



Academy of
Osseointegration
osseo.org

Academy NEWS

A QUARTERLY MEMBER NEWSLETTER

Be in the Know in Implant Dentistry

*Academy events advance latest
innovations and research*

Academy of Osseointegration

Annual Meeting

Be in the Know:
A Global Perspective
on Implant Dentistry

PHOENIX

March 16 - 18, 2023



2022 SUMMIT



Academy of Osseointegration

CONTROVERSIAL TRENDS

or Long-term Results for Individual Patient Outcomes

VOLUME 34, NUMBER 1 • 2023

Introducing a New Reason to Fall in Love

Engineered for immediacy and peri-implant health.
Get ready to fall in love with TSX™ Implants

- Placement predictability and primary stability in soft and dense bone
- Designed for immediate extraction and loading protocols
- Proprietary surface technology excels in peri-implant health and crestal bone maintenance
- High apical torque
- New 5.4mm Diameter



TSX IMPLANTS



COMPATIBILITY PROFILE

TSX is completely compatible with existing TSV and Eztec surgical and restorative components (except for the Zirconia-based abutments).

Formally a subsidiary of Zimmer Biomet

 **ZimVie**

Unless otherwise indicated, as referenced herein, all trademarks and intellectual property rights are the property of ZimVie Inc. or an affiliate; and all products are manufactured by one or more of the dental subsidiaries of ZimVie Inc. (Biomet 3i, LLC, Zimmer Dental, Inc., etc.) and marketed and distributed by ZimVie Dental and its authorized marketing partners. For additional product information, please refer to the individual product labeling or instructions for use. Product clearance and availability may be limited to certain countries/regions. This material is intended for clinicians only and does not comprise medical advice or recommendations. Distribution to any other recipient is prohibited. This material may not be copied or reprinted without the express written consent of ZimVie. ZV0665 ©2023 ZimVie. All rights reserved.

Contact us at: 1-800-342-5454 or visit ZimVie.com to take Xtraction Site Stability to the Next Level.

TABLE OF CONTENTS

IN THIS ISSUE

<i>President's Message:</i> A journey full circle	4
Board nominations include director, secretary for AO; New director, officers for OF	5
New Emerging Leaders competition captures enthusiasm of early career clinicians	6
Darwinian Implantology	7
Reflections on the past and future of the Socket Shield Technique	8
Young investigators' perspective: 2022 AO Summit	11
OF implements Research and Education Fund naming opportunity	12
Dr. Dennis Tarnow to be bestowed prestigious OF award	14
Dynamic Navigation: The past, the present and the future	15
Smoking, diabetes and the oral microbiome: Implications for periodontal and implant health	17
Young investigators' perspective: AAP Best Evidence Consensus	19
Implant placement considerations for the adolescent patient	21
The Academy's management firm earns AMCI reaccreditation	22
<i>Editor's Editorial:</i> 2022 Summit results to be presented during 2023 AO Annual Meeting: Here's why you should be there	23

ACADEMY NEWS

Academy of Osseointegration
85 W. Algonquin Road, Suite 550
Arlington Heights, IL 60005
847.439.1919

Editor

Mehrdad Favagehi,
DDS, MS

Board Liaison

Joseph P. Fiorellini,
DMD, DMSc

Editorial Consultants

Riad Almasri, DDS
Lourdes Ann Christopher, DDS, MS
Paul A. Fugazzotto, DDS
Philippe Khayat, MSD
Yong-Han Koo, DDS
Harriet K. McGraw, DDS

Staff Editor

William R. Wille

President's Message

A journey full circle

By Amerian D. Sones, DMD, MS

Just like that, as our **2023 Annual Meeting** approaches, this special year passed quickly. I can reflect on all that the Academy has accomplished this year for you and our future.

I am so pleased to welcome you to Phoenix where I began my dental career as a Lt. Col. in the U.S. Public Health Service, Sells, AZ serving the Tohono O'odham Indians. Traveling to Phoenix for Indian Health Services meetings brings alive fond memories of the excitement of a new location, the mission of service to this special community, and my wide-eyed approach to oral health as a new dentist. The 2023 Annual Meeting, post-pandemic represents the full circle for me as we return to sunny Arizona for the great live meeting which awaits you, wide-eyed to renew, refresh, and inspire you!

Just like that, full circle describes many transitions which have occurred in implant dentistry. Implant restorations evolved from retrievable (screw-retained), to non-retrievable (cement retained) representing the "yin and yang" of restorative design. Now, full circle of retrievable designated screw-retention is our preferred design.

Smooth surface implants evolved to bone level implants with rough surfaces of many designs, materials, and surface treatments, bringing along an increase in peri-implantitis. Now full circle, interest returns to the concept of smooth surface advantages at the bone/tissue level as new hybrid designs are created.

Full circle back to new designs in ceramic implants as the historic sapphire implants were replaced with titanium. Full circle to the legacy of Professor Brånemark as the next generation of osseointegration scientists continue to expand our boundaries with 2023 Keynote Speaker, Dr. **Rickard Brånemark**. Fashions, known to full circle as demonstrated by the classic Brånemark bowtie, are now popular (that is if you can conquer the challenge of tying them).

As president, my year has been fulfilling with accomplishments which I believe will impact the Academy for years to come.

Here are the highlights:

- 1 AO Global University Webinar Series** providing not only dental implant education to members, students, residents, and faculty, but also launching a new session within the program entitled **"Jumpstart your Career."** This session included exciting guest panelists (accountant, attorney, practice management and dental service individuals) who provided valuable information to students and residents as they begin their careers. The experience of others is shared full circle as we engage the next generation.
- 2 New Emerging Leaders Competition:** This new session to be enjoyed prior to the 2023 Closing Symposium will enable early career professionals (10 years of practice or less) to present a case on the main podium during the Annual Meeting. Five AO member judges will determine the winners of the competition which will also be announced during the 2023 Closing Symposium. We will engage and inspire our next generation of leaders and speakers. This journey full circle continues our mission and purpose.
- 3 OF Research and Education Fund Naming Opportunity:** This impactful accomplishment was created by myself with the AO team, the OF Research and Education Fund naming opportunity for 10 members. The process of establishing this special naming fund was time consuming, however the unique mechanism for receiving contributions have been developed for the first time for our foundation. Those interested in continuing the **"journey full circle"** for the next generations of scholars and implant researchers could continue their naming legacy while contributing to AO education and research.

It has been an honor and privilege to serve as your 2022-2023 president for our global, premier dental implant organization. Thank you for this incredible opportunity! The Academy continues to define the future of dental implant therapy as advances in clinical and research innovations improve the quality of life for our patients around the world. I look forward to welcoming you to Phoenix to reconnect with colleagues, refresh your knowledge as we make a difference in total health for all.

Board nominations include director, secretary for AO; New director, officers for OF

Nominated for election to the Academy of Osseointegration (AO) Board of Directors at the Annual Business Meeting March 18, 2023 in Phoenix, AZ, will be a new director, AO Fellow **Daniel I. Taub**, DDS, MD, an oral and maxillofacial surgeon at Thomas Jefferson University Hospital in Philadelphia, PA. Also nominated for secretary will be current director and AO Fellow **Joseph Y. K. Kan**, DDS, MS, Loma Linda University School of Dentistry Center for Implant Dentistry (Loma Linda, CA).



Dr. Daniel Taub

Dr. Taub is currently an associate professor, the vice chair and program director of OMFS at Thomas Jefferson University Hospital. He is also in full-time academic practice of OMFS at the hospital.

"It is truly an honor to be appointed to AO's Board of Directors. I have been a member of the Academy since residency (2006) and the Annual

Meeting has always been my favorite event. I have developed life-long friendships through AO and I look forward to learning more from my fellow board members and giving back," said Dr. Taub.

Active in the Academy, Dr. Taub has served on five committees, including chair of the Website Education Committee. At Annual Meetings, he has been a plenary and ePoster speaker, and presented to the AO Study Club at the University of Pennsylvania School of Dental Medicine.

In addition to the new director and treasurer, AO members participating in the Annual Business Meeting will elect a new slate of officers and directors for 2023 – 2024:

Officers

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

President-elect: AO Fellow **Joerg Neugebauer**, DDS, PhD

Vice President: AO Fellow **Robert C. Vogel**, DDS

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

New: **Secretary:** AO Fellow **Joseph Y. K. Kan**, DDS, MS

Immediate Past President: AO Fellow **Amerian D. Sones**, DMD, MS

Directors

AO Fellow **Jeffrey Ganeles**, DMD

AO Fellow **Stephen L. Jacobs**, BDS, FDS RCPS

Robert R. Lemke, DDS, MD

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

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

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

The Osseointegration Foundation also has a new slate for 2023-2024, as approved by the AO board at its October 1, 2022 meeting. The OF slate will be as follows:

Officers

President: Life Fellow **Russell D. Nishimura**, DDS

Vice President: **Hans-Peter Weber**, DMD

Secretary/Treasurer: **Mehrdad Favagehi**, DDS, MS

Past President: **Andrea L. Henderson**, DDS

Directors

AO Fellow **Amerian D. Sones**, AO immediate past president (1 year only)

Nipul Tanna, DDS, MS

Harriet K. McGraw, DDS

New: **Lesley A. David**, DDS



Dr. Lesley David

Dr. **Lesley A. David**, an AO member since 2021, is an oral and maxillofacial surgeon who maintains a private practice in Toronto, Canada. She is an associate clinician at the University of Toronto in the Oral and Maxillofacial Surgery Clinic, a Fellow and past examiner of the Royal College of Dentists of Canada, and is on staff at the Mt. Sinai Hospital and The Trillium Hospital. Dr. David is a remedial course provider for the Royal College of Dentists of Ontario in oral and maxillofacial surgery and implant dentistry. She is an Emerging Leader Council member for the Foundation for Oral Rehabilitation and is a co-founder of Global Dental Mentorship. Dr. David has numerous publications in implant dentistry and lectures internationally on various topics in implant dentistry and oral and maxillofacial surgery.



