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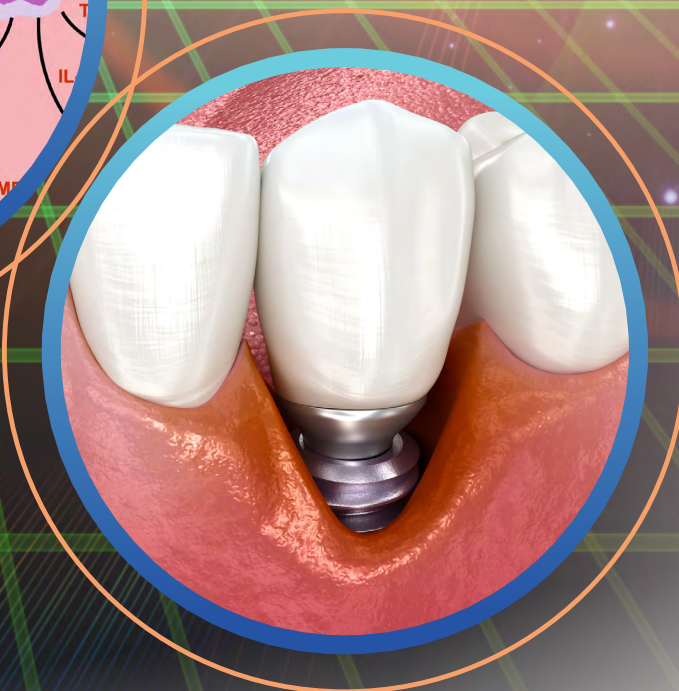
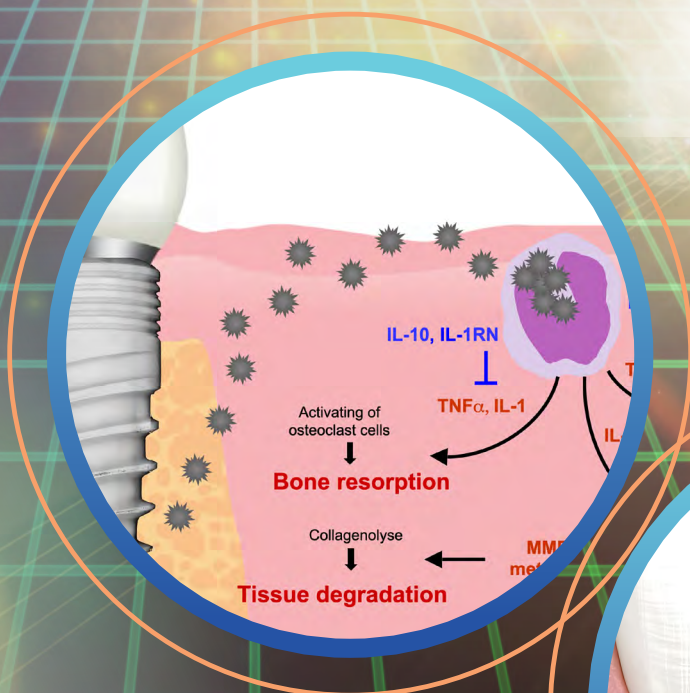
Academy NEWS

A QUARTERLY MEMBER NEWSLETTER

Peri-implantitis Revisited

Inside this issue:

- Photogrammetry
- Re-osseointegration
- Platform Switching
- Implant Cleanliness



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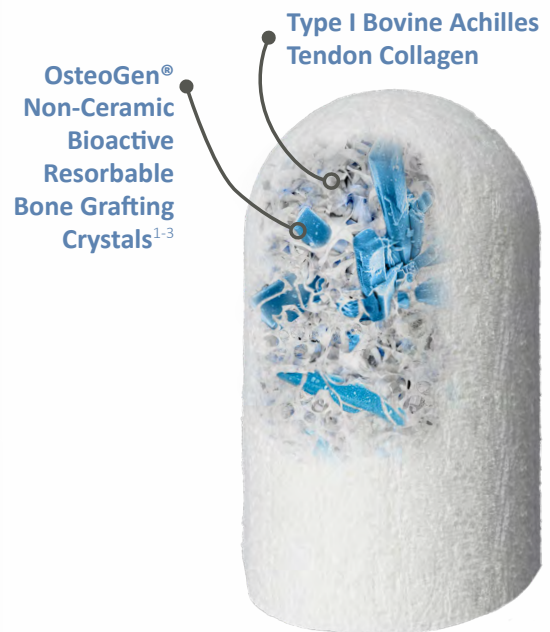
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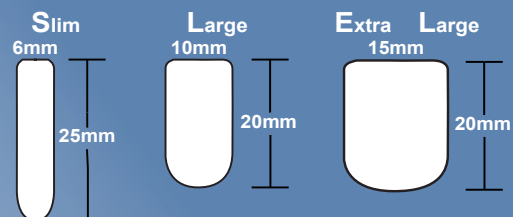
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1. Spivak, J Biomed. Mater Research, 1990
2. Ricci, J Oral Maxillofacial Surgery, 1992
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ACADEMY NEWS

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President's Message

Thank you for advancing AO

By Hom-Lay Wang, DDS, MSD, PhD

Dear AO members:

I hope each of you had a restful and joyful holiday break and are feeling refreshed and excited to welcome 2024 with renewed energy and perspective.

We are now on the cusp of once again having the opportunity to connect in person in Charlotte, North Carolina for the **2024 Annual Meeting** of the Academy. Our theme, "Going Beyond the Boundaries: Optimizing Patient Care through Scientific and Clinical Innovation," sets the stage for invaluable face-to-face interactions among colleagues and experts. I'd like to extend a special thank you to **Gustavo Avila-Ortiz**, DDS, MS, PhD, and the Scientific Program Committee for curating an impressive lineup of world-renowned experts in implant dentistry for our 2024 Annual Meeting.

The teams have put in a tremendous amount of effort for this meeting, and I look forward to attending the intriguing sessions and seeing many of you there!

As my term as president draws to a close, I want to express my gratitude for the unwavering support and dedication I've received from AO board members, our committed staff, and our loyal members. Working closely with the board, I have spearheaded initiatives aimed at fortifying AO's position and relevancy to meet future challenges. A few highlights that I'm particularly proud of include the expansion of collaborations and international affiliations, enhanced credentialing processes, and the growth of our membership base.

First, I am proud to share that the collaborative effort between AO and the **American Academy of Periodontology (AAP)** on the "Prevention and Management of Peri-Implant Diseases" consensus conference, which is making remarkable progress. We're on the verge of completing eight exceptionally high-quality consensus manuscripts, poised for submission to our flagship official journal, the *International Journal of Oral and Maxillofacial Implants*, as well as the *Journal of Periodontology*. This achievement is truly significant as it marks the first time our organizations have united for a consensus conference, synergizing expertise from both fronts to enhance the professional landscape for all involved practitioners.

Additionally, over the past year, I've had the privilege of advocating for AO's mission and elevating implant education across numerous countries. As a result, we've established **international affiliated associations** and

AO training centers globally, offering unparalleled educational opportunities. In October, we announced the "**The Osseo Alliance**," between AO and **European Academy of Osseointegration (EAO)** to establish joint consensus conferences in 2025 focusing on Patient Reported Outcome Measures (PROM) and Clinician Reported Outcome Measures (CROM). This is such a critical initiative, and I am beyond thrilled that we now have such an esteemed, dedicated task force diligently assembling world experts and stakeholders.

Next, it brings me great joy to see how our **AO Master** and **AO Diplomate** credentialing processes, now in their second year, have gained significant traction. The new process is meeting the needs of our growing membership, ensuring the recognition of their accomplishments.

And last, but certainly not least, I'm ecstatic about our **membership growth**, welcoming over 440 new members. This success is a culmination of our collective efforts, expanded affiliations, and new outreach efforts. Notably, our Social Media Committee successfully launched the "**AO Hotseat**" podcast last fall, which generated significant engagement across our AO-affiliated social media platforms. These exchanges have proven exciting and insightful, offering valuable knowledge-sharing opportunities to more of our members.

Continues on page 5



Dr. Hom-Lay Wang

AO board nominations include two directors, treasurer

Among those nominated for election to the Academy of Osseointegration (AO) Board of Directors at the Annual Business Meeting March 9, 2024 in Charlotte, NC, will be two new directors: **Harriet K. McGraw**, DDS; and **Bach T. Le**, DDS, MD, FACD.



Dr. Harriet McGraw

Dr. McGraw has been an AO member since 2005, most notably as editor of *Academy News* from 2017 – 2020. She also served vice chair on that committee. In addition to coming to the AO Board, she has been serving as a director on the board of directors of the Osseointegration Foundation since 2022.

