



Academy of
Osseointegration
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Academy NEWS

A QUARTERLY MEMBER NEWSLETTER

Realist Versus Idealist

*Debating philosophy of bone
loss around implants (pages 10 - 11)*



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ACADEMY NEWS

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President's Message

Expanding member value and strategic direction in an ever-dynamic field

By Jay P. Malmquist, DMD

A number of trends are rapidly shaping the field of implant dentistry like never before, and in early October the AO Board and staff dedicated a full day to updating our strategic plan. Member value was foremost in our discussions, and I am very pleased to announce the Academy's adoption of *The International Journal of Periodontics and Restorative Dentistry* (IJPRD) as our second official journal! This newest benefit comes at no additional cost to members!

With an international reputation for high-quality editorial content and unparalleled color illustrations, the Board agreed IJPRD is a peer-reviewed journal based in science and very clinical in presentation. Articles are uniquely presented showing the relationship between a healthy periodontium and precise restorations, as well as the integration of implants with comprehensive treatment planning. The main focus of this often-cited journal is providing clinically relevant information for your daily practice.

The Academy is delighted to now offer two highly regarded and frequently cited journals: IJPRD and the *International Journal of Oral and Maxillofacial Implants* (JOMI), which is consistently rated as our number one benefit.

The strategic planning session was facilitated by Dr. **Kenneth Slaw**, who also led the Academy through its 2015 - 2018 strategic planning process. Dr. Slaw did an excellent job, guiding AO's board and staff through the initiatives and priorities we have collectively been working hard to accomplish for the past three years, and planning our strategic direction for the years ahead.

At this session, careful consideration was given to reviewing and updating the Academy's mission, vision and values, its strengths/differentiators, and opportunities. The AO Board also identified and discussed a list of domains and strategies that were generated from a survey and numerous hours of phone conversations with members of the board by Dr. Slaw in advance of the session. The domains under which the board has mobilized resources to implement its new strategic plan are: Member Value, Quality Practice, Education, and Interdisciplinary Strength.

The day following the strategic planning session, the Board held its regular meeting. Among the many action items on our ambitious agenda was hearing the impressive results being realized on the global front from the hard work of AO Secretary Dr. **Hom-Lay Wang**, Ann Arbor MI, and his leadership of the Global Program Development Committee. As part of setting direction for global programming through 2020, AO will be holding its first joint conferences with the Taiwan Academy of Osseointegration and the Asia Pacific Society of Osseointegration in Malaysia. AO Vice President and Fellow **Tara L. Aghaloo**, DDS, MD, PhD, Los Angeles,

CA, and I will be presenting at these meetings on January 5 and 6, 2020, respectively.

These meetings, arranged under a new International Affiliate Membership initiative proposed by Dr. Wang earlier this year, will serve as new outreach models for establishing and assessing meeting outcomes, assisting regional implant organizations in providing high quality educational programs, and increasing interest in membership and participation in new geographical areas for AO around the world. More than 60 dental professionals from Taiwan have already joined the Academy as new members. We look forward to seeing many of these individuals at our 35th Annual Meeting, March 18 - 21, 2020 at the Washington State Convention Center in Seattle, WA.

Registration is now open for AO's 2020 Annual Meeting and my home area of the Pacific Northwest will prove to be an amazing venue worthy of hosting our meeting. Much excitement is already building, as evidenced by the significant number of e-Poster and abstract submissions received, and the outstanding work by 2020 Program Chair, AO Fellow **Craig M. Misch**, DDS, MDS, Sarasota, FL, and his committee to assemble the world's most accomplished presenters in dental technology.

Be sure to peruse this issue of *Academy News*, as it includes several articles highlighting many different aspects of this dynamic implant meeting. Early registration is highly encouraged to take advantage of early bird rates, hotel availability and secure the sessions you want to attend.

With the initiatives planned for 2020 and beyond, the Academy of Osseointegration has a bright future ahead. Our dedicated board and staff are embracing change to lead the global field of implant dentistry, support our members who consistently practice at the highest level of evidence-based care, and their efforts to advance the science and best practices in implant dentistry.



Dr. Jay P. Malmquist

New frontiers in robotic surgery, its impact on medicine and dentistry

Has medical technology affected overall life longevity?

What is the difference between infrastructure limited technology deployment and fast deploying technologies?

Are emerging technologies like robotics and Artificial Intelligence (AI) having implications on medical training and practice?

These will be among the many compelling questions addressed by **Catherine Mohr, MD, MS** (Sunnyvale, CA), Keynote Speaker during the Opening Symposium of the Academy of Osseointegration's (AO) 35th Annual Meeting. Dr. Mohr is President of the Intuitive Foundation.

According to Dr. Mohr, robot-assisted surgery has been in existence for 25 years. Approval from the U.S. Food and Drug Administration (FDA) in 2001 has led to more widespread use over the past 10 - 15 years and significant growth most recently.

"When you look at where robotics has been growing, it has been in surgeries where there is low penetration minimally-invasive surgery. Robotics helps bridge the gap between what clinicians want to do for their patients, and what they actually can do. It is crucial to note this technology must be a function of filling the gap of a particular clinical need to help improve life outcomes," she said.

Surgical robots, such as the da Vinci produced by the Intuitive Foundation, act as tele-manipulators in which, Dr. Mohr stresses, the surgeon is in complete control. Sitting at a console, the surgeon looks in a viewer connected to a 3D scope, which is placed through an 8 mm or 12 mm port, with the robotic instruments placed through 5 mm or 8 mm cannulas.

"The intuitive part occurs when the surgeon perceives the instrument in the field of view. They see the instruments superimposed over where they feel their hands to be. When someone is working in a clinical situation, they do not need to be thinking about the interface," stated Dr. Mohr. "That has been the successful part of the design ethos. It makes the user interface fade into the background and as the surgeon, you are tele-present."

As it relates to dentistry and implant applications, orthopedic robots hold the greatest potential similarities. These instruments are considerably stiffer than their soft tissue counterparts, with a primary mode of operation of guiding a drill to mill out a socket using guided navigation. With this type of technology, Dr. Mohr suggests, a dentist



Dr. Catherine Mohr

could benefit from using image guidance in the patient's mandible or maxilla to determine the orientation needed for the targeted fixture.

There are also two newly available soft tissue surgical robots, for which the clinical applications are single port procedures, and lung cancer biopsies. Although over the years robotic-assisted surgery has become the gold standard in prostatectomies, the majority of cases are gynecologic, and the fastest growth has been in the general and thoracic surgical arenas, including lung and colon surgeries. The da Vinci is involved in over 1,000,000 procedures per year.

