increase once they are maintaining health and are no longer trying to fix that **RED** Sea of disease in the patient's mouth.

The ultimate goal of dentists is comprehensive care. Dentists have an incredible passion for Restorative-Land and must constantly be forced to return to Perio-Land when pursuing the comprehensive care they want to deliver to their patients. Having a well-focused perio department will not only add value for their patients, but it will increase the bottom line of both restorative and perio.

the question is: is your practice in the pink?

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PARADIGM SHIFT REGARDING BONE

One of the most stressful situations as a dentist is when our patient has any sort of osseous issues. Based on past experience, we know that if we have to contour bone most likely we will have to outsource the procedure, it is going to hurt the patient and most likely not get vertical bone growth. The implementation of all-tissue laser technology in dentistry has dramatically changed how we now deal with these various osseous situations. Why is this? Can it really be done easily, predictably and without discomfort for the patient by a general dentist? The answer to all of these questions is yes and here is why.

- **All-tissue lasers cut by non-contact surface ablation, no smear layer or micro fractures.**
- **All-tissue lasers can be calibrated to remove only 2-5 cell layers per pulse of energy which limits discomfort.**
- **All-tissue lasers reduce bacteria and cross contamination.**
- **All-tissue lasers have bio-modulation properties that expedite healing and growth at a cellular level.**
- **All-tissue lasers cut with water reducing the nominal thermal energy that is present.**

All these factors make dealing with osseous issues completely different than with "traditional" modalities. Here are just a few osseous applications that are much more predictable to do with All-tissue lasers:

- **Hard Tissue Crown Lengthening/Aveloplasty without Extraction**
  From aesthetics, crown and bridge, and lesions/fractures below the bone, many times we need to create 1-2 mm of biological width. With the laser, in most cases, this can now be done without a flap.
- **Periodontal Defects & Furcations**
  On some of the minor furcations and defects, all-tissue lasers make these cases much more straightforward, conservative, and clean for the general dentist, making it more predictable and pain-free than in the past.
- **Implants & Bone Grafting**
  All-tissue lasers can help with access to the osseotomy site and help remove smear layer for easier implant placement. Cleaning up tissue around salvageable implants is selective and clean. Also, using all-tissue lasers to cause bleeding on the cortical plate at a grafting site will start to heal much quicker, and patients will have much less post-operative pain.

Doing osseous procedures with all-tissue lasers is much more conservative, has nominal or no bleeding, heals in an expedited fashion, and patients respond very positively to these once feared procedures. Think of all the cases that were compromised, watched or referred out "pre" all-tissue laser. If general dentists just did two of these osseous cases a month at $750 per site, it would be an additional $18,000 in annual revenue for a practice in just these cases alone. Remember, All-tissue laser can be used on over 65 ADA codes, so when a practice simply adds a hand-full of other ADA codes, you can start to see adding $3,500 a month or over $42,000 to a practice annually is easily attainable for the average general dentist. All-tissue lasers can help you clinically while simultaneously having a positive effect on your practice's bottom line.

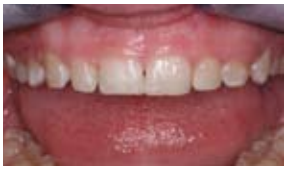
VALUE OF LASERS STRAIGHT FROM THE DOCTOR'S MOUTH

"My initial hesitation in getting the Versa Wave all-tissue laser was the cost as well as thinking that for many of the procedures I already have other things I can use such as a handpiece. Luckily I took the plunge and realized after a short learning curve how great it is to use the Versa Wave. With the great training and amazing support from Hoya I have been able to utilize the VersaWave to do treatments that otherwise I would have not attempted. It is a win-win situation with the clients getting great treatment and myself becoming more and more productive."
– Dr. Dan Haas, Erbium user for 2 years

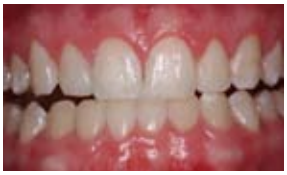
LASER CLINICAL SPOTLIGHT

By Sam Kherani, DDS, FAGD, LVIM, FICCMO

Closed Flap Osseous – Take the Case from Good To Great!



Before



After VersaWave Closed-Flap Osseous on #6-11

A paradigm shift has occurred in aesthetic dentistry. In the past, we used to be limited to the patient's boney architecture when contouring tissue. Resulting architecture may not have been optimal based on natures golden proportion, or 1/1.6 ratio we are striving for, but with the implementation of all-tissue lasers, we can now create these optimal proportions without a flap! Being the LVI Clinical director, we do hundreds of aesthetic cases a year. Since implementing the all-tissue laser 3 years ago, on average 25% of the cases require closed flap osseous to take our cases from good to great. For a detailed video on this procedure, go to *www.lvivisions.com/Sam_Closed%20Flap%20All_384K_Stream.wmv,* where I do a 10 minute overview of the procedure in detail. There will also be a detailed breakout at the IACA in San Diego.

LASER FACTS

Laser on Bone

"Low speed bur osteotomy leaves an altered layer approx 24 µm thick which delayed bone healing up to 7 days. Erbium-YAG osteotomy showed earlier bone repair with advanced bone healing at 7 and 14 days versus the bur-treated sites."
Lasers Med. Science 2007, Elaine Duarte Artuso de Mello, et al, Brazil

"The Er:YAG laser irradiation can be safely and effectively utilized in periodontal flap surgery and has the potential to promote new bone formation through a biostimulation effect."
Lasers Surg. Med. 38:314-324, 2006, Koji Mizutani, et al Tokyo Medical and Dental University

UPCOMING LASER TRAINING AT LVI

April, 2011
1-2, *Laser Standard Proficiency Course (& Nov 18-19)*
27-29, Core 7 *"Advanced Laser Procedures & How to Increase Revenue with your Laser"*

May, 2011
4-6, Core 2 *"Dental Laser Overview, it is more than diodes"*
4-6, Core 5 *"Laser Technique Training"*
19-20, *HOYA ConBio – Introductory All-Tissue Laser Training*
21, *HOYA ConBio – Advanced All-Tissue Laser Training*
25-27, Core 7 *"Hands-on Laser Workshop"*

June, 2011
16, *Laser Component in LVI Hygiene Program*
22-24, *Implant 1 "Lasers with Implants"*
26-28, *Implant 2 "Laser Hands-on"*

July, 2011
28, *IACA Laser Breakout "How to Do Laser Closed Flap Osseous"*

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Low Level Laser Therapy

Not just Why, but How?

By Dr. Peter Pang, LVI Visiting Faculty, Laser Director

The dental profession has wrestled for centuries to overcome patient's fears and reduce anxiety associated with dental pain. We have evolved into a compassionate profession as we strive to be a positive influence to those we care for. The most successful practices seem to master "pain-less" dentistry and provide good "chair-side" manner. We have become experts in psychology choosing our words carefully. We use discretion and eliminate from plain sight syringes and other devices to avoid a cascade of anxious feelings in our client/patient. Available anesthetics and other medicaments continue to evolve with science and technology and so has laser dentistry. The information in this article is a glimpse of some information taught at the LVI Laser Program. The article will offer not just why, but how laser technology can benefit our practices and ultimately our client/patient.

Living tissues thrive on just the right amount of light. Ponder for a moment, a few examples of tissue and cellular interaction with light:

- Why does light affect the circadian rhythm and sleep?
- The gentle warmth of the morning sun in contrast to the heat of the mid-day sun.
- Plants that require just the right amount of light for chlorophyl production.
- How can the body's cells convert sunlight into Vit. D?

Just a few minutes of sunshine each day can make a difference. However, too much of a good thing and the result can be catastrophic—leathery weathered skin or skin cancer. Light's influence on living cells is termed PhotoBioModulation (PBM) and Low Level Laser Therapy (LLLT) is a form of PBM.

If you have taken my laser program you may remember, **"With the Right Light and the Right Time we can see extraordinary things".** The power of laser regeneration and healing was brought to the forefront by Dr. Heidi Dickerson's personal experience with low level laser therapy (LLLT). Please see related article in the previous issue of LVI Visions.[1] Many have asked why did the laser help and how does it work. Laser irradiation can aid in the regeneration of nerve tissue, collagen, and bone. Light therapy even has a place in TMD treatment and muscular disorders.

It is important to note that light doses and settings for LLLT are far below laser ablation parameters. For example, in a typical hygiene procedure we may use a 980nm laser, 0.5-0.8 W, 400 micron fiber (spot size) for 10 sec in a 6mm pocket. This would deliver a total light dosage of 5-8 Joules (396-634.9 J/cm2) in the pocket.

Compared to LLLT, typically measured in daily doses of 2-3 J/cm2 spread over 1-2 weeks. Animal studies have shown, total light dosages of 10-1,000 J are typical for LLLT. Effective doses can vary depending on tissue type. Instead of measuring Watts, LLLT works with thousandths of a Watt (mW).

Research studies have shown that crushed and severed nerves regenerate more rapidly following laser irradiation.[2,3] Others have inactivated neurons with potassium cyanide and were able to show that specific light can restore function through the uptake of cytochrome c oxidase.[4] Nerve regeneration has been demonstrated with both transcutaneous irradiation (through the skin and tissue) techniques as well as other experiments which directly irradiate the exposed and damaged nerve.

Surprisingly, laser irradiation peripherally, at the surgical site, has been shown to prevent or decrease

The key to LLLT success appears to be in early treatment and frequent treatment.

degeneration in corresponding motor neurons of the spinal cord.[5] Nerve tissue has been analyzed with protein tracers such as tetramethylrhodamine biotinylated dextran (mini-ruby)2 and horse radish peroxidase3 to determine the time period of new axonal growth. This is exciting work with obvious applications for spinal cord injuries. Studies have shown that laser irradiation can stimulate the proliferation of Schwann cells[6], macrophages[7] involved with Wallerian degeneration, and fibroblasts[8] which provide the collagen fibril structure for the nerve. Consequently, multiple mechanisms of action are responsible for LLLT effects on peripheral nerve regeneration. [9, 10]

Different wavelengths, times and settings for optimal nerve regeneration have been studied. Allthough most laser groups have shown promise, certain wavelengths and settings work better than others. We have taught that absorption is the primary interaction regarding laser tissue effects. This is true as far as surgical procedures are concerned. Basic laser use dictates that for optimal tissue interaction, matching the wavelength to the target chromophore is the primary goal. However, if PBM and LLLT is our treatment goal, scattering will play an important role as well. Therefore, wavelengths that offer deeper tissue effects will be more effective. Typically, these wavelengths can be found in the 400-1000nm range. This region of the electromagnetic spectrum is termed the visible to near-infrared region. As the beam attenuates, photons are scattered in every direction, contributing to further absorption deeper within the tissue. Consequently, most of the LLLT research and studies involve laser wavelengths in the visible and near-infrared regions. However, when used appropriately, every laser device can offer enhanced cellular metabolism. [11] For example, bone has been shown to heal faster and with less complications when compared to conventional bur with the use of the Er:YAG laser. [12]

The mechanism for this seemingly miraculous healing has been reported to be found within the tiniest organelles within the cells—the mitochondria. With the appropriate type of light (laser wavelength) and the right time, ATP synthesis is enhanced providing fuel for the cells to thrive. When the cells thrive, healing and regeneration occurs more readily. In addition, LLLT has been shown to enhance growth factors and BMP's.

