



Academy of
Osseointegration
osseo.org

Academy NEWS

A QUARTERLY MEMBER NEWSLETTER

Make a Difference

Transforming the Lives of
Our Patients and Ourselves



VOLUME 36, NUMBER 4 • 2025

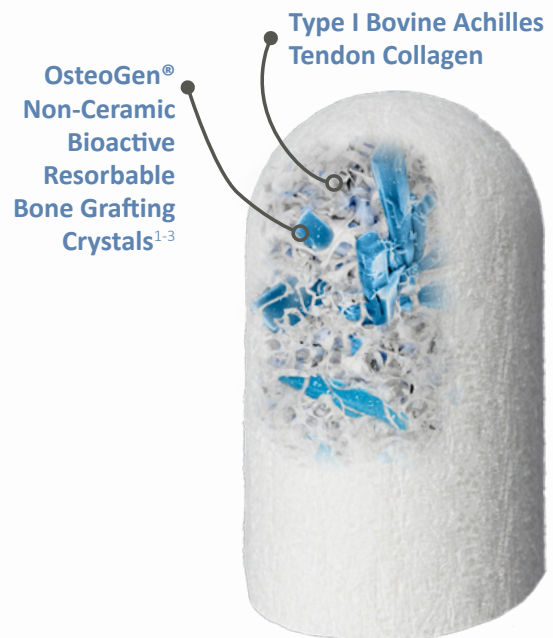
OSTEOGEN[®] PLUG

One Step Bone Grafting Solution for Socket
Preservation Without the Need for a Membrane

Socket grafting has never been easier or more affordable.

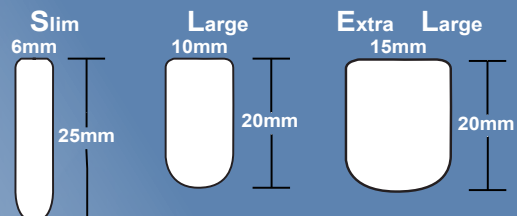
Just drop an OsteoGen[®] Plug into the socket & suture over top.

The bone graft particulates are contained by the collagen,
so there is no need to use a separate membrane.



See More @
ImpladentLtd.com

THE OSTEOGEN[®] BONE GRAFTING PLUGS
ARE AVAILABLE IN THREE SIZES:



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

TABLE OF CONTENTS

IN THIS ISSUE

<i>President's Message:</i> Join Us in Washington: Celebrating Growth, Education, and Global Collaboration	4
Should I Stay Or Should I Go Now?	5
The Key	6
The DSO Path for New Dentists	7
"It Is Both"	9
If Time Could Take Me Back to My Final Year of Periodontics Residency	10
Digital Workflow Strategies for All-on-X Immediate Loading: Wash-Impression vs. Fiducial-Marker	12
AO Events and CE Calendar	15
AO Builds Momentum in 2025 With Nationwide and International GP Outreach Initiatives	16
Academy of Osseointegration Welcomes Distinguished Periodontist Prof. Cardaropoli as New Fellow	18
A Second Chance at a Smile: Dentistry4Vets Addresses Veteran Dental Needs	19
<i>Editor's Editorial:</i> Now Is the Time to Register for the 2026 AO Annual Meeting in Washington, D.C.	21

ACADEMY NEWS

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

Editor

Mehrdad Favagehi,
DDS, MS

Board Liaisons

Joseph Y.K. Kan, DDS
MS
Robert A. Levine, DDS

Editorial Consultants

Lourdes Ann Christopher, DDS, MS
Tirakhsh Emadi, DDS, MS
Adam S. Foleck, DMD
Paul A. Fugazzotto, DDS
Philippe Khayat, MSD
George A. Mandelaris, DDS, MS
Robert J. Miller, DDS
Julie Ann Mitchell, DMD, MS
Jinlong Shao, BDS, MSc, PhD
Rafael Siqueira, DDS, MS, PhD
Shih-Chang Tseng, DDS

Staff Editor

Jack Dempsey

President's Message

Join Us in Washington: Celebrating Growth, Education, and Global Collaboration

By AO Fellow and Diplomate Robert C. Vogel, DDS

As we close out another year, I would like to take the opportunity to wish everyone a Happy, Healthy and fulfilling 2026.

The Academy of Osseointegration Annual Meeting Committee chaired by Dr. **Paul Fugazzotto**, along with our AO staff, have been finalizing every detail of a truly outstanding lineup of world-class clinicians and researchers for the 2026 meeting in Washington, DC March 5-7. Thanks to input from our members and corporate friends, they have introduced some exciting changes to the meeting format, venue and social events to ensure commitment to the world's finest dental implant education. The 2026 Annual Meeting has shaped up to be 100% relevant to our practices with presentations focused on cutting-edge topics and techniques delivered in a relaxed environment and a chance to socialize and network friends, speakers and manufacturers.

On other AO fronts, it's inspiring to see the huge number of young and seasoned members that are applying for Diplomat, Master and Fellow status in the Academy. Regardless of your area of specialization or general practice, this has



Dr. Robert C. Vogel



become a recognized display of knowledge, skill and commitment around the world by our patients and peers. Congratulations!

I would also like to acknowledge the outstanding quality of articles in the AO official publications: *JOMI* thanks to Editor in Chief (Dean) **Clark Stanford** and *IJPRD* Editors Drs. **Avila-Ortiz** and **Gonzalez-Martin**. With so much content available online, our journals have maintained a firm mission of ensuring evidence-based, non-bias, peer-reviewed content. This can easily be lost in the tsunami of content on social media, and I applaud our editors and authors for staying the course to help us and our patients have reliable, repeatable science-based information to guide us.

On the international front, the AO Board of Directors have been meeting with Dental Implant Organizations in every part of the globe to bring the international community closer together in sharing knowledge. Look forward to some interesting opportunities in the near future.

As we all prepare for the excitement of holidays and a new year, I would like to close with a sincere hope to see everyone in Washington, DC at the 2026 Annual Meeting so we can share together as a community of devoted professionals making a difference to transform the lives of ourselves and our patients.

Bob

Should I Stay Or Should I Go Now?*

By Paul A. Fugazzotto, DDS – Program Chair for the 2026 AO meeting



Innumerable "how to" online technique videos. In-person courses hosted by one of the 52,795,445 private "institutes" presently in existence. Never ending case reports, devoid of context. Multi-day symposia by long-established academies.

The tsunami threatens to overwhelm us, as the number of "opportunities" rivals that of the "pre-approved loans" we are offered throughout the day (which would support a very comfortable retirement if one opted to accept them all, drew out the cash and disappeared!).

In such an environment why use your valuable time to attend the annual Academy of Osteointegration (AO) meeting in Washington, D.C., March 5-7, 2026, entitled "Make A Difference: Transforming the Lives of Our Patients and Ourselves"?

Yes, the AO is one of the most respected implant academies on earth, characterized by an unsurpassed synthesis of scientific understanding and clinical acumen. Yes, the collegial atmosphere of the meeting ensures a welcoming, stimulating and enjoyable experience.