Regarding new frontiers in robotic surgery, Dr. Mohr considers the AI generated from robotic surgeries akin to giving surgeons "superpowers." She says there has been an enormous expansion over the past 10 years in the ability to analyze machine learning. Digitized task-specific data is helping gain insights into how a surgeon learns, how to improve teaching of procedures, and how variations result in different patient outcomes.

"The promise of AI is building on physical skills associated with judgement and decision making, and getting high level, high value, and high impact coaching from these analyses. This could not be done without these data streams and the new renaissance in algorithm development," she said.

Looking ahead to her keynote address at the Academy's 2020 Annual Meeting, Dr. Mohr says, "There is always something to learn from all the different specialties. I will be very interested in understanding some of the challenges and goals in the dental space and the types of technologies your attendees are interested in exploring."

Factors Affecting Outcomes: Applying the principles of P4 Medicine to implant dentistry

By Kevin Luan, BDS, MS, Academy News Editorial Consultant

The concept of P4 medicine, although widely accepted with increasing popularity, is still relatively new to dentistry. When first proposed in 2004, **Leroy Hood**, MD, PhD, Founder and Board Chair of the P4 Medicine Institute, had a vision that medicine would become “predictive, preventive, personalized, and participatory.” Although controversial at the time, these four key elements have been largely adopted, with increasing relevance in implant dentistry. The P4 concept has become more integrated in healthcare due to three megatrends (Figure 1):

- The ability of systems biology and medicine to decipher the biological complexity of disease.
- The digital revolution with advanced capabilities for collecting, integrating, analyzing, and communicating data and information (e.g., medical histories, clinical tests, etc.).
- Consumer access to information with increased interest in self-management of health. Consumers driving transformation utilizing social networks.

Systems Biology and Medicine

Systems medicine relates the application of systems biology to human disease utilizing holistic but quantified approaches to better understand a complex biological issue. In the case of implant dentistry, there are an increasing number of high impact studies that have been analyzed in order to better understand the relationship of implants in health and disease. The World Workshop on Classification of Periodontal and Peri-Implant Diseases from the American Academy of Periodontology and the European Federation of Periodontology addresses and classifies implant health and disease into four categories. In addition to this classification, the Academy of Osseointegration’s 2018 Summit “Optimized Patient Care: Converting Osseointegration to Patient Integration” addressed key risk factors for predictable osseointegration in four position papers.



Dr. Kevin Luan



P4 Principles in Implant Dentistry

The P4 principles have been influencing how implant dentistry is performed and managed by clinicians as well as understood by patients. By understanding the biology of peri-implant disease, the P4 principles can be appropriately adapted to implant dentistry (Table 1).

P4 Principle	Implant Dentistry Relevance
Predictive	Can we identify the patient’s path towards disease while still healthy? Can we predict a patient’s tendency towards disease?
Preventative	Can we maintain health and prevent disease of the implant?
Personalized	Can we identify factors that would impact the health of the patient and the implant(s)?
Participatory	Can we aid patients to positively engage with their health to prevent chronic disease?

Table 1: Incorporation of P4 medicine with relevance to implant dentistry.

It is the hope that P4 medicine as applied to implant dentistry will combine the scientific technological power of systems medicine with the active participation of consumers to:

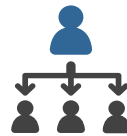
- Reduce the incidence of disease.
- Provide more cost-effective disease care.
- Improve health-related lifestyle decisions.
- Provide data essential to innovate more advanced systems.

Digital Revolution and “Big Data”

The collection of vast amounts of data from a number of patients with dental implants, both in private and hospital environments, helps to create a wealth of statistical knowledge that helps demystify health and disease. As the literature for dental implantology grows with increasing contributions from clinicians of all specialties, the reliance on case studies becomes less impactful compared to the more sophisticated and mathematically driven “big data.” “Big data” aids in diagnosing diseases with more accuracy and greater cost-effectiveness. Through the analysis of information, such as systemic health and

Continued on page 11

Academy brings back popular membership initiative



Active members of the Academy of Osseointegration (AO) have a great opportunity to help shape the future of implant dentistry and at the same time receive additional discounts when attending the 2020 Annual Meeting.

After realizing impressive results when it was implemented several years ago, the Academy is bringing back the "Member-Get-a-Member" campaign to help expand its mission of serving dental professionals around the globe by advancing the science and best practices in implant dentistry. To participate, members simply need to talk with their non-member colleagues about membership in the Academy.

"Your personal endorsement of the Academy is by far our most effective recruitment tool," **Maria A. Hernandez, DDS**, Fort Lauderdale, FL, AO Membership Committee Chair enthusiastically stated. "Recruit your colleagues and you could potentially attend the Academy's 2020 Annual Meeting at no charge!"

As incentive for members to participate in the Member-Get-a-Member campaign, the following levels of recognition have been established:

Gold

Recruit 10 or more members and receive complimentary registration at the Academy's 35th Annual Meeting (March 18 - 21, 2020, Seattle, WA).

Silver

Recruit five-to-nine members and receive half price on the 2020 Annual Meeting registration.

Bronze

Recruit two-to-four members and receive half price on 2020 Annual Meeting registration (provided that at least one new member attends the Annual Meeting).

"When talking with your colleagues, don't forget to mention all of the many advantages membership in the Academy offers," continued Dr. Hernandez, who specified those as:

- Substantially discounted registration fees to AO's Annual, Regional and Charter Chapter Meetings.
- Subscription to the Academy's official journal, the *International Journal of Oral and Maxillofacial Implants (JOMI)* and its related online resources.
- **Brand New Benefit!** Subscription to the Academy's second official journal, *The International Journal of Periodontics and Restorative Dentistry*.
- Unlimited access to AO's online Education Center, including complimentary participation in AO's interactive (and archived) ADA-CERP approved webinars.

Learn more at
osseio.org



- Access to the "Members Only" section of AO's website.
- *Academy News*, a quarterly newsletter that will keep you abreast of activities within the implant community.
- A personalized membership certificate suitable for display in your office.
- Eligibility to earn the Academy's Certificate in Implant Dentistry.
- Leadership opportunities ...and numerous other valuable benefits.

To participate in AO's Member-Get-a-Member Campaign, non-members should indicate the referring member's name in the "Promotion Code/Referred By" box on AO's membership application, which is available via osseio.org. In order to be qualified, a complete application and dues must be received, and approved by AO's Membership Committee. For questions, please contact Amanda Wiff, AO Membership Manager at 847-725-2267.