A general dentist who has practiced in Harbor Springs, MI for more than 30 years, Dr. McGraw's practice places emphasis on dental implants and complex restorative cases. She treats difficult cases with a team approach, working closely with various dental specialists and laboratory technicians. She attended the University of Michigan, Ann Arbor, for undergraduate and dental school, receiving her doctor of dental surgery degree there in 1978.



Dr. Bach Le

Dr. Le has been in private practice in Whittier, CA since 2000 as well as clinical associate professor of Oral & Maxillofacial Surgery at the Herman Ostrow School of Dentistry at USC also during this time. His primary focus has been in the area of hard and soft tissue regeneration for improving esthetic outcomes and practices a full scope of oral and maxillofacial surgery. He has been

a main podium speaker at numerous dental organizations, including AO. He completed his specialty training in Oral & Maxillofacial Surgery at Oregon Health Sciences University. Dr. Le has been a member of AO since 2008.



Dr. Jeffrey Ganeles

Nominated for treasurer is AO Fellow **Jeffrey Ganeles**, DMD, a Boca Raton, Fla. periodontist, elected to the AO Board of Directors in 2018. A member of the Academy since 1990, he has served on several Annual Meeting scientific program committees and chaired the Program Committee for the 2017 Annual Meeting. In 2006, he served as co-chair of the State of the Science in Implant Dentistry (SSID) consensus conference.

In addition to the new directors and treasurer, AO members participating in the Annual Business Meeting will vote on the following new full slate of officers and directors for 2024 – 2025:

OFFICERS

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AO Fellow **Joerg Neugebauer**, DDS, PhD

President-elect

AO Fellow **Robert C. Vogel**, DDS

Vice President

AO Fellow **Joseph P. Fiorellini**, DMD, DMSc

Treasurer

AO Fellow **Jeffrey Ganeles**, DMD

Secretary

AO Fellow **Joseph Y. K. Kan**, DDS, MS

Immediate Past President

AO Fellow **Hom-Lay Wang**, DDS, MSD, PhD

DIRECTORS

Robert M. Lemke, DDS, MD

AO Fellow **Lambert J. Stumpel**, DDS

AO Fellow **Robert A. Levine**, DDS

AO Fellow **Daniel I. Taub**, DDS, MD

New: **Harriet K. McGraw**, DDS

New: **Bach T. Le**, DDS, MD, FACD

President's Message *(continued from page 4)*

I've been fortunate to learn from esteemed predecessors and colleagues, whose guidance and wisdom have been invaluable. I also want to take a moment to thank our diligent AO staff whose contributions were critical in enabling ongoing and new initiatives to continue seamlessly. And, of course, none of this would be possible without the support and engagement from our members.

In conclusion, I'm deeply grateful for your support and camaraderie throughout my tenure as president. I firmly

believe that together, we have and will continue to advance AO and establish it as a premier organization for dentists. Your thoughts and suggestions on how we can further enhance and expand our efforts to fulfill AO's mission are always invaluable and welcomed.

Respectfully,
Hom-Lay Wang

Stereophotogrammetry in implant dentistry: Advancements, applications, and challenges

By: Gustavo Mendonça DDS, MS, PhD; Academy News Guest Contributor

Other contributors: Priscila Ceolin Meneghetti DDS, MS, PhD; Paulo Sergio Borella DDS, MS; Alia Al Houch DDS, MS, PhD; Gus Khalil CDT; and Junying Li, DDS, MS, PhD

Modern implant dentistry has advanced incredibly since its discovery by **Prof. P-I Brånemark**.

The advancements in technology related to dentistry with intraoral scanners and 3D printers has created a high level of accuracy and predictability never imagined before. Traditionally, it relied on physical impressions, manual registration, and subjective evaluations. However, digital technology has evolved with new imaging techniques available that enhance accuracy and efficiency. Intraoral scanners have made significant progress in scanning dentate patients with enough accuracy and speed. Challenges remain in creating screw-retained full-arch implant restorations. Photogrammetry offers a solution by precisely capturing multiple implants position and facilitating seamless data transfer for prosthesis fabrication.

With currently available 3D printers and biocompatible resin a full arch screw-retained implant supported restoration can be designed and 3D printed in less than one hour after the implants are placed and patient properly scanned (some pre-op preparation is required). Here we provide an overview of photogrammetry in implant dentistry for full-arch screw-retained implant restorations. It explores principles, benefits, and limitations, emphasizing its potential to enhance patient outcomes and future research directions.

Current intraoral scanners present a limitation in which they capture multiple pictures of the mouth including scanbodies to generate a 3D model. Putting together all these small images (size of the intraoral camera) can lead to small distortion in a full arch scan. While these small distortions are irrelevant for single implant crowns, cement retained FPD, surgical guide or occlusal appliances, they are very significant for screw-retained prosthesis on a cross-arch situation. On top of that, you also need to align the captured image of the scanbody to the original STL that is present in the implant system library in the CAD/CAM software. In a full arch scenario, 1-degree buccal error of a misaligned scanbody on tooth #3 area could lead to about 85µm misfit of the prosthesis on tooth #14 area (Fig. 1).



Fig. 1A: STL image of scan-bodies provide using photogrammetry (Micronmapper, S.I.N. Dental, USA)

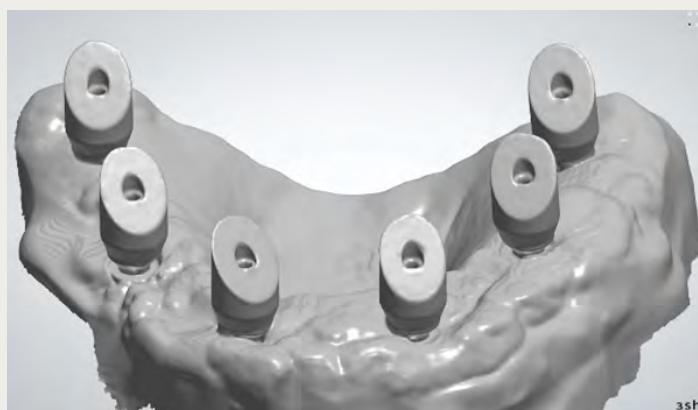


Fig. 1B: STL image of scan-bodies generated from intraoral scanning (Trios 5, 3Shape, Denmark)

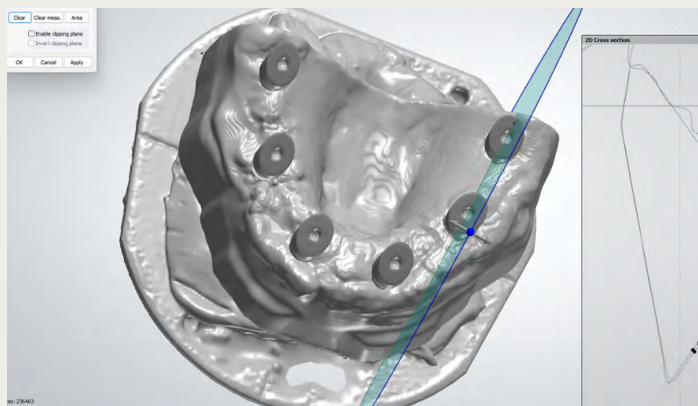


Fig. 1C: Superimposition of both scanbodies showing a small discrepancy between them.

Continues on page 7

Stereophotogrammetry *(continued from page 6)*



Fig. 2A: Photogrammetry equipment (Micronmapper, S.I.N. Dental, USA) and intraoral scanner (Trios 5, 3Shape, Denmark) used to demonstrate one clinical case.

Photogrammetry, as demonstrated in figures 2A and 2B, uses a large camera that can see all scanbodies at the same time. Introduced to implant dentistry in 1994, it measured the marginal adaptation between prostheses and implants. Early studies showed promise, but complex operations limited its clinical use. Photogrammetry in restorative dentistry captures images of dental structures to obtain precise measurements and create digital models. Stereophotogrammetry uses multiple cameras to capture precise implant positions, critical for full arch screw-retained restorations. Specially designed scan bodies are used as an implant coordinate transfer system.

The process involves image acquisition, preprocessing, image registration, analysis, and alignment. Soft tissue scans with intraoral scanners are also taken. 3D models are generated from the images, facilitating the creation of full-arch implant-retained restorations. The intraoral scanner captures the tissue contours and maxillo-mandibular relationship while the implant position information is merged from the stereophotogrammetry.

Advancements in high-resolution cameras, both intraoral and extraoral, have improved image quality. Intraoral scanners capture precise 3D images, eliminating the need for physical impressions. However, they may struggle with capturing multiple implant positions accurately. Modern software and algorithms create detailed 3D models from photogrammetric data, which are merged with intraoral scanner data. This integration ensures accurate analysis, treatment planning, and communication with patients and dental technicians.