BUT what makes the 2026 program so special?

I am positive that our committee (Drs. **Irene Marron-Terrazzi, Will Martin, Phil Melnick, Greg Phillips, Todd Schoenbaum & Ting Wang**) working under the direction of AO president Dr. **Robert Vogel**, and with oversight of the AO board, has put together a unique experience for all.

- A real-world discussion of how Artificial Intelligence is revolutionizing patient safety, clinical efficiency and ethics in daily practice.
- A single-track format, eliminating the artificial separation between surgical and restorative therapies, and emphasizing comprehensive patient care.
- Sessions devoted to treatment of fully edentulous and partially edentulous patients, incorporating video examples as appropriate.
- A constellation of over 40 speakers, made up of world-renowned experts and rising stars.
- A "Failure Session", in which highly respected clinicians will discuss implant and treatment failures, and how to prevent and/or successfully manage such failures.
- A "Young Clinicians Business Session", designed to help newer practitioners decide upon career paths, and manage their practices. If you feel you have everything figured out, this session is not for you. However, if you are not yet sure which practice environment you will

pursue (a new practice, purchase of an existing practice, associateship with or without eventual partnership, DSO employment, etc.), or if you are in private practice and have less than a 93-94% comprehensive care case acceptance rate, a true overhead above 55%, or a trickle of new patients rather than a river, this session is for YOU.



Limited attendance
half-day clinical
hands-on workshops



More than 200
research presentations



A vibrant and
engaging array of
"lunch with the
masters" sessions



53.25 hours of
available CE credits



"To the point"
presentations of 2-5
minutes in length



Close to 100 exhibitors
demonstrating the
latest technologies,
tools and techniques

Most importantly, this AO experience is grounded in a discussion of "The Why". Why we do what we do: for the benefit of our patients and ourselves, but ultimately because it is the right thing to do.

And there's more...

To help foster interdisciplinary comprehensive patient care, the AO board has authorized a 44% tuition discount for all study club members!

Pass the word... Have your study club members come to Washington... Let's raise the bar together!

* Apologies to
Joe Strummer

The Key

By Edward B. Sevetz, Jr., DMD, AO Past President

Do you see this? Know what it is?
If you said, "a wooden stool"... NAH!
You'd be wrong.

It's a "wooden" metaphor. Now that
you know what it is, aren't you curious
to know how it works?

Of course you are.

It is the key to optimum patient care
in the realm of implant dentistry.

Seriously? Certainly is.

Look carefully. Let me explain. You see three legs.
Each must be of equal length, and equally sturdy. One
leg represents the restorative caregiver and overall
coordinator, one leg represents the surgical person, and
the third leg represents the laboratory professional. Each
"leg" must be "up to the task," or ultimately, the patient
slides off the stool, and treatment fails.

Look even more closely. See the struts that connect each
of the three legs? These are crucially important. They
represent the vitally important communication between
each of the three "legs." Without sharing of important
communication, the legs will splay outwards and again,
the patient's treatment outcome, sitting on top of it all,
will slide off and fail. Not good.

What does the top of the stool represent?

It represents the manufacturer of the vital
components necessary for quality patient
care. All three "legs" must trust
their selected manufacturer/
provider for components
that are of proven
quality, and not just
some "knock-off"
of some other
corporation's
research. So,
the "legs" have
the professional
responsibility to
"choose wisely," as the
Old Crusader Knight
advised in the
movie, "Indiana



Jones and The Last Crusade." If the "legs" do not choose
wisely with whom they want to collaborate, and the seat of
the stool collapses due to its product being merely "smoke
and mirrors," any patient so treated with inferior quality
products will have their treatment fail. And what's worse,
in this analogy, the professional reputations of the "legs"
will be covered with _____ as the patient gets a "wooden
colonoscopy" when their treatment (seat) fails.

So, what's the take-away from this "wooden" metaphor?
We all want quality care for our patients in implant
dentistry. It should be solidly based upon scientific,
evidence-based education, which attending AO Annual
Meetings provides. In-person attendance fosters the
communication (connecting struts) between treating
disciplines ("legs"), which no online "attendance" could
ever equal/do. And, once educated, you choose the basis
upon which you opt to treat your patients. Which do you
think assures the most long-term stability.... a bi-pod or
even a single-legged stool (if you fancy yourself as a "jack
of all trades)? Nope! It's the "tripodization" of the time-
honored, three-legged stool. "Choose wisely" when you
team-up with, and which corporation you trust. And don't
just think, "it's not personal; it's just business." No way. For
the patient, it IS personal. Your hard-earned professional
reputation also is supported on that "stool,"
along with your patient. Don't let anyone,
or anything, "slide off" that stool. Ever!

**Plan to attend the AO Annual Meeting
upcoming in our nation's capital in
Washington, DC next March. You'll
later thank yourself for having
done so. And your patients will
be forever grateful.**





The DSO Path for New Dentists

By Frank Schiano, DMD, Guest Contributor

One of the greatest aspects of selecting dentistry as a profession is the fact that your life truly will be a choose-your-own-adventure book. Imagine you are a senior dental student who is about to complete four hard years of didactic and clinical study. Maybe you are a recent graduate looking for a new opportunity. It has come time to make the next big decision in your life – where and how to practice in a way that will maximize your growth both personally and professionally. There are so many variables to consider; be prepared to experience a lifetime of emotion in your early career stages.



One option is to practice in a DSO setting. “DSO” stands for “dental support organization,” which means a management company provides nonclinical supportive services to the dental office. This includes all aspects of the business side not directly related to patient care. I co-founded a New England-based DSO and helped grow

it to 14 locations and \$30 million in revenue. As the chief clinical officer, I was responsible for all clinical aspects of our business, including hiring dentists and supporting them. My goal is to help you understand and genuinely feel what it is like to be a clinician practicing within this type of organization.

Continues on page 8

There are many types and structures of DSOs, and “DSO” was a dirty word for many years. However, with high levels of student debt, rising practice acquisition and startup costs, and a desire to be part of something bigger, nearly half of all new graduates and younger dentists are employed by DSOs today. If you choose the right group and show commitment and dedication to your office, your patients and the company, the positives will far outweigh the negatives.

Remember, you graduated having inserted at most five crowns and quite possibly have never filled a real root with gutta-percha. You still perform “caries control,” and it takes four appointments to finalize the restoration on that tooth. You were taught that a four-surface posterior composite encompassing half a tooth is a successful long-term and predictable procedure. You certainly did not learn much about managing the business side of dentistry, such as how the operations and clinical teams overlap for a dental office to function at a high level. How comfortable are you at this point to practice alone?

There is a tremendous amount of benefit to working for a DSO at this stage in your career. Perhaps the most significant benefit of working with the right DSO is the level of direct clinical support and mentorship that you will receive from more senior doctors. Most groups have cloud-based software, which allows your clinical support director (also a dentist) to review your patient records, including radiographs and clinical photos, and host virtual meetings with you to discuss your diagnoses and treatment plans. This does not mean someone is watching you to suggest procedures that are not necessary to boost office production. It means that you have a resource to help you provide outstanding clinical outcomes while ensuring an excellent patient experience. There is no value to anyone in destroying either one of those. You will learn how to work with the hygiene team by understanding effective communication strategies and setting expectations for comprehensive and periodic exams. You will learn about efficient procedure scheduling and detailed and complex interdisciplinary treatment planning for the real world. Collaboration with other doctors in your network will take you to the next level.