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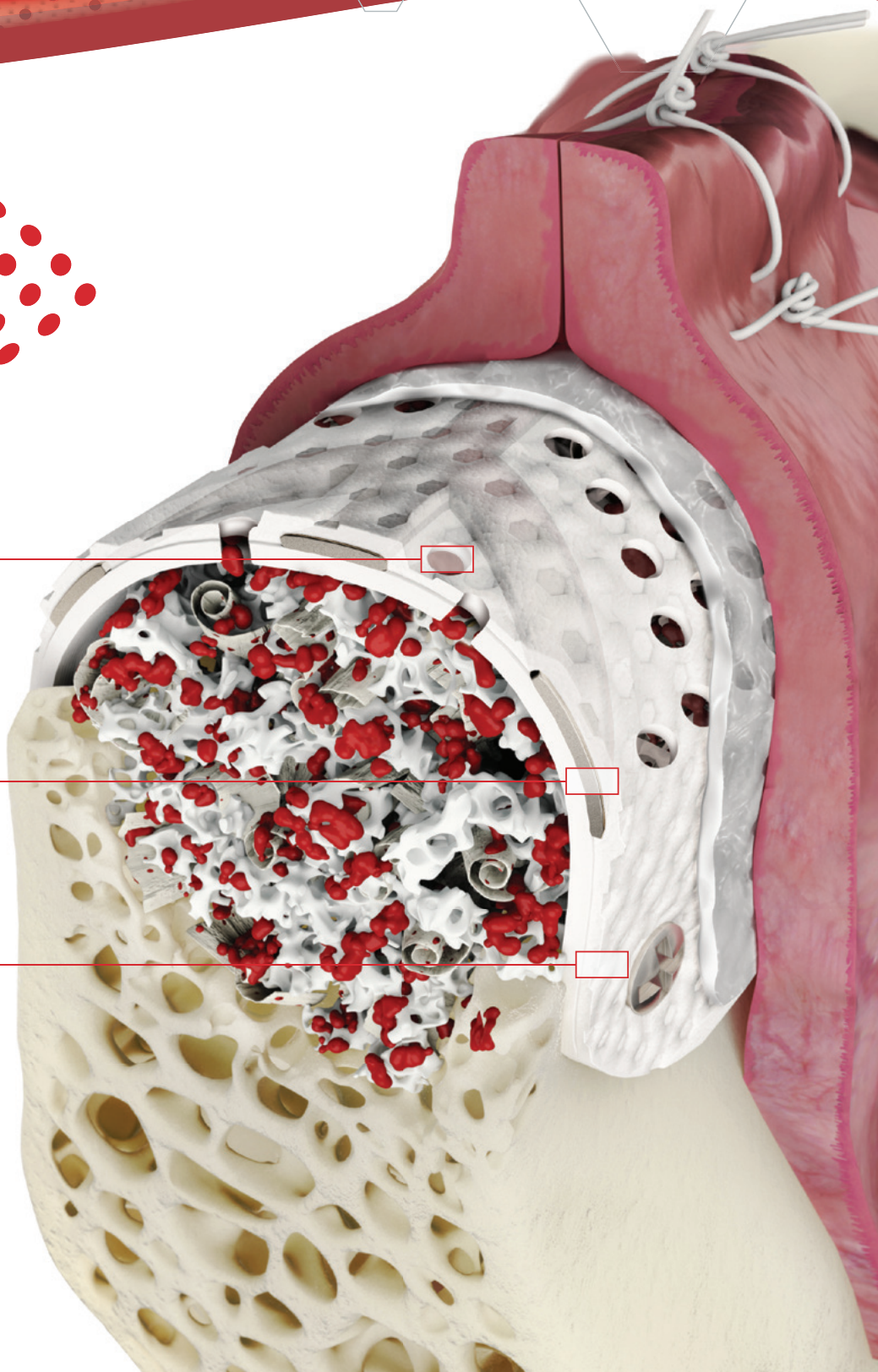


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Doctor: Don't abdicate your power

By Lourdes Ann Christopher, DDS, MS and Mehrdad Favagehi, DDS, MS

The marvels of digital technology have completely transformed our lives. We can effortlessly sit in a self-driving car and have the car drive us after a simple voice command ordering the car to go home. During the ride, we can ask the car to play our favorite music or audiobook, while we adjust the thermostat at home and order dinner on our smartphone. Did you know that smartphones these days have a million times more computing power than all four MIT computers NASA used for the first moon landing?¹

The technology behind digital implant workflow is so advanced and seamless that the greatest challenge for many of us is remembering to supervise the process. Getting there is so much easier now, but without the right directions, we can have a very pleasant drive to the wrong destination hundreds of miles away from our intended destination.

Driving a self-driving car seems very simple. Similarly, dental implant digital workflow can appear as effortless. The process of ordering surgical guides is not complicated. After getting a scan, one may mistakenly think that a surgical guide can be ordered without a doctor's supervision. Unfortunately, this misconception is already causing problems in the field of orthodontics.

Technological advances have made the ordering of digitally based orthodontic aligners an effortless and simple process. There are many companies that instruct consumers on how to take impressions or get intra-oral scans in order to receive orthodontic appliances, without an orthodontist's or dentist's supervision². Unfortunately, many U.S. consumers are seeking orthodontic treatment without becoming patients in traditional doctor-patient practices. In a 2017 press release, the American Association of Orthodontists reported that "nearly 13 percent of its member orthodontists are seeing patients who have tried do-it-yourself teeth straightening; some of those attempts have caused irreparable damage³."

As in digital orthodontic aligners, the implant workflow process can be seamless. A dental assistant with a minimal skill level can easily scan a patient and order the fabrication of advanced surgical guides and final restorations from a fully automated factory on the other side of a digital cloud.

What is happening in orthodontics and implant dentistry is known in the business world as **disruptive innovation**. According to Wikipedia: "In business theory, a disruptive innovation is an innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market-leading

firms, products, and alliances⁴." Well-known examples of disruptive innovations are smartphones, digital photography, office and home printing, and the internet. Companies such as Amazon, Skype, Uber, Google, Apple, and Southwest Airlines have grown by taking advantage of disruptive innovation by seizing opportunities to take over new market segments.

According to Dr. **Hamid Shafie**, Director of Postdoctoral Implant Training at Washington Hospital Center Department of Oral and Maxillofacial Surgery, "Advances in digital technologies have enabled general dentists to benefit from disruptive innovation and challenge surgical specialists' implant practices. To overcome this serious challenge, we have changed our implant training. Clinical competency and knowing about digital workflow have become the baseline. Residents' competitive advantage comes from the comprehensive training about digital transformation in our curriculum. We teach our residents how to implement digital transformation by looking at it as an HR problem rather than a technological challenge."