New Emerging Leaders competition captures enthusiasm of early career clinicians

Excitement has been building among up-and-coming members of the Academy to engage in a new program at the 2023 Annual Meeting.

The “Emerging Leaders Case Presentation Competition, 6 Under 10 – Short Talks from Early Career Clinicians,” spearheaded by Academy President and AO Fellow **Amerian D. Sones**, DMD, MS, has generated nearly 20 applications from several regions of the globe from the United States to Italy, Germany and Egypt.

From all those who applied, six clinicians have been invited to present their cases on the main podium from 2:00 – 3:00 pm (MT) just prior to the Closing Symposium, March 18 in Phoenix. Judges will identify the “Best in Case” presentation and announce the recipient during the Closing Symposium. Top prize is \$1,000.

“The Academy is thrilled with the response from early career clinicians and pleased to provide them the opportunity to be an exciting, new part of our Annual Meeting program,” said Dr. Sones.

To be considered, early career clinicians (as defined in practice less than 10 years) were encouraged to submit a complete case that is surgical, restorative or a combination of both, along with a one-minute video describing it. Among the case presentations submitted were:

- *Split Mouth Ridge Augmentation Using BMP-2 and BMP-2 With Xenograft: A Case Report*
- *Novel CAD-CAM Applications for Treatment of Complex Cases: Taking Bone and Soft Tissue Augmentation Procedures to the Next Level*
- *Guided Lateral Window Osteotomy Using Dynamic Navigation for Maxillary Sinus Augmentation: A Novel Technique*
- *Full Mouth Rehabilitation With Maxillary and Mandibular Hybrid Prosthesis*
- *Esthetic Implant Complication Management and Oral Rehabilitation With the aid of Digital Technology*
- *External Root Resorption*
- *Minimally Invasive Ridge Augmentation*



- *Multidisciplinary Implant Reconstruction and Prosthetic Rehabilitation of the Resected Maxilla Status-Post Recurrent Oral Cancer*
- *PAIR Virtual Patient Assisted Full-Mouth Immediate Implant Placement and Loading*
- *Maxillary Anterior Immediate Tooth Replacement With and Without Socket-Shield: 1-Year Prospective Study*
- *Full Arch Implant Fixed Prosthesis*
- *Digital Workflow: Single TLX Implant Immediate Provisionalization*
- *Implant Rehabilitation in a Patient With Sinusitis Aspergillosis*

Concluded Dr. Sones, “We are looking forward to the Emerging Leaders case presentations and strongly encourage all Annual Meeting registrants to attend and enjoy this inaugural competition among our next generation of AO members!”

To view a sneak preview of the six finalists who will be presenting their cases, please scan the QR code.



Advance registration for the Academy's 2023 Annual Meeting is available through February 23. For more information and to register, please visit osseoo.org.

Darwinian Implantology

By Paul A. Fugazzotto, DDS; Academy News Editorial Consultant

Is there anything left to say about comprehensive interdisciplinary care? Or has the topic been dissected and explored to its fullest, uncovering hidden gems and providing guidance to one type of practitioner, and representing a dead carcass to which lip service must be given to another level of practitioner? Do we really need to read another ode to the “comprehensive practitioner?”

Oral Implantology has gone through several predictable phases.

EVOLUTION

Phase One, Individualism: Driven by visionaries who recognized the potentials of implant therapy, albeit at a time of more limited understanding of a fledgling science, these mentors utilized their specific expertise to contribute to successful implant therapeutic outcomes. The surgeon “surgerized,” the prosthodontist “prostheticized,” and the lab technician bridged the gap between reality and the desired idealized treatment outcome. If everything went well, the patient received functioning, implant-supported teeth.

Phase Two, Communication: The surgeon – restorative dentist (no longer only a prosthodontist) – technician triad raised the level of joint treatment planning, discussing the limitations and possibilities of implant therapies in a given situation. Implant positioning, implant selection and prosthetic designs were considered and chosen.

Phase Three, Development and Application: The need for additional implant designs and prosthetic options, and for techniques to predictably regenerate lost bone to facilitate implant placement served as the impetus for industry and individual research and development. The results were dramatic and treatment possibilities became reality.

Phase Four, Simplification and Widespread Application: As predictable techniques were developed to regenerate bone to prepathological dimensions and morphology without subjecting the patient to autogenous bone harvesting, and simplified restorative protocols proved successful, implant therapies became part of the non-specialist clinician’s lexicon, to the great benefit of the patient.

Phase Five, The Expanding Universe: Research and conceptual evolution continues to explore new, exciting possibilities of care; biologics positively impact regenerative therapies, improving treatment outcomes while lessening patient trauma; material evolution provides the tools for ever stronger and more esthetic results; and “the team approach” is spoken about at every meeting.

In such a stimulating environment, with a seemingly incandescent future, what concerns could there be? At the risk of sounding like one of Cassandra’s acolytes, there are cautions to be considered.

STASIS

Our definitions of success have remained essentially unchanged since the groundbreaking work of Prof. **Tomas Albrektsson**, et al. Based essentially upon radiographic measurements and absence of pain or signs of inflammation, combined with esthetic satisfaction, assessment of success today lacks a three-dimensional component such as buccal and lingual/palatal bone sounding, and is more aptly defined as survival.

Generally accepted definitions of success following Guided Bone Regeneration (GBR) procedures are often based upon ideal implant positioning, with scant consideration given to the quantity and morphology of bone necessary for predictable long-term success.

Our expectations for success are in themselves limiting. Short term success is meaningful only to an actuary, not to a patient who must face the ramifications of failure. The most efficient manner by which to manage complications and failures is to prevent them from happening. Rather than critically assessing the reasons for our complications and failures, we focus a disproportionate amount of our time and effort upon developing techniques for treating complications as they arise. While these techniques are necessary and important, such an approach is reminiscent of the characters in McGregor’s “*The War Of The Worlds*” pastiche celebrating the development of prosthetic limbs to replace those lost to radiation poisoning without attempting to curtail the causes of the radiation.

Our failure to truly maximize immediate treatment outcomes and long-term success can be traced to lack of evolution of our understanding of two, interrelated foundational aspects of effective comprehensive care: the treatment team and effective diagnosis (a topic for another time due to its complexity).

Continues on page 9



Reflections on the past and future of the Socket Shield Technique

By Markus B. Hürzeler, Prof, DMD, PhD; and Otto Zuhr, DDS; Academy News Guest Contributors

More than 15 years have passed since we came up with the socket shield technique.

At that time, we realized that no matter the technique being used for ridge preservation following extraction, partial resorption of the extraction site was inevitable. By closely studying the biologic processes at work following tooth extraction, it became clear that we needed to maintain the periodontium. That would be the key to preserving the entire volume of the extraction site. Our proof-of-principle study data supported this thinking, and the socket shield technique was shared with the dental world.

Shortly after its introduction, there was a lot of skepticism and criticism regarding the technique, which was understandable. The recommendation from our team was also very conservative. We knew that more research had to be performed to gather the evidence required for such a technique to be fully endorsed. In the last 10 years, seven randomized controlled trials have been published on the socket shield technique, so it is no longer considered experimental. However, there is still much to learn before the technique can be fully recommended, primarily the long-term complications and how they influence the technique itself.



Two adjacent implants replacing maxillary central incisors using the socket shield technique: Note the preservation of the inter-implant papilla.

Unfortunately, different variations of the technique have been described, studied, and reported in the literature without true understanding of the original approach. Many of these modifications to the socket shield technique will result in long-term complications, which is why the biology underpinning the original technique is so crucial to understand.



Dr. Otto Zuhr

I know people misunderstand our original concept because I have experienced the bewildered expressions and questions from my colleagues.

Just this past year at the 2022 European Association for Osseointegration (EAO) meeting in Geneva, Switzerland, I spoke with great friends and key opinion leaders at the welcome reception. When I mentioned the fact that one of the most important considerations for avoiding long-term complications with the socket shield technique is the

anchorage of the shield mechanically or biologically, they stared back at me and said, "What do you mean about anchorage of the shield?" This was a wakeup call that the technique is not yet fully understood.

In our first experiment, we described direct contact between the implant and the shield as well as a gap intentionally left open between the shield and the implant surface. Today we know how crucial this relationship between the

implant surface and the shield is for stability.