- Initial bone healing following Er:YAG laser irradiation occurred faster than after mechanical bur drilling and CO2 laser irradiation—Pourzarandian, Hisashi, Watanabe, Aoki, Ichinose, Sasaki, Nitta, Ishikawa. Histological and TEM Examination of Early Stages of Bone Healing after Er:YAG Laser Irradiation. Photomedicine and Laser Surgery 2004;22(4):342–350.
- LLLT with 830nm diode laser increased bone morphogenic protein expression and bone mineralization—Fujimoto K, Kiyosaki T, Mitsui N, Mayahara K, Omasa S, Suzuki N, Shimizu N. Low-Intensity Laser Irradiation Stimulates Mineralization via Increased BMPs in MC3T3-E1 Cells. Lasers Surg Med 2010;42:519-526.
- Gingival incisions heal faster with LLLT—Neiburger E. Rapid healing of gingival incisions by the helium-neon diode laser. J Massachusetts Dent Society 1999;48(1):8-13,40.
- Gingival inflamation is reduced, enhanced healing and increased growth factors—
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- Mitochondria stimulation, enhanced ATP synthesis with LLLT--
    1. Tunér J, Hode L. Laser therapy: Clinical practice and scientific background. Sweden: Prima Books AB, 2002: Ch. 3 Biostimulation pp 61-114 and Ch. 11 The mechanisms pp. 333-364.

We have often heard,
"if it can't be measured
it can't be proven".

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3. Karu T. Ten lectures on basic science of laser phototherapy. Grängesberg, Sweden: Prima Books, 2007.

On a more practical standpoint—what are the settings? How is it accomplished? Unfortunately, it's not that simple—it depends on what you want to do and your lasers' wavelength. However, all lasers can provide some benefits often reflected in our patient's smile and referrals. Do not forget basic laser physics and pay attention to what chromophores are in the region of laser treatment. Safety is paramount to avoid complications. If in doubt, why not take an update course?

If the clinician does not have a dedicated LLLT device, a typical CI. IV laser in a gated mode (pulsed) may provide powers in the 0.2-0.5W. In addition, using the device in a defocused mode will increase the spot size and reduce the fluence more appropriate for LLLT.

The key to LLLT success appears to be in early treatment and frequent treatment. Most researchers advocate daily or several times/ week of laser irradiation with treatment times not lasting more than 2-3 minutes. CI. IV lasers should be placed to minimal settings and larger spot sizes. Lower peak powers appear to be better. Of course, these guidelines will vary depending on the diagnosis and exact nature of treatment goals. Research is ongoing and the future is bright!

In summary, laser procedures heal more comfortably and with less need for prescription medications when compared to conventional bur, scalpel and electrosurgery.

Although typically discredited as anecdotal, there are several mechanisms responsible for laser benefits including: direct stimulation of ATP synthesis within the mitochondria, RNA and DNA production, increased growth factors, reduction of bacteria and increased microcirculation, bypassing the inflamatory process. [10]

We have often heard, "if it can't be measured it can't be proven". In several research studies, animals were euthanised to show results and test theories, obviously eliminating any placebo effect. Let us hope that these sacrifices can be used to benefit humanity. Although promising, the work must continue with additional random clinical trials in keeping with research protocols. I have been blessed to work with dentists all over the world. Through my experiences, I have found that new laser users begin with simple soft tissue procedures and often do not continue to evolve and learn beyond that. This is unfortunate, since laser use has been shown to enhance every aspect of dentistry including restorative, endodontics, periodontics, orthodontics and implantology. Light therapy has also been found to aid TMD treatment and muscular disorders. [13, 14, 15, 16]

Reducing bacteria, inflamation and promoting healing are hallmarks of achieving success in dental treatment. Like any high-tech device, lasers continue to evolve for the benefit of our patients. Quality continuing education is key to remaining current, especially with the exponential advances of the high-tech world.

Peter Pang's Upcoming Courses at LVI Global
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San Diego California is the seventh largest city in the United States.

The Complete Dental Practice:

5 Steps to Balance

By: Brad Durham DMD, LVIM

As I sit on a plane flying back to my home town of Savannah GA, after spending the weekend with a group of dentists, I am reflecting on our time together. Some of the dentists were LVI graduates, some were not. Some were NM trained, and some were not. All were very experienced, very successful by any standard, but all were so very different from each other in that some had more “complete practices” than the remainder of the group. In my career of being a dentist, of being a teacher, and of being a coach I have seen a lot of practices. Let’s take a look at the components that make a practice special and what makes for a complete dentist.

If you could divide a practice up into its component pieces it would probably include the categories of leadership, marketing, management, sales and technical skills. Most dentists look for the one magic bullet, the one pearl, or the one secret weapon that will give them the practice they desire. The truth be told, it does not exist. A practice needs to be balanced in all the mentioned areas. Any one weak area is like a weak link in a chain… the entire chain fails.

Let's take a look at the components that make a practice special and what makes for a complete dentist.

Leadership: Without leadership, nothing happens. I am amazed how many dentists are such poor leaders. If you don't lead, your practice simply wanders around in no particular direction, randomly ending up who knows where by the end of your career. Lack of leadership is easily the number one crisis in a dental practice. More dentists spend more time planning their vacation than planning their career. How cool would it be to know where you were going to be in 5, 10 and 20 years, how you were going to get there, and then being along for the ride! I would not take my boat out on unfamiliar waters without a plan, why would someone not exercise the same amount of planning with their career. Leadership is a trainable trait, fueled by passion. What excites you about dentistry? What do you want your practice to look like next year? If you don't know, I have some bad news for you… it won't happen by itself! Learn to lead! It is a lot easier than following! "Only the lead dog gets a change of scenery!"

Management: The role of management is to implement the plan created by leadership. I am a pretty good leader, but a poor manager. Getting bogged down with why something isn't getting done, along with the same old staff issues, is pretty frustrating. It is easily the number one complaint and major frustration of most dentists. Perhaps you can delegate the management, but you can't delegate the leadership. You have to check on or inspect what you expect. We use a series of checklists to help each team member manage themselves as well as help "us" manage them. Systems also create consistency in management. Systems can be used to control "the big 3" in your practice… relationships (your patient base), time (your appointment book), and your finances (financial arrangements and payables). Each of "the big 3" has its own contribution to the whole and must be managed optimally for a successful practice.

Marketing: In the age of external marketing, it still pays to maximize your internal marketing opportunities. Treating people well and earning referrals will always be the primary focus. Developing a brand or simply how your practice is known in the community will be your platform from which you will be judged. It will also be the platform from which you can enter the arena of external marketing. If you are an LVI student, you are trained to do some pretty advanced dentistry. Who will know what you can do and who will benefit from your services unless you tell people? Most dentists fail at marketing by not building and leveraging their brand. This is usually because they do not hire competent help. A dentist who composes his own ads typically will create ads that attract dentists. Let's face it, we don't know a lot about image and advertising. Develop a marketing program, fund it, and run it continuously without cutting it on and off. Monitor your results and adjust your message and placement for even more improved results. Having a well run marketing program is a lot of work but a magical thing indeed!

Most dentists look for the one magic bullet, the one pearl, or the one secret weapon that will give them the practice they desire. The truth be told, it does not exist.

Sales: We have all heard it before… "nothing happens until the patient says yes". It is of utmost importance to have a well defined method of examination, education, communication, and motivation process in your practice. Whether you focus on new patients or storing patients in your hygiene system until their need arises for some dentistry, a well defined process is necessary for practice success. This done properly in a relationship based setting is extremely powerful. Some dentists are too pushy; some dentists are on the other end of the spectrum. We focus on dealing with the right patient. If you have a patient in the office who naturally wants what you have to offer, all you have to do is simply give it to them! Nothing is more important in successful practices than working with the right patient, and the right patient is the one who not only needs what you provide, but also wants it.

Technical Skills: Please note that I placed technical skills last in this sequence. Not because it is least important, but because it is certainly not the most important! Most dentists focus too much energy on learning technical skills without focusing on how to get the right patient in the office and then properly enrolling them into treatment. Learning how to do full mouth NM dentistry in a practice that is "branded" as an average insurance based emergency dental practice will do little more than rack up a lot of CE credits! Most dentists focus on technical skills alone and forget about the other pieces of the puzzle. What is even more of a tragedy is most dentists never implement the knowledge they are "learning". If you think I am not talking to you, go to the special place you keep your CE library and randomly pick up some of the material… are you using it on a routine basis? Dentists love technical CE but have a hard time implementing it because of a weakness in some of the other areas I have mentioned. Weak leadership forgets to tell the poor management that the intent is to implement the CE. If the leadership and management do their jobs, marketing and sales have not delivered the proper patients and motivated them to say yes. Having all the pieces of "the big 3" puzzle together is critical for becoming the Complete Dentist.

What is the solution? I am glad you asked! First honestly rate yourself how well you have done in the 5 categories. Focus on improving the lowest rated area first. Get training, help, coaching to improve your weak areas.

Once you have an idea of your weak points, and have corrected them, focus on CE, information, and/or coaching that hits all 5 areas evenly. My suggestion is that if you improve one area of your practice, you also improve the other 4 areas at the same time and in the same fashion. All 5 areas support each other. Look for information that is bundled to do this.

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THE *Keys* TO

Understanding NM, OSA and PPM Philosophy

PART IV | *Introduction to Tooth Eruption*

Norman Thomas BDS; MBBSc; PhD; FRCD; FADI; AAOMFPath; DAAPM; Cert MedAc; MICCMO
Director of NM Research LVIADS USA

Now that we have advanced to Part IV of the 'Keys to Understanding NM, OSA and PPM" allow me to enquire if the reader is able to envisage a common denominator between the following conditions: Edentulous and Partially Edentulous status, Complete or Partial Anodontia, Cleidocranial Dysostosis, Hypothyroidism, Ectodermal Dysplasia, Ehler's Danlos Syndrome, OSA, Myofascial Pain Dysfunction, Musculoskeletal Disorders, Collagen disorders, Mucopolysaccharidosis, Marfan's Syndrome (Abraham Lincoln), Lathyrism and TMD? Yes of course they are all abnormal dental conditions, but apart from that they all produce Neuromuscular Fatigue due to loss of vertical dimension and thus point up NMD/TMD as the Great Impostor.