Properly adopting and implementing digital implant workflow can involve delegation of technical aspects to qualified dental or digital technicians. It should never expand to abdication of a doctor's responsibilities. For our patients' sake, we should never abdicate our powers to a manufacturing center somewhere on the other side of a digital cloud.

Digital workflow alone cannot distinguish what the best solution is for a dentally crippled patient with only basal bone versus a patient with sufficient alveolar bone and a failing dentition. Only a qualified clinician would know when to order a bone reduction guide to remove "excessive bone" in order to make room for a prosthesis or when to take advantage of "abundant bone." Knowing when, where and how to regenerate bone or when to go beyond the sinuses to the zygoma for implant placement is not what we should expect of a dental technician, a dental lab owner, or a digital workflow concierge. It's okay to delegate tasks to technicians, but as doctors, we should never abdicate our responsibilities to those who don't have our training and qualifications.

We should also put aside our smartphones when driving in our self-driving automobiles and constantly watch what the car is doing and where it's going to make sure we get home safely and on time for dinner.

Editor's Note: References available on request.

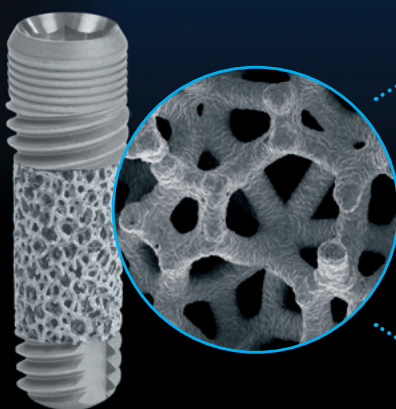
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Bone loss around implants: What is your philosophy?

Point-counterpoint with Drs. Philippe Khayat and Tomas Linkevičius

By Mehrdad Favagehi, DDS, MS and Lourdes Ann Christopher, DDS, MS

Many dentists agree that peri-implantitis is the most common complication in implant dentistry. It's defined as a destructive inflammatory process associated with ongoing bone loss. But, what about bone levels around implants? It's a perplexing issue because there isn't a unanimous philosophical viewpoint.

One philosophy maintains that bone loss around implants can be a normal, common and expected occurrence. The other philosophical point of view looks at bone loss as a pathological process that can be prevented altogether.

Adopting a philosophy about bone preservation around implants is not just an abstract academic exercise; it has ramifications on how implant dentistry is practiced.

During the 2019 AO Annual Meeting in Washington DC, we asked Drs. **Philippe Khayat**, Paris, France; and **Tomas Linkevičius**, Vilnius, Lithuania; two AO members who are known to hold different philosophical views on this subject, to summarize their views for *Academy News*.

Dr. Khayat is an international speaker and researcher in implant dentistry, with decades of experience in all aspects of implant dentistry. A prosthodontist by training, he maintains a referral-based implant surgery practice in Paris, France.

On the other side of the philosophical spectrum, Dr. Linkevičius, also a prosthodontist by training, has dedicated many years of his career to implant research. He coined the phrase: "Zero bone loss concepts." He has conducted a series of systematic longitudinal studies looking at various factors that cause bone loss around implants and has shown that recognizing and managing those factors can result in zero bone loss. Dr. Linkevičius presented at the 2019 AO Annual Meeting and has also conducted webinars for AO, which can be accessed by members at no charge.

Zero bone loss concepts

By Tomas Linkevičius, DDS, PhD, Dip Pros

It seems like crestal bone loss has been with us forever, and for the majority of clinicians has become the norm. Maybe that's because we all have been taught by Dr. **Tomas Albrektsson**, Goteborg, Sweden, et al, since 1986 that 1.5 mm of bone loss within the first year of loading can be considered a success, and if subsequent bone loss does not exceed 0.2 mm annually. There are so many possible reasons for bone loss, that dentists think it is impossible to control all of them and tend to give up on the idea of crestal bone stability. However, I consider it outdated and do not accept the idea that bone loss is unavoidable. That is why my research team and I have developed Zero bone loss concepts – clear clinical



protocols for developing and maintaining long-term crestal bone stability around implants.

Prior to surgery, several factors must be considered: adequate vertical soft tissue thickness, a polished implant neck and the microgap; all of which dictate implant placement depth. It has been shown that if there is at least 3 mm of vertical soft tissue thickness, and the implant is placed in the appropriate position, as dictated by its design, surgical bone stability will be achieved.

Prosthetic factors affecting bone stability include screw-retained restorations, titanium bases with ideal emergence profiles, and polished zirconia in subgingival areas for promoting epithelial adherence.

In conclusion, no one factor is most important for ensuring crestal bone stability. It is the combination and interaction of factors that determine the outcome. It is only through accepting this multifactorial reality that clinicians can change their thinking and begin on the path to zero bone loss.

Zero bone loss versus zero peri-implantitis

By Philippe Khayat, DDS, MSD

Bone loss is an important sign of peri-implantitis. Many believe that implant design and proper 3-D surgical placement can prevent initial bone loss in the implant cervical portion and consequently, may be an excellent way to prevent peri-implantitis.

Is this really true?

A paralogism is a piece of illogical or fallacious reasoning which appears logical or which the reasoner believes to be logical.

An example of paralogism:

- A) All humans are mortals.
- B) My dog is mortal.
- C) Therefore, my dog is human!

Let's see how paralogism is present in our debates:

- D) Eliminating bacterial leakage through tight implant-abutment connections will prevent marginal bone loss.
- E) An important expression of peri-implantitis is marginal bone loss.
- F) Therefore, eliminating bacterial leakage through tight implant-abutment connections will prevent peri-implantitis.

Now let's consider this: the worst connection we've ever had in implantology with regard to bacterial leakage was the external hex connection. Didn't we use this connection

for over 20 years on first generation, machined Brånemark implants, without experiencing peri-implantitis, or only on very rare occasions? Regarding peri-implantitis, a tight connection is obviously not the key!

When considering bone loss, we make an important mistake if we do not recognize two very different biological processes:

- G) Bone loss from **initial bone remodeling**, which takes place very early in the healing process; and
- H) Bone loss from **peri-implantitis**, which usually develops several years after implant placement.