You will be paid some percentage of either production or collections as a W-2 employee. Specialists may be offered 1099 contractor positions. The good news is most DSOs collect close to 100% of what is produced. There are revenue cycle teams that are submitting claims and reviewing denials on your behalf. The operations staff has been trained to take copayments at the time of service. Therefore, you can expect a steady income to support your family and pay your student loans, without the administrative burden of running your own practice.

Another draw toward DSOs for early career-stage dentists is the opportunity to use the latest technologies to treat patients. AI programs such as Overjet and Pearl are excellent in helping identify areas of concern on radiographs, such as caries and bone loss. Intraoral

scanners, such as the iTero and Trios, help you provide visual education to your patients and quicker turnaround times with dental labs using a more efficient digital workflow. Additionally, CBCT units are common in some of the larger, multispecialty offices, and



this technology will help elevate the standard of care you provide.

There are some personal priorities to consider. Work-life balance is important for the new generation of graduates. My suggestion is to be clear about your personal expectations during the interview process, including commute time. What will your schedule look like? How available are you after hours for call and emergency coverage? Flexibility on your part goes a long way. Do not expect to take off every holiday throughout the year. Other benefits may include health insurance, access to a 401(k), CE allowances, malpractice insurance and other various miscellaneous reimbursements.

The landscape of dentistry is constantly changing. It is the new and younger generation of dentists that will help shape the future of our profession. Working in a DSO setting might not be your career choice, but it is a great place to start. You have all the opportunity in the world to choose your own adventure. Use the wisdom and experience you gain to evolve. Learn from your mistakes. Most importantly, give back to your patients and fellow dentists every chance you get.



"It Is Both"

By Bruce Barr, DDS, Past editor, Academy News

When Connie Francis sang her international hit song "Where the Boys Are," she was not thinking of the boys who appeared in the driveway of her Mafioso brother, George Franconero, on March 7, 1981, leaving him with two bullets in his head. A power move thwarted? A drug deal gone bad? Or perhaps the Genovese family was not happy to learn he was giving secret testimony to the FBI and the U.S. Organized Crime Strike Force about their infiltration of the union dental market?

Yes, the mob recognized dentistry as a lucrative business long before the dental service organizations. The two syndicates are, however, unnervingly alike. It is difficult to imagine the Don and his consigliere bickering over the true definition of a Morse taper; for gangsters, dentistry is merely another income stream running parallel to flows from loan sharking or prostitution. Similarly, venture capitalists do not meaningfully differentiate their stakes in DSOs from investments in other moneymakers such as internet startups and shale oil. If anything, the reliable payday that DSOs yield offsets riskier plays. Both operations need a "front man" with a license to function and comply with state board regulations.

Profit margins, not crown margins, guide investors. For dental practitioners, however, precise crown margins are indeed paramount, as are the more conscience-driven margins of acceptable care for our patients. Ethically, we are motivated to do the right thing by those who entrust their health to our expertise. Professionally, some of us are also required to perform for corporations that may prioritize the bottom line over patients' well-being. The tension between these responsibilities defines our field today.

DSOs are neither good nor bad. Rather, they offer an alternative to private practice and have become an increasingly necessary haven for young dentists. Student loan debt, compounded by the ever-rising price of equipment and ever-shrinking insurance fees, often renders the upfront costs of opening an office insurmountable. For older independent dentists preparing to wind down their clinics, DSOs can provide a fruitful off-ramp. Further, regardless of age, many practitioners simply prefer to focus on treatment free from the logistical overhead of running an office. If the aggressive practice of tapping patients' benefits continues unchecked, it seems inevitable that insurance companies will seek to protect themselves through vertical integration, purchasing DSOs in order to bound expenses.

The key question then is: Who regulates? Unlike medicine, with its raft of accrediting bodies, dentistry is subject to scant oversight. Scrupulous quality assurance by more objective third parties would likely benefit our industry, but external monitoring alone would not be sufficient for enforcing thresholds of care. The supervision must source from within. That is why it is imperative that dentists participate in the very institution that accredits our educational programs and legitimizes us – the ADA – regardless of whether they work in private practice or for a DSO. This organization and others like the AAP, AAMOS, AAE, AAPD and AGD establish scientific standards of care that should be lodestars for dentists irrespective of venue. For DSOs, as for Michael Corleone in *The Godfather*: "It's not personal, it's strictly business." For our dental peers, it is both.

If Time Could Take Me Back to My Final Year of Periodontics Residency

By Sam Bakuri, DMD, MSD, Guest Contributor

Editor's note: Dr. Bakuri is one of the presenters in the Business of Implant Dentistry session at the upcoming 2026 AO Annual Meeting.

If time could rewind to my final year of periodontics residency, I would still carry the same passion for patient care, the same curiosity for learning, and the same gratitude for the mentors who shaped me. But I would approach the business of dentistry with an entirely different mindset – one grounded not only in clinical excellence, but in strategic foresight, financial literacy and leadership.

Dentistry is a beautiful profession. It offers us the privilege to heal, to restore confidence and to improve lives every single day. Yet, as fulfilling as it can be, it also has a harsh side – one that reveals itself when clinicians enter the real world without understanding how to navigate the financial and operational complexities of running a practice.

In life, there are two ways to learn: by absorbing the experience of others, or by walking through the fire ourselves. Most of us, unfortunately, learn the hard way. We pay for our lessons not only in money, but in time, stress and missed opportunities. Looking back, I wish I had recognized sooner that understanding business is not a distraction from clinical excellence – it is what allows clinical excellence to thrive sustainably.

The Changing Landscape of Dentistry

Since 2020, dentistry has been tested in ways few could have imagined. The pandemic exposed vulnerabilities in every aspect of the profession – from staffing shortages and patient hesitancy to supply chain interruptions and cost inflation. What followed was a steady escalation in overhead expenses. The cost of materials, rent and wages has risen dramatically, far outpacing the modest 2% to 4% growth rates most practices once relied upon.

The traditional financial model that once defined private practice no longer guarantees success. Today's dentist must navigate a landscape where margins are thinner, insurance reimbursements are stagnant or declining, and competition – both from DSOs and within saturated markets – is fiercer than ever.

Dentistry in 2025 is not the same profession it was in 1985. The old formula – graduate, associate, buy a practice, work until retirement – has lost its simplicity. A dentist today must think strategically not only as a clinician but also as a business owner, investor and brand. The most successful dentists of this new era are those who combine exceptional patient care with data-driven decision-making and a deep understanding of how to build and scale a sustainable practice.



The Questions Every Young Dentist Should Ask

The first and perhaps most defining question a young dentist should ask is: Where do I want to live and build my life?