In Parts I, II and III we saw that TMD is not simply a jaw joint click with or without pain, but a syndrome consisting of multiple musculo skeletal signs and symptoms including myofascial pain dysfunction, internal derangement, occlusal, craniofacial, postural anomalies, sleep apnea and nerve palsies such as those presented by the conditions listed above. It should therefore come as no surprise to the reader that TMD or more specifically NMD probably affects 99% of subjects living in industrialized areas of the world.

Weston Price DDS has previously demonstrated that the Inuit living on the ice floes are free of the signs and symptoms of TMD because they are not subjected to the effects of pollution, but as soon as they leave the ice floes and enter the industrial community

they suffer dental arch collapse with rampant caries and periodontal disease. While the accompanying chart (Fig 1) of musculoskeletal (TMD) signs and symptoms does not specifically list all of the health conditions afflicting industrial man, it is a broad list of signs and symptoms such as depressed Curve of Spee, malrelated dental arches, bicuspid drop off, lingually tilted molars (hypo-occlusion) and postural problems including Forward Head Posture (hypoxia) that are characterized by neuromuscular fatigue.

The most critical failure of the development of the occlusion in modern or post industrial man (hypo and hyper-occlusion) with resulting neuromuscular fatigue stems from combined anomalies of loss of periodontal support and delayed eruption. These anomalies can be shown to include altered relative sizes of the dental arches, restriction of the airway including that of the nasal, oral and pharyngeal volumes with resulting mouth breathing, tongue posturing, anterior or lateral tongue thrust and scoliosis both in man and animals (figures 2-12).

Cardiologists also recognize that cardiomyopathy is highly correlated with loss of periodontal health signified by high levels of C reactive protein. Obstructive sleep apnea that is associated with neuromuscular fatigue is also well known to be correlated with stroke (cerebrovascular accident), myocardial infarction, diabetes mellitus and hyper cholesterolemia. Leading pulmonologists and sleep physicians at Johns Hopkins Hospital connect neuromuscular fatigue of airway musculature with Obstructive Sleep Apnea (OSA).

Musculoskeletal – Occlusal Signs Exam Form

NAME
DATE
AGE

SYMPTOMS
1. ☐ Headaches
2. ☐ TMJ Pain
3. ☐ TMJ Noise
4. ☐ Limited Opening
5. ☐ Ear Congestion
6. ☐ Vertigo (Dizziness)
7. ☐ Tinnitus (Ringing in the Ears)
8. ☐ Dysphagia (Difficulty Swallowing)
9. ☐ Loose Teeth
10. ☐ Clenching / Bruxing
11. ☐ Facial Pain (Nonspecific)
12. ☐ Tender, Sensitive Teeth (Percussion)
13. ☐ Difficulty Chewing
14. ☐ Cervical Pain
15. ☐ Postural Problems
16. ☐ Paresthesia of Fingertips (Tingling)
17. ☐ Thermal Sensitivity (Hot and Cold)
18. ☐ Trigeminal Neuralgia
19. ☐ Bell's Palsy
20. ☐ Nervousness / Insomnia

SIGNS (Extra-oral)
1. ☐ Facial Asymmetry Bilaterally
2. ☐ Short Lower Third of the Face
3. ☐ Cheilitis
4. ☐ Abnormal Lip Posture
5. ☐ Deep Mentalis Crease
6. ☐ Dished-Out or Flat Labial Profile
7. ☐ Facial Edema
8. ☐ Mandibular Torticollis
9. ☐ Cervical Torticollis
10. ☐ Forward Head Posture (Lordosis)
11. ☐ Elongated Lower Face (Steep Mandibular Angle)
12. ☐ Speech Abnormalities

SIGNS (Intra-oral)
1. ☐ Crowded Lower Anteriors
2. ☐ Wear of Lower Anterior Teeth
3. ☐ Lingual Inclination of Lower Anteriors
4. ☐ Lingual Inclination of Upper Anteriors (Div. II Occlusion)
5. ☐ Bicuspid Drop Off
6. ☐ Depressed Curve of Spee
7. ☐ Lingually Tipped Lower Posteriors
8. ☐ Narrow Mandibular Arch
9. ☐ Narrow Maxillary Arch (High Palatal Vault)
10. ☐ Midline Discrepancy
11. ☐ Malrelated Dental Arches
12. ☐ Tooth Mobility
13. ☐ Flared Upper Anterior Teeth
14. ☐ Facets
15. ☐ Cervical Erosion (Abfractions)
16. ☐ Locked Upper Buccal Cusps
17. ☐ Fractured Cusps (Particularly Cl. I & II Non-functional Cusps)
18. ☐ Chipped Anterior Teeth
19. ☐ Loss of Molars
20. ☐ Open Interproximal Contacts
21. ☐ Unexplained Gingival Inflammation and Hypertrophy
22. ☐ Crossbite
23. ☐ Anterior Open Bite
24. ☐ Anterior Tongue Thrust
25. ☐ Lateral Tongue Thrust
26. ☐ Scalloping of the Lateral Border of the Tongue

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Figure 1 - Musculoskeletal Signs and Symptoms due to muscle and nerve entrapment in TMD- THE GREAT IMPOSTOR

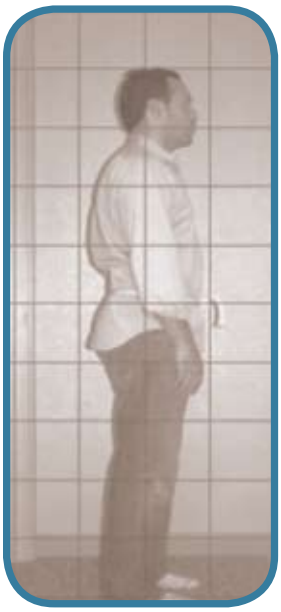

Figure 2 - Scoliosis with Thoracic Kyphosis, Lumbar Hyperlordosis and Forward head Posture with Airway Restriction and resulting occlusal dysharmony

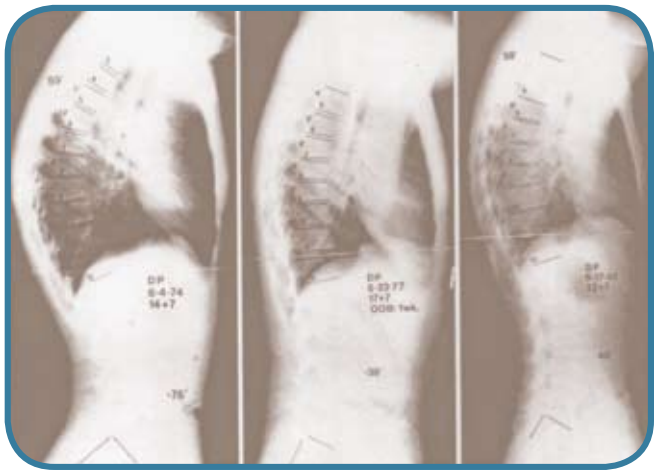

Figure 3 - Radiological studies on the stages of pre and post Treatment of Scoliosis in man using a TENs orthotic

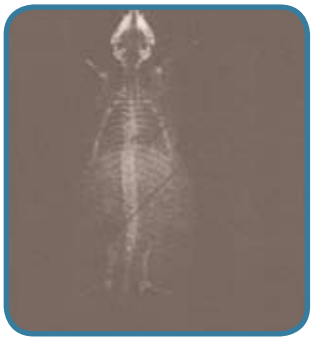

Figure 4 - Control Rat radiograph no scoliosis prior to production of Experimental lathyrism

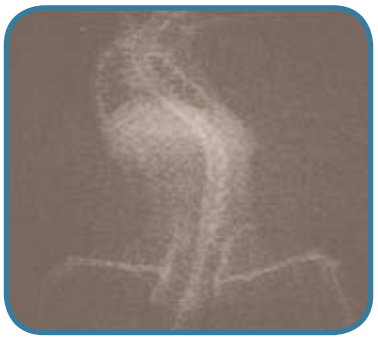

Figure 5 - Note the scoliotic spine in Lathyrism

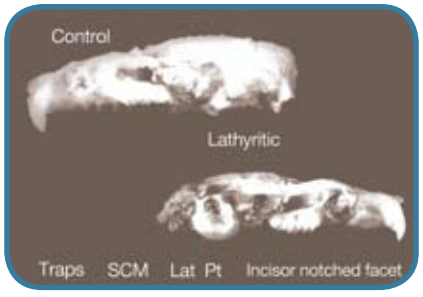

Figure 6 - 53 day old control (C) rat above and lathyritic (L) below. Note in the lathyritic rat retarded eruption of the teeth with perforation of the bone overlying the incisor apex, abnormal bruxofacets of the incisor, bony exostoses of the trapezius (traps), sternomastoid (scm),and lateral pterygoid (Lat P) muscles in the lathyritic rat. The tympanic bulb is enlarged, a connect with tinnitus etc. in TMD.

All of the above conditions as well as the signs and symptoms in patients with musculoskeletal listed in Figure 1 including paralysis like facial palsy, paresthesia in the fingers and toes and readily produced in man and animals by pollution of their diet with a lathyrogen from the plant Lathyrus Odoratus which may be thought of as a model of TMD and MPD. The chemical found within the Lathyrus sweetpea is a specific inhibitor of collagen crosslinking and has been identified as Beta aminoproprionitrile (BAPN) and alpha aminoacetonitrile (AAN). Feeding a bi product of penicillin known as penicillamine (cupramine) will also produce lathyrism and is used therapeutically to treat hypertensive connective tissue as in Dupuytren's contracture of the palm of the hand, which is an autosomal dominant genetic disease with variable penetrance and though its precise pathogenesis is unknown it occurs most often in diabetes mellitus and alcoholism.

But lathyrism like TMD is in essence a condition characterized by loss of connective tissue support throughout the body including lack of periodontal support, crowding of the dentition as well as posturing of the tongue and cheek between the teeth to assist the airway presenting as a scalloped tongue and pronounced linea alba in the buccal mucosa. Thus we are looking at a very extensive condition not correctly designated as a psychosomatic illness that is untreated by neglect or a flatline splint as AADR has recently published much to the disdain of clinicians who readily treat the condition by muscle relaxation and orthotics to the resulting true resting posture.