Unfortunately, many of the described protocols of the socket shield technique involve procedures (e.g., separating the root mesiodistally and removing the palatal part of the root) that preclude achievement of its primary goal, thereby reducing the mechanical anchorage of the shield. It is clear that the socket shield technique needs to be taught differently in order to be understood correctly.

The potential of the technique is tremendous, and we do not even know its limits yet. Many clinical situations warrant its use, for example the replacement of two adjacent teeth with implants in the esthetic zone. The socket shield technique is the only technique where the clinician can predictably achieve a papilla between two implants from our point of view; this is not predictably achievable with the conventional approach.

Therefore, we have an obligation to optimize the socket shield technique and introduce it to every clinician so they



Dr. Markus Hürzeler

Darwinian Implantology... *(continued from page 7)*

While most practitioners today agree the treatment team is made up of the patient and the patient's significant other, all treating dentists and the dental laboratory, such a team is incomplete. All necessary physicians must be included, for a variety of systemic reasons including sleep disorders. Acupuncturists and physical therapists are often necessary, to help manage parafunction and pain. Behavioral modification may be required when treating smokers. Etc., etc., etc.

Employing such an approach, in combination with the techniques and materials available today, results in long-term success rates of 99% or more, in a healthy patient.

DE-EVOLUTION

Unfortunately, there are other disturbing trends in implant dentistry, which threaten to undo already accomplished progress.

The rise of super dentists, whether they be surgeons, restorative dentists, endodontists or anyone else, does not bode well for patients or our profession. I am not speaking about a restorative dentist who performs regenerative and implant therapies or a surgeon who restores an implant they have placed, following a thorough examination, insightful diagnosis, formulation of an appropriate treatment plan, and execution of therapy to the level of their surgical or restorative colleague, with recognition of their limitations.

The danger is the practitioner who believes he or she knows all there is to know and performs complex therapies (are there any other type?) without input and perspective from colleagues. Such an endeavor is as fool hardy as the books written by authors in centuries past which purported to explain everything about earth, the universe and existence itself.

Following is a portion of a discussion between myself (P) and Dr. Z., a renowned and well-respected clinician.

P: What percentage of the therapies you perform is implant related and what percentage is periodontal therapies?

Dr. Z: I don't do perio anymore. I only do bone grafts and implants.

P: What about your patients with perio problems?



Dr. Z: My patients don't have a lot of perio needs. Besides, I am too busy just doing implants, and perio pockets come back after a few years no matter what you do.

P: Perio pockets don't come back if perio treatment is done correctly in healthy patients who brush their teeth.

Dr. Z: I don't believe that. You say that because you are one of those crazy Kramer BU guys.

This discussion actually took place. My being called crazy does not bother me, as it is nothing new. The disturbing part of this exchange is the tunnel vision approach of Dr. Z., and the disservice it does to Dr. Z.'s patients.

We are not metallurgists. We are part of a treatment team. Patients don't come to us for a piece of metal, or a beautiful crown or a full arch implant supported prosthesis.

Patients come to us for the same reason they go to their physicians. Patients desire an optimal quality of life. We play an indispensable part in delivering such quality, by whatever means is in the best interests of the individual patient.

We are at a crossroads. Do we continue the evolution of our field, and it's inter-connectedness to comprehensive patient care, or do we fail at this important and honorable endeavor?

We all know the correct answer.

Reflections on the Socket Shield Technique... *(continued from page 8)*

understand its indications. Clinicians need to know the parameters that make the technique more sensitive and when it can be performed with more predictability.

The socket shield technique is a demanding approach and requires a lot of biologic understanding from the clinician.

At the same time, however, every implant treatment in the esthetic zone is also a challenge, and conventional approaches (i.e., immediate implant placement, early implant placement, and delayed implant placement) are not simple treatment options. The socket shield technique is just the next level of care for our patients, in our opinion.



Digital & Minimally Invasive Implant Symposium

At Alyeska Resort, Girdwood, Alaska

AUGUST 6-7, 2023

**2 DAY
SYMPOSIUM**
\$2,295 / Person

Speakers

Joe Kan, DDS, MS
Dan Cullum, DDS
Michael Block, DMD
RW Emery, DDS

REGISTER NOW!

inwlive.com



COURSE LEVEL: ADVANCED CE CODE: 690
Implants Northwest Live Learning Center
Nationally Approved PACE Program Provider
for FAGD/MAGD credit.
Approval does not imply acceptance by
any regulatory authority or AGD endorsement.
10/1/2021 to 9/30/2023
Provider ID# 320242



TUNNELING INSTRUMENTS

These instruments allow for a minimally invasive tunneling preparation to avoid large openings



46.013.00Z

Great for preparing
flaps or subsequent
reconstructions of
the alveolar ridge

TOUCH GRIP Hürzeler/Zuhr

46.035.20HZU
Tunneling
Combination
Instrument



46.035.17HZU
Papilla Elevator
Double Ended



THE ORIGINAL
Improving
Atraumatic Extraction



**THINNER
BLADE!**



H&H COMPANY (800) 491-9989
FINEST QUALITY INSTRUMENTS hhcompany.com



HELMUT ZEPF



More than 50 AO members representing all disciplines and many parts of the globe took part in the 2022 Summit.

Young investigators' perspective: 2022 AO Summit

By: Todd R. Schoenbaum, DDS, MS; Tara Aghaloo, DDS, MD, PhD; Chandur Wadhvani, DDS, MS; and E. Dwayne Karateew, DDS; Academy News Guest Contributors

On behalf of the entirety of the AO Summit group, let me just say... "Wow!" What an amazing event.

Under the guidance of Summit Co-chairs **Joerg Neugebauer**, DDS, PhD; and **Clark M. Stanford**, DDS, PhD, MHA; Summit facilitator **Michael R. Norton**, BDS, FDS, RCS(Ed), and AO President **Amerian D. Sones**, DMD, MS, our group of 56 clinicians, scientists, clinician-scientists, academics, and leaders from eight countries made significant contributions to the future of implant dentistry. We were collectively tasked with running systematic reviews on the topics of: flap versus flapless surgery in guided implant placement (chaired by Dr. **Ilser Turkyilmaz**), guided versus navigational implant placement accuracy (chaired by **Tara L. Aghaloo**, DDS, MD, PhD), ceramic implants (chaired by Dr. Neugebauer, co-chaired by **Markus Blatz**, DMD, PhD, and **Joseph P. Fiorellini**, DMD, DMSc), and Δ MBL (change in Marginal Bone Level) and survival of implants based on prosthetic connection design (chaired by Drs. and **Todd R. Schoenbaum**, DDS, MS, co-chaired by **E. Dwayne Karateew**, DDS).

For those unfamiliar with the workings of a systematic review, in essence, it is a formal distillation of the currently available science on a particular topic. This systematic aggregation of published data is commonly considered among the highest levels of evidence, and one at the least risk for biases.

The process starts by formulating a research question in the standard **PICO** format. **PICO** stands for **P**atient/**P**opulation to study, **I**ntervention/treatment, **C**omparison and **O**utcome.

The team of experts *systematically* work down through the available publications to determine if the papers can be included in the final dataset. The data from these papers are extracted and statistically analyzed through Forest Plots. This method of data analysis facilitates the summarization of the collective findings on each topic (i.e., accuracy, survival rate, Δ MBL (change in Marginal Bone Level)). Keep an eye out for the papers generated by the four teams, to be

published in an upcoming edition of one of our Academy's official peer reviewed journals, the *International Journal of Oral and Maxillofacial Implants (JOMI)*. A preview of the Summit findings will be presented at the Academy's 2023 Annual Meeting in Phoenix, AZ March 16, 2023 by Summit Co-chair Dr. Neugebauer. We sincerely hope they contribute to our collective understanding of relevant issues and further improvements in implant dentistry.

*Editor's note: **Todd R. Schoenbaum**, DDS, MS is a professor at the Dental College of Georgia where he trains residents and students in implant restorations and clinical research. As a young scientific investigator with a leading role in the 2022 Summit, we asked Dr. Schoenbaum to share his experience.*

The experience of the Summit for me was mostly a repeated (internal) exclamation of "Oh wow! I know you (and your work)!" To be surrounded by so many of the professionals who have shaped and defined our field was simply amazing.

So often we quote the high success and survival rates of implant dentistry. These individuals, working together under one roof in suburban Chicago, are those largely responsible for the literature we quote with familiarity. They are not only documenting and reporting the data, but are the ones creating the materials, protocols, and techniques. I don't get star struck easily or often but sitting next to some of these giants of our profession was a profound experience. This group represents the best of the best of our profession, and I was honored to contribute to it. My co-authors here (Drs. Aghaloo, Wadhvani, and Karateew) so well represent the multidisciplinary, collaborative, mentoring environment of the Academy.

On a personal note, it was truly amazing for us to participate in this Summit. Such proceedings often go unnoticed by most of the profession. We are busy seeing patients, doing research, teaching, or some combination of the three.

Continues on page 12

OF implements Research and Education Fund naming opportunity

By: Andrea L. Henderson, DDS; President, Osseointegration Foundation, and Kevin Smith Executive Director

Spearheaded by Academy President and AO Fellow, **Amerian D. Sones**, DMD, MS, the Osseointegration Foundation (OF) this year implemented a new program, the Research and Education Fund, for 10 donor naming individuals.