Are you anchored to a specific geography by family or personal preference, or are you willing to pursue opportunity wherever it exists? The choice between lifestyle and opportunity is not an easy one, but it sets the foundation for every professional decision that follows.

Next comes the question of how you want to practice. Will you join a large group or corporate entity? Do you envision a fee-for-service model or an insurance-based office? Are you driven by volume or by relationships? These are not abstract preferences; they define your daily environment, your patient base and your long-term financial potential.

You must also be honest with yourself about your career timeline. How many years do you plan to practice? How many days per week? What kind of lifestyle do you want to build outside of work? The answers will determine how aggressively you save, how you structure your business and how you ultimately exit.

Too often, young dentists rush into associateships or ownership opportunities without understanding how those decisions align – or conflict – with their larger life goals. A few years later, they find themselves relocating, restructuring or restarting entirely. Strategic clarity early on can save years of frustration and hundreds of thousands of dollars in lost productivity.

The Gap in Dental Education

Almost every dental school excels at teaching anatomy, pathology and surgical technique. But very few teach students how to read a profit-and-loss statement, negotiate a lease, interpret production reports or lead a team effectively. The result is a generation of talented clinicians who are unprepared for the realities of running a business.

Most dentists learn those lessons the hard way – five to 10 years into private practice – through mistakes that can range from poor financial management to inefficient scheduling, underpricing or failed marketing efforts. The cost of that learning curve can easily exceed half a million

Continues on page 11

dollars, and for some, it leads to burnout or early exit from ownership altogether.

A dentist should never have to choose between being a great clinician and a successful entrepreneur. Both skill sets are essential, and both can be learned. The earlier we integrate business education into dental training, the better equipped our future colleagues will be to thrive rather than merely survive.

The Power of Strategic Planning

Success in dentistry is not accidental; it is engineered. Every dentist should enter the profession with a plan that outlines both the entry and exit strategies – how to build wealth, sustain growth and eventually transition gracefully.

That plan should include:

- Clear financial goals, defined not in vague terms like “make a good living,” but in specific, measurable numbers.
- Production targets, broken down annually, monthly and even hourly, to track efficiency and set realistic expectations.
- Fee analysis, ensuring that your pricing aligns with your expenses, location and desired profit margin.
- A growth strategy, which could include expanding services, investing in technology or acquiring additional practices.
- An exit plan, designed early enough to ensure financial independence and a smooth transition when the time comes.

A dentist who knows these numbers and plans accordingly will always have a stronger sense of control and purpose.

The Need for Continuous Business Education

The techniques and strategies that worked in the 1970s no longer apply today. The pace of change in technology, communication and economics has redefined what it means to manage a dental practice. Patients are more informed. Competition is more visible. Overhead is more volatile. To succeed, we must evolve with the landscape.

Continuous education – not only clinical but business-oriented – is now essential. Courses on leadership, financial planning, digital marketing and team management should be considered as important as implant or esthetic courses. Understanding how to build a brand, measure ROI and create systems is as critical to the modern dentist as mastering a surgical flap or restorative technique.

That is why I believe dental organizations and study clubs play an increasingly vital role in bridging this gap. Collaborative networks such as the Seattle Study Club and academies dedicated to leadership and practice

growth are redefining the way we learn and support one another. They allow dentists to share data, strategies and insights – to learn from experience rather than through avoidable hardship.

Looking Ahead: Redefining Success in Dentistry

Dentistry will continue to evolve, and so must we. Artificial intelligence, teledentistry, digital workflows and new materials are reshaping how care is delivered. But no matter how advanced technology becomes, the human element – empathy, communication, integrity – will always be the foundation of success.

At the same time, success itself must be redefined. For some, it may mean multiple practice ownership; for others, it may mean a balanced lifestyle and meaningful patient relationships. There is no single blueprint, but every dentist deserves to make those choices intentionally, not by accident or inertia.

My hope for the next generation of dental professionals is that they enter this field equipped with both clinical excellence and business acumen. That they understand how to set goals, interpret data, lead people and adapt to change. And most importantly, that they see dentistry not merely as a profession, but as a platform for building a fulfilling, prosperous and purpose-driven life.

If I could go back to my last year of residency, I would tell my younger self this: Mastering your craft will open the door, but mastering the business will determine how far you walk through it.

Dentistry rewards those who plan, who adapt and who never stop learning. The future belongs to those who blend compassion with competence, and passion with prudence.



Dr. Sam Bakuri

Digital Workflow Strategies for All-on-X Immediate Loading: Wash-Impression vs. Fiducial-Marker

By AO Fellow Tirakhsh Emadi, DDS, MS, DABOI/ID, Editorial News Consultant

Introduction

The All-on-X concept has become one of the most widely adopted surgical and prosthetic approaches for the treatment of terminal dentition and complete edentulism. In the United States alone, recent estimates suggest that more than 36 million people are completely edentulous, and more than 120 million are missing at least one arch of teeth.¹ Worldwide, edentulism remains a major oral health burden, with prevalence rates reported between 7% and 69%, depending on age group and geography.² With an aging population and improved implant survival, demand for full-arch, fixed implant restorations continues to rise.

One of the strongest drivers of patient acceptance is the possibility of same-day teeth. Patients increasingly expect to leave surgery with a functional, esthetic provisional prosthesis, minimizing the psychosocial and functional impact of tooth loss. Immediate loading protocols, enabled by advances in implant surface technology, digital planning and CAD/CAM, have made this a reliable option with high survival rates.³

Within this context, digital workflows have transformed immediate loading. They not only increase efficiency and predictability but also allow integration of intraoral scanning, photogrammetry and virtual design for streamlined prosthesis delivery. Among digital methods, two workflows dominate current practice: (1) the wash-impression digital workflow, which blends analog esthetic registration with digital design, and (2) the fiducial-marker workflow, which captures digital records intraoperatively. Understanding their differences helps clinicians choose the most appropriate pathway for predictable patient outcomes.

The Wash-Impression Digital Workflow

In this workflow, the foundation is prepared before surgery with the fabrication of maxillary and mandibular record dentures. These dentures are designed by the laboratory based on preoperative records, including diagnostic casts, intraoral scans or radiographic information (Fig. 1). Having these record bases available at the time of surgery provides a reliable guide for esthetics and occlusion.