The first process can be controlled, even eliminated, through implant design, tight connections and proper surgical positioning. But, some of the features we use to prevent initial bone remodeling, like rough surfaces to the top of the implant or microthreads can play a very negative role, especially if a few years later, these surfaces are exposed and become contaminated. What prevented initial bone remodeling may now favor peri-implantitis! **The surfaces designed to prevent bone loss may now favor bone loss!**

It all comes down to this important question: which battle should we fight? The battle against initial bone remodeling or the war against peri-implantitis? Which one is most important for the success of our treatments? For our credibility? For our patients?

The war against peri-implantitis will require smoother surfaces in the cervical part of the implant, simpler implant neck geometries and more demanding long-term studies. Those who choose this narrow path will not be the trendiest guys. But they can count me in!

Perhaps, Drs. Khayat and Linkevicius represent the realist versus the idealist points of view regarding bone loss around implants. In our practice, we have been able to put both philosophies to use based on what we've learned from the debate about bone loss around implants. For example, for patients who present with known risk factors for peri-implantitis, we use an implant design that enables us to better manage bone loss and peri-implantitis. On the other hand, by identifying and managing factors that can cause bone loss, we strive to achieve zero bone loss.

What is your philosophy about bone loss around implants? To aid in developing an evidence-based philosophy that fits your practice, an excellent resource is the proceedings of the 2018 Academy of Osseointegration Summit entitled, "Optimized Patient Care: Converting Osseointegration to Patient Integration." It's on the AO website and was published as a supplemental issue of the *International Journal of Oral and Maxillofacial Implants (JOMI)* earlier this year.

The 2018 AO summit was a culmination of dedicated work by 70 international clinician-scientists, in collaboration with representatives of dental organizations, including the American Association of Oral and Maxillofacial Surgeons (AAOMS), the American Academy of Periodontology (AAP), and the American College of Prosthodontists (ACP).

From left, Drs. Philippe Khayat, Bich Khayat, Lourdes Ann Christopher, Mehrdad Favagehi, Ed McGlumphy and Tomas Linkevicius at the Hope Diamond exhibit in the Smithsonian National Museum of Natural History in Washington, DC during AO's 2019 President's Reception.

2020 Annual Meeting Program to feature new technologies, techniques and methodologies

By AO Fellow Craig M. Misch, DDS, MDS, 2020 Annual Meeting Program Chair



Dr. Craig M. Misch

The theme of the Academy of Osseointegration's (AO) 35th Annual Meeting program is "Evolving Technologies in Implant Dentistry." We have invited renowned experts from around the world to share different methodologies that may improve outcomes or streamline dental implant therapy for patients, while discussing technology that is current, cutting edge and available to clinicians.

New Hands-on Workshop Format

Among the 2020 program highlights will be a new format for our hands-on workshop series. In response to attendee and exhibitor preferences, our workshops will be held on Friday and Saturday, instead of the Wednesday immediately preceding the Annual Meeting (see related article on page 14 of this edition).

March 18: Pre-Conference Courses

The meeting will commence with Pre-conference courses designed to navigate surgical and prosthetic pitfalls. Dr. **Kenneth Reed** (Marana, AZ) will provide a comprehensive review of sedation and medical interactions. Dr. **Antoanela Garbacea** (Loma Linda, CA) will present on full-arch fixed implant restorations. These courses are designed to fulfill some of the AO Certificate in Implant Dentistry requirements.

March 19: Corporate Forums, Opening Symposium, Welcome Reception

Our meeting will begin with the popular Corporate Forums, highlighting the latest innovations from a collection of our industry's leading corporations, followed by e-Poster sessions in the Exhibit Hall during lunch.

The Opening Symposium, chaired by AO Past President and Life Fellow Dr. **Michael S. Block** (Metairie, LA), will feature keynote speaker Dr. **Catherine Mohr** (Sunnyvale, CA), President of the Intuitive Foundation, manufacturer of the da Vinci surgical robot, discussing how new technology will impact medicine. Dr. **Robert E. Guldberg** (Eugene, OR) will update us on the future of tissue engineering for implant dentistry. Dr. **Christian Coachman** (Sao Paulo, Brazil) will present on digital planning for esthetics. Digital workflow for the implant team will be covered by Dr. **Marcus F. Abboud** (Lexington, KY). Dr. **Frank M. Spear** (Seattle, WA) will close by answering the question, "When is a Dentition Terminal?"

Thursday evening, join us in the exhibit hall for our traditional Welcome Reception and e-Poster presentations. Please show your support to the researchers from around the world, while enjoying hors d'oeuvres, networking and visiting exhibitors offering the latest technologies.

March 20: Morning with the Masters, Surgical and Prosthetic Tracks

Friday will begin with Morning with the Masters, providing an opportunity to interact with world-renowned experts, in a smaller setting: Drs. **Istvan A. Urban** (Budapest, Hungary), **Bach T. Le** (Whittier, CA), **Rodrigo Neiva** (Philadelphia, PA), **Wael Att** (Boston, MA), AO Fellow **David L. Guichet** (Orange, CA), **Bill Marais** (Portland, OR), **Mark S. Montana** (Tempe, AZ) and **Howard Gluckman** (Cape Town, South Africa).

The morning Surgical Track will cover Virtual Planning and Guided Surgery with Drs. **German O. Gallucci** (Boston, MA), **Hugo De Bruyn** (Ghent, Belgium), **Michael A. Pikos** (Palm Harbor, FL), **Michael S. Block**, **Jeffrey Ganeles** (Boca Raton, FL), **Michael Scherer** and **Arndt Happe** (Muenster, Germany).

The morning Prosthetic Track will be an Update on New Restorative Materials and Technology with Drs. **Bryan M. Limmer** (Wheat Ridge, CO), **Markus B. Blatz** (Philadelphia, PA), **Marta Revilla León** (Dallas, TX), **Nitzan Bichacho** (Tel-Aviv, Israel), **Benjamin M. Wu** (Los Angeles, CA), **Lee Culp** (Sarasota, FL) and **Wael Att**.

The afternoon Surgical Track will discuss Technology for Bone Augmentation with Drs. **Federico Hernández-Alfaro** (Barcelona, Spain), **Marc L. Nevins** (Boston, MA), **Dong-Seok Sohn** (Daegu, South Korea), **Alan S. Herford** (Redlands, CA), **Darnell Kaigler** (Ann Arbor, MI), and **Bilal Al-Nawas** (Mainz, Germany). The afternoon Prosthetic Track will be on Digital Prosthetic Dentistry, with Drs. **Mark Ludlow** (Charleston, SC), **Lyndon F. Cooper** (Chicago, IL), **Curtis E. Jansen** (Monterey, CA), **Peter S. Wöhrle** (Newport Beach, CA), **Ueli Grunder** (Zollikon-Zurich, Switzerland) and **Alessandro Pozzi** (Rome, Italy).