This new OF initiative, in which special invitations were sent to the Academy's membership to support OF's research and education efforts, is supported by the Academy's Board of Directors. For each gift it receives of \$100,000 or more to support this initiative, OF will establish a Research and Education Fund in the name of the donor.

Each Fund's purpose will be to support research and education programs related to osseointegration implant dentistry conducted or supported by the Foundation and the Academy. To honor the donor and express OF's appreciation, each program will include acknowledgement that the program is supported by the OF's Fund named for the donor. To date, four such donors have come forward:



The R. Gilbert Triplett DDS, MD, PhD, Research and Education Fund

Dr. Triplett trained and served as an oral and maxillofacial surgeon in the U.S. Navy Dental Corps, retiring with the rank of Captain after 21 years of service.

He is the assistant editor of the only textbook ever written on the topic of war injuries to the head and neck

region. He was recruited by the University of Texas Health Science Center at San Antonio to join their faculty in 1984. In 1991, he was named chair of the Texas A&M University College of Dentistry Department of Oral and Maxillofacial Surgery. Dr. Triplett's areas of research interest are bone physiology, hyperbaric oxygen therapy, head and neck infection, maxillofacial trauma, dental implants, guided tissue regeneration, and micro neurosurgery.

Dr. Triplett is vice chair of the department, director of Hospital Affairs, and chair of the Dentistry Department at Baylor University Medical Center. In 1998, he was named a Regents Professor, one of the highest honors in the Texas A&M University System.

Why this contribution is so important to Dr. Triplett

As a past president of the Osseointegration Foundation, I am thrilled to participate in this remarkable naming opportunity to advance the education and research for the Foundation and the Academy. To be named after an educational program is such an honor and provides a legacy of which you, my family, and I can be proud. The Academy is the only dental organization that has successfully brought together all aspects of dentistry for education, interaction and patient care regarding function, esthetics, and oral health. I align myself with AO's values and hope my contributions will mentor and promote the future of the Academy with this education and research program.

Continues on page 13

Young investigators' perspective: 2022 AO Summit (continued from page 11)

Nevertheless, such meetings of experts can and will make marked changes in the way we treat implant patients.

The way you do a particular procedure, or the factors which influence the success of an implant, or the predictability of a specific material... it came from here, these people. The AO Summit is a chance for the brightest minds and finest hands in our profession to meet and debate, and disagree, and challenge each other on cutting edge findings and classic metrics. I don't consider myself an expert in anything but surrounding myself with (and diligently learning from) the best and brightest in our profession. The AO Summit was an amazing opportunity to do so. I consider myself deeply in the debt of my co-collaborators and co-authors.

To our younger Academy colleagues, we need your enthusiasm, your new ideas, your contempt

for "things as they are." Implant dentistry won't improve by accident or time alone. Improvements happen when people, like you, make them happen. The Summit happens every four years and the next one is in 2026. We hope you'll consider joining us and shaping the future of implant dentistry. If you are interested in helping shape the future of implant dentistry, reach out to AO leadership at the Annual Meeting in Phoenix to get involved.

It's hard but rewarding work. This is no small task, and the road ahead fraught with challenges.

We need you. We are counting on you. And, we are waiting...

View a list of all 2022 Summit participants via this QR code:



OF implements naming opportunity *(continued from page 12)*



The Robert Vogel, DDS Research and Education Fund

Robert C. Vogel, DDS graduated from Columbia University and conducted his residency training at Jackson Memorial and Miami Children's Hospital. He maintains a private practice in Palm Beach Gardens, FL focused on implant prosthetics and conducting clinical trials. Dr. Vogel speaks internationally on Precision, Productivity and Ideal

Patient Care in Implant Dentistry. He has developed prosthetic components currently in use for implant dentistry and is a Fellow of the International Team for Implantology, Fellow and Secretary of the Academy of Osseointegration, and Fellow of the International College of Dentists.

Why this contribution is so important to Dr. Vogel:

During my first year out of residency, I was invited by a local specialist to attend an Academy of Osseointegration Annual Meeting as his guest. This meeting set the foundation for my next 36 years in practice, both professionally and personally. The Academy exposed me to a world of education, professional integrity, and individuals that became the cornerstone of my practice and friendships. I feel it is critical to give back to AO so that young dentists don't miss out on the same life changing opportunity I was fortunate to experience, which impacted my professional career.



The Jeff Lloyd, DDS Memorial Research and Education Fund

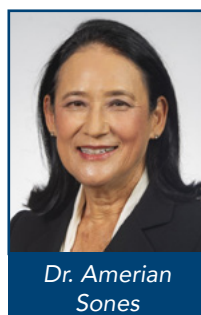
An AO board member from 2015 to 2019, **Jeffrey D. Lloyd**, DDS left this world too early in 2019 at the age of 67. He knew at age 12 that he wanted to be a dentist, just like his dad. Dr. Lloyd graduated from USC School of Dentistry in 1978 and practiced general dentistry for 41 years. He is married to his loving wife, Jackie, who supported

him through all his endeavors, as did their six children, 18 grandchildren, and seven great-grandchildren. This fund honors Jeff and all he gave to our Academy and to remember a great colleague and educator.

What this contribution means to the Lloyd family (Written by Mrs. Jackie Lloyd):

It is such a blessing and honor for my family and I to see my incredible husband, Dr. Jeff Lloyd's, name and legacy live on through this research and education naming scholarship. His many contributions to dentistry are important as he was an inspiration and mentor to so many in his profession. Dr. Lloyd's success as a general dentist, gnathologist, and life-long learner is due to his passion for education. He was a dedicated, caring and outstanding member of so many dental organizations. Dr. Lloyd leaves a legacy of

enthusiasm and love for teaching and sharing knowledge with others at the highest level. Our family is proud to have this opportunity so his name will live on as a mentor, whose persistence and devotion to dentistry were exemplary.



The Amerian D. Sones, DMD, MS, Research and Education Fund

AO Fellow **Amerian D. Sones**, DMD, MS is president of the Academy of Osseointegration, associate clinical professor, Texas A&M University, School of Dentistry in Dallas, TX, executive director of Continuing Education, Chief, Dental Oncology and the Center for Maxillofacial Prosthodontics, and prosthodontic faculty in the

Department of Comprehensive Dentistry for the Advanced Education General Dentistry and Graduate Prosthodontic Residency Programs.

After graduating from Tufts University School of Dental Medicine, Boston, MA, she served in the U.S. Public Health Service as Chief Dental Officer for the Tohono O'odham Tribe in Sells, AZ, where she directed a six-chair dental service for this patient population.

Dr. Sones attended UCLA School of Dentistry, Los Angeles, CA postgraduate prosthodontics, and maxillofacial prosthodontic residency program. She served as full time faculty, UCLA School of Dentistry in the Department of Removable Prosthodontics. While at UCLA, she was involved with the first implant training center of the west coast and initially organized the first "Brånemark implant team."

Dr. Sones is a Life Member of the American Dental Association, a past member of the California Dental Association and now the Texas Dental Association, a Fellow of the American College of Prosthodontics, Fellow of the International College of Dentists, Fellow of the American College of Dentists, and president-elect of the Pacific Coast Society for Prosthodontics. She is a Diplomate of the American Board of Prosthodontics.

Why this contribution is important to Dr. Sones

This naming opportunity is special as it is a living and dynamic legacy which uniquely supports the Foundation's education and research. I am proud to make this contribution, which will remain named for many years to come. I have contributed to many organizations over the years, however, the OF naming opportunity is like no other. Investing in our organization, the future of OF and the Academy, will bring great returns for our next generation of AO leaders.

Additional information regarding OF is available at:

osseointegration-foundation-and-of-grants.org.

If you are interested in participating and/or would like to learn more about this initiative, please contact Kevin Smith at: 847-439-1919 or KevinSmith@execadmin.com.

Dr. Dennis Tarnow to be bestowed prestigious OF award

Dennis P. Tarnow, DDS, is the 15th recipient of the prestigious Nobel Biocare Brånemark Osseointegration Award. The award is given annually by the Osseointegration Foundation (OF) to honor an individual whose impact on implant dentistry is exemplary in any or all the Foundation's mission categories: research, education, and charitable causes.

Dr. Tarnow is universally respected as a pioneer and leader in implant dentistry. Throughout his stellar career, he has "filled the gap" between research, academics and clinical practice. Dr. Tarnow is also known to be a prophetic visionary as we showed in a recent *Academy News* article series about Hybrid Design Implants (HDI) by **Daniel Buser, DDS, DMD** and others.

The following is a selection of testimonials from Dr. Tarnow's peers collected by *Academy News* Editorial Consultants, **Harriet K. McGraw, DDS**; and **Paul A. Fugazzotto, DDS**.