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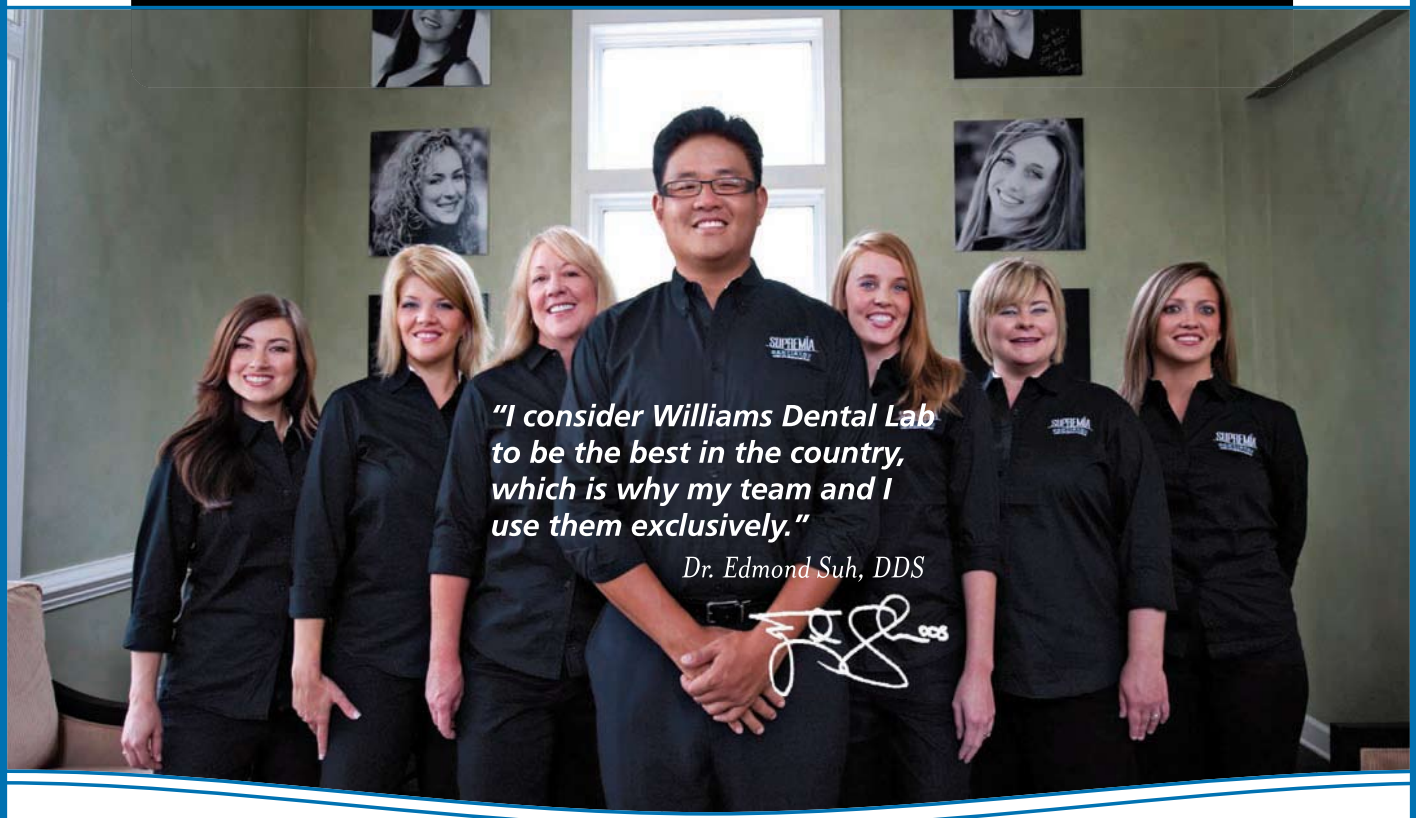

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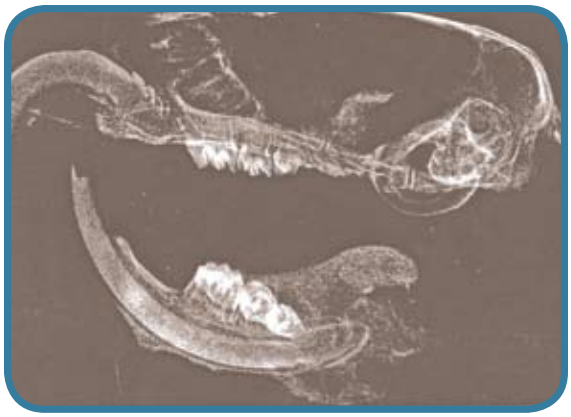

Figure 7 - Lathyritic Rat showing exostoses at muscle insertions,retarded eruption with dilacerations of the roots, abnormal bruxofacets and thickened periodontium

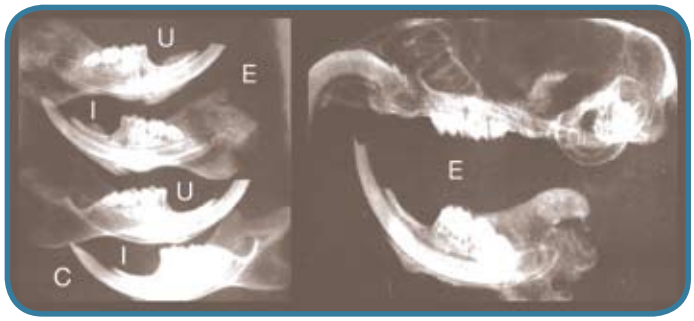

Figure 8 - Muscle insertions in lathyrism and dilacerated teeth apices

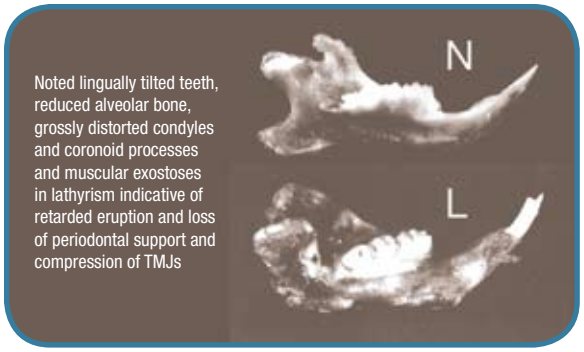

Figure 9 - Mandible of Normal rat (N) compared with that of a Lathyritic (L) rat

The posturing of the tongue and cheek between the teeth of lathyritic patients is ubiquitous in lathyrism among indigent communities of the world because it is more economical than other cereals and is a fatal condition. Lathyrism also impedes the eruption of the teeth and gives rise to malrelated and size discrepancy of the alveolar processes and dental arches. Unimpeded and impeded eruption also occurs when the teeth are either in or out of occlusion as in patients provided with an incomplete orthosis such as an NTI appliance.

E Hovarth DDS; PhD (1972) produced similar developmental anomalies of the jaws, head and neck as well as malocclusion of the dentition and disrupted supportive periodontal and alveolar tissues by restricting breathing through the nose by application of nose plugs, which promoted mouth breathing.

Such then is the complexity of morphological and functional findings in MPD and TMD that it has become known as the Grand Impostor because it mimics the signs and symptoms of many distinct and apparently separate pathological entities. I say ‘apparently’ because the fundamental lesion of neuromuscular fatigue is not understood to be pathognomonic of all of these different conditions. Thus my purpose in bringing the condition of lathyrism to clinician’s mind because lathyrism is also an unrecognized Great Impostor as C1 compounds products of redox metabolism in the body are an essential part of the crosslinking process. Thus we see the connection of lathyrism to wound healing and its occurrence as in scurvy in which limits in the supply of vitamin C prevents the function of prolyl hydroxylation of collagen proline to hydroxy proline a precursor for crosslinking of all collagens.

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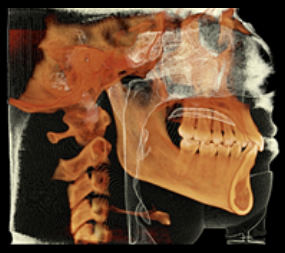

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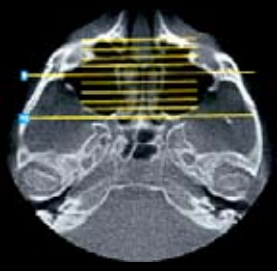
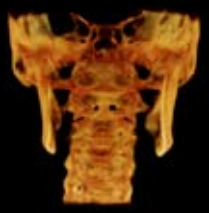


Paranasal Sinuses



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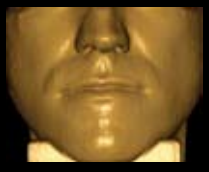

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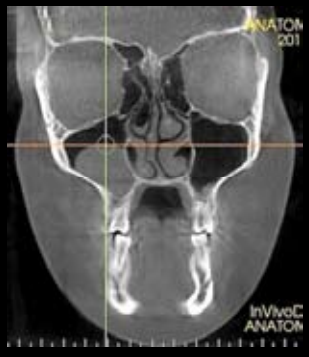
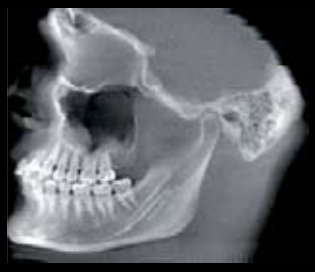
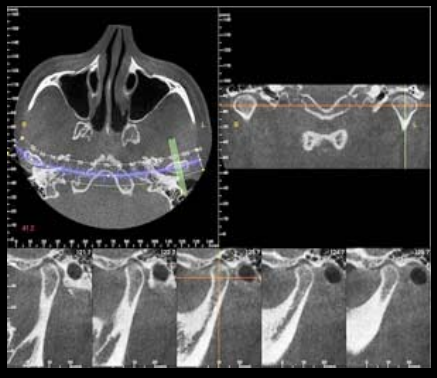


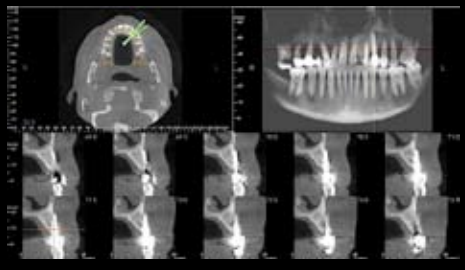
Maxillary Sinuses

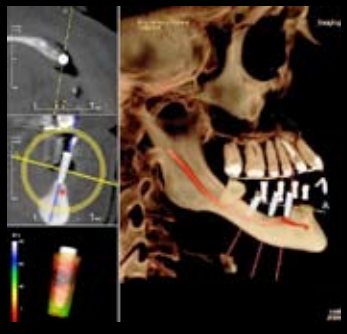


TMJ's, Maxillary Sinus Pseudocysts



TMJ's, Deviated Septums





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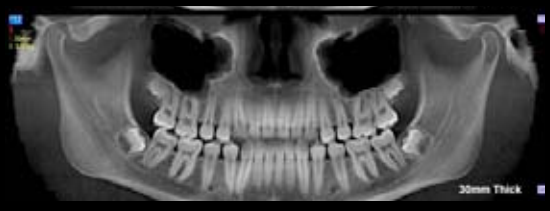

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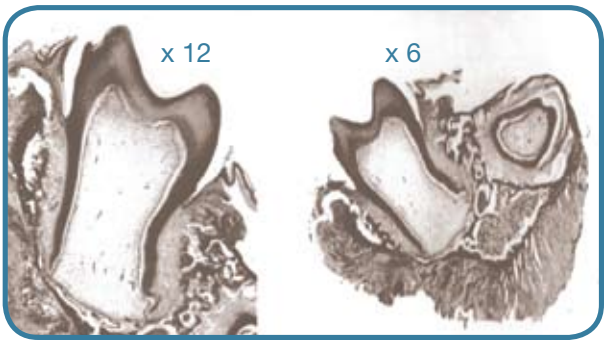