Continuing AO's tradition of supporting research and innovation, the Oral Clinical Research Presentations will be held Friday morning and the Oral Scientific Research

and Clinical Innovations Presentations will be held Friday afternoon.

Hands-on Workshops will feature "Immediate Provisional Restoration of Post-extraction Socket Implants," with Dr. **Stephen J. Chu** (New York, NY) in the morning. Friday afternoon, Dr. **Tiziano T. Testori** (Como, Italy) will facilitate "Maxillary Sinus Augmentation Techniques."

Expanded AO President's Reception

Friday evening, AO President and Fellow Dr. **Jay P. Malmquist** (Portland, OR) will host the President's Reception at the Museum of Flight, complimentary to all attendees and registered guests. This iconic AO event is being expanded to three hours and promises to offer an exciting, fun filled evening at the museum's entire campus, featuring historic, commercial and military aircraft, and the Red Barn, birthplace of the Boeing Airplane Company. Free admission to the museum, ground transportation, hors d'oeuvres, cocktails, and live musical entertainment will all be included in this very special evening.

March 21: TEAM and Allied Staff Programming, Closing Symposium

Saturday will offer the full-day TEAM Program for Allied Staff and Dental Laboratory Technicians. Hands-on workshops will include "Socket Shield Technique in the Esthetic Zone" on Saturday morning presented by Dr. Gluckman, and "Digitally and Biologically Driven for Full-arch Reconstruction" by Dr. Pozzi on Saturday afternoon.

The main podium on Saturday morning will address the important topic of Treatment Planning Decisions. Dr. **Costa Nicolopoulos** (Glyfada, Greece) will discuss the retreatment of failed implant cases. Whether to save or remove an ailing implant will be covered by Dr. **Paul S. Rosen** (Yardly, PA). Dr. **Anton Sculean** (Bern, Switzerland) will review methods to treat soft tissue defects around dental implants. Peri-implantitis and methods for implant surface detoxification will be covered by AO Secretary and Fellow Dr. **Hom-Lay Wang** (Ann Arbor, MI). Dr. **Sonia S. Leziy** (North Vancouver, BC, Canada) will present on gingival augmentation options for esthetic zone implants. The morning session will end with the Australian team of Drs. **Brent Allan** (West Leederville, Western Australia) and **Glen J. Liddelow** (West Perth, Australia) on the use of technology for full-arch immediate loading.

During lunch, please join us at Lunch with the Masters to experience personal interaction with five wonderful clinicians: Drs. **Todd R. Schoenbaum**, AO Fellow (Los Angeles, CA), AO Fellow **Georgios E. Romanos** (Stony Brook, NY), **Michael Scherer**, AO Vice President and Fellow **Tara L. Aghaloo** (Los Angeles, CA), **Marco A. Brindis** (New Orleans, LA), and **Bradley S. McAllister** (Tualatin, OR). This is the perfect chance to get up close and personal with leaders in implant dentistry.

Saturday afternoon's Closing Symposium promises to end the meeting with a bang, debating minimally invasive approaches versus reconstructive techniques to manage four common clinical problems. Renowned authority Dr. **Dennis P. Tarnow** (New York, NY) will moderate this exciting session. Drs. Testori and **Homayoun H. Zadeh** (Woodland Hills, CA) will discuss regenerative versus non-regenerative solutions for the posterior maxilla. The question of saving teeth versus extracting them for implant replacement will be debated by **Saj A. Jivraj** (Oxnard, CA) and **Pamela K. McClain** (Aurora, CO), Drs. **Edmond Bedrossian** AO Fellow (San Francisco, CA) and **Gerry M. Raghoobar** (Groningen RB, The Netherlands) will help us determine the indications for using bone grafting or zygoma implants for the severely atrophic maxilla. The management of esthetic zone defects by reconstruction versus using prosthetic gingiva will be addressed by Drs. Chu and AO Director **Joseph J. K. Kan** (Loma Linda, CA).

The Academy's 2020 Annual Meeting promises to be an outstanding opportunity to become updated on the latest technologies in implant dentistry and learn from leaders in the field. We invite you to mark your calendar and register today. See you in the beautiful "Emerald City" - Seattle!



AO unveils new Hands-on Workshop format for 2020

One of the main programming changes for the Academy of Osseointegration's (AO) 2020 Annual Meeting is a new format for its hands-on workshop series.

Four workshops are scheduled during the main program on Friday and Saturday, instead of the Wednesday immediately preceding the Annual Meeting, when they have been traditionally offered. This programming change aligns with preferences expressed by attendees and exhibitors, and helps consolidate schedules while at AO's Annual Meeting.

These popular AO limited-attendance sessions are often sold out, so registrants are encouraged to secure their seats early in order to receive first-hand experience with the latest technologies under the guidance of renowned experts:

Friday, March 20, 2020, 8:00 am - noon **Maxillary Sinus Augmentation: Lateral Approach**

Tiziano T. Testori, MD, DDS (Como, Italy)

"This workshop will differ from similar events because anatomical models will be utilized to give participants hands-on instruction to the lateral approach. In addition, a planning session with dedicated software of the models will allow participants to evaluate the difficulty of the case utilizing the "Maxillary Sinus Elevation Difficulty Score," said Dr. Testori. "Although we have been offering this didactic program for many years, every single workshop is a new, improved and updated experience."

Friday, March 20, 1:00 - 5:00 pm **Immediate Provisional Restoration of Post-extraction Socket Implants**

Stephen J. Chu, DMD, MSD, CDT (New York, NY)

In his presentation, Dr. Chu will focus on the immediate temporization of extraction socket implants with either custom healing abutments or full provisional crowns. Temporary restorations will be made both free hand or with preformed gingival former devices to capture the shape

of the peri-implant tissues. A step-by-step technique will be shown in the fabrication of these restorations, which is critical for the preservation of tissues post-extraction.

Saturday, March 21, 8:00 am - noon **Socket Shield Technique in the Esthetic Zone**

Howard Gluckman, BDS, MChD, PhD
(Cape Town, South Africa)

According to Dr. Gluckman, the loss of teeth will lead to resorption of the buccal plate, extensive augmentative procedures, and the risk of poor long-term aesthetic stability. Socket shield techniques that allow the buccal bone plate to be maintained, prevent the collapse of the alveolar bone, and create a platform which is stable in the long-term. This hands-on will take you through the different options of immediate implant placement, and the most cutting-edge socket shield technique in a step-by-step fashion.