"A very gracious expert who welcomed a Midwesterner with a little New York charm. The charm of the challenge was graceful. Dr. Tarnow allowed me to "interview" him twice. Each time, the interviews became an intellectual dialog. We each were improved as we departed. Dennis is always an intellectual and a gentleman." – **Clark M. Stanford, DDS, PhD, MHA**

"Dennis is a visionary and his contributions to dentistry are impeccable and profound. I do not know of anyone practicing dentistry that does not use one of his concepts or rules. I have had the personal honor and privilege of calling him my lifetime mentor, who has always guided me to overcome many challenges in my life. He is so generous with his time and expertise, always willing to help those asking for advice. Dennis truly is an incredible mentor and trailblazer in our field, whose legacy and contributions continue to benefit dentists and patients each and every day." – **Hom-Lay Wang, DDS, MSD, PhD**

"Dennis Tarnow = innovator, educator, collaborator, and motivator. Not many have Dennis's skills to articulate a message and make it stick. He has changed the landscape of dental implantology, from design to placement, from preventing complications to treating problems, and from creative concepts to clinical realities. Thank you, Dennis, for making us all better for the patients we serve (but you do need to work on your downhill skiing).

– **Joan Otomo-Corgel, DDS, MPH**

"Two years out of residency, I attended my first AO Annual Meeting and listened to a speaker who had a profound impact on the rest of my professional life. Dennis Tarnow presented useful, reliable, repeatable information in a way I had never seen before. The following day, while I was having lunch, Dennis sat down at my table and introduced himself, proving that incredible education both changes how we treat patients, and can be approachable and real. Anyone who treats patients with ideal care is aware of Dennis's research and principles, although they may have forgotten where they came from. Every profession has recognizable, single name icons such as Prince or Celine. We have Dennis, performing one miracle at a time."

– **Robert C. Vogel, DDS**

"I have known Dennis for 30 years and we have practiced together in the same office as partners since 2005. He is the consummate teacher, as well as a deep thinker/clinician when treating our patients together at SDNY Dental. I would not have been able to co-author a book on implant dentistry and write numerous research articles if not for him

Continues on page 16



Dr. Dennis Tarnow

Dynamic Navigation: The past, the present and the future

By: Robert W. Emery, BDS, DDS; Academy News Guest Contributor

The adaptation of technology follows a predictable path. First, a clinical dilemma is identified. Innovators create technology to address the problem, early adaptors evaluate the technology and spread the word. Usage spreads as more clinicians recognize the advantages for themselves and their patients. Eventually, literature is developed that either supports or refutes its value.

The adaptation of Cone Beam Computed Tomography (CBCT) and Intraoral Scanners (IOS) come to mind. These devices have been adopted because they improve our ability to diagnose and treatment plan. We can visualize plans in three dimensions. They do not, however, allow us to execute the plan. We need some form of Computer Assisted Surgery (CAS) to use the data. I believe one form of CAS, Dynamic Navigation (DN), addresses this clinical dilemma in an accurate, real-time, efficient, flexible and evidence-based fashion.

Neurosurgeons pioneered the use of DN in the 1980s. Today, DN is used in otolaryngology, orthopedics, craniofacial surgery to name a few. Medical DN systems in use now allow a surgeon to project a CT on the back of a patient via augmented reality headset and track the placement of spine pedicle screws with minimal incisions.

Today, thousands of robots around the world are used in medicine, many driven by DN vision. These robots are not only performing surgery they are sterilizing rooms, delivering medication, and delivering comfort care.¹⁻³

DN in dentistry began around 2000 with the approval of the first devices to place dental implants. A DN simulation system was also introduced to train dental students in restorative dentistry.⁴ At the time, CBCT and IOS technology did not exist. Additionally, the hardware and software were difficult to use and expensive. The early literature was promising as it showed the accuracy and precision of DN was excellent.^{5,6}

Fast forward 23 years: the techniques of CAS have matured. There is a deep body of literature supporting all forms of CAS. Numerous studies support the same conclusion. Any

form of CAS is superior to freehand surgery and there is no statistical difference in accuracy and precision between any of the CAS modalities.⁷⁻⁹

The usage of CAS has accelerated as early adapters recognized its importance and its efficiency. CBCTs and IOSs are becoming ubiquitous. DN has played a role in this accelerated adoption with over 3,000 sold in the U.S. DN is relatively inexpensive and highly adaptable to many procedures; light and software acting like a GPS system for the maxillofacial structures give the clinician freehand flexibility.



Light from the camera assembly bounces off the patient and handpiece tracking arrays back to the stereo cameras. The tracking system processes the images to give a live view of the surgical plan on the monitor.

We routinely scan, plan, and execute the plan in less than 30 minutes. Staff performs image acquisition, initial planning, and calibration. The doctor completes the planning process and places the implant. Most importantly, the plan can be changed at any time based upon the clinical situation. Visualization is improved to the level of microns and degrees on the DN system for planning and execution.

There is nothing obscuring the surgical field or restricting irrigation. The clinician can feel the effects of dense bone as they would with freehand but with DN they can also see the effects. For patients with minimal mouth opening DN allows guidance in areas impossible with any other form of CAS. Finally, for those who perform craniofacial reconstruction, the use of extraoral fixation with DN is often the only form of CAS that is possible.

Since DN systems are not bound by hardware constraints, the approved clinical uses will expand. In development now are AI systems that will automate the basic implant planning process, thus improving efficiency. DN systems are capable of navigated stereophotogrammetry. This means the last piece of the complete digital workflow is attainable using one device. The DN systems will take accurate full arch impressions that are related to the digital diagnostic images and planned final restoration in the same coordinate system.

DN is not without its challenges.¹⁰ Our teams must learn how to properly register a patient and ensure the

Continues on page 16

Dynamic Navigation: The past, the present and the future (continued from page 15)

accuracy of tracking. Optical interference must be recognized, and the team learn how to avoid it. This learning curve is between 10 and 20 implants, at which point the doctor and their team are proficient. Proficiency means they are statistically equivalent in accuracy and precision to any other properly trained surgeons.⁸ Once a team is proficient placing implants with DN, the surgeon can place implants faster than freehand and with more confidence and improved outcomes.^{11,12}

In summary, a broad body of literature supports the use of CAS for placing dental implants. Accuracy, precision, and outcome literature shows that we are more accurate with the benefit that skilled surgeons and patients will have better outcomes with the adaption of CAS. Esthetics and

function can all be improved by ideal implant positioning through the effective use of CAS. Choosing the best form of CAS for you is driven by your personal preferences and the clinical situation thus making DN a flexible, efficient, and cost-effective option for the future.

The question moving forward is not if you will adapt CAS, but when and using which modality. Why not for every patient and every implant?

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



Dr. Dennis Tarnow to be bestowed prestigious OF award (continued from page 14)

sharing his knowledge throughout the decades. Always a gentleman, friendly, personable, and willing to share his time and knowledge with anyone. So well deserving of this highest, prestigious award from OF." – **Stephen J. Chu**, DMD, MSD, CDT

"I feel very fortunate to have followed Dr. Tarnow, an elite educator, throughout my professional career. With his energetic and engaging approach to lecturing, I always found myself locked into absorbing the wealth of knowledge he freely shared. The first time I met Dennis was when I spoke at the 2003 GNYAP Meeting, as a nervous, young clinician, speaking at a highly esteemed meeting. He was very supportive and encouraging to me to continue my path in education. I am sure he has had the same impact on many other clinicians over his career. Thanks Dennis! – **William C. Martin**, DMD, MS

"Dennis Tarnow represents the most sublime essence of teaching. He ignited within me the fire and passion for knowledge and learning like no one else before, expanding my horizons, and making the potential seem limitless. He is, and always will be, my everlasting mentor and dear friend." – **Francesco Amato**, MD, DDS, PhD

"An amazing educator, clinician, communicator, and influencer with a solid biological foundation that transcends time!" – **Joseph Y. K. Kan**, DDS, MS

"For over 30 years, I have been reading Dennis Tarnow's work and have been influenced by his insights. To describe Dennis as one of the "Greats" of our time, would be no exaggeration. I struggle to think of another colleague who can be said to have influenced as many professionals in the field of implant dentistry as Dennis. The award given by the Foundation reflects this outstanding achievement; one which he rightly deserves." – **Michael R. Norton**, BDS, FDS, RCS(Ed)

"A colleague once remarked that speakers on the podium were motivated by money, a need to feed their ego, or by a sincere desire to contribute to the profession. Dr. Tarnow is the embodiment of the latter." – **Harriet K. McGraw**, DDS

From The Merriam-Webster Dictionary, 2023 Edition Tar-now, Den-nis

proper noun

1. a teacher; 2. a mentor; 3. a scientist; 4. a quality human being

adjective:

1. ex: The presentation was a perfect blend of science and clinical applicability; it was **Tarnow - like**.

verb:

1. ex: The speaker tried to present opinion as fact, but he was politely **Tarnowed**.

synonym:

1. caring; 2. rigorous; 3. principled; 4. George Clooney doppelgänger

– **Paul A. Fugazzotto**, DDS



This award is made possible by a grant from Nobel Biocare. The selection process involves nominations by the members of the Osseointegration Foundation's Titanium Society. Dr. Tarnow will make an exclusive presentation at the Titanium Society Breakfast on Saturday, March 18, 2023 during the Academy of Osseointegration Annual Meeting, in Phoenix, AZ. AO members are encouraged to join the Titanium Society to help support the Osseointegration Foundation.