Figure 10 - Note lathyritic molar and incisor with dilaceration of traumatized roots with adaptive thickening of the traumatized periodontium and no fundic bone between nerve canal and tooth due to loss of periodontal support and cessation of active eruption

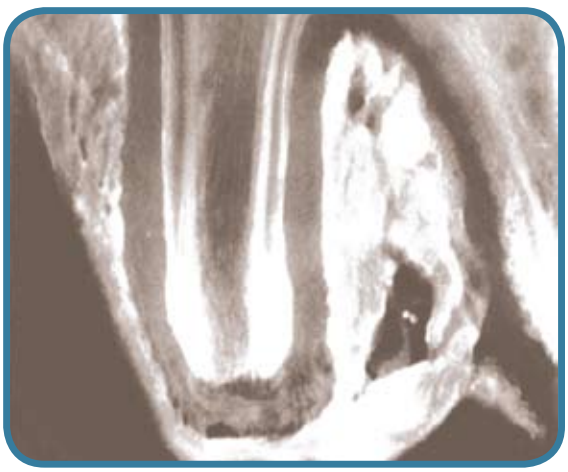

Figure 12 - Normal healthy rat molar normal thickness of the periodontium with fundic bone and no root dilaceration

Thus we are lead to conclude that postural imbalances of the head and neck designated as “Top Block” disharmony is always associated with collagen formation and crosslinking. But in TMD the muscles responsible for maintaining tone connect to bone by collagen and the fibroblasts and fibromyoblasts in the periodontium connect to the extracellular collagen by intracellular actin at fibronectin (mucopolysaccharide) sites and contribute to the tone of collagen in the periodontium. Studies have shown that the fibroblasts are under the same neural control as the muscle spindles in the craniomandibulocervical apparatus. Thus lathyrism is an excellent model for studying TMD.

In figures 2 and 3 we see a patient with scoliosis prior to and following successful treatment by an occlusal orthotic which is produced by TENs relaxation of fatigued musculature to true physiological rest that operates at the craniocervical masticatory muscle and periodontal fibromyoblast level. Remember the same trigeminal and cervical sympathetic nerves supply the periodontium and the cervico masticatory musculature (the latter will be shown in the next issue of Visions).

In figures 4-10 we observe the effects of lathyrogen o.3% in the drinking water on a normal healthy skeleton (fig 4) to produce scoliosis seen in fig 5. In Figures 6-10 we are introduced to the effects of lathyrism on the craniomandibular apparatus. In figure 6, we note exostoses in the lathyritic skull at muscle attachment sites as well as altered bruxofacets on the incisor crowns. In the radiographs of figure 7, we see that the support of the teeth by the periodontium is decreased with resulting dilacerations of the apices of the teeth. The form of the temporomandibular

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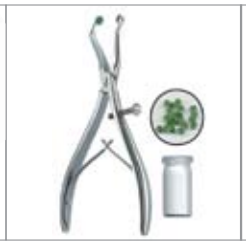


condyles and coronoid processes are compressed due to loss of the occlusal support and the consequent hyperactivity of the craniomandibular muscles. The weakness of the periodontium has stimulated excessive thickness of the periodontal ligaments compared with the controls seen in Figs 8 and 9. Note also the extremely compressed TMJ condyles in the experimental rats which have also developed a perforation of the intrarticular cartilaginous tissues. Finally in Figures 10, 11, 12 and 13, the histology of the affected teeth reveals in the comparison between control and lathyritic rats in the latter dilacerations in conjunction with loss of normal collagen architecture of the periodontium, which is greatly hypertrophied with abnormal periodontal connective tissue as well as inhibited growth of the alveolar processes compared to the healthy periodontium.

Dr. Alvin Gardiner's findings at the Pathology department at Georgetown University USA published in an article in the Journal of Dental Research in 1959 and obtainable on the internet, describes some of the gross and histological effects in the periodontal ligament of osteolathyrism and neurolathyrism that mimic pathological lesions such as osteogenesis imperfecta, Pagets disease, the neurological diseases of paraesthesia and paralysis, as well as alterations in body posture defined as scoliosis that results from eating sweat peas, lathyrism.

Lathyrism which arises from a specific inhibitor of collagen polymerization cross linkage became of central importance to me as I set out as a PhD student at Bristol University, UK in 1958 to investigate the process and mechanism of tooth eruption in the pathogenesis of TMD in man and animal, which I will consider in detail in Part V of "Understanding NM, OSA and PPM". In the meantime I would encourage the readers of Visions to study the findings of Dr Alvin Gardiner, whom I confirmed and extended on in my own studies partly reported here and which results in neuromuscular fatigue which Dr. Gardiner did not report on.

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Bullying: A Threat to Your Practice

By: Tim Twigg and Michelle Allen

We saw them, and sometimes encountered them, on the playground when we were kids. And they exist today in the workplace as adults--that's right, bullies. They are often surrounded by sycophants, projecting an air of intimidation.

Human resources experts have been warning about this toxicity in the workplace for years. Whether from a dysfunctional or an unreasonably demanding supervisor; an employee who appears to enjoy placing co-workers in uncomfortable or compromising situations; or a vendor who, when visiting the office, promises rewards for purchases with the veiled threat that you will "rue the day if you ever choose a competitor." Sadly, this has become more common as a workplace challenge.

Try as we might to avoid and/or ignore them, there will be times, as an employee or an employer, when bullies and bullying behavior is encountered and must be addressed. For the practice owner, the impact can be a loss of team function or productivity and also carries liability. "Hostile work environments" are the concern that employer's must be aware of today.

Not too many years ago, a federal court in New Jersey dismissed a female auditor's complaint of harassment by her supervisor. The court found that the supervisor's "loud, profane and obnoxious" behavior, including vulgar sexual and racist jokes, swearing and abrasive contact was "inappropriate and unprofessional." They also found that his behavior was allegedly intended to make him "appear powerful" in relation to female subordinates. In the end, the court concluded that the supervisor's offensive conduct and profanity "was obnoxious to all employees, male and female" and not specifically directed to the complainant because she was a female. Thus, a summary judgment was granted in favor of the employer that appeared based on the patently absurd defense that "our loud, profane and offensive supervisor conducts himself with equal opportunity, therefore we win."

As Bob Dylan stated almost fifty years ago,
"the times they are a-changin'."
And in this arena they are changing fast.

"abusive work environments can have serious effects on targeted employees and serious consequences for employers."

Since then, in March, 2007, the Bureau of National Affairs, Inc. reported that "approximately 44 percent of American employees have worked for an abusive boss." Furthermore, the Employment Law Alliance has found that, when asked about specific kinds of workplace abuse, more than half of workers have experienced or heard about supervisors making sarcastic jokes, rudely interrupting, publicly criticizing, giving dirty looks, personally insulting, yelling at, or ignoring subordinates. An Alliance representative concluded: "only an employer in a state of denial would ignore the poll results and not re-examine their personnel policies, supervisor-employee relations, and management training."

A 2008 study, conducted by M. Sandy Hershcovis, Ph.D., et.al, concluded that bullied employees reported more job stress, less job commitment and higher levels of anger and anxiety. "Bullying is often more subtle and may include behaviors that do not appear obvious to others," she observed. She added that "the insidious nature of these behaviors makes them difficult to deal with and sanction."

Last June, the Wall Street Journal reported that the New York Senate passed a bipartisan measure that would allow workers who have been physically, psychologically or economically abused while on the job to file charges against their employers in civil court. The Journal stated that sixteen other states have introduced legislation in recent years aimed at curbing workplace bullying.

Just this February, the state of Washington focused on workplace bullying based on the assertion that one in five employees "directly experiences health-endangering workplace bullying, abuse, and harassment" and that "abusive work environments can have serious effects on targeted employees and serious consequences for employers." It is proposed that the Washington Law Against Discrimination (WLAD) be amended to make it an "unfair practice" to subject an employee to "an abusive work environment."

It is easy to see how quickly and dramatically the landscape has shifted as legislation is enacted to ensure a safe and protected workplace for employees. In so doing, the responsibilities and liabilities placed on employers have also increased.

Whether your motivation is impending legislation, potential liability from a claim for a hostile work environment, a tort action for "intentional infliction of emotional distress," a claim of assault based on behavior that is perceived to be "threatening," a workers' compensation claim, or simply the belief that all employees should be treated with dignity and respect, bullying must no longer, and can no longer, be ignored or tolerated in the workplace.

What is the best course of action?

A person subjected to bullying behavior is best advised to:

- Walk away when behavior becomes abusive.
- Ask the person exhibiting the offensive behavior to cease doing so.
- Have a co-worker present as a witness, if the interaction will be confrontational.
- Log abusive incidents in a journal, including the date, time, and location when they occurred in addition to the specific content of the interaction.
- Report flagrant and/or repeated examples of bullying to a practice owner, supervisor or human resources representative.

Employers should:

- Exercise care that hiring procedures are in place that identify the potential propensity to bully. Conducting reference checking is essential. Background checks and personality instruments, such as the one Bent Ericksen & Associates' provides, are also valuable and proven screening tools.
- Ensure that bullying is prohibited and is properly addressed with written policies covering:
    1. established reporting procedures (call for a copy of our Problems/Concerns Report),
    2. retaliation prohibitions,
    3. confidentiality assurances,
    4. a commitment to a prompt and thorough investigation, and
    5. resultant discipline that will be considered if the allegations are found to be true.
- Have a conflict resolution mechanism in place that will result in allegations being addressed respectfully and decisively.
- Include the respect for others in the practice's values statement and include relevant behavioral examples. Recognize and reward unique and/or consistently respectful conduct with regard to customer relations in ongoing and regularly scheduled performance evaluations.
- Be attentive to ostensibly minor personality conflicts in the workplace and address them positively and constructively before interactions deteriorate and cause tension and negativity.

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• Do an exit interview with employees who are severing employment with your practice (call for a copy of our form for this purpose). This provides you with the opportunity to obtain valuable information, to prevent a severance when you believe it to be inappropriate and/or be able to intervene when problems in your practice are identified.

• Contact a human resources expert such as the technical assistance team at Bent Ericksen & Associates for assistance. Occasionally, an employee will allege the existence of a hostile work environment when in actuality it is a product of a confrontational but legitimate and non-discriminatory remedial intervention to ensure that work performance expectations are met. A human resources expert can help sort out the details and determine the best way to move forward given the allegations, whether legitimate or not.

Unquestionably, bullying is unacceptable in the workplace and should not be tolerated. The times have changed in this regard and the issue is more important than ever. Whether you are motivated to avoid liability and/or proactively ensure respectful behavior, as noted above,

"only an employer in a state of denial would ignore bullying and not re-examine their personnel policies, supervisor-employee relations, and management training."