Following implant placement and the connection of multiunit abutments, the maxillary record denture is placed intraorally to establish esthetic references for the



Fig. 1

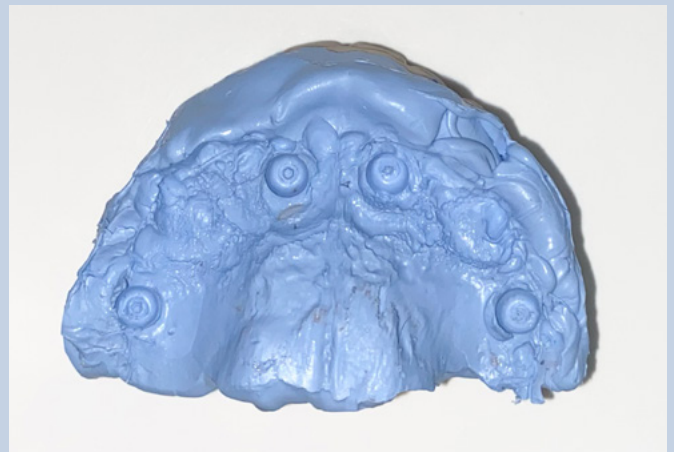


Fig. 2



Fig. 3

Continues on page 13

abutments and surrounding soft tissue. A fast-setting polyvinyl siloxane impression material is then used to stabilize and register the correct position (Fig. 2 and 3). This step allows the clinician to directly confirm and adjust the midline, smile line, occlusal plane and other esthetic determinants in the patient's mouth. Once the upper is verified, the mandibular record denture is positioned to register the vertical dimension of occlusion (VDO) and centric relation. Together, the upper and lower records provide a functional bite registration that reflects both esthetic and occlusal goals.

Next, these relationships are transferred to the digital domain. Using an intraoral scanner, the bite is captured intraorally. Additionally, the intaglio surfaces of both record dentures are scanned extraorally to create a complete digital representation. These files are then uploaded to the design team, who will digitally align and process the data for the prosthesis conversion.

Finally, photogrammetry is performed to capture the three-dimensional implant positions with submicron accuracy (Fig. 4). Depending on the clinician's preference and soft-tissue management, this step can be completed either before suturing – immediately after implant placement and multiunit abutment connection – or after soft-tissue closure. By integrating impression-based esthetic control, intraoral digital scans and photogrammetry, this workflow provides a balance between hands-on verification and precise digital processing.

The Fiducial-Marker Workflow

Unlike the wash-impression digital method, the fiducial-marker workflow eliminates intraoral impressions altogether and relies exclusively on digital records. The process begins before surgery, when fiducial markers are placed in the patient's mouth. These markers serve as reference points for the intraoral scanner and must remain stable throughout the procedure. An initial intraoral scan is performed with the markers in place to establish a baseline dataset (Fig. 5).

Once surgery is initiated, workflow interruptions are required at key steps. After the maxillary arch surgery is completed, photogrammetry is performed (Fig. 6). Then the fiducial markers and the implant positions – along with the connected multiunit abutments – are scanned intraorally (Fig. 7). The same process is repeated after the mandibular arch surgery. These scans, combined with photogrammetry of implant positions, are transferred directly to the design team.

Because no wash impression is captured intraorally, this workflow relies heavily on preoperative planning. Esthetic and occlusal information is derived from diagnostic records rather than chairside adjustments. In particular, establishing a highly accurate vertical dimension of

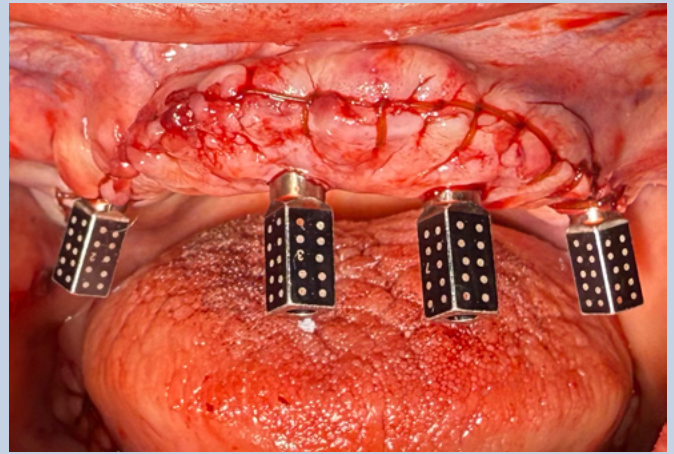


Fig. 4

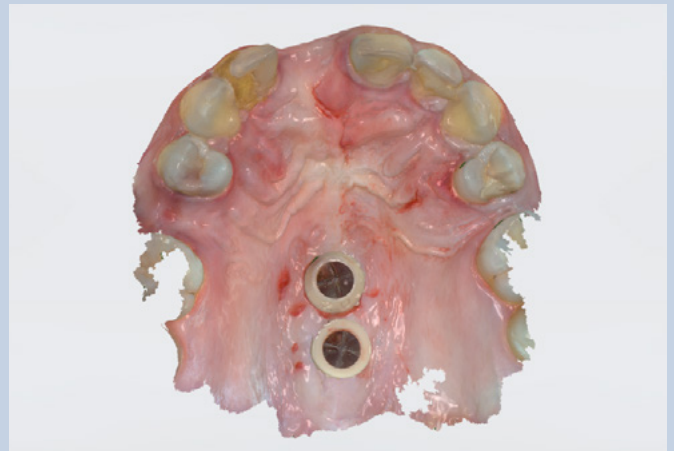


Fig. 5

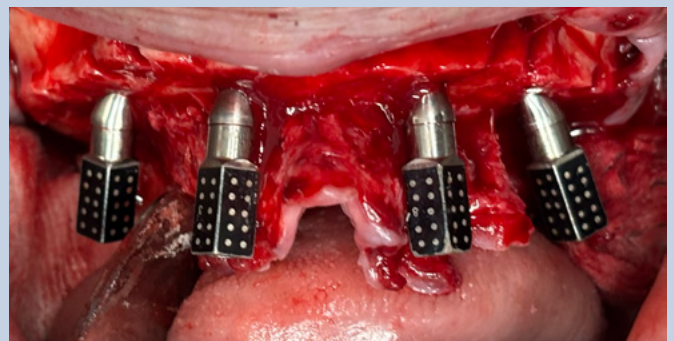


Fig. 6



Fig. 7

occlusion (VDO) during the preoperative phase is critical. Unlike in the wash-impression workflow, adjustments to VDO cannot easily be made once digital records are captured, as even minor digital modifications can potentially disrupt centric relation.

While this approach offers the advantage of efficiency and fully digital processing, it also carries potential challenges. If the fiducial markers become loose, the accuracy of the entire workflow may be compromised. In some cases – especially in the mandible – fiducial markers may

physically interfere with implant placement. Furthermore, in edentulous patients or those with highly mobile teeth, the stability of markers can be unreliable, jeopardizing the accuracy of the scans.

In summary, the fiducial-marker workflow is a powerful digital solution for immediate loading, but its success is highly dependent on marker stability, precise preoperative planning and seamless coordination with the digital design team.