Smoking, diabetes and the oral microbiome: Implications for periodontal and implant health

By Sukirth M. Ganesan, BDS, PhD, Academy News Guest Contributor

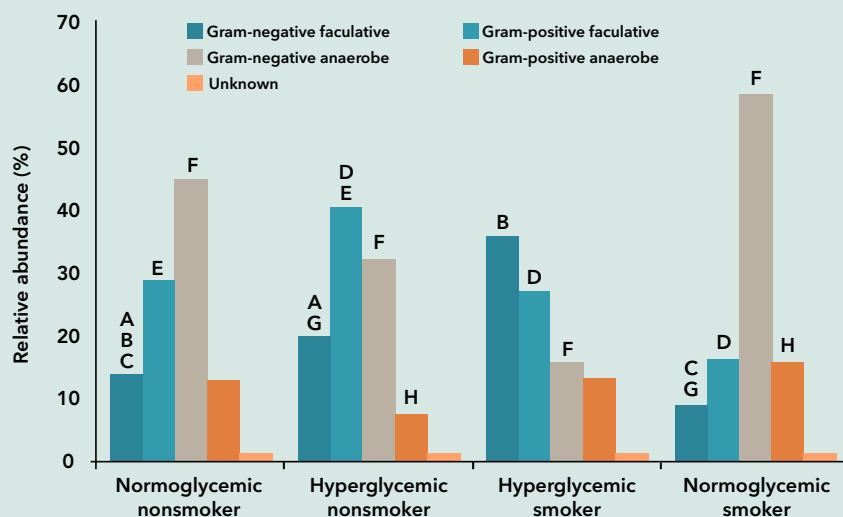
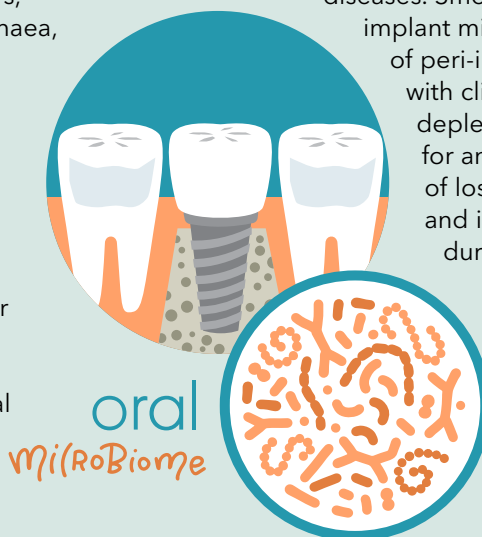
The oral cavity is a complex, open ecosystem that houses hundreds of microbial species co-existing with the host cells. This collection of microbial members, including bacteria, viruses, fungi, and archaea, constitute the oral microbiome.

In health there is homeostasis, a harmonious, continuous interaction between the microbial and host. Disruptions in this homeostasis define periodontal and peri-implant diseases. Specific factors, such as cigarette smoking, and Type 2 Diabetes (T2D) alter this ecosystem in the short-term or long term. While smoking and T2D are firmly established as risk factors for periodontal disease, each impacts the oral environment differently.

For instance, smoking leads to peripheral vasoconstriction, decreased vascular permeability, and lower oxygen tension, while diabetes increases vascular permeability. Therefore, smoking and diabetes are associated with distinct microbial colonization in the oral cavity, and specifically, in the subgingival environment.

In T2D, the subgingival environment exhibits lower levels of anaerobes (bacteria that survive in oxygen-free conditions) and microaerophiles (bacterial that survive in very little free oxygen), including bacteria belonging to the genera *Parvimonas*, *Prevotella*, and *Tannerella*, *Lachnoanaerobaculum*, *Lactobacillus*, *Fretibacterium*, *Dialister*, *Eubacterium*, *Fusobacterium*, *Atopobium*, *Alloprevotella*, and *Porphyromonas*, and higher levels of facultative genera (bacteria that can survive in both oxygen-rich and oxygen-free environments), like *Hemophilus*, *Pseudomonas*, *Neisseria*. In contrast, smokers demonstrate higher abundances of anaerobes and lower levels of facultatives, corresponding to the environmental changes caused by cigarette smoking¹.

Although inconclusive, uncontrolled diabetes and smoking may be associated with increased risk for peri-implant diseases. Smoking alters the clinically healthy peri-implant microbiome even before the development of peri-implant mucositis or peri-implantitis with clinically healthy smokers showing a depletion of commensals and enrichment for anaerobes and pathogens. This pattern of loss of beneficial microbial members and increased pathogens further develops during the in peri-implant mucositis and peri-implantitis². Evidence on the impact of T2D on the peri-implant microbial environment is scarce and inconclusive, consisting mostly of cross-sectional studies. Alterations in the levels of *C. rectus*, *P. gingivalis*, *A. actinomycetemcomitans*, and *T. forsythia* have been reported³.



Overall, more rigorous, frequency-matched prospective studies that control confounding factors are needed to determine the impact of smoking and diabetes on the peri-implant environment. Regardless, current evidence demonstrating enrichment of pathogens and depletion of commensals suggests that smoking, and

possibly T2D, can disrupt microbial homeostasis in the peri-implant environment, priming implant sites for development of clinical disease. Therefore, these high-risk cohorts may require more frequent monitoring and recall appointments to remove the enriched pathogens from the environment and re-establish the commensal microbiome.

References:

1. Ganesan, S. M. et al. A tale of two risks: smoking, diabetes and the subgingival microbiome. *ISME J.* **11**, 2075-2089 (2017).
2. Tsigarida, A. A., Dabdoub, S. M., Nagaraja, H. N. & Kumar, P. S. The Influence of Smoking on the Peri-Implant Microbiome. *J. Dent. Res.* **94**, 1202-1217 (2015).
3. Sabancı, A., Eltas, A., Celik, B. & Otlı, B. The influence of diabetes mellitus on the peri-implant microflora: A cross-sectional study. *J. oral Biol. craniofacial Res.* **12**, 405-409 (2022).

OSTEOGEN® PLUG

**ONE STEP BONE GRAFTING SOLUTION
FOR SOCKET PRESERVATION WITHOUT
THE NEED FOR A MEMBRANE**



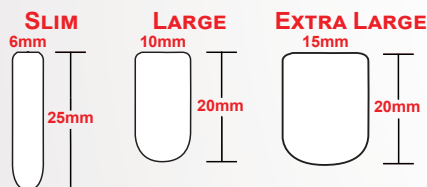
**OSTEOGEN®
NON-CERAMIC
BIOACTIVE CRYSTAL
BONE GRAFT**

**TYPE I BOVINE
ACHILLES TENDON
COLLAGEN**

**BUY 5 BOXES
GET
1 FREE**

**CALL TODAY OR SHOP
ONLINE & USE CODE
OGX808**

Available in Three Sizes



At less than \$50 per piece, the Impladent Ltd OsteoGen® Bone Grafting Plug combines bone graft with a collagen plug to yield an easy and affordable way to clinically deliver bone graft for socket preservation and ridge maintenance, all without the need for a membrane!

1. Spivak, J Biomed. Mater Research, 1990; 2. Ricci, J Oral Maxillofacial Surgery, 1992; 3. Valen, J Oral Implantology, 2002.

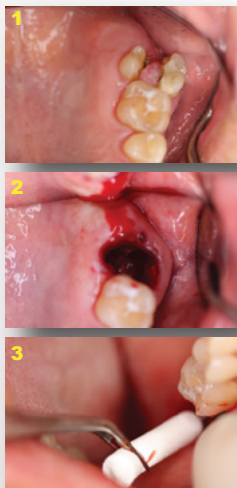
Clinical Case Example

Clinical images courtesy of German Murias DDS, ABO/ID

Tooth #15, set to be extracted.

Remove the entire pathologic periodontal ligament and flush socket twice. Use #6 carbide bur, make holes through the Lamina Dura to trabecular bone and establish Regional Acceleratory Phenomenon.

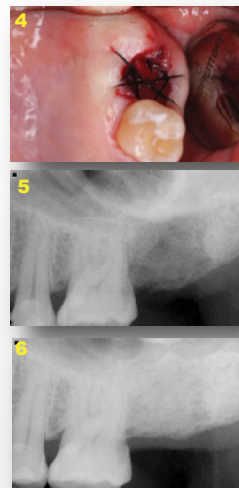
Insert Large or Slim sized OsteoGen® Bone Grafting Plugs and allow blood to absorb.



Two Slim OsteoGen® Plugs are in place. Suture over top of socket to contain Plug. Do not suture through Plug. No membrane is required.

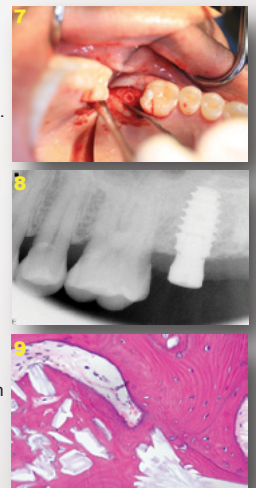
OsteoGen® is a low density bone graft and the OsteoGen® Plugs will show radiolucent on the day of placement.

As the OsteoGen® crystals are resorbed and replaced by host bone, the site will become radiopaque.



The collagen promotes keratinized soft tissue coverage while the OsteoGen® crystals resorb to form solid bone. In this image, a core sample was retrieved.