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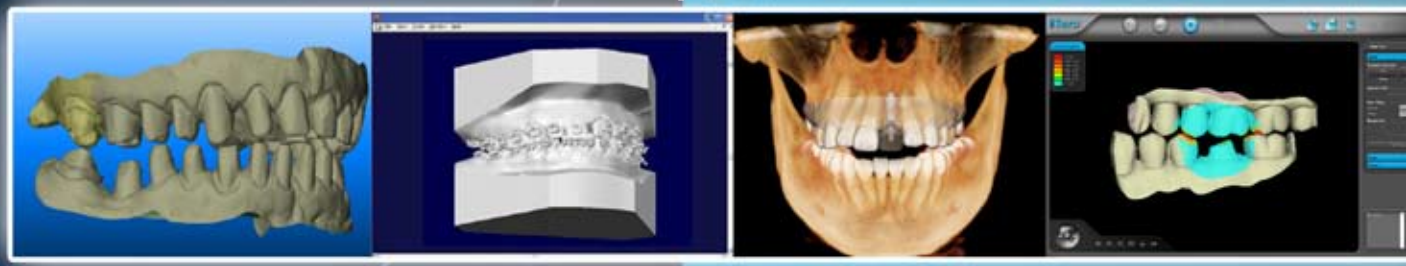

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MARK'S PICKS

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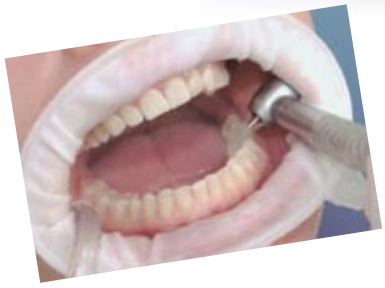
Cavity Shield – Force fields are still science fiction, but the Cavity Shield is about as close as you can get for those patients who need that extra bit of support. At the end of the recare visit you just paint on and leave it alone…

Proxyt – getting your patient's smile's perfect is a labor of love and when done in the proper Neuromuscular bite, should be stable and beautiful for decades to come – make sure your recare protocols are caring for the porcelain too! Proxyt is the ideal tooth polish for your hygiene operatories.

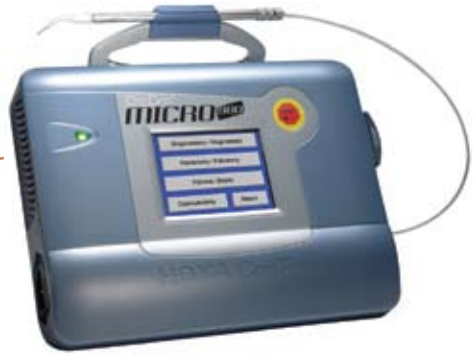
Cervitec Plus – wouldn't it be great if there was some magic potion you could simply paint onto your patient's teeth and restorations that would inhibit bacteria and treat sensitivity? Something that combined chlorhexadine and thymol, and was scientifically supported to improve your patients' long term health and success? Well, this is it and with decades of proven use behind it, it is time to make it a mainstay in your practice too!

Sonicare – the tools to create and protect perfect tissue health are changing. It is simply not sufficient to ask your patients to brush and floss anymore… we know a better way… the Sonicare toothbrush is the only toothbrush on the planet that will literally clean the teeth past where the bristles touch. Your patients deserve a mouth that clean!

Hydrofloss – we will never win the floss war – so it's time to find another way to get the places a brush can't reach! The Hydrofloss is the only oral irrigator that attacks the biofilm directly AND changes the surface charge of your teeth making them less plaque retentive to begin with!



Optragate - Not quite as dramatic as the parting of the Red Sea, but it is an everyday miracle that you will wonder how you got along without! Simply slip one ring in the mouth and the other outside and the Optragate keeps the buccal mucosa pulled back and out of the way – the ideal solution to controlling the field when prepping, taking impressions, creating provisional, and in hygiene!



Microdent Diode Laser – diode laser technology presents the ideal tool to literally vaporize a huge portion of the bacterial invasion that is occurring below the tissues… and stimulate healing in the process… every proactive soft tissue program should include the diode laser for their patients.

MARK'S CHOICE

By: Mark Duncan, DDS

Featured at the 2011 IACA

The dental profession is enjoying one of the most significant periods of rapid change in the history of the profession with major advances in every aspect. The rate of change has been so rapid that the idea of staying current with only 20 hours of continuing education is all but impossible! However, as rapid as the pace of change has been for dentistry, there is an industry that is growing at a much faster pace, and that is your internet presence and the web.

There was a time when all you needed was a virtual business card – essentially a name, address, and phone number. As the internet grew to be better utilized, websites needed to become interactive and have multiple layers. They were no longer simply announcing the presence of the office, but could actually detail the services offered and educate the patients on these benefits. As a depository for such valuable information, it became a great marketing tool, and the omnipresent Google search made search engine optimization critical.

While the introduction of social media made blogs an invaluable tool, but the website still had to provide basics such as the name and contact info as well as the details of services and photos from the office to create a more inviting feel for the practice. As social media grew and blogs were introduced, the sites needed to be more dynamic and advanced.

The easy integration of streaming video creates an opportunity for a website to be absolutely stunningly impressive and valuable. If only the dentist could find the time... and besides, the website that is currently up is doing most of that already, so way not just hold off. The problem is that the public is already two steps ahead – but that is why I'm so excited about the new services available from Page 1.

Nothing is more inviting than a personal introduction, and who better to introduce the practice than the actual doctor?! With video introductions and customized snippets about the power of advanced dentistry, the practice website will *literally speak to patients.* The customized clips will be short, fast loading, and interactive so it's easy for the potential patient to watch. They will be built around content relative to particular interests of the doctor and then can be customized for each practice or dentist. With the site built to provide video, it is a short leap to have patient testimonial videos produced with animated graphics for that finished feel, as well as being designed to integrate with social media seamlessly.

One of the greatest things about this new approach is that it literally sets the stage, then provides a verification of the practice all before the patient even takes a risk. We all know the value of a referral, and with this combination of features on the website, the referrals are all coming in verified from the website. In addition to that, one of the most important validations is reviews and ratings. Therefore the management of the practice reputation is absolutely essential. This is an emerging industry that has knocked some practices to their knees while others have catapulted because of the power of ratings and reviews. With the combination of all of these powerful tools, the practice can create a presence on the web that will sustain and feed the practice with patients who already feel at home, like the doctor, know what they want, know what their appointment involves and have heard from another patient that this doctor and the place to have it done!

The most impressive thing that Page1 has put together is the way to do this with your existing website. They can absolutely build a new site for you; that is one of the pillars they are built on. In fact, when I opened my practice it was their expertise that I relied on. If you want a new site from the ground up, they can manage that for sure, but the great thing is you don't have to! These powerful new features can be added in as modules and built by Page 1 to fit into your existing site.

The power of the internet is undeniable, and is something you can either benefit from or be punished by. It doesn't matter how great you are as a clinician, if your website turns patients away before they get to your door, you will never have a chance to shine. On the other hand, if your website paints that picture for them, your patient will come to you as friends who are educated and eager to get started!

Check out Page1 at the IACA meeting or give them a call – they can help you to take your practice forward and into the future!

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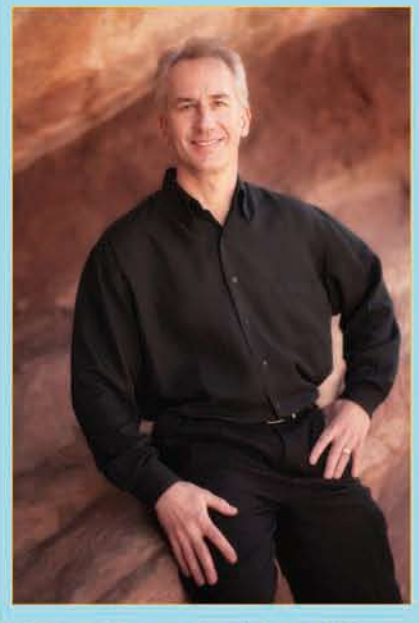

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PAGE 1 SOLUTIONS LLC

"Are Cephalometric Radiographs Needed for Orthodontics"

By Jay Gerber, DDS, FICCMO, FIAO, DAAPM

The argument of the need for diagnostic cephalometric radiographs for orthodontic diagnosis and treatment is currently a hot topic. It is however not a new one as researchers / orthodontists (most studies have quoted only orthodontists) have brought up the question of the relevance of lateral cephalometrics in several journal articles.

Cephalometric radiographs have been used for decades in the US for treatment planning, treatment progress and finishing documentation in orthodontics.

Wikipedia defines Cephalometrics as:

Cephalometric analysis depends on cephalometric radiography to study relationships between bony and soft tissue landmarks and can be used to diagnose facial growth abnormalities prior to treatment, in the middle of treatment to evaluate progress or at the conclusion of treatment to ascertain that the goals of treatment have been met.

It should be noted that the medical profession also uses a lateral radiograph. There is a slight modification of vertical patient positioning of this film as it is lowered somewhat so as to image the cervical vertebrae, and thus is referred to as the neutral lateral cervical. It images all seven cervical vertebrae in addition to about 2/3rds of the cranium. The orthodontic cephalometric image only goes down to the C3-4 region primarily to image the odontoid process of C2.

The imaging of C1-7 is essential as many of us including renowned physical therapist and researcher Prof. Mariano Rocabado Seaton, have documented numerous patients presenting for orthodontic treatment that suffer from Craniocervical dysfunctions. By employing both images we can screen the patient for dental, airway and cervical postural disorders.

The early origins of cephalometric use in orthodontics go back to the first article by Pacini in 1922, and additionally Hofrath, Margolis and Higby documented the technique. Since the origin was so long ago many experts of that time and even more recently have failed to recognize and document on a regular basis the importance of airway and postural abnormalities. Many of the diagnostic analyses, including those in use today have never or rarely consider TMJ, airway or neuromuscular function.

A study published in the Journal of Clinical Orthodontics revealed that about 25% of the over 1000 Orthodontists surveyed treat TMJ and a similar percentage used functional appliances in their practice. Which is the whole point. If you do not treat why would you bother to recognize and document.

The Steiner's analysis is the most recognized and used in American orthodontics. It is common knowledge of the extreme inconsistencies found in this analysis. Many practitioners know this; so it appears that it is becoming more acceptable among orthodontists and general dentists to "just look at the face" when treating malocclusions.

Currently, those practitioners that elect to use "clear or invisible" orthodontic appliances seldom or rarely use cephalometrics. The analysis is not often used nor required by the companies, laboratories or doctors making and utilizing these methods.