Comparative Summary

Feature	Wash-Impression Digital	Fiducial-Marker Digital
Reference capture	Chairside wash impression after surgery + bite scan + extraoral denture scans + photogrammetry	Placement of Fiducial markers before surgery + Pre-op marker scan + intra-op marker & implant scans + photogrammetry
Chair time	Similar (impression + scanning)	Similar (no impression, but intra-op scan interruptions multiple times)
Accuracy	High (photogrammetry confirms implant position)	High (marker + photogrammetry); depends on marker stability
Esthetic/occlusal control	High (verified chairside)	Moderate (pre-op planning, lab-dependent)
Patient comfort/trauma	Good; some impression-related pressure	Moderate; no impression, minor marker placement trauma
Workflow interruptions	Minimal, after impression	Required pre-op scan, intra-op scans after each arch
Marker risks	N/A	Loosening, possible interference, rare fracture
Edentulous/loose teeth caution	Acceptable	Accuracy may be compromised
Learning curve	Moderate to high	Moderate (intra-op scanning & marker protocol)
Cost	Moderate	Higher (markers, hardware)
Best use scenario	Complex esthetic cases; need chairside verification	Streamlined digital workflow; high-throughput centers

Clinical Pearls

Wash-Impression Workflow

- Provides direct, chairside control over esthetic and occlusal outcomes. Clinicians can verify the midline, smile line, occlusal plane and vertical dimension of occlusion (VDO) in real time, reducing the risk of postoperative adjustments.
- Particularly valuable in cases with complex esthetic demands, uneven ridges or when the patient's soft-tissue anatomy requires careful intraoperative verification.
- May be preferable when patient-specific nuances, such as lip support or facial profile, need to be confirmed immediately, allowing adjustments before finalizing the digital design.

Fiducial-Marker Workflow

- Optimized for efficiency and streamlined digital prosthesis delivery. Eliminates the need for chairside impressions, making it well-suited for high-

volume practices focused mainly on same-day prosthesis workflow.

- Relies heavily on precise preoperative planning and accurate marker placement. Success depends on stable markers, reliable intraoperative scans and smooth coordination with the digital design team.
- Useful for nonsedated patients who cannot tolerate impressions or have gag reflex issues.

Hybrid Strategy

- In complex or high-stakes esthetic cases, consider combining both approaches: using the wash-impression technique on the maxillary arch and the fiducial-marker method on the mandibular arch.
- This approach balances efficiency with esthetic security, providing a "best of both worlds" workflow for immediate-loading full-arch cases.

Continues on page 15

Conclusions

- Both wash-impression and fiducial-marker workflows represent mature, fully digital solutions for immediate loading in All-on-X procedures.
- The wash-impression workflow offers higher chairside esthetic and occlusal control, making it particularly suitable for complex cases or when fine-tuning intraoperative esthetics is critical. It provides clinicians with tactile and visual feedback, which can reduce the risk of postoperative adjustments and enhance patient satisfaction.
- The fiducial-marker workflow emphasizes efficiency, speed and a streamlined digital process. It is ideal for high-volume practices or situations where minimizing chair time is a priority. With careful planning and marker management, it achieves high accuracy and supports reliable same-day prosthesis delivery.
- Clinicians should select the workflow based on case complexity, patient factors, practice setting and available resources. In some scenarios, a hybrid approach may optimize outcomes, leveraging esthetic verification from wash impressions while maintaining the efficiency and accuracy of a fully digital, marker-based workflow.
- Ultimately, the choice of workflow should be guided by the goal of maximizing both esthetic outcomes and procedural efficiency, ensuring predictable results and high patient satisfaction.

References for this section:

1. American College of Prosthodontists. *Facts and Figures about Tooth Loss*. ACP, 2016.
2. Müller F, Naharro M, Carlsson GE. *What are the prevalence and incidence of tooth loss in the adult and elderly population in Europe?* Clin Oral Impl Res. 2007;18(Suppl 3):2-14.
3. Gallucci GO, et al. *Consensus Statements and Clinical Recommendations for Implant Loading Protocols*. Int J Oral Maxillofac Implants. 2014;29(Suppl):287-290.

Dr. Tirakhsh Emadi



AO Events and CE Calendar

Monday, February 9 - 7:30 pm EST

AO Student Webinar Series

Navigating Full-Arch Implant Rehabilitation: Which Pathway and Workflow Should You Adopt?

Jie Sun, DMD, MMSc

March 5-7 • Washington, DC

AO Annual Meeting

MAKE A DIFFERENCE: Transforming the Lives of Our Patients and Ourselves

Tuesday, April 21 - Noon EDT

AO Webinar

Inferior Alveolar Nerve Injury During Dental Implant Operation

Gintaras Juodžbalys DDS, PhD

Thursday, May 7 - Noon EDT

AO Webinar

How to Diagnose and Treat the Fulcrum Effect

Robert Kaspers, DDS, MS

Thursday, May 14 - Noon EDT

AO Webinar

Beyond the Intraoral Scan: Advancing Prosthetic Accuracy Through Facial Scanning Integration

Rami Salloum, DDS



AO Builds Momentum in 2025 With Nationwide and International GP Outreach Initiatives

The Academy of Osseointegration expanded its educational reach in 2025, delivering hands-on implant training directly to general practitioners through a strong lineup of outreach programs. Guided by the membership committee and the GP Outreach Task Force, AO organized several initiatives on its own while also partnering with corporations, universities and study clubs to extend its impact.

These efforts reflected a growing understanding that empowering general practitioners with implant knowledge strengthens the entire profession and ultimately improves patient care. Throughout the year, AO engaged dentists across the United States and internationally through lectures, workshops and live clinical training.

This fall, Dr. **Mehrdad Favagehi** helped bring AO's message to three major events: the Midwest Implant Institute Annual Meeting in Columbus, Ohio; the Delaware Valley Academy of Osseointegration Study Club; and Virginia Implant Excellence Week at Virginia Commonwealth University. In October, Dr. **Michi Katafuchi** coordinated an event at the University of Washington, where periodontist Dr. **Shi Yin** delivered a lecture titled "Recent Updates on Sinus Augmentation." Dr. Yin, who presented at AO 2024 as an emerging leader, was invited by Dr. **Chandur Wadhwani**, whose own lecture at the event was widely praised. The session offered a strong opportunity to encourage attendees to participate in AO's annual meetings and to introduce younger clinicians to the Emerging Leaders Case Presentation Competition.

Despite blizzard conditions, Dr. **Megan Ratliff** traveled to Marquette University to speak about AO membership, its benefits and the value of participation. At the University of Louisville, Dr. **David Donatelli** delivered a presentation titled "What Can the Academy of Osseointegration Do for Me?" during which he reviewed the Academy's history, membership advantages and educational programs available during and after dental school. Dr. **Omar Tattan** also presented a prosthetically driven clinical case that highlighted the use of digital technology.

At UT Health San Antonio, Dr. **Robert Lemke** discussed the benefits of AO membership and partnered with Nobel Biocare to deliver an evening program that combined lectures on implant placement concepts with a hands-on component.

AO's outreach extended well beyond the United States. In October, the Academy presented its latest educational initiative, the AO Global University Hands-On Workshop in Athens, Greece, offered in partnership with the Hellenic Society of Odontostomatological Research.

In December, an additional presentation was scheduled at Eastern Carolina University. The program was organized by Dr. **Katafuchi**, with Dr. **Acela Martinez Luna** delivering the presentation.

Please view the photos from several of these hands-on and educational events.

Continues on page 17



Athens, Greece



Delaware Valley



Midwest Implant Institute



University of Washington



UTHSCA



VCU Virginia Implant Excellence Week

Academy of Osseointegration Welcomes Distinguished Periodontist Prof. Cardaropoli as New Fellow

The Academy of Osseointegration is pleased to introduce Prof. **Daniele Cardaropoli**, who recently became a fellow of the organization.