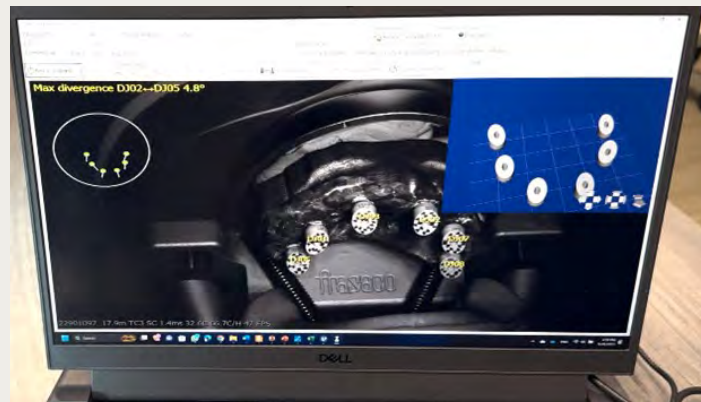


Fig. 2B: Image from the capture with photogrammetry. Only the file with the STL (implant positioning) is exported. No tissue data is collected.



Fig. 2C: Prototype 3D printed (SprintRay Pro 55S, SprintRay, USA) using OnX Tough resin (SprintRay, USA).



Fig. 2D: 3D printed prototype after finishing in the typodont.

Stereophotogrammetry integration with CAD/CAM systems enables efficient design and fabrication of dental restorations. This seamless merger ensures precise and personalized restorations that fit harmoniously within the patient's dentition. These technological advancements have significantly improved the accuracy and efficiency of photogrammetry in restorative dentistry (Fig. 2).

Continues on page 8

Stereophotogrammetry (continued from page 7)

BENEFITS AND CHALLENGES OF PHOTOGRAMMETRY

Accuracy and Precision

Photogrammetry offers high accuracy in capturing implant positions for full arch screw-retained restorations. Studies have shown its accuracy to be comparable to conventional impression techniques. However, we should exercise caution as this technology requires proper use and calibration of equipment.

Time Efficiency

Photogrammetry reduces chairside time by potentially eliminating the need for physical impressions. Integration with CAD/CAM systems streamlines restoration fabrication, saving time and reducing patient discomfort. Making an impression and fabricating a model for a verification jig is still a good approach specially for novice users. This model does not need to be articulated as this part of the process can be fully digital.

Improved Workflow and Productivity

As previously described, the digital nature of photogrammetry optimizes workflow by eliminating physical models (or at least mounting in articulators) and simplifying design and fabrication processes. Clinicians can focus on clinical aspects, improving productivity and patient care. These benefits, including accuracy, time efficiency, and streamlined workflow, contribute to enhanced patient outcomes and satisfaction in restorative dentistry.



Dr. Gustavo Mendonça

Image Acquisition and Standardization

Ensuring consistent image acquisition and standardization across operators and clinical settings remains a challenge. Capturing images in challenging clinical situations can also be problematic. All scanbodies must be fully seen by the equipment and partially blocked posterior implants can limit accuracy. The accuracy of photogrammetric measurements depends on data processing quality. Errors during image registration, alignment, and analysis can affect results, necessitating continuous assessment and improvement.

Compatibility

Integrating photogrammetry with existing clinical systems and workflows may face compatibility issues, necessitating standardization and calibration. Currently, photogrammetry data about implant position needs to be merged with soft tissue data from intraoral scans for fabrication of prosthesis. Errors in alignment of these two data sets can lead to errors in occlusion or impinging of soft tissues.

Training

Proficiency in photogrammetry requires training and expertise. Continuous education is essential to ensure clinicians can effectively utilize photogrammetry.

Future Directions and Research Opportunities

- Advancements in imaging technology and image processing can improve measurement precision and 3D model quality.
- Integrating AI and machine learning can automate image analysis, enhance diagnostic accuracy, and improve treatment planning.
- Long-term studies and clinical trials will establish photogrammetry's long-term effectiveness, clinical validity, and cost-effectiveness.

Stereophotogrammetry is a promising technology in implant dentistry, offering accuracy, efficiency, and streamlined workflow. While challenges exist, ongoing research and advancements will continue to enhance its role in improving patient outcomes and shaping the future of restorative dentistry.

Dr. Gustavo Mendonça, DDS, MS, PhD is a professor at Virginia Commonwealth University and an AO Diplomate.

References for this article and a short video by Dr. Mendonça are available via scanning this QR code.



AO Emerging Leaders Competition update

By: Amerian D. Sones DMD, MS; AO Fellow, Immediate Past President, and AO Diplomate; Academy News Guest Contributor

The excitement generated by the inaugural AO Emerging Leaders Competition held last year in Phoenix, spearheaded by myself and a team of experienced AO member judges, has captured the attention of early career members.

During its inaugural year, *Emerging Leaders – Short Talks from Early Career Clinicians* generated more than 20 submissions from around the world. The judges were impressed with the quality of the presentations and the confidence and skill displayed by those who participated.

For early career private practice clinicians or academics, this program provides a unique venue to showcase their best work whether it be surgical, restorative or both.

As a result, the Academy once again was pleased to provide a special invitation to those interested and qualify to submit a case presentation this year, and AO President, **Hom-Lay Wang**, DDS, MSD, PhD has reserved a special time for those selected to present on the main podium of the 2024 Annual AO Meeting in Charlotte, NC.

All Annual Meeting registrants are invited to attend the *Emerging Leaders Case Presentation Competition: 5 Under*

10 – Short Talks From Early Career Clinicians, following the Surgical Track from 5:00 – 5:45 pm on Friday, March 8. Each finalist will present a nine-minute presentation of their case. Judges will identify the “Best in Case” from the competing presenters and the winner will be announced during the Academy’s Annual Business Meeting on Saturday, March 9. The finalists are:

Abdusalam Alrmali, BDS, MFDS, RCS, MDS

Sarah Baker, DDS, MS

Marianthi Papaioannou, DDS

Rafael Siqueira, DDS, MS, PhD

Shi Yin, DDS

“As the Academy grows our membership, our commitment to early career members is strong with new leaders in the field of dental implant practice identified as we transition to our next generation of AO leaders,” said Dr. Sones.

For any questions regarding this program, please contact Kim Scroggs at kimscroggs@osseo.org or 847-725-2288.

Osseointegration Foundation reaches 140 Student Travel Grant recipients globally

“The Osseointegration Foundation has always supported education and research. Part of this is supporting our young clinicians and Student Travel Grants via helping them attend the Annual Meeting to get that personal networking, and also help develop their career visions and aspirations,” says **Russell D. Nishimura**, DDS, president of the Osseointegration Foundation (OF). “It’s been a very important to the OF to get these young clinicians who are tomorrow’s leaders and researchers, to the Academy’s Annual Meeting.”

In that spirit, OF is proud to once again award 25 dental students, each with \$1,000 Student Travel Grants, and the opportunity to present their research at the Academy of Osseointegration’s (AO) Annual Meeting. Including those given for the 2024 Annual Meeting, OF has now awarded 140 students with these grants since instituting this program in 2017.



Grants are allocated toward travel expenses related to attending the Academy’s Annual Meeting to assist in paying travel expenses including airfare, hotel and ground transportation. This annual award is open to both AO student members and student non-members who submit an abstract for the meeting and are currently enrolled in a dental school program.

The winning students were selected for a travel grant after receiving the top scores of student-submitted oral research and e-poster abstracts for the 2024 Annual Meeting as reviewed by members of the AO Research Submissions and ePoster committees.

Scan the QR code to see the full list of recipients. Congratulations to all!





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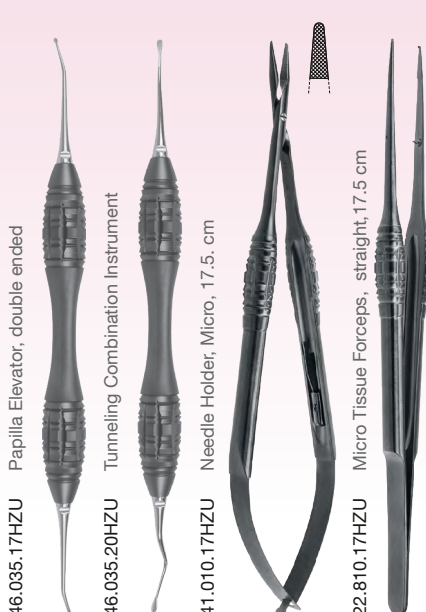


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Platform Switching: Evolution and requirements

By: Richard J. Lazzara, DMD, MScD; Academy News Guest Contributor

Platform Switching is a beneficial component of implant dentistry that was discovered serendipitously.

These accidental findings were first published in 2006 following the development of wide-diameter implants with a wide platform (beyond the hex area) to provide substantial stability to the restoration. These 5 mm and 6 mm diameter implants with corresponding 5 mm or 6 mm platforms (restorative seating surface) were developed and surgically placed for some time before the corresponding wide-diameter abutments were available.