Implant is placed. Note the histology showing mature osteocytes in lamellar bone formation. Some of the larger OsteoGen® crystals and clusters are slowly resorbing. Bioactivity is demonstrated by the high bone to crystal contact, absent of any fibrous tissue encapsulation.



Scan Here
For Product
References



Scan Here
For Product
Videos



Young investigators' perspective: AAP Best Evidence Consensus

By: Shayan Barootchi, DMD, MS; and Lorenzo Tavelli, DMD, MS; Academy News Guest Contributors

Editor's note: In 2022, the Academy conducted a Summit to review the best evidence regarding guided implant surgery, ceramic implants and dental implant connections. Also in 2022, the American Academy of Periodontology (AAP) conducted a Best Evidence Consensus (BEC) workshop about the role of biologics in regenerative and mucogingival surgery. We asked two young investigators involved with the AAP workshop to provide Academy News readers a report about the AAP 2022 Best Evidence Consensus regarding the use of biologics.

The goal of the American Academy of Periodontology (AAP) in the adoption of the Best Evidence Consensus (BEC) statement and guidelines has been to address important clinical questions where there is currently a lack of adequate scientific evidence regarding treatment decisions. In summary, this process is based on the conduction of systematic reviews on selected topics, to provide objective and evidence-based results to pre-determined focus questions, which are then discussed by an expert panel convened by the AAP, alongside the systematic review authors with the ultimate aim of developing practice-based guidelines to clinicians.

Previously, the AAP had conducted three BEC workshops on the topics of Cone Beam Computed Tomography¹, Laser therapy², and the Periodontal Phenotype³. Most recently, the BEC aimed to provide an updated and evidence-based perspective on the current therapeutic applications of biologics with regards to three main areas of treatment: Periodontal Plastic Surgery (root coverage and gingival augmentation therapy)⁴, surgical treatment of Infrabony Defects⁵, and lastly, Alveolar Ridge Preservation/Reconstruction and Implant Site Development⁶.

The term biologics, in the context of oral tissue regeneration, may refer to any therapeutic agent with biological activity administered to achieve an enhanced regenerative or reparative effect.

While the concept of tissue engineering to enhance the outcomes of periodontal therapy is not new, and has been around since the late 1990s, over the past several years and more recently there has been a surge in the use of biologics for a variety of practical applications and different regenerative approaches to test and stimulate new oral tissue formation^{7, 8}, particularly in contemporary periodontal practice and implant therapy⁹. In general, biologics can be categorized into stem cell therapy, gene therapeutic agents, Autologous Blood-derived Products (ABPs), and bioactive factors, such as enamel matrix derivative (EMD), recombinant human platelet-derived growth factor (rhPDGF), bone morphogenetic proteins (BMPs), fibroblast growth factor (FGF), etc.

It is without doubt that the field of regenerative periodontal medicine is progressively moving in a direction of highlighting patient-centered outcomes and increasing treatment efficiency by reducing intra-surgical chair time, and post-operative morbidity/discomfort, while maintaining or rather increasing treatment efficacy outcomes¹⁰. Conceivably, the concept of tissue engineering-based approaches and the application of biologics lies along this path.

The proceedings of the current BEC meeting¹¹ (as well as previous meetings and reports) along with the systematic reviews⁴⁻⁶ are published and can be viewed in the *Journal of Periodontology*. Based on an analysis of the current evidence and expert opinion, the BEC report concluded that the appropriate use of biologics in periodontal practice and implant therapy is generally safe and provides added benefits to conventional treatment approaches.

In summary, as it relates to the topic of periodontal plastic procedures, it was found that biologics can promote soft tissue healing and reduce the incidence of postoperative complications. In addition, with the use of biologics in appropriate situations, patients may experience less postoperative pain and reduced need for analgesics.

Considering their effectiveness, it was found that an increased predictability of treatment in patients undergoing root coverage and gingival augmentation therapy can



Dr. Shayan Barootchi

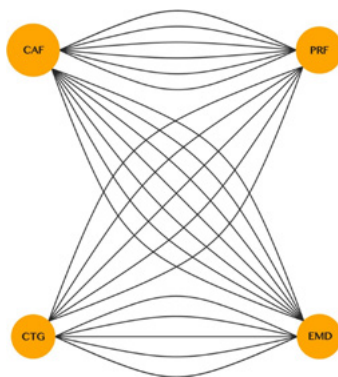


Figure 1 displays the generated network plot (also referred to as the network meta-analysis plot). For detail about this figure, please scan the QR code at the end of this article.



Dr. Lorenzo Tavelli

Continues on page 20

Young investigators' perspective (continued from page 19)

be expected. Nonetheless, readers are cautioned, as the quantitative results of the systematic review found that neither of the biologics of PRF nor EMD could serve as efficacious in terms of percent- or complete-root coverage, relative to the autogenous connective tissue graft.

With regard to the surgical treatment of infrabony defects, it was reported that the use of biologics (i.e., ABPs, EMD, and rhPDGF-BB) may significantly enhance the clinical and radiographic outcomes, such that rhPDGF-BB and PRF are associated with superior clinical and radiographic outcomes compared to EMD and Platelet-rich Plasma (PRP).

In addition, combination therapies involving bone grafts, either with a biologic agent or barrier membrane, are the most effective strategies for the treatment of infrabony defects. However, the use of membranes with biologics together should be avoided when graft containment is feasible since their combined use may prevent some of the benefits associated with the use of biologics (i.e., chemotaxis for pluripotential mesenchymal cell migration from soft tissue niches).

Allogeneic and xenogeneic bone grafts were also associated with greater clinical benefits than autogenous and synthetic bone graft particulates.

Lastly, on the topic of alveolar ridge preservation/reconstruction and implant site development, the benefits of using biologics were found to generally increase with the complexity of the defect (e.g., noncontained, large defects). In addition, it was found that the use of biologics (i.e., ABPs, EMD, rhPDGF-BB, and rhBMP-2) may enhance osteogenesis when combined with biocompatible/biodegradable scaffolds (e.g., xenografts, allografts, alloplasts) translating into favorable histomorphometric outcomes (i.e., mineralized tissue formation observed in bone core biopsies).

Nonetheless, there is limited evidence to support that the use of biologics – either as a monotherapy or in combination with graft materials – renders superior clinical or radiographic outcomes when compared with conventional interventions.

The conduction of the systematic reviews to gather the existing literature in an unbiased and objective manner with regards to each topic, is a vital step and serves as the foundation for each discussion, moving forward.

One of the novelties of the current systematic reviews of the BEC compared with previous reviews, was the methods underlying the quantitative analysis of data derived

from the individual randomized clinical trials. Notably, the use of a frequentist mixed-modeling approach to network meta-analysis (NMA)¹² allowed for the simultaneous statistical assessment of a large number of studies, and a relative comparison of the included treatment arms (i.e., different biologic mediators) to each other, as well as to positive and negative control groups. This allows for a simultaneous comparison of all treatment arms (regardless of if they have been compared head-to-head in a study before hand).

And specifically for the topic of Infrabony

defects⁵ via this approach, we contrasted and essentially isolated the specific components of the utilized treatments through additive and interactive models, to explore the relative impact of different bone grafts, biologics, and the application of barrier membranes on different therapeutic outcomes. This also allowed for obtaining direct and indirect comparisons among the stated treatment constituents, together, and in separation, all of which are vital for an evidence-based quality synthesis with the ultimate goal of improving daily clinical decision making and patient care.

Shayan Barootchi, DMD, MS is Adjunct Clinical Assistant Professor, Department of Periodontics and Oral Medicine, The University of Michigan School of Dentistry, Ann Arbor, MI.

Lorenzo Tavelli, DMD, MS is Clinical Assistant Professor, Department of Oral Medicine, Infection, and Immunity, Division of Periodontology, Harvard School of Dental Medicine, Boston, Massachusetts.

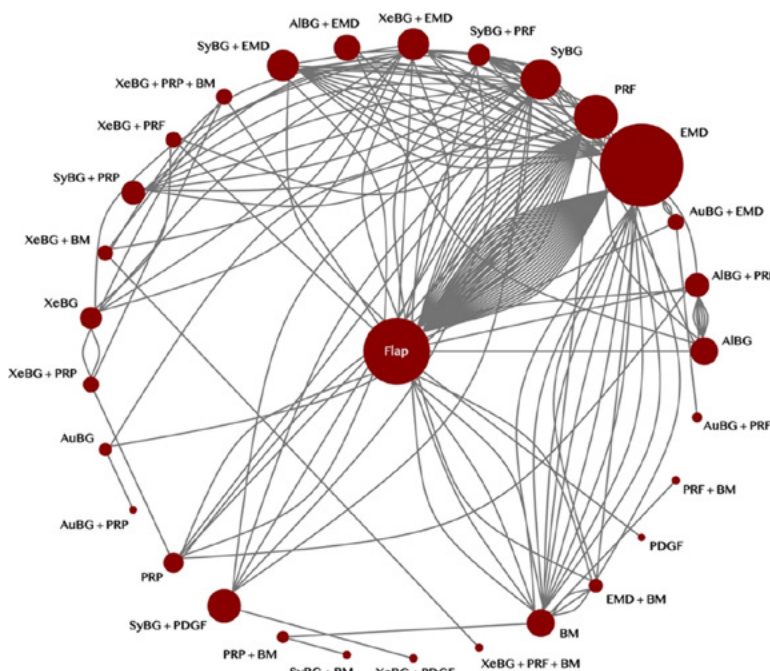


Figure 2 displays the existing relationships among study arms included in the network meta-analysis, on the surgical treatment of periodontal infrabony defects. For detail about this figure, please scan the QR code at the end of this article.