Prof. Cardaropoli is a world-renowned periodontist based in Torino, Italy, where he maintains a private practice. He earned his doctor in dentistry degree, graduating cum laude, and completed his certificate in periodontology at the University of Torino.

He currently serves as adjunct clinical professor in the Department of Periodontics at Penn Dental Medicine, University of Pennsylvania, Philadelphia, and as adjunct professor in the EFP Master in Periodontology program in the Department of Periodontology at the University of Torino. From 2018 to 2022, he served as adjunct professor in periodontology at the University of Catania.

Prof. Cardaropoli holds leadership positions in several prominent organizations. He is scientific director of PROED, Institute for Professional Education in Dentistry, in Torino, and president of the Giuseppe Cardaropoli Foundation for Research and Care in Periodontology. He also serves as president of the Torino section of ANDI Italian National Dentists Association and as consultant doctor for Juventus Football Club.



His professional memberships include active member of the Italian Society of Periodontology, the European Federation of Periodontology, the Italian Academy of Osseointegration and the Italian Society of Oral Surgery. He is a fellow of ITI (International Team for Implantology) and an international member of the American Academy of Periodontology.

Prof. Cardaropoli has received numerous awards throughout his career. He won the Henry M. Goldman Award for Clinical Research from the Italian Society of Periodontology in 2000 and the National Award in Clinical Orthodontics from the Italian Society of Orthodontics in 2006. More recently, he received the R. Earl Robinson Periodontal Regeneration Award from the American Academy of Periodontology in 2022, the International Award in Scientific Research from the Ancient Salerno Medical School in 2022 and the Outstanding Presentation Award from the International Society of Periodontal Plastic Surgeons in 2023.

He has authored more than 50 articles published in peer-reviewed international journals. He contributed the chapter "Seeking the Optimal Aesthetic Result in the Maxillary Anterior" to the textbook *Implant Therapy: Clinical Approaches and Evidence of Success*, edited by Nevins and Wang (Quintessence Publishing, 2019), and the chapter "Management of Post-extraction Sites in Partially Edentulous Patients with Multiple Edentulism" to the textbook *How to Do It*, edited by Simion, Bressan and Zucchelli (Edra Edizioni, 2024).

Prof. Cardaropoli also edited the textbooks *Soft Tissues and Pink Esthetics in Implant Therapy* (Quintessence Publishing, 2019) and *Periodontal Plastic and Regenerative Dentistry* (Edra Edizioni, 2022).

Throughout his career, his clinical research projects have focused on immediate implant placement, alveolar ridge preservation, orthodontic-periodontal treatment in Stage IV periodontitis patients and soft tissue management and augmentation around natural teeth and implants.

A Second Chance at a Smile: Dentistry4Vets Addresses Veteran Dental Needs

By Dr. George and Patricia Yellich, Guest Contributors

Many people are surprised to learn that military veterans do not receive dental benefits in the VA benefit package unless they were a POW, are 100% disabled, or have dental injuries that occurred during their time of service. In 2024, only 4.5% of veterans in the U.S. received dental care through the VA, leaving a large gap in care for our veterans. Many veterans suffer from compromised health that stems from edentulism, missing teeth, oral infections, and dental pain. Many live a reclusive life due to the embarrassment that accompanies missing teeth.

Founded in 2018 by Dr. **George Yellich** (OMS) and **Patricia Yellich**, Dentistry4Vets is a nonprofit organization that recognized this gap in care for veterans. The mission of Dentistry4Vets is to provide comprehensive, long-term and emergency dental care to military veterans in a nurturing and professional clinic (www.dentistry4vets.org).

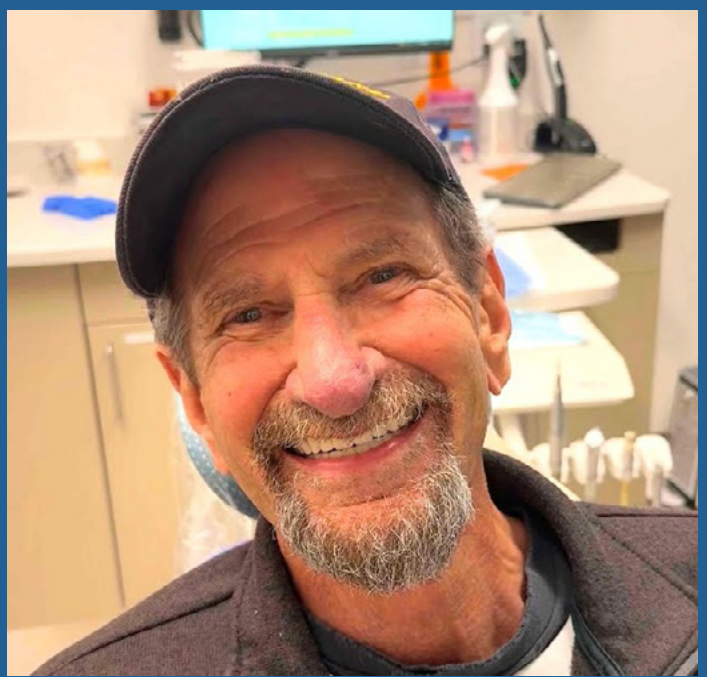
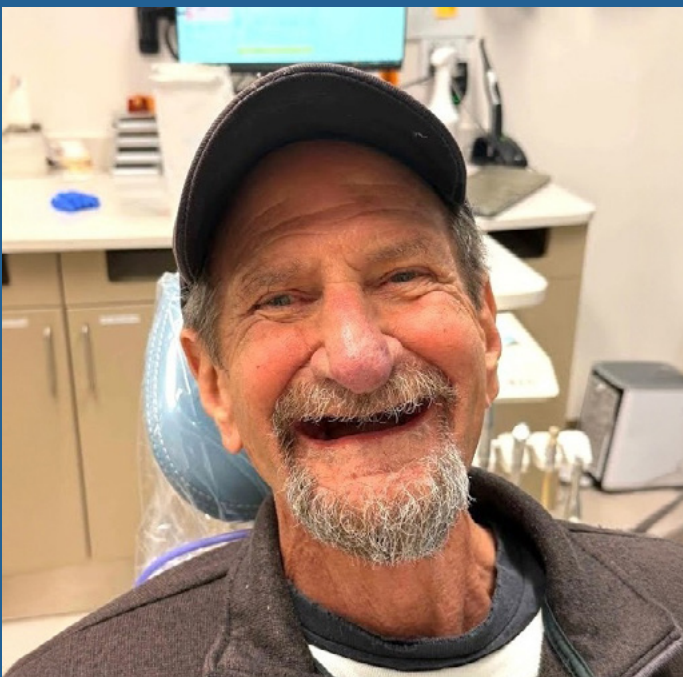
In fulfilling this mission, Dentistry4Vets gives veterans a second chance at life by restoring their confidence, dignity, and purpose with a new smile. Re-engaging in society both professionally and socially opens new doors for these veterans, who would otherwise hide from society, feeling embarrassed and unworthy.