Additionally we all know about orthodontic failures that are seen almost daily in our

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practices. Which leads to the question; why is post treatment orthodontics so inconsistent? One could easily state that while newer techniques are evolving diagnosis remains stagnate or even regressive in nature.

The cephalometric analysis that is currently taught in the NM Ortho programs at LVI was developed directly from the Sassouni Plus Analysis of Dr. Richard Beistle. That analysis evolved from the original by Dr. Viken Sassouni. It is based upon a unique system (unlike all others) that employs arcs. Arcs that are not unlike Opening/Closing trajectories seen in bioelectrical instrumentation like the Myotronics K7 scans #2 and #13. The scientific application of this analysis is derived from a comparative study of NM data based upon Craniomandibular Scanning (CMS), Mandibular Range of Motion (ROM), Electrosonography (ESG) and electromyography (EMG) studies using bioelectrical instrumentation (Myotronics K6, K6i & K7).

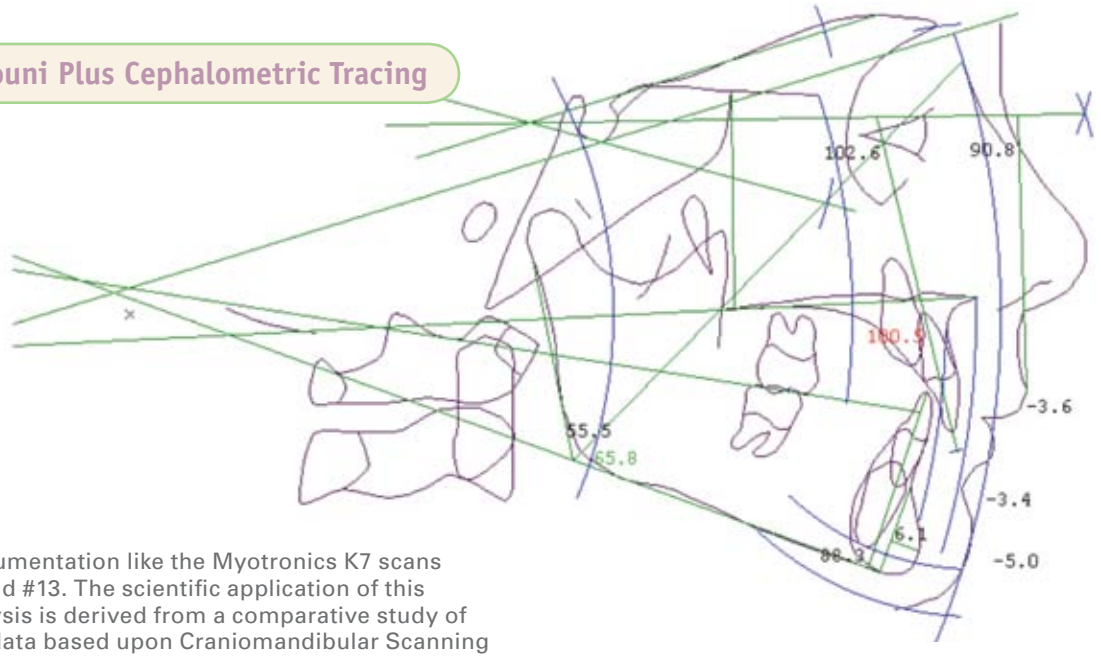
Furthermore, the NFO Analysis was established and constantly updated to comparative functional relationships in regards to the final goal of long-term occlusal stability. Stability evaluated in orthodontics, prosthodontics, TMJ treatment, airway and postural evaluation of the Craniocervical complex. Cephalometric Analysis is a fundamental aspect of the diagnosis of the patient presenting for orthodontic treatment.

You must have direction when providing treatment. In neuromuscular dentistry we all know well the importance in recording diagnostic data before beginning treatment. It shows us to recognize the makeup of the dysfunction and what treatment is required in the rehabilitation of the Craniocervical complex.

In our NM world we understand the need to define and treat to function. I truly believe that why I teach at LVI is because we are so far ahead of the curve. We are always documenting and defining our position. I am also sure that the readers of this article do not practice exactly what they learned in dental school. But school did give us a basis to which to build upon. We all have evolved in practice, we have refined not regressed.

This is not what we are seeing with the evolution of cephalometric diagnostics. It appears from the research that many dentists and non-professionals simply do not want to 'cloud-up' the treatment. Anyone not taking a film and K7 studies is at least neglect from a NM perspective. Additionally, airway appraisals, postural screening, photographs, occlusal symmetroscopic and arch analyses should be included when treatment planning orthodontic patients.

NFO Sassouni Plus Cephalometric Tracing



Therefore, we can conclude that diagnostics are ever evolving and should be addressed constantly in our patient treatment. Eliminating cephalometrics? No we need to improve. We cannot afford to look for short cuts. With the technological advances in imaging and bioelectric modalities, we are now more than ever capable to provide the most comprehensive measurable treatment.

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Balboa Park was named after the Spanish explorer Vasco Nunez de Balboa and was founded in 1868.

THE Weathers' report by Arthur "Kit" Weathers, Jr., DDS

Apex Locators-Magic or Mystery

What you don't know about apex locators may be compromising your endodontic therapy!

At my Endodontic *"Root Camp"* seminars, there are always questions concerning the proper use of electronic apex locators. Most people either love them or hate them, and for many dentists, there is a great deal of confusion concerning their use. The purpose of this article is to eliminate the stress and mystery connected with electronic apex locators.

Historically, dentists have tried many methods for determining accurate working length, including radiographs, tactile sensation and electronic apex locators. Additional adjunctive methods include: microscopic magnification, average tooth length, paper points and my personal favorite, poke and hope. Nothing is more reliable than the apex locator, however, so let's take a brief look at the history of the electronic apex locator, and how to maximize its effectiveness.

Using an electronic measuring device for root length determination was first investigated by Custer in1918. The idea was revisited by Suzuki in 1942 when he found that electrical resistance between the periodontium and oral mucous membrane in dogs was a constant value (roughly 6.5 kilo Ohms). The resistance changes dramatically when the file exits the canal and contacts the periodontal membrane.

First-generation apex location devices measured the flow of direct current or resistance. When the tip of the measurement instrument reached the apex in the canal, and the device sensed the resistance value of 6.5 kilo-ohms, the locator would read apex. There were a number of problems with the first generation locators, including the fact that the canal had to be dry so fluid would not short circuit the measurement and the 40 milliamps of current created a mild electrical shock in some patients.

Newer apex locators began operating on the principle that there is electrical impedance across the walls of the root canal, which is greater apically than coronally. At the apex, the level of impedance drops dramatically. The unit detects the sudden change and indicates it on the analogue meter. To overcome problems associated with a wet environment, insulated probes were often utilized.

The principle on which "third- generation" apex locators are based requires a short introduction. In biologic settings, the reactive component facilitates the flow of alternating current, more for higher than for lower frequencies. Thus, a tissue through which two alternating currents of differing frequencies are flowing will impede the lower-frequency current more than the higher-frequency current. Since the impedance of a given circuit may be substantially influenced by the frequency of the current flow, these devices have been called "frequency dependent." Since it is impedance, not frequency that is measured by these devices, and since the relative magnitudes of the impedances are converted into "length" information, the term "comparative impedance" may be more appropriate.

The "fourth-generation" apex locators are of the ratio type, self calibrating, and are extremely accurate. Looking back at the previous paragraph, I realize I am providing more information than most dentists need, so let's move on to how to obtain the most accurate measurements with your apex locator

Whether you are measuring resistance or impedance, the most accurate measurement point is found when the tip of the file peeks through the apex. Other indicators on the electronic apex locator show the file getting closer to the apex, but the most accurate measurement comes when the file is in direct contact with the apical tissue. At that point, however, the file is beyond the apical terminus, so I recommend subtracting one millimeter when the locator reads "apex."

To measure the resistance circuit, one wire of the locator is attached to the patient's lip and a second wire is attached to the measuring file. The file is then advanced into the canal until it touches the periodontal tissue at the apex, which completes the circuit. Because hard tooth structure is a poor conductor, the signal at initial setup, will be very weak at best. As the file is advanced to the patient's apical foramen, the signal becomes very strong due to the electrical conductivity of these tissues.

The signal is transmitted to the operator via the consoles screen or a series of lights and typically an audible alarm will sound when the file touches the apical tissue. Studies show that using an electronic apex locator in this manner provides very accurate measurements, and when used in conjunction with a good radiograph, provides the best feedback available for determining apical foramen location.

Incidentally, I recommend taking two pre-op radiographs of every tooth that will have endodontic therapy; one perpendicular shot and a second image taken at a 30-degree angle. The second radiograph is taken from a mesial angle on all teeth except the upper first molar, which is taken from a distal angle. The perpendicular angle on an upper molar shows all three roots while the distal angle reveals the two canals that are frequently present in upper molars.

Commonly asked questions:

"Does it help or hinder my root canal therapy?"

The answer to this question is simple. At this point in time, the electronic apex locator is the very best way to accurately determine working length, and I would not want to practice without it.

"Why do apex locators work sometimes and not others?"

There are several reasons apex locators may provide inaccurate measurements, and once you understand what those reasons are it becomes easy to avoid most of the common errors. Usually the errors are caused by improper usage rather than problems with the equipment, and if you follow the following suggestions, you will obtain very accurate measurements.

Mistake number one is leaving fluid in the pulp chamber. Fluid conducts electricity and can short circuit from one canal to another or to a metal restoration, which will cause inaccurate measurements.

The second mistake is using a file that is too small. If the file fits loosely in the canal, it might not have good contact with the tissue around the apical opening, resulting in erratic readings. If the needle on your apex locator is jumping around, use the largest file that will go to working length.

Third, you must be aware of the possibility of a perforation or a crack in the root. These situations will be quite obvious because the working length will be way off.

Finally, if there is a metal restoration in the tooth or a porcelain fused to metal (PFM) crown, and the measuring file contacts the metal, you will get a short circuit and a reading that is way too short. I suggest you remove all amalgam in the tooth prior to measurement and be very careful to avoid touching the metal in a PFM as you enter the access opening. In these cases, you should definitely make certain the pulp chamber is dry to avoid a short circuit to the metal.

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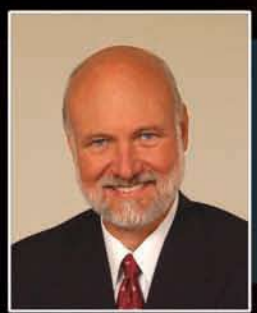

The Endo Experts

As Designed by Dr. Kit Weathers

"Is the electronic apex locator standard of care?"

Not only is the electronic apex locator recommended by most endodontists, many practitioners do not take a measurement x-ray of the file in the tooth. In those cases, it is perfectly acceptable to note in the chart that an EAL (electronic apex locator) was used to obtain working length. Even though I trust my apex locator, I still take a digital radiograph to help verify my measurements

"Do I have to take an X-ray in addition to using an apex locator?"