Saturday, March 21, 1:00 - 5:00 pm **Digitally and Biologically Driven for Full-arch Reconstruction**

Alessandro Pozzi, DDS, PhD (Rome, Italy)

New surgical and prosthetic protocols, based on the dynamic navigation technology, will be widely described in order to teach attendees how to precisely position implants and deliver the complete arch x-guided prosthesis. The new digital assisted soft sculpturing (DASS) technique to sculpt the bone and soft tissue and the use of xenogeneic collagen matrix to achieve a scalloped interface for highly esthetic pink free restoration will be presented on real patient training models.

Full descriptions and objectives of each hands-on workshop and registration information may be found on AO's 2020 Annual Meeting website, ao2020.osseo.org. Pre-registration is required and admission is by ticket only. Register by January 13, 2020 to secure Early Bird rates, the best hotel availability and your seat at these workshops.





Expert AO clinicians present 7th annual symposium at FDI World Dental Congress

A trio of dental implant experts from the Academy of Osseointegration (AO) presented “Advances in Clinical Implant Dentistry,” at its seventh annual symposium in conjunction with the FDI World Dental Congress (WDC). Held in San Francisco, CA, the FDI joined forces with the American Dental Association (ADA) for the 2019 WDC, which also celebrated the ADA’s 160th anniversary.

The lineup of presenters, moderated by AO Immediate Past President James C. Taylor, DMD, MA, Ottawa, ON, Canada, included:

- AO President and Fellow **Jay P. Malmquist**, DMD, Portland, OR
Grafting Large and Small Alveolar Defects With Bone Proteins and Blood Modifiers Using Ti Mesh Constructs
 Dr. Malmquist’s presentation centered on the use of bone proteins, specifically rhBMP-2 to enhance the implant platform. Discussing the use of constructs such as titanium mesh or collagen 3-D barriers was the main topic of his lecture. According to Dr. Malmquist, using BMP-2 with titanium mesh allows for a way to expand bone defects through grafting to allow for adequate implant placement. “Using the proteins allows for an alternative approach to grafting without a second site surgery and avoids the need for various xenografts or allografts,” said Dr. Malmquist. “This continues to be a significant topic of interest in implant reconstruction.”
- **Alina Krivitsky Aalam**, DDS, Los Angeles, CA
Critical Evaluation of Soft Tissue in Implant Dentistry for Long-term Crestal Bone Maintenance

A main focus in implant dentistry has been on hardware, such as implant connections, implant surface, platform switching, and more recently on instrumentation and partial extraction therapy. Dr. Aalam discussed new strategies in merging the concepts of biology (preservation of buccal plate and increasing vascularization) and biomechanics (platforms, surfaces and instrumentation).

- **Lambert J. Stumpel**, DDS, San Francisco, CA
Fixed Hybrid Prosthesis: The Cumulative Experience of Over 500 Cases

According to Dr. Stumpel, there are many more options and insights today on how to restore edentulous patients back to function. In his presentation, Dr. Stumpel reviewed the restorative process, starting with treatment planning, and discussed various immediate load techniques, followed by providing almost every possible way clinicians can produce a final prosthesis.

With its seventh annual symposium, AO continued building on its partnership as an Affiliate Member with the FDI World Dental Federation. Achieved in 2016, AO’s status affords it the opportunity to further support the FDI mission of promoting the ethics, art, science and practice of dentistry, and the delivery of the best possible oral health care to patients around the world.

(At top center): AO President Jay P. Malmquist was the first of three presenters at “Advances in Clinical Implant Dentistry.”

AO funds international implant sciences award for ninth consecutive year

Reflecting its reputation as a global nexus for evidence-based clinical practice in implant dentistry, the Academy of Osseointegration (AO) has made a cumulative investment of nearly \$700,000 to help investigators from around the globe pursue novel research focused on maintaining and improving oral health and quality of life.

AO has sponsored the International Association for Dental Research (IADR)/Academy of Osseointegration Innovation in Implant Sciences Award, which provides a \$75,000 grant to the annual recipient's research institution.

This year, **Marco C. Bottino**, DDS, MSc, PhD, associate professor in the Department of Cariology, Restorative Sciences, and Endodontics in the School of Dentistry at the University of Michigan, Ann Arbor, MI, was the recipient of the award for his research, entitled "Customized 3D Printed PEEK-AMP Dental Implants with Enhanced Osseointegration."

"Thanks to the generous award sponsored by AO, I look forward to expanding our knowledge and clinical translation of PEEK as a 3D printable dental implant with unique osseointegration ability," said Dr. Bottino.

The goal of this research is to develop customized 3D-printed dental implants made of polyetherether-ketone (PEEK), a fairly new polymeric biomaterial, with unique properties, as compared to those of titanium implants.

"We predict the presence of the amorphous magnesium phosphate (AMP) within the PEEK matrix will increase hydrophilicity and enable CaP (or Mg-doped CaP) deposition on the implant surface. This would enable enhanced osseointegration and the customized PEEK-AMP 3D printed implants can be translated as an innovative bioactive dental implant for oral rehabilitation," he said.

Dr. Bottino has more than 10 years of experience in the development of dental and orthopedic biomaterials, in addition to tissue scaffolds and drug delivery systems for regenerative dentistry. He completed his DDS in Dentistry at the Universidade Paulista, São Paulo, Brazil and his PhD in Materials Science at the University of Alabama at Birmingham.

To date, nine IADR/AO research grants have been awarded to:

- **Jake Jinkun Chen**, DMD, MDS, PhD, Tufts University, Boston, MA (2012)
 - **Owen Addison**, BDS, PhD, University of Birmingham, England, UK (2013)
 - **Rene Olivares-Navarrete**, DDS, PhD, Virginia Commonwealth University, Richmond, VA (2014)
 - **Gustavo Mendonça**, DDS, MS, PhD, University of Michigan, Ann Arbor, MI (2015)
 - **Alireza Moshaverinia**, DDS, MS, PhD, University of California, Los Angeles, CA (2016)
 - **Lyndon F. Cooper**, DDS, PhD, University of Illinois at Chicago, Chicago, IL (2017)
 - **Daniela B. Mendonça**, DDS, MS, PhD, University of Michigan, Ann Arbor, MI (2018)
 - **Marco C. Bottino**, DDS, MSc, PhD, University of Michigan, Ann Arbor, MI (2019)
- **Min Lee**, PhD, University of California, Los Angeles, CA (2011 recipient)

"IADR is pleased that the Academy of Osseointegration is sponsoring this award for a ninth year," said IADR President Rena D'Souza. "IADR thanks the Academy of Osseointegration for their continued support which allows dental, oral and craniofacial researchers to create innovative discoveries that can be applied in clinical practice."