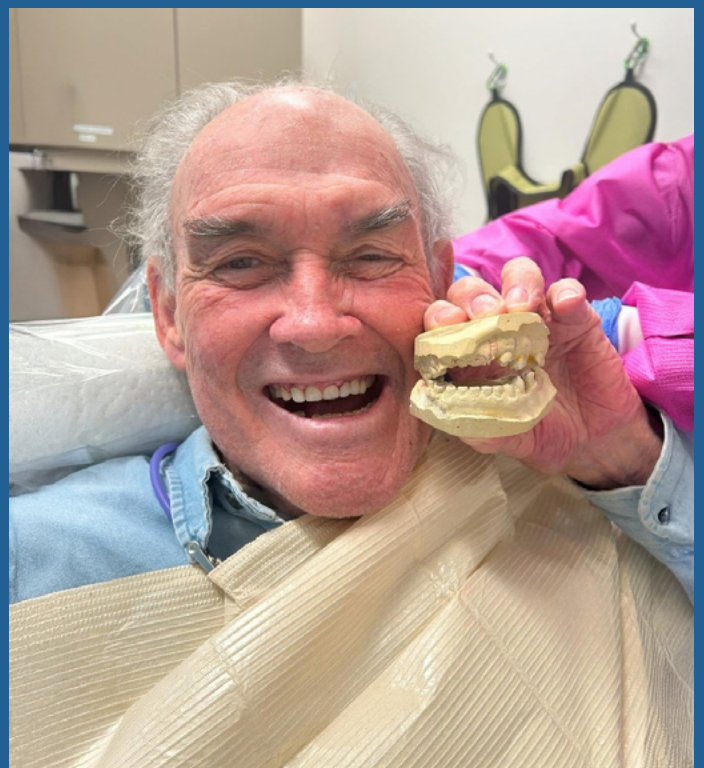
Dentistry4Vets provides dental services in a fully staffed dental clinic that is exclusive to military veterans with these four core commitments: 1) Quality dental care provided by experienced dentists, hygienists, and registered dental assistants; 2) Comprehensive dental care, including dental specialists; 3) Continuity of dental care to ensure long-term optimum health benefits; and 4) Ease of dental care – we only serve veterans.

Annually, Dentistry4Vets serves over 600 patients, provides more than 2,000 dental appointments, and delivers over 4,000 dental procedures. Treatment plans prioritize the aesthetic zone, occlusion, infections, and education with regular dental hygiene appointments.

Dentistry4Vets has been so successful in fulfilling its mission that two major outcomes have developed: 1) The organization is poised to relocate to a larger facility in 2026 to meet the growing demand for its services; and 2) It has been recognized at the national level and received a grant to create a template of the new clinic that can be used to open future clinics.

Continues on page 20





The design of the new clinic will reflect the special needs of our veterans. Thirty percent of our patients suffer from a disability, physical or mental. As such, the new clinic has two ADA parking spaces at the entrance, and the treatment rooms are an open-bay layout with large windows. Two chairs will have movable privacy modules that can accommodate wheelchairs and walkers. Fifty percent of our patients require dental specialty work to achieve a healthy oral status, so there will be a dental specialty suite complete with oral sedation certification. A small conference room for case studies and educational purposes will also be included in the design.

It is worth noting that our first commander in chief, Gen. George Washington, had only one remaining tooth when he took office. In 2026, our nation will celebrate the 250th anniversary of Independence Day. For 250 years, we still had not addressed the dental needs of our veterans – until the founding of Dentistry4Vets. At Dentistry4Vets, saying “thank you for your service” is combined with providing much-needed dental care to veterans.

Below, you will see George Washington’s mouth stuffed with cotton to make it appear that he had teeth, and the dentures he fabricated from animal teeth, human teeth, and ivory.



Now Is the Time to Register for the 2026 AO Annual Meeting in Washington, D.C.

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

The theme of the AO 2026 Annual Meeting highlights the transformative power of implant dentistry – for both patients and clinicians. As implant providers, we are privileged to witness how profoundly implant therapy can change patients' lives. A compelling example appears in Dr. Yellich's article on page 19, "A Second Chance at a Smile Dentistry4Vets."

The journey to becoming an expert in implant dentistry is equally transformative for clinicians. Unless you have completed dual specialty training in prosthodontics and surgery, mastery in implant dentistry requires a deep commitment to continuing education (CE). That commitment becomes even more demanding for those who provide both surgical and restorative care.

“As the world's premier implant organization – led by internationally respected experts – the AO consistently delivers CE that balances clinical experience, rigorous evidence and meaningful innovation.”

While traditional specialty programs offer structured curricula under the guidance of full-time educators who mentor a small group of residents over several years, implant dentistry experts must navigate a broad and varied CE marketplace on their own, as they seek the latest knowledge, techniques and collaborative insights to remain at the forefront of a multidisciplinary field.

Complicating this process is the essential role of the implant industry. Implant dentistry simply cannot be practiced without the products companies develop. Fortunately, many industry partners are known for their dedication to quality and innovation. However, corporate involvement also means that much of the CE landscape is influenced – directly or indirectly – by commercial sponsorship. Too often, CE programs drift into infomercials, presenting biased or incomplete information.



Dr. Mehrdad Favagehi

This is where the Academy of Osseointegration stands apart. As the world's premier implant organization – led by internationally respected experts – the AO consistently delivers CE that balances clinical experience, rigorous evidence and meaningful innovation. AO programs draw from academia, research, private practice and industry, offering a uniquely comprehensive and objective educational experience. For a preview of the exceptional curriculum planned for 2026, please see the article on page 5 by Dr. **Paul Fugazzotto**, chair of the 41st AO Annual Meeting Committee.

The 2026 AO Annual Meeting will once again feature popular programs including the Opening and Closing Plenary Sessions, hands-on workshops, topic-focused courses and the Hygiene and Implant Maintenance Symposium, always a favorite among hygienists. Your office team members are also welcome to join you as guests at events such as the President's Reception.

New for 2026 are courses addressing complications and the business aspects of implant dentistry, offering practical strategies to strengthen your clinical outcomes and grow your practice. In this issue, business-related articles by Drs. **Sam Bakuri**, **Bruce Barr** and **Frank Schiano** highlight the new focus on the business side of implant dentistry, which will be highlighted at the 2026 annual meeting. Aligned with the meeting's theme of how implant dentistry transforms lives, an estate planning session will cover financial and tax strategies, retirement planning, and philanthropic opportunities through the Osseointegration Foundation.



Registration for the AO 2026 Annual Meeting opened in late November, and seats for hands-on workshops and special sessions, including the complimentary estate planning seminar, are limited. If you plan to join us in Washington, D.C., March 5-7, 2026, now is the time to register.



Academy of
Osseointegration

**SAVE
THE DATE!**



2026
Annual Meeting
Washington, DC
March 5-7

**MAKE A
DIFFERENCE**

Transforming the Lives of Our Patients and Ourselves

osseointegration.org