Consequently, a number of 6 mm diameter implants were placed and restored with standard diameter 4.1 mm platform components. Subsequent post-restorative radiographs revealed surprising results. Instead of the typical 1.5 mm or so of bone remodeling, which was considered the norm, the bone remained at the top of the implant. We first published these findings in 2006 describing this and coining the term "platform switching." Additionally, we found this bone position was stable years after restoration and the implant in function.

Platform Switching has a number of distinct advantages, such as:

- Preservation of the marginal bone height to support the soft tissue in the aesthetic zone at the labial aspect of the implant restoration.
- Providing increased support when placing short implants.
- Preserving intra-implant bone height and restorative space when implants need to be placed in close proximity to one another.

Platform Switching does not work in all clinical situations, such as:

- In areas of inadequate soft-tissue height above the implant. Because of the dimensional requirements of the biologic seal approximately 3 mm of soft tissue is required.
- When a corresponding diameter abutment or healing abutment was placed prior to the smaller-diameter definitive abutment.

Curious to understand the biological basis for the platform switch bone preservation phenomenon, we understood that the inflammatory response at the implant-abutment junction was responsible for the so-called normal 1.5 mm of bone loss remodeling around two-piece implant systems. This was demonstrated in studies by Ericsson. They discussed an inflammatory infiltrate that

was dimensionally equal above and below the implant-abutment junction.

Obviously, a biologic complex was forming a seal above the bone to prevent bone infection or contamination from the bacteria of the oral cavity. This caused the normal bone resorption of 1.5 mm apical to the implant-abutment junction in two-piece implant systems in order to allow space for the sealing complex.

Zitzmann et al. demonstrated in that the ab-ICT (abutment-implant junction inflammatory connective tissue) was half-moon shaped with more or less equal dimensions above and below the implant-abutment interface.

Luongo et al. in a human histology case report, showed that the configuration of the ICT was changed on the platform-switched implants and that the lower point of the inflammatory infiltrate was trapped on the platform above the crest of bone. Consequently, the bone was not challenged and did not resorb. However, this can be modified by the overriding requirements of the dimension of the biological width, which is superseding. Thus the approximately 3 mm of the dimensional requirements of the seal caused the bone changes regardless of the configuration or location of the ab-ICT. Therefore, even platform-switched implants in minimal tissue heights still show bone resorption at the top of the implant, below the implant-abutment interface. This minimal soft tissue height effect was demonstrated by Raja et al. in 2022.

While a number of articles have demonstrated the successful use of the platform-switching technique, few, if any, articles take into account the dimension of the soft tissue as a factor.

References for this article are available via scanning this QR code.



Dr. Richard Lazzara

Laudatio for David L. Cochran

By: Daniel Buser, DMD, Dr. med.dent.; Professor emeritus, University of Bern;
Academy News Guest Contributor

David L. Cochran, DDS, PhD, is the 16th recipient of the Nobel Biocare Brånemark Osseointegration Award. This annual award is bestowed by the Osseointegration Foundation, honors an individual whose impact on implant dentistry is exemplary in any or all of the Foundation's mission categories: research, education, and charitable causes.

I can only congratulate the award committee, since David Cochran highly deserves this recognition, primarily for his outstanding record in pre-clinical and clinical research, often called today translational research, but also for his leadership functions in large international associations.

I've known David Cochran since 1990, when I met him first together with **Hans-Peter Weber**, DMD presenting a one day CE course at the Medical College of Virginia, School of Dentistry in Richmond. This course was arranged by **Ray C. Williams**, DMD, an important mentor of David Cochran, at that time professor and chairman at the Department of Periodontics, Harvard School of Dental Medicine in Boston, where I spent a 20-month stay for pre-clinical research.

David Cochran moved in 1992 to San Antonio to become professor and chairman of the Department of Periodontics at the University of Texas, Health Science Center. Arriving in San Antonio, he built up a strong team, first with **Jim T. Mellonig**, DDS, MS, later with **Brian L. Mealey**, DDS, MS, as director of the graduate program.

With my team at the University of Bern, we established in 1993 a very successful collaboration in translational research, which lasted almost 25 years. Our teams looked together at several research topics such as implant surfaces, the concept of biologic width, the role of the micro-gap at the implant-abutment interface, and many others. He also established close collaborations with other researchers, such as **Barbara D. Boyan**, PhD, and **Zvi Schwartz**, DMD.

In the past 30 years, he has authored and co-authored more than 300 scientific papers and his scientific record based on a Web of Science analysis is outstanding. Many of these publications are highly cited documenting the significant impact these studies have had and still have.

This results in a Hirsch-Index (h-Index) of 80, and a total of more than 24,000 citations. There are only a few authors in the field of implant dentistry in this champion's league category.



Dr. David Cochran

Besides his excellent research achievements, he also served in multiple functions in leading international associations such as the American Academy of Periodontology (AAP), the Academy of Osseointegration (AO), and the International Team for Implantology (ITI). Due to his scientific reputation, his leadership capacity and his diplomatic skills, he served in all three associations finally as president. What an achievement. I served with him for many years on the ITI Board, and I could witness his talent for leadership with great pleasure and admiration.

In the past, he has been honored with multiple highly prestigious awards, the most important ones are the honorary doctorate award (Dr.h.c.) by the University of Bern/Switzerland (2010), the Gold Metal from the AAP (2017), the ITI Honorary Fellowship (2021), and now the Nobel Biocare Brånemark Osseointegration Award medallion (2024).

Besides all that, David Cochran is just a fine human being, a really good friend with great loyalty. He is very passionate about everything he does. I hear that his private hobby has picked up significantly in recent years. He loves to fix mostly old British sports cars from the 1950s to 1970s, mostly Triumphs and Spitfires. I have to see this, when I make my next visit in San Antonio.

In summary, I congratulate David Cochran on receiving the Nobel Biocare Brånemark Osseointegration Award from OF. You can be really proud, since you highly deserve this recognition for your outstanding contributions to the field of implant dentistry.

Beyond re-osseointegration

By: Philippe Khayat, DDS, MSD; Academy News Editorial Consultant and Guest Contributor Arnaud Darré

The repair of a peri-implant bone defect is possible, and histology shows that the newly formed bone can be in direct contact with a previously infected implant surface. Evidence to support this claim is available both in animal and human studies. This re-osseointegration process is regarded by many as the ultimate treatment for peri-implantitis. But the question is: will this regenerative strategy prevent disease recurrence?

Animal studies

Animal studies supporting re-osseointegration are presented in two systematic reviews. The first one¹, carried out by Prof. **Stefan Renvert** of the University of Kristinstad (Sweden), includes 25 studies. The second² was co-authored by Prof. **Daniel Wismeijer** of ACTA University, Amsterdam (Netherlands), and includes 11 studies.

Different decontamination techniques and surgical protocols are described. Most of them lead to success and histology shows that direct bone to implant contact can be re-established at least on part of the exposed surface. Submerging implants after treatment appears to have a positive influence on the results. In animal studies, the evidence is there: re-osseointegration is possible.

Clinical studies

In such studies, patients are required to undergo surgical treatment and then accept removal of the implant with its surrounding bone. One can imagine why human data is not abundant. Still, five clinical reports³⁻⁷, all presenting



Fig. 1: Following peri-implantitis, this implant (Nobel Biocare, TiUnite surface) was treated with electrolytic decontamination (GalvoSurge, Straumann) combined with a regenerative protocol. The limit between residual bone and newly formed bone is shown with white arrows. The newly regenerated bone is in direct contact with the implant surface (courtesy of Dr. **Urs Brodbeck**, from the animal study "Is Complete Re-Osseointegration of an Infected Dental Implant Possible? Histologic Results of a Dog Study"⁹).

histology, can be found in the literature. They are mainly case reports or very small case series. They include a total of 12 implants (Table 1). In almost all cases, the patient agreed to the block removal of a non-strategic treated implant with a trephine drill. In one study, the patient was treated for peri-implantitis but died a few months later. He had donated his body to medical research, and his family authorized the harvest.

Each of these five studies describes a different decontamination and regeneration protocol, from simple chemical decontamination (hydrogen peroxide, sodium hypochlorite, EDTA) to electrolytic decontamination (GalvoSurge, Straumann) and lasers, but submerging the implant is attempted in all instances. In these patients, histology has

Continues on page 14



Dr. Philippe Khayat



Fig. 2: Human histological section (a and b). This implant (Straumann, SLA surface) was also treated with electrolytic decontamination (GalvoSurge, Straumann) combined with a regenerative protocol. Direct contact between newly formed bone and the implant surface can be observed. This is indeed re-osseointegration, as two persistent but decontaminated calculus spicules present at the implant surface, are also directly in contact with the newly formed bone (courtesy of Dr. **Urs Brodbeck**, from the clinical study "Evidence of re- osseointegration after electrolytic cleaning and regenerative therapy of peri-implantitis in humans: a case report with four implants"⁷).