Dr. Marco Bottino

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therapeutic medication, implant therapy can become more personalized and able to address potentially harmful risk factors in order to increase the likelihood of an implant veering away from a diseased state.

The increase in available data and active participation from the scientific community also creates an acceleration in biomedical innovation that integrates disease care and advanced technology to address disease. Innovation utilizing technology such as lasers and biologics are a continual process that help contribute to the vast data collection that feeds into the principles of P4 medicine. This data generates hypotheses that are continually tested to facilitate effective and efficient delivery of implant therapies.

Consumer Access and Self-management

Due to the increasing amount of literature and data published, there is a plethora of data available for analysis and collection for a more personalized and holistic treatment. Science-based healthcare has moved beyond disease care in the clinical setting to enhanced wellness by patients in their homes. With increased access to data and information, patients are more aware of dental implants than in the past. Journals such as the *International Journal of Oral & Maxillofacial Implants (JOMI)* integrate clinical and scientific data to improve methods and outcomes of oral and maxillofacial implant therapy. This information can be translated from the clinician to patients in order to promote and enable continuous improvement of implant health through "learning healthcare systems" for self-management. These can include digital platforms, engaging and empowering patients, alignment of incentives to encourage continuous improvement, and the creation of positive feedback loops for patients through regular recalls in order to maintain healthy implants. The information will also provide individuals with detailed and personal data with respect to their risk factors. Evidence indicates that, when supplied with meaningful information on their health status, patients are more likely to exhibit positive behavioral changes. Through P4 medicine principles, the delivery of science-based healthcare no longer excludes patients but includes them by applying personalized knowledge in order to better care for themselves.

P4 medicine has become widely accepted and has been shown to provide patients and physicians with personalized information about factors and biology unique to the individual. The information collected as data will help provide a basis and foundational knowledge for patients and clinicians to improve health, with the individual's lifestyle decisions in mind. The utilization of digital information and advanced technologies will help reduce the incidence of chronic implant diseases, in addition to helping prevent their occurrence. Through continual collection of individual data, personalized healthcare via the P4 principles will aid and contribute to

the evolving technological advances within the field of implant dentistry.

Dr. Kevin Luan is a Diplomate of the American Board of Periodontology, a Clinical Assistant Professor at University of Illinois College of Dentistry, and a Health Professions Education Fellow at Johns Hopkins University. He serves on the Academy's Young Clinicians Committee, AO & OF Research Grant Committee, and Academy News Committee.

AO events and CE calendar



2019

December 11

Live Webinar: "Maintenance of Patients with Implants for the Dental TEAM"

Diane Daubert, RDH, MS, PhD

December 12

Live Webinar: "New Concepts in Guided Implant Surgery"

Gary Orentlicher, DDS, MD

2020

January 5/6

Joint conferences with Taiwan Academy of Osseointegration and the Asia Pacific Society of Osseointegration, Malaysia

- "Using Titanium Mesh and Bone Proteins to Enhance Bone Defects for the Implant Platform"
AO President and Fellow **Jay P. Malmquist, DMD**
- "Management of the Edentulous Maxilla with Hard and Soft Tissue Grafting"
AO Vice President and Fellow **Tara L. Aghaloo, DDS, MD, PhD**

March 18 - 21, 2020

AO 35th Annual Meeting: "Evolving Technologies in Implant Dentistry"

Washington State Convention Center, Seattle, WA
Registration now open: <https://ao2020.osseo.org/>
Early Bird Pricing through January 13, 2020

The Academy's comprehensive live webinar series and e-Learning Center are highly valued benefits of your membership. AO's e-Learning Center currently holds more than 100 recorded presentations, including webinars, which are available for CE credit for up to 90 days following the live session, as well as past Annual Meeting presentations, and courses specifically certified for achieving the AO Certificate in Implant Dentistry. For the dates of all upcoming AO webinars and to explore our e-Learning Library, please see our website at osseo.org.

Tell me what you see!

By Harriet K. McGraw, DDS, Academy News Editor

Donald A. Kerr, Professor of Oral Pathology at the University of Michigan School of Dentistry would admonish his students to "Tell me what you see!" when describing orofacial photos. By doing so, he pushed the class to look beyond the obvious. In addition to what they could see in the visual image, he encouraged students to pose relevant questions to aid in arriving at a diagnosis.

I recently had a conversation with a physician friend, who had an orthopedic issue that was misdiagnosed until he was finally seen by someone who correctly identified the source of his pain. What made the difference? The doctor had him walk, while observing his gait and pointing out to orthopedic residents the critical signs in making a differential diagnosis. None of the previous specialists consulted had him perform that simple task.



3. **Articulate** what is important.
4. **Adapt** to the situation by avoiding inherent biases, thereby being open to new perspectives.

A study evaluated medical students on their ability to react effectively to mock emergency situations. The majority were able to collect and correctly interpret vital signs and other data. However, very few knew how to prioritize quickly the information they collected, thereby delaying critical treatment. Similarly, today's technological advances in dentistry allow us to collect a great deal of information. However, being able to identify what is relevant and of greatest importance requires careful thought. To aid in the



With increased focus on technology, there is less emphasis on physical observation and asking questions, both important aids in arriving at a course of treatment tailored to the needs of a specific patient.

Dr. **Steven I. Present**, DMD, AO member (North Wales, PA), and Clinical Associate Professor, Department of Restorative Dentistry at Kornberg School of Dentistry, recommends that dental students he teaches read the book *Visual Intelligence* by **Amy E. Herman**. In it, she shows how sharpening one's observational skills can have profound work/life benefits. The process she teaches is very applicable to dentistry. It involves the following:

1. **Assess/observe** available information carefully. Look at the forest and the trees.
2. **Analyze** information that has been gathered, paying attention to what may be missing, and then creating a list of priorities.

process, enlisting input from colleagues is invaluable, since they can offer additional perspectives, especially when dealing with challenging cases.

As with any skills, refining one's powers of observation and ability to prioritize information takes practice. Sharpening those skills aids critical thinking, which is beneficial both personally and professionally.

The Editor's Editorial is intended to contribute to the dialogue on issues important to implant dentists. The views expressed in the editorial do not necessarily reflect the policy of the Academy of Osseointegration or its Board of Directors. Readers who would like to comment or express a point of view on the editorial are invited to write to the editor via email at hkmcgraw@me.com. We will endeavor to publish pertinent comments or views when space permits.



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