Technically, if you trust your apex locator, you do not have to take a measurement x-ray, but I take a confirmation x-ray most of the time. With digital radiography it takes less than a minute to snap a confirmation x-ray and I like to shoot this film from another angle to see if there is anything I might have missed.

"What about amalgam or PFM – how do I prevent shorting out?"

You can cut a small piece off one of the tiny straws used to stir coffee as insulation or make the access a little bigger, or the best thing is to remove the crown prior to endo. You can also use the Endopoint, which has a built-in sliding insulator.

"Does the canal have to be dry?"

Fluid in the pulp chamber can short out the apex locator's circuit and provide faulty readings. This will usually be very apparent, as the readings will usually be erratic and ridiculously short. Fluid in the canal doesn't seem to make any difference when using the newer generation of apex locators.

"What about large apical radiolucencies, cracked roots or large lateral canals?"

All of the above situations can provide false readings, but the errors are so obvious, you will know instantly something is wrong.

"Which unit is the best?"

The best apex locator is "the one you will use." All apex locators work well if you understand their limitations. The worst apex locator is better than the best digital image, so trust your apex locator. I have a Root ZX and a Miltex Mark VII apex locator and they both provide very accurate working length readings. I prefer the Miltex unit because it's compact and attaches to the patient's bib placing it in a very convenient location.
P.S. the Mark VII is roughly half the cost of the Root ZX and I cannot tell any difference in accuracy between the two. I just spoke with someone at EndoSolutions, and they will give a 25% discount for ordering an apex locator before the end of 2011. And finally, make certain the apex locator you are using is third generation or later.

"If apex locators measure resistance, why can't I just buy an ohmmeter?"

Technically, you might be able to use an ohmmeter, but I would not advise it. It would be very difficult to calibrate ideal resistance using such a device, and it certainly isn't "standard of care."

Technique Tips

(1) Do not measure the working length until you have prepared the coronal 2/3 of the canal. Wait until you have used a 'crown down' approach for gross removal of the infected upper 2/3 of the canal so that the transfer of bacteria apically is reduced (all done before the working length PA or apex locator check). The other thing about taking a working length before you have opened up your canals is that translocation of your apical seat beyond the constriction will ensue as the curvature of the canal system (and therefore actual working length) is reduced with filing. Using a crown down technique (pre-flaring) makes it MUCH easier to get good results with the apex locator...

(2) When determining working length, select a file that fits snugly at the apex. Advance it slightly past the apex and pull it back to make your readings. Do it several times to verify. If the readings are not reproducible, they probably are not accurate.

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Inaccurate readings sometimes occur when a periapical lesion is present. Once the measuring probe (a file or a reamer) touches the periodontal ligament the apex locator will indicate that the apex has been reached.

(3) Make certain the pulp chamber is dry before placing the measurement file in the canal. This recommendation doesn't apply to the latest generation of apex locators that work with virtually any fluid in the canal. In all cases, however, you must make certain the pulp chamber is dry prior to measurement.

Summary

Working length determination during root canal therapy has been greatly aided by electronic apex locators. They can save time in determining initial working length, save on the number of x-rays taken, and can be particularly helpful when the periapex is unclear on radiographs or when there is a question about whether a perforation has occurred. In my practice I consider the apex locator absolutely essential for the simple reason that the apical foramen does not coincide with the anatomical apex in most teeth (See figure 1). You can confirm this fact by examining the morphology of extracted teeth. Intraoral radiographs do not show the apical foramen and are often misleading, leading to compromising results, and you will never be able to determine accurate working length without a good apex locator.

Some clinicians are so confident in their use of EALs that they take only preoperative and postoperative radiographs. For most clinicians, however, it is advisable to confirm working length with a radiograph. There are several tips which are helpful in using EALs. Turn on the EAL and allow it to self- equilibrate before connecting to the patient. Be sure the file and lip clip do not contact metal restorations.

Non-conducting irrigants give the most accurate readings. These include RC Prep, alcohol or dried canals. Conducting irrigants, such as sodium hypochlorite or saline are more problematic. If a conducting irrigant is used, be certain it doesn't allow conduction to another canal or a metal restoration. Some apex locators claim to be equally accurate with all irrigants, but clinical experience and recent literature indicates this is not the case.

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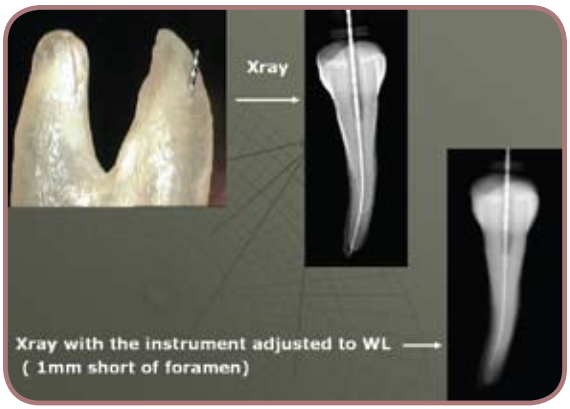

Figure 1- More often than not the root canal exits the tooth short of the radiographic apex. Taking at least two pre-op x-rays at different angles will help identify this discrepancy, but the most accurate measurements come from using an electronic apex locator. Trust your apex locator to avoid over extension, excessive enlargement of the apical opening, bleeding in the canal, and unnecessary post-op pain.

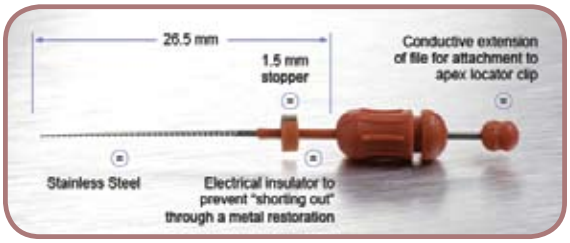

Figure 2 – There is a new device on the market that can make measuring with an electronic apex locator even easier. The recently introduced EndoPoint features a 26.5mm file with a sliding stopper that can measure up to a 25mm canal, and an "electrical insulator" down the shaft of the file, which prevents "shorting out" while accessing through a metal restoration.

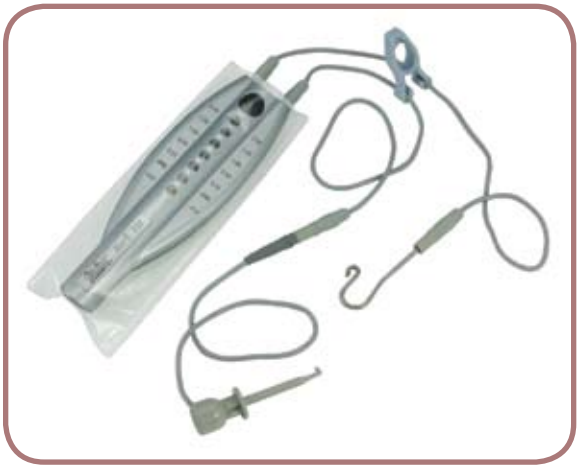

Figure 3 – Mark VII apex locator from www.EndoSolutions.net

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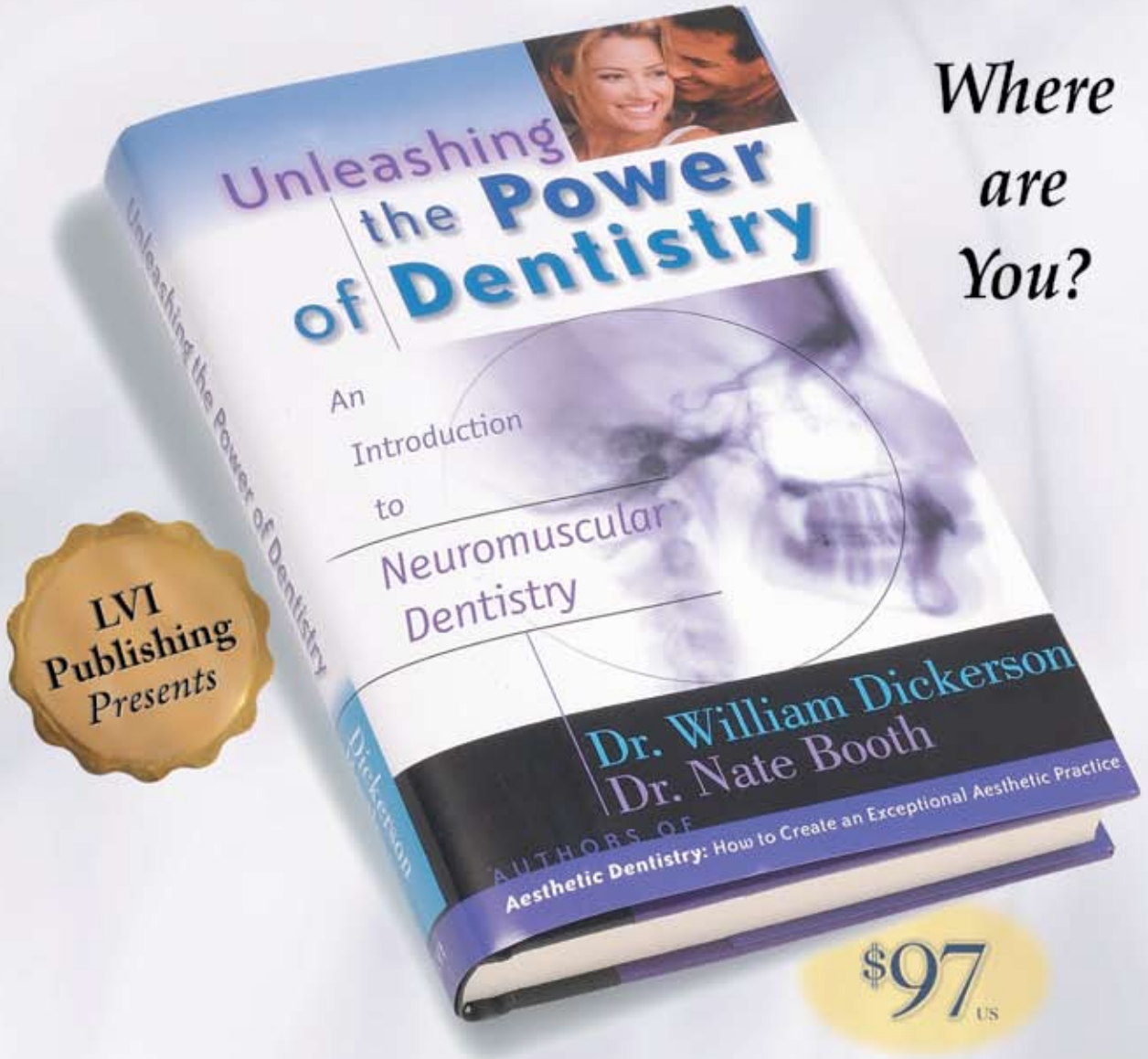

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