Study	Implants (patients)	Implant type	Treatment protocol and implant surface decontamination	Results
Wohlfahrt 2011	1 (1)	IMZ implant	1) Swabbing with 24% EDTA gel for 2 min. 2) Rinsing with sterile saline 3) Graft: porous titanium granules (PTG) 4) Attempt to submerge the implant (the prosthesis is removed)	Newly formed bone between the titanium granules and in direct contact with the implant surface. Alternating zones of re-osseointegration and interposed fibrous tissue.
Fletcher 2017	1 (1)	Nobel Biocare (Mk III)	1) Swabbing with 0.25% sodium hypochlorite for 1 min. 2) Rinsing with sterile saline 3) Swabbing with 1.5% hydrogen peroxide for 1 min. 4) Graft: calcium sulfate and xenograft 5) Resorbable membrane 6) Implant submerged	Bone regeneration on 3 out of 11 exposed threads. On these 3 threads, newly formed bone in direct contact with the implant surface. Biomaterial particles integrated into newly formed bone at a distance from the implant surface.
Kim 2018	2 (1)	Straumann	1) Ultrasonic cleaning (copper alloy insert) 2) Swabbing with diluted tetracycline hypochloride 250 mg for 5 min. 3) Rinsing with sterile saline 4) Graft: biphasic calcium phosphate 5) Non submerged	Newly formed bone in direct contact with the implant. Re-osseointegration achieved over 1.90 mm in one case and 1.41 mm in the other. Biomaterial particles integrated into newly formed bone.
Nevins 2020	4 (3)	No information	1) Laser surface debridement (Er,Cr:YSGG) 2) Graft: Freeze dried bone allograft (FDBA) and platelet-derived human growth factor (rhPDGF-BB) 3) Absorbable collagen membrane 4) Implant submerged	Newly formed bone in direct contact with previously exposed surfaces of the first two implants (two distinct patients). For the remaining implants (3rd patient), no improvement, apart from the resolution of inflammation.
Bosshardt 2022	4 (3)	Steri Oss (HA) Straumann (BL, SLActive) Straumann (BL, SLActive) Straumann (BL, SLActive)	Protocol for first 3 implants: 1) Electrolytic cleaning (GalvoSurge) 2) Graft: xenogeneic bone and autogenous bone (50/50) 3) Absorbable membrane stabilized with pins. 4) Implant submerged 4th implant protocol: 1) Electrolytic cleaning (GalvoSurge) 2) Graft: allogeneic, autogenous bone and A-PRF 3) Absorbable membrane (without pins) 4) Implant submerged	Percentage of re-osseointegration: up to 39% of the implant surface. Newly formed bone in direct contact with each of the implants studied (Fig. 1). A fragment of calculus on the surface of one of the implants was not removed, but was decontaminated. Re osseointegration also took place in direct contact with this fragment of calculus (Fig. 2).

Table 1

shown that re-osseointegration of a previously infected implant surface is possible (Fig. 1 and Fig. 2).

Percentage of re-osseointegrated surface

In animal studies, the re-osseointegration process takes place on one to 84% of the previously exposed surface¹. A wide variation! But, in clinical studies, this percentage usually varies between 20 and 40%^{4,7} leaving a rather important portion of the textured implant surface still supra crestal.

A clinician's perspective

Re-osseointegration is a great objective but removing the prosthesis for a few months in order to achieve submerged healing is not simple or well accepted by the patient. Furthermore, even in the best scenario, a significant part of the implant rough surface is still exposed after treatment and opened for biofilm recolonization. Implantoplasty creates a smoother surface and a radical change of environment. It has been shown to be one of the most

successful methods to treat peri-implantitis⁸. If our main goal is to prevent disease recurrence, shouldn't regenerative techniques always be combined with implantoplasty of the most cervical portion of the exposed implant surface?

Conclusion

Five human case reports present histological sections that confirm the positive results observed in animal studies. The combination of rigorous decontamination, a regenerative protocol, and implant submerging is necessary to obtain the best results. However, direct contact is never achieved over the entire initially exposed surface. A cervical portion of varying size is never re-osseointegrated. Using implantoplasty to obtain a smoother implant surface in this area could help prevent recurrence of the disease. Welcome in the era of combined peri-implant therapy!

References for this article are available via scanning this QR code.



Revisiting peri-implantitis therapy through implant-specific evidence

By: Georgios A. Kotsakis, DDS, MS; and Cathy Tsai, DDS, Academy News Guest Contributors



Dr. Georgios Kotsakis

1) Latest insights on peri-implantitis pathogenesis

The evolution of implantology has been nothing short of remarkable. From the biomaterial surface improvements to the procedures followed, dental implantology has come a long way in ensuring that titanium implants are safe, reliable, and effective with tremendous success rates.

However, peri-implantitis remains a major concern affecting over 10% of functioning implants. Peri-implantitis is an inflammatory condition that affects the tissues surrounding a dental implant. This inflammation can lead to bone loss around the implant, affecting its stability and longevity. Among the challenges it poses, is its remarkable resistance to antimicrobial treatments¹. One of the main reasons why the efficacy of antibiotics in managing peri-implantitis has been increasingly questioned, is that their effectiveness is compromised in the presence of inflammation due to titanium particles^{2,3}. It is now well established from multiple independent sources of robust investigation that peri-implant inflammation very rarely exists in the absence of associated implant biomaterial breakdown.

In other words, due to multiple reasons including biocorrosion and iatrogenic corrosion, the passivation layer of the implant biomaterial surface breaks down in peri-implantitis⁴. Consequently, in the absence of its robust passivation layer, the titanium implant starts leaking titanium in the form of titanium microparticles in the peri-implant plaque and tissues. Moreover, the titanium particles can induce a pro-inflammatory host immune response, even in the absence of living bacteria, further complicating the immune inflammatory response in the peri-implant environment⁵. This can potentially limit the role of antibiofilm or antimicrobial therapies in resolving peri-implantitis as it is evidenced by the very limited efficacy of non-surgical peri-implantitis treatments. In summary, while antibiotics are often employed to counter peri-implantitis, the presence of titanium particles from implants can hinder their effectiveness, emphasizing the need for multifaceted therapeutic approaches.

Traditional cleaning techniques, while effective in plaque removal, can inadvertently lead to increased titanium release. A recent study⁶ delved into non-abrasive methods, emphasizing the consideration of iatrogenic damage with the use of abrasive dental cleaning aids on titanium⁶. Results showed that the optimal

solution to implant surface decontamination prioritizes the safety of the implant surface while ensuring effective biofilm removal, which seemed to lead to considerably higher re-osseointegration capacity *in vitro*⁶.

While the release of titanium particles from dental implants has been a primary concern due to its potential inflammatory effects in *in vitro* and in animal studies, a breakthrough approach to this challenge in humans was offered by Daubert et al. who recently showed that mechanical abrasive implant cleaning methods lead to nearly 10-times greater titanium release over time in the peri-implant microenvironment as compared to mechanical non-abrasive cleaning⁷. In fact, this increased titanium release was associated with significantly worse clinical outcomes in terms of probing depth⁷.

Collectively, as research in the field of peri-implantitis has progressed to consider the implant biomaterial-host-microbial interface, it became evident that mechanical and chemical influences can lead to the release of titanium particles. These micro and nanoparticles can leak into the surrounding tissues through, leading to an inflammatory response, exacerbating the progression of peri-implantitis. Thus, contemporary treatments focus not only on biofilm removal but also on the preservation of titanium surface passivation without abrasive effects.

2) Revisiting non-surgical peri-implantitis therapy through an implant-specific lens

One of the factors that have been associated with the progression of peri-implantitis is the release of titanium particles from the implant's surface, which can trigger an inflammatory response in the surrounding tissues^{2,3}. The particles can indirectly foster bacterial biofilm pathogenicity by altering host immune surveillance activity and leading to structural changes to the peri-implant microbiome, which resist conventional periodontal antimicrobial treatments.

Biofilms, which are dense colonies of bacteria encapsulated within a protective matrix, are inherently more resistant to antibiotics. The adherence of these biofilms on titanium surfaces, coupled with the challenge of accessing the subgingival environment of an implant, makes bacterial eradication particularly difficult⁸.

In addition, other implant-specific non-plaque related factors are implicated in the pathogenesis of peri-implantitis in certain cases, such as excess cement.



Dr. Cathy Tsai

Continues on page 16

Revisiting peri-implantitis therapy (continued from page 15)

Wilson has previously elucidated the cause-effect relationship of excess cement, usually resin type cement, and peri-implantitis when cement is present⁹. This established evidence paves the way for implant-specific treatment workflows that deviate from what is done around teeth in respect of the differences between teeth root surfaces and implants, such as the absence of submucosal calculus in the latter.