References and details about the figures in this article are available via scanning this QR code.



Implant placement considerations for the adolescent patient

By: Nipul Tanna, DMD, MS; Academy News Guest Contributor

A common question asked by many clinicians is: When is the optimal time (in terms of age) for placement of implants in the younger patient?

Reports in the literature have demonstrated a high implant survival rate and it has been shown that dental implants placed in the younger patients have integrated well. A recent report resulted in a rating of 100% implant survival. However, at the prosthetic follow up, the survival rate for the final prosthesis dropped to 70%. The 30% change was attributed to loss of proximal contacts and infraocclusion.¹

Several factors must be considered when answering this question and there are many variations in addition to the chronological age that must be evaluated. Two major components to consider include skeletal development and dentoalveolar development. Significant disparities can exist between the skeletal age, dental age, and chronological age, as well as the gender.

To add further complexity to this question, clinicians must also take into consideration the planned location for implant placement because growth and development of the cranio-maxillary-mandibular complex varies greatly in terms of the process, the direction as well as the rate based on the region. Much of the current understanding as it relates to craniofacial growth is based on the anatomic studies by Enlow and Hans² as well as the metallic implant studies by Bjork and Skieller.^{3,4} Additionally, soft tissue changes, which may have a significant impact in the esthetic zone continue well into adulthood and reflect the changes that occur in the aging face.

In the maxilla for example, postnatal development occurs via intramembranous ossification. The maxilla translates downward and forward during growth and development. An area of bone apposition occurs along the sutures, however, bone remodeling at the surface level occurs in the anterior region. In fact, the entire anterior portion of the maxilla resorbs as the maxilla develops downward and forward except for a small region in proximity to the anterior nasal spine.

In the mandible, development occurs via two processes. Endochondral ossification at the condylar level leads to an increase in the ramus height, as well as periosteal apposition at the posterior aspect of the mandible, which leads to an increase in length of the mandibular body.

In addition to the skeletal changes, the dentoalveolar changes occur in both the primary and secondary dentitions. During normal vertical growth, in health, active dentoalveolar eruption is proportional to the amount of skeletal growth that occurs vertically in the maxilla as well as the mandible,

allowing the dentition to remain in occlusion and to maintain facial height throughout the developmental process.

During this active eruption process, the entire attachment apparatus and the tissues that comprise it migrate coronally resulting in a net increase in the height of the crestal bone, as well as the gingival complex. Any aberration in this process, such as an ankylosed tooth, will manifest clinically in the form of a vertical deficiency due to a lack of normal eruption and therefore an insufficient coronal migration of the dentoalveolar and dentogingival complex.

In terms of growth and development, well osseointegrated implants behave in a manner similar to an ankylosed tooth.⁵ As the craniofacial complex and the dentoalveolar complex within it continue to grow, any portion that is ankylosed will remain "behind."

The clinic manifestation of this scenario, over time, will be a height discrepancy in both hard and soft tissues as well as an occlusal disparity resulting in an infraocclusion of the implant prosthesis. Brugnolo and co-workers reported similar findings of infraocclusion in patients aged 13-to-14.5 years.⁶ Animal studies by Thilander⁷ as well as by Sennerby⁸ have shown similar findings. In theory, if placed too early and there is substantial growth post implant placement, it is possible for an implant to become buried, resulting in further complications.

Continues on page 22



Dr. Nipul Tanna

Implant placement considerations for the adolescent patient

(continued from page 21)

Under certain conditions such as severe ectodermal dysplasia, osseointegrated dental implants have been quite beneficial for the young patient. Most cases have required a prosthesis remake to accommodate changes in the occlusion related to growth. For these patients, implant placement in the anterior mandible has shown a more favorable outcome compared to other areas.

The end goal of the developmental process results in a functional equilibrium that is within a dynamic environment and will continue to display changes within that environment. The goal of the clinician aims to provide a treatment modality that can safely adapt within that functional equilibrium without resulting in an undesired sequela.

Pressures from parents, patients and significant others, along with the psychosocial pressures, add more complexity to the decision-making process. Circling back to the original question, with all factors considered, the most favorable time for implant placement would be at the end of the growth curve or nearing its completion. The determination of this timing can be based on the evaluation of each patient's growth chart, measurement of the patient's stature, hand/wrist radiographs and superimposition of serial cephalometric radiographs. When these indicators suggest completion of growth, the likelihood of an undesired outcome is less.

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



The Academy's management firm earns AMCI reaccreditation

We're proud to announce that the Academy's management firm – Executive Administration, Inc. (EAI) – was recently reaccredited by the AMC Institute (AMCI) following an extensive accreditation review. The comprehensive audit was conducted by AMCI, the global trade association representing the association management industry.



The AMCI accreditation process is the most demanding and comprehensive in the industry and requires firms to demonstrate adherence to the highest level of operational and ethical best practices (and just 10% of all association management companies have achieved this nationally recognized status).

We applaud EAI for its ongoing commitment to meeting the incredibly high standards required for AMCI accreditation.

Academy of Osseointegration Diversity & Inclusion Statement

Academy of Osseointegration (AO) values diversity and inclusion.

AO's diverse membership, leadership, staff, and other contributors are critical to AO. Since its founding over three decades ago, these voices have successfully advanced AO and the field of osseointegration and implant dentistry. AO's enduring commitment to different perspectives continues to foster excellence and innovation among its approximately 5,000 members located in more than 70 countries.

Approved by the Academy of Osseointegration (AO) Board of Directors October 1, 2022

2022 Summit results to be presented during 2023 AO Annual Meeting: Here's why you should be there

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

Attendees of the Academy's Annual Meeting this year will have a bonus.

Joerg Neugebauer, DDS, PhD, will present the results of the Academy's 2022 Summit. Like the World Cup or Olympics every four years, a selection of AO's best and brightest from around the globe come together for a Summit to help us understand the cutting edge of science and trends in implant dentistry.

The 2022 Summit evaluated the best evidence for guided implant surgery, ceramic implants and various dental implant connection platforms. In addition to evaluation of the best science to support long-term outcomes, the Summit involved a candid review of controversies and pertinent trends about each topic as well.

An example of a controversial trend discussed at the Summit was flapless implant placement using guided implant surgery by the novice. Guided surgery technologies may facilitate implant surgery and delivery of pre-made restorations without traditional flap surgery by novice dentists with little or no surgical training. But the question is: "Are we there yet?"

The technology is certainly there for driverless cars, but we still don't let our Teslas go out there by themselves to find parking spots. What is the best evidence to show the impact of flap versus flapless guided surgery on implant success? How do you define implant success? Should we look at bone levels around implants as a measure of success? How statistical significance can be translated to clinical relevance? The Summit findings will include the best scientific evidence to answer these and similar questions.

You may find the Summit discussions about trends and controversies to be as informative as the scientific data. For example, ceramic implants represent a very strong trend in implant dentistry. Now, the Summit findings can provide you with expert analysis of long-term data about this new trend in implant dentistry.

Many of us feel so strongly about our favorite implant connections, so much so that our treatment philosophies

Dr. Mehrdad Favagehi



and therapeutical approaches revolve around what we see as the ideal implant connection. The 2022 Summit can now validate or refute our views about implant connections based on long-term data analysis provided by a group of unbiased researchers and clinicians who participated.

In addition to long-term results and controversial trends, the Summit focused on individualized patient outcomes. No one, except you as the caregiver, is better situated to

determine if a statistically significant mean difference translates to clinical significance for each individual patient under your care. The Summit report will provide you with scientific data showing average differences between different interventions and treatments, but perhaps of more clinical significance to you is to look at the standard deviations that will also be reported in the Summit results. You may

find it more useful to look at standard deviations as the expected range of error as you develop a treatment plan for your patients. What about operator error? The expert panels also focused on analyzing the scientific data and recommendations based on the demands of a novice, advanced or expert clinician.

The official findings of the AO Summit will be published in one of the Academy's official peer reviewed journals: *International Journal of Oral and Maxillofacial Implants (JOMI)* as well as at osseointegration.org. But to ask questions or participate in the discussions and debates involving controversial trends, statistical versus clinical significance and individualized long-term outcomes, I highly recommend for you to attend the Academy's 2023 Annual Meeting presentations of the outcomes in person. You will find the discussions as revealing as the data.

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



One Ecosystem. One Connection. Your Choice.

EV Implant Family consists of three implant designs, featuring proven innovations from Astra Tech Implant System EV. All implants have an EV connection, so whichever implant you choose, you can access the same comprehensive restorative platform.

EV Implant Family – surgical flexibility and restorative clarity



EV Implant Family

Astra Tech Implant® EV
PrimeTaper EV™ Implant
OmniTaper EV™ Implant

See you at the
AO Annual Meeting in Phoenix, AZ
@ **Booth # 313**



dentsplysirona.com/implants