An example of an implant-specific workflow for the non-abrasive management of peri-implantitis that the authors have devised based on the best evidence available for implant surface decontamination in peri-implantitis therapy is presented below in a step-wise manner to highlight the subtle but impactful differences in the management of teeth versus implants¹⁰. This workflow is based on identifying implant-specific risk factors and maintaining the peri-implant tissues without iatrogenic damage to the titanium passivation layer while performing biofilm control (Fig. 1).

Step 1. How to probe implants?

Implants can and should be probed for proper diagnosis. Nonetheless, the weaker epithelial and connective tissue seal around the implant necessitates reduced probing force. An Impl-Safe Probe (Salvin Dental, Charlotte, NC) is narrower yet more elastic than the average probe, which increases the clinician's tactile sense as the probe flexes when it comes in contact with the implant. This does not abrade the implant surface, and is not as bulky as the common plastic probe, which makes probing more effective and minimally invasive.

Step 1B. What if calculus is detected?

It is now well established that supramucosal calculus is common on abutments but rare on the submucosal implant surface due to differences in the electrochemistry of titanium versus cementum. If calculus is visible supramucosally a soft titanium (i.e., reduced Rockwell hardness as compared to the implant alloy) is used for calculus removal. Curettage on the implant surface submucosally is avoided to prevent release of titanium particles and damage to the titanium passivation layer.

Step 2. Identify implant-specific risk factors

The most detrimental risk-factor for peri-implantitis is excess cement⁹. Unfortunately without endoscopy or flap

reflection, it is very hard to identify residual thin films of resin cements. In this workflow, a thin Impl-Safe Cement Explorer (Salvin Dental, Charlotte, NC) that is specifically designed to accommodate "mushroom-like" transition of the implant crown to the abutment is employed to detect any possible residual cement at the junction. Using tactile perception, if the explorer "bounces" when encountered with excess cement the clinician is prompted to attempt to retrieve the excess.

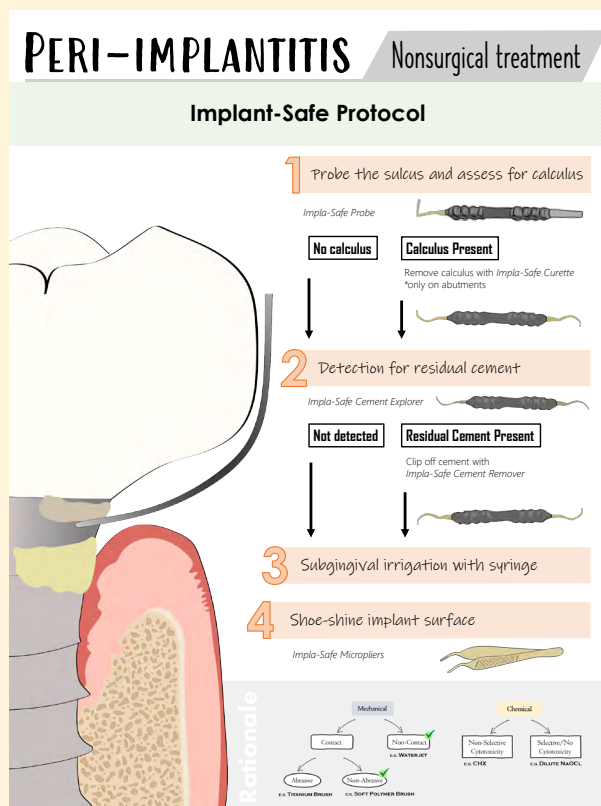


Fig. 1 (Full size graphic available via QR code)

Step 2B. Protocol If residual cement is detected.

There is a 75% chance that excess cement removal can resolve peri-implant inflammation⁹. Every effort should be made to remove cement with a single stroke rather than performing repeated scaling to avoid iatrogenic damage to the titanium passivation layer and particle release. Here an implant-specific sickle with a micro-serrated working end is used to engage the cement apically, and allow for removal of the excess cement without excessive scaling strokes (Impl-Safe Cement Remover, Salvin Dental, Charlotte, NC)

Step 3. Flush the sulcus with normal saline.

Step 4. Perform Biofilm Control.

Use titanium micropliers to take a small sterile gauze soaked in normal saline to "shoe-shine" the

implant surface. If any antimicrobial agents are used they have to have selective or no cytotoxicity to host cells¹⁰. Other non-abrasive modalities include waterjet irrigation (mechanical non-contact) and polymer microbrushes (mechanical contact non-abrasive)¹⁰.

Georgios A. Kotsakis, DDS, MS is professor of Oral Biology & assistant dean for Clinical Research, and Director of Research at Rutgers School of Dental Medicine, and Diplomate, American Board of Periodontology. Disclosure: Dr. Kotsakis has received honoraria from Salvin Dental related to the development and training on the use of peri-implant instruments.

Cathy Yi-Wen Tsai, DDS is an International Team for Implantology (ITI) Scholar at University of Texas Health Science Center at San Antonio, and Lecturer at Tri-Service General Hospital and National Defense Medical Center. Dr. Tsai has no conflicts of interest.

References for this article are available via scanning this QR code.



Implant cleanliness – An underrated factor for clinical success?

By: Dirk U. Duddeck, DDS, Academy News Guest Contributor

The success of dental implants is constituent upon the direct structural and functional union between implant and bone as influenced by the surface properties of the implant¹.

Predictable outcomes can be hampered by local or systemic factors² causing either immediate implant failure or degradation of the interface over time, resulting in the destructive inflammatory process of peri-implantitis. The etiologic vectors associated with the demise of natural teeth are well understood; however, the reasons for the loss of dental implants, either immediately or over time, remain poorly understood for the most part.

A search through the U.S. Food and Drug Administration's (FDA) MAUDE database (Manufacture and User Facility Device Experience) revealed more than 1.5 million FDA-reported "serious injuries" with dental implants, which equals to implant failures due to a lack of osseointegration³. More than 350,000 of those reported occurred between 2020 and 2021. These figures have caused significant concerns among dentists in the U.S. and abroad as the number of unreported implant failures is likely to be much higher.

It is specious to suggest that the etiology of complications in implant therapy is solely found in patients with pre-existing conditions, poor oral hygiene, or placement by dentists and oral surgeons with inadequate training and experience. Some manufacturers assert that these factors are the root cause of failure to osseointegrate, conveniently omitting their responsibility for the flaws of manufacturing and packaging processes.

Sterility does not predicate a clean surface

In 2016, the CleanImplant Foundation was created to perform worldwide quality assessment studies on dental implants in global markets and to identify occult factors responsible for peri-implantitis, bone loss, implant failure, and associated consequences.

Over the past seven years, the Foundation has commissioned extensive analyses of more than 300 different dental implant systems. These were performed exclusively in independent and accredited testing laboratories using scanning electron microscopy and elemental analysis under clean-room conditions.

Continues on page 19





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Implant cleanliness... (continued from page 17)

Significant impurities were found on approximately three out of 10 implants that were sterile packaged but contaminated due to incomplete factory cleaning or deficiencies in the packaging process⁴⁻⁶. (Fig. 1 & 2)

Organic carbonaceous particles and foreign materials ranging from 1 to 100 µm were identified in subsequent Time-of-Flight Secondary Ion-Mass Spectrometry

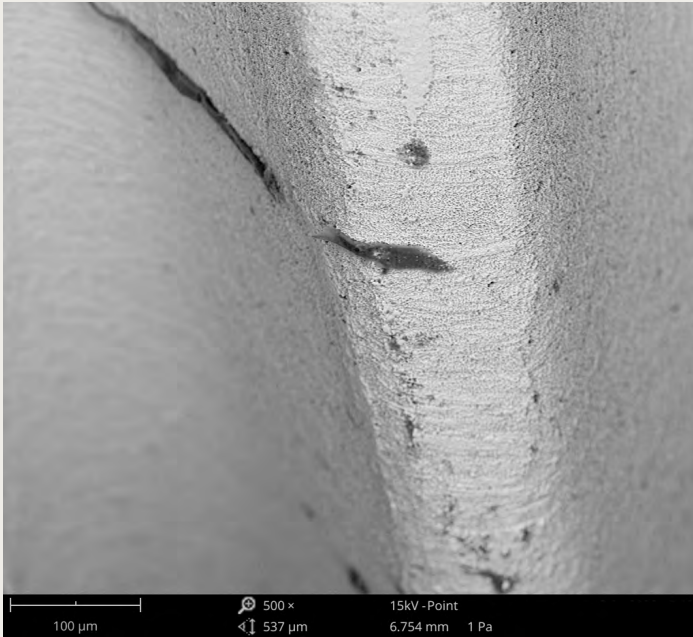


Fig. 1: SEM image of an implant surface at 500x directly after unboxing the sterile packaged sample.

(ToF-SIMS), as polysiloxane, synthetic polymers, or thermoplastics. Some implants revealed distinct thin-film residues that could be classified as significant remnants of dodecylbenzene sulfonic acid (DBSA), which is a cell-toxic hazardous aggressive surfactant as well as didecyltrimethylammonium chloride (DDAC-C10), a quaternary ammonium compound and biocide, that causes disruption of intermolecular interactions and dissociation of lipid bilayers. It should be noted that all tested implants were in their original packaging, ready for clinical use.

Carbonaceous contaminants are specifically associated with initial bone loss or even peri-implantitis. In particular, foreign particles of 0.2 to 7.2 µm are classified as pro-inflammatory⁷⁻⁹. When these contaminants detach from the surface during the implant insertion, macrophages in the process of phagocytizing these particles release pro-inflammatory cytokines such as TNF-α, which stimulate the differentiation of osteoclast precursors into mature osteoclasts¹⁰. The result is an expanding zone of soft tissue degradation and bone resorption (Fig. 3).

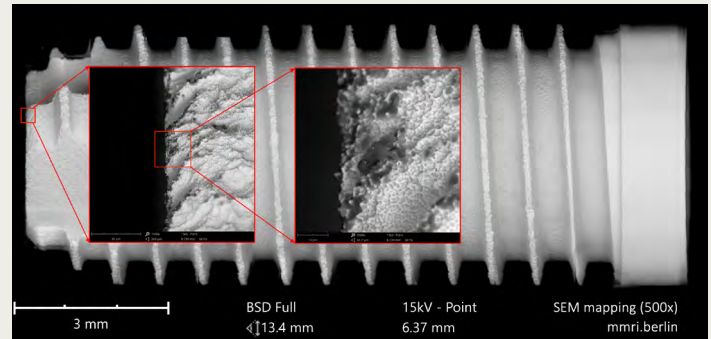


Fig. 2: SEM Mapping image with detail enlargements (1,000x and 5,000x); The apical region shows plastic residuals that will be inserted into the implant site.

Implant quality is a key factor for successful osseointegration.

Every implant must be free of foreign particles and contaminants resulting from deficits in the complex chain of production¹¹. It is evident that some manufacturers fail to strive for sufficient quality assurance while others deliver flawless dental implants free of technically avoidable contaminants.

Patients rely on our decision for surgical procedures as well as for the medical devices such as a specific implant system. As clinicians, we must trust in the cleanliness of medical products we use in our daily practice, as patients deserve no less. Implant providers should be aware that trust is like paper. Once it's crumpled, it can never be perfect again.

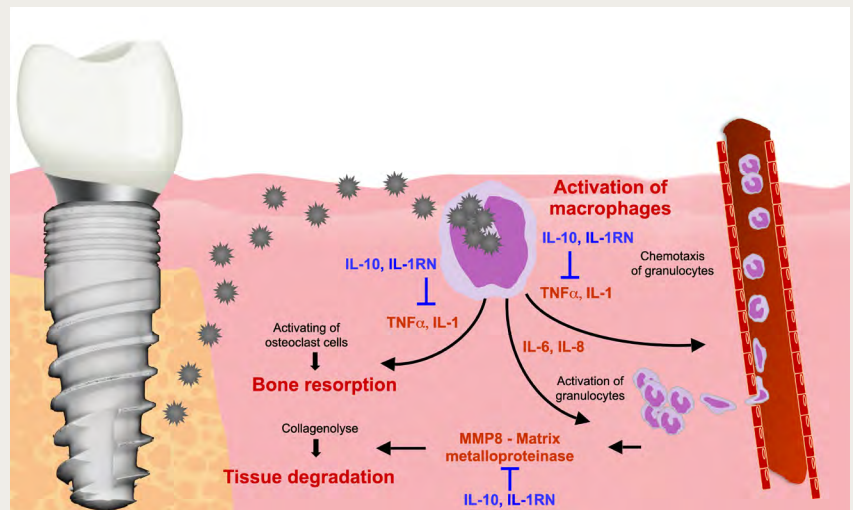


Fig. 3: Particle-induced peri-implantitis follows a foreign body type reaction, triggering the hosts immune response that results in bone loss around the implant. (Courtesy of Dr. Volker von Baehr)



References for this article are available via scanning this QR code.



CE “junkies”: Do you consider yourself one?

By: Riad Almasri, DDS, AO Fellow and Diplomate; Academy News Editorial Consultant

Continuing Education (CE) meetings are one great way to expand our knowledge and social network and are very beneficial for our patients. As I always say, if you're not improving yourself, then be content when you're behind as everyone around you is moving forward by learning and adding new tools to their toolbox to better serve their patients.

Even though one might have excellent clinical skills, without continuing education, skills will not improve. The question is, can one overdo CE and become addicted to meetings?

I asked one of my mentees: Do you think you are a CE “junkie”? His answer was “Yes, I really enjoy sharing knowledge at meetings, and networking with colleagues that I do not get a chance to see often. Dentistry can be isolating at times. I love what I do and love to talk about all things dentistry. My friends and family are sick of hearing me talk about teeth and implants. When attending a CE course, I always want to take home one or two pearls of wisdom, but also sometimes just validate that what we are doing is up to date and along the lines of others.”

The next question is: How often do CE courses deliver what you are looking for? This can be hit or miss. You really need to research the courses before you sign up. Are you going because you really like the content? Are you going because of the speaker or the venue/destination? You may love Vegas for example, but that doesn't mean the content or even the speaker will always be great.

I have friends who accumulate anywhere between 70 to 80 CE hours. Some would rather attend meetings, others want

weekend courses or dinner events. Depending on what your goals are, one might consider the type of CE event! If you are looking for an event that covers multiple topics, hands-on sessions, many CE hours, social networking and a destination for leisure afterwards, then an annual meeting organized by one of the major dental associations might be the best bet.

If you have a certain area that you want to improve your clinical skills, then a live patient course is recommended but they are hard to find in the U.S. Even though they are starting to become more readily available, many doctors tend to travel to foreign countries to attend these courses. Benefits of foreign travel may include less restrictive licensing issues for live patient courses and cost savings. If you like traveling to different countries and exploring, this might be the way to go.

On the other hand, staying in the U.S. for these live patient courses has far more benefits, such as fewer days away from the office and less travel. Follow ups are more likely to be feasible, and the best part about it is that your mentor is closer and easier to reach.

When I ask colleagues, they usually say they love the traveling part of attending courses in foreign countries. It is an excuse to break the routine. The only downside to a live patient course is they mainly cover one topic and that can be restrictive, not meet everyone's goals and expectations.

Usually smaller venues over a weekend can tackle a specific topic well. Larger meetings have more content in the form of quick short topics. Sometimes one wants to focus on a specific topic for two days but other times a

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AO website has new look

If you have not already, log on to the Academy's website (osseo.org) to view an entirely new design and interface structure.

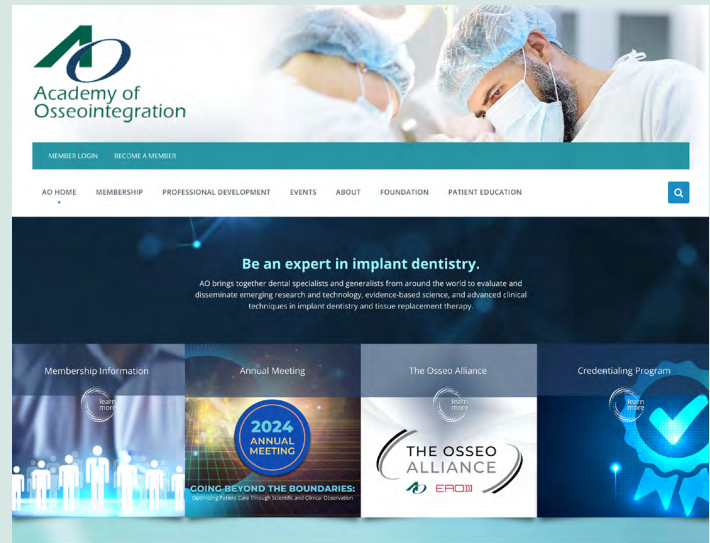
This redesign coincides with several upgrades that have been integrated into the platform to offer an enhanced user experience throughout the site. Increased speed and added access points directed to the most popular areas of the website facilitate an easier search for information. Here are a few of the new features to look for:

Improved home page menus and access points

The home page has been redesigned to provide direct links to the most frequently viewed Academy information. An enlarged top menu with an easy to view horizontal format provides more entry points into the user-friendly interior pages. At-a-glance sections show upcoming webinars and highlighted Academy programs, news and events.

New member homepage simplifies searches

A redesign of the Welcome AO Member web page offers a more comprehensive member-centric collection of information that has the most value to members. Quick links provide easy access to the high frequency member pages as well as a dedicated menu designed to find exclusive member content. *Academy News* is prominently displayed for easy viewing of current and past issues, and a featured Upcoming Events section helps members stay informed of events, programs and important deadlines.



Improved, redesigned online education center

A new platform has been developed for the Academy's Online Education Center. Over the coming weeks, this website will continue to be updated with upcoming live webinars, on-demand webinars, archived clinical videos and other online resources.

Watch your email and social media for updates as new content is added to the new AO website.

CE "junkies"... (continued from page 20)

synopsis of multiple topics that I can then decide if I want to get more in depth on a specific topic.

Dinner CE events are a quick, short fun way to get CE and socialize with your colleagues. Depending on where a dentist lives, this can be sometimes limited.

With regard to corporate CE courses, many implant companies have great educational support for their products. However, be cautious when signing up for corporate educational programs because some offer infomercials instead of a truly objective program.

Run through this list before registering for any CE offering:

- 1 Assess your clinical skills in the topic matter: Beginner, good or advanced?
- 2 Determine weak points you want to improve.
- 3 Set goals.
- 4 Make a list of CE events that can help you.

- 5 Do your homework and research about the quality of events.

- 6 Ask friends or colleagues about their experiences.

In a nutshell, CE addiction is a real issue, and we need to avoid it as it can become costly. Selecting the wrong CE event/meeting might have a poor ROI and discourage doctors from attending future CEs that could be beneficial.

Last advice when it comes to CE selection: To be successful at what you do, always set the goal somehow slightly higher than the last achievement so you are steadily rising. Do not attempt to attend the most advanced courses when you are a beginner in any given topic. This is a complete waste of time and money.



Dr. Riad Almasri

Acknowledging that implants (almost) never fail

By: Lambert J. Stumpel, DDS; Academy News Guest Contributor



Dr. Lambert J. Stumpel

Many years ago, it started to dawn on me that we, as a profession, at times, were not telling the truth. To ourselves and to our patients.

This was and is really hurting the relationship we have with our patients, who are also our (paying) customers.

Interestingly, this misleading narrative hasn't hindered communication among dental professionals. Colleagues seem to share an unspoken understanding of the reality, allowing them to communicate although collectively misrepresenting it. However, the same cannot be said for the patient-dentist relationship.

I have tried to bring this up to those who want or had to listen to me, but this is a small group. (Maybe for a good reason).

There was some progress in spreading the word, so to speak, during the last AO Annual Meeting in Phoenix. I had drinks with some friends, and one of them was **Clark M. Stanford**, DDS, PhD, MHA, past president and current editor of the *Journal of Oral and Maxillofacial Implants (JOMI)*. He was so kind to capture the discussion and write a very thoughtful editorial in that journal.

Now Editor Favagehi is allowing me space in the newsletter to shine another light on this subject; here we go.

Please! Can we stop saying that dental implants fail, because in reality, they almost never do. Still as a profession we talk and write about failing implants. "Failed implants" yields an impressive number in PubMed searches.

The implant is most of the time made from metal, as long as the metal does not break or bend the implant is similar to when it came out of the manufactures packaging. Per definition it did not fail.

What we really mean is that the bone which was holding on to this implant has stopped holding on to it, or it never did in the first place. We as professionals know that, but our patients do not.

The emphasis is on the emotional impact of such communication. While the clinical outcome remains the same, disclosing the truth empowers the patient to take

ownership of the problem.

They are not burdened with the perception of purchasing a defective product but rather understand that their body's response needs attention.

What happens if we tell the patient that their implant failed. In their mind they think; that is nice, you sold me the implant and it failed. I bought something that is defective, the seller should take responsibility to fix that.

This will make an emotionally charged situation even more difficult. This contrasts with if we tell them what really happened. "Mr. Jones your bone did not hold on to the implant and your body is rejecting it." Now this patient will own the problem; it's actually his or her bone that is responding unfavorably.

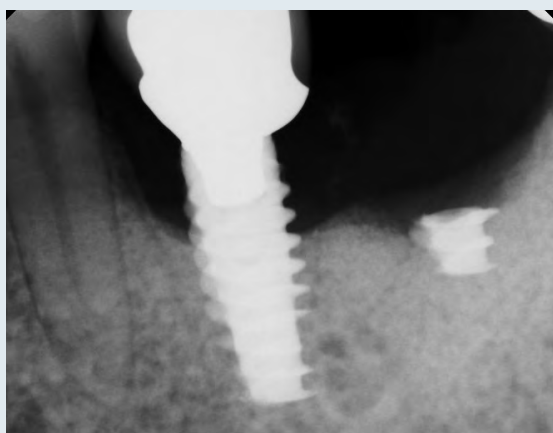


Fig 1. One of these two implants clearly failed.

Although the clinical outcome is the same, the emotional outcome is vastly different. You are not the seller of a defective product, but you are the doctor who is going to help to get the patient's bone to do a better job the next time. You can still do that for free, at a reduced fee or full charge, but you will see that the relationship you have with the patient is so much better.

To plant a seed in the patient's mind at consultation I say, "Mrs.

Jones, dental implant therapy is very successful but with almost everything in life it is not 100%. At first, we have about a 92% success rate. You see the implant is made out of metal, it is dumb, it cannot do anything, it is our biology that has to do the job for the bone to fuse with the implant and maintain that over the years. So, what happens if your bone does not fuse with the metal, we take the implant out, wait three months and place a new implant again. At that time our biology is about 85-90% successful."

In conclusion, dear colleagues, if we want to keep telling ourselves that implants fail, please do. Although I hope that editors, reviewers, and authors adopt the correct words to describe what they see happening.

At least be smart and tell your patients the truth; it will make the relationship we have with our patients better and at the same time prevents us from shooting ourselves in the foot.

Have fun!

Going beyond current boundaries in implant maintenance: What we can learn from NASCAR pit stops

By: AO Fellow Mehrdad Favagehi, DDS, MS, Academy News Editor

Patients ask how long their implants will last. Successful implants should last a lifetime. What about implant restorations? Is it our goal to create durable implant restorations that last forever as well?

We manufacture super strong, monolithic zirconium implant prosthesis reinforced with titanium substructures that could easily last for a millennium. Future anthropologists will be in awe of the strength and durability of current implant prosthesis. Yet still, many dentists avoid the word "final" when describing any restoration or prosthesis. That's because even the most durable implant restorations may need to be changed for myriad biological and mechanical reasons. Patients change as they age. Restorations should be designed to be maintained, adjusted, or replaced to accommodate changes over time.

Our mission in implant dentistry is to provide patients with lifetime rehabilitation, and that doesn't necessarily mean an implant restoration that could last a lifetime. In fact, for some patients, especially younger implant patients, an adjustable or replaceable implant restoration may be more beneficial than a durable restoration that can last 50 years.

Scott D. Ganz, DMD, a pioneer of using CBCT in guided implant surgery, is known for stating that "*It's not the Scan, It's the PLAN!*" which determines success with the digital workflow. The same could be said about implant restorations. It's not necessarily the restoration itself that needs to last a lifetime, but our rehabilitation plan that needs to serve patients throughout their life.

Digital technologies are revolutionizing every aspect of implant dentistry. Going beyond the current boundaries of implant dentistry, we can employ technology to shift focus away from expensive, non-adjustable, durable implant restorations to seek less expensive restorations designed to be easily removed for repair, replacement, or routine maintenance. With a new patient scan we can update a digital twin of the original restoration and deliver a "factory-clean," new replacement for aging restorations at regular maintenance intervals.

Maintenance and serviceability have been priorities in many high-tech fields such as aeronautical engineering and the modern car industry. In Formula One or NASCAR car racing, high efficiency maintenance pit stops are widely recognized as a key to success.

The average NASCAR pit stop times have shortened significantly over the years as NASCAR stock cars

have been redesigned for more efficient maintenance and part replacement. For example, according to fantasyracingcheatsheet.com, the Next Gen NASCAR stock car introduced in 2022, only has one lug nut on its tires, compared to five lug nuts on previous NASCAR vehicles. As a result, the average NASCAR pit stop in the 2023 season was a mind blowing 12.698 seconds.

Maybe the "Next Gen" implant prosthesis should be designed to streamline maintenance pit stops to include repair and economical replacement of implant restorations in the aging patient.

On March 8, 2024, the Academy's revered annual President's Reception will be held at the exciting NASCAR Hall of Fame in Charlotte, NC. As you experience simulated head-to-head NASCAR Pit Stop competitions with other attendees, please think of all that implant dentistry can learn from NASCAR.

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. To provide feedback about this edition, or contribute as a guest author, please contact me at mfavagehi@yahoo.com. We will endeavor to publish pertinent comments or views when space permits.



Dr. Mehrdad Favagehi



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¹ Norton MR, Astrom M. The influence of implant surface on maintenance of marginal bone levels for three premium implant brands: A systematic review and meta-analysis. Int J Oral Maxillofac Implants 2020;35(6):1099-111
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