The Academy of Osseointegration Silver Anniversary Summit

Impact of Biological & Technological Advances on Implant Dentistry

August 5–8, 2010 • Oak Brook, IL

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The Academy of Osseointegration (AO) is a multidisciplinary, international dental implant organization that exists to bring together individuals of different backgrounds in order to share experience and knowledge regarding dental implants. Academy members share the common goal of moving the field of osseointegrated implants forward through clinical and evidence-based research and education. The AO mission is to enhance oral health globally by advancing the science, practice, and ethics of implant dentistry and tissue engineering. The mission is achieved, in part, through annual meetings, publication of *The International Journal of Oral & Maxillofacial Implants*, and periodic workshops and conferences.

2010 marked the 25-year silver anniversary of the formation of the AO. As a way to recognize this milestone and to honor the AO's dedication to research and education, the AO Board organized and convened the AO Silver Anniversary Summit: Impact of Biological and Technological Advances on Implant Dentistry. The Summit was almost 2 years in the making and involved extensive planning and resources to accomplish. This could not have been achieved without the dedication of the AO Summit Planning Committee.

With the input of the Planning Committee, the co-chairs invited six experts and 100 participants to the Summit. In addition to the AO Board and the AO Foundation Board, other experts in implant dentistry were asked to participate, including scientists, academicians, and clinicians. Industry representatives, who, along with the AO Foundation funded the Summit, and professional partners, including the American Academy of Periodontology (AAP), the American Association of Oral and Maxillofacial Surgeons (AAOMS), and the American College of Prosthodontists (ACP) were also invited to participate.

The goal of the Summit was to gain an understanding of how certain biotechnologies might impact the future of implant dentistry. The Summit was not a consensus conference but was instead intended to educate participants and AO members in general about the nature of these biotechnologies and to provide the opportunity to envision how each of them could play a part in the future of implant dentistry.

The Summit also included a discussion of the outcomes of implant dentistry. The goal with the outcomes element of the Summit was to assess these new technologies, not just against scientific merit or their potential to improve clinical outcomes, but also to insure that improving patient outcomes (ie, answering the "So what?" question for patients) is included as well. The objective was to educate the participants in the Summit as well as the AO membership in general about this issue through the publication of the proceedings of the Summit. The Summit also afforded those who are experts in the outcomes area, or interested in the topic as it relates to dental implants, to have a chance to interact about the issue and make recommendations to their colleagues about moving the outcomes discussion forward in the future. Clinical and patient-centered outcomes were discussed to assist in the development of definitive success criteria for implant therapy that must be adopted by the profession.

Experts were identified and asked to present a lecture on their area of expertise as well as prepare a manuscript to be included in this publication. The quality of the content for the Summit was influenced in large part by the knowledge, expertise, and dedication of these experts.

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Stem Cell Therapy

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Growth and Differentiation/ Signaling Molecules

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Outcomes

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BREAKOUT GROUPS

Bioengineering

Chair: David L. Cochran, DDS, PhD
Secretary: German O. Gallucci, DMS

Nanotechnology

Chair: Brian L. Mealey DDS, MS
Secretary: Wayne A. Aldredge, DMD

Stem Cell Therapy

Chair: Tara L. Aghaloo, DDS, MD, PhD
Secretary: John P. Schmitz, DDS, MS, PhD

Growth and Differentiation

Chair: Clark M. Stanford, DDS, PhD
Secretary: Joseph P. Fiorellini, DMD, DMSc

The Summit began with the six presentations from the experts. After the presentations, each expert had time to answer questions and hear discussion from the participants relative to their topic. The manuscripts included in this publication reflect the content for each of these presentations.

The participants were then assigned to one of four breakout groups focused on each of the biotechnologies. These breakout groups were given the task of answering a set of common questions relative to their biotechnology area. Each group had a chair and a secretary to facilitate the discussion and document it. The breakout groups also included the expert for that biotechnology.

The questions that each biotechnology breakout group was asked to address were:

1. What is the primary rationale for the development of the technology?
2. What is the potential for the technology to improve clinical outcomes (eg, enhanced predictability of clinical results with hard and soft tissues) in dental implant therapy?
3. Improved kinetics (ie, faster osseointegration and/or improved wound healing)
4. Fewer complications (ie, infections, peri-implantitis, etc)
5. Better-quality clinical outcomes overall (ie, improved osseointegration and/or wound healing, better long-term survival/success rates, etc)
6. What kinds of patients are most likely to need, want, or be candidates for the treatment/technology? Please be as specific as possible about potential patient selection criteria for the technology.
7. What is the potential for the technology to improve a patient's physical health (oral and systemic) and quality of life (ie, psychosocial, functional)?
8. Is the current evidence sufficient to warrant further research and resources being directed toward the technology relative to dental implant therapy? If so, why?

The breakout group sessions were followed by the first plenary session in which each chair presented to all participants their respective group's answers to the common questions. In this plenary session, the breakout group representatives also had an opportunity to provide any additional clarification or input they thought was important. Each presentation was also followed by questions and answers as well as discussion. The group reports reflecting the answers each group had for the questions is included in this publication. The names of the members of each group are also provided.

The format for the next set of breakout sessions was altered at this point in the Summit to allow for inclusion of the outcomes discussion. Representatives were taken from the biotechnology breakout groups to comprise a separate breakout group focused on discussing outcomes and, more specifically, how outcome domains for implant dentistry might be identified and measured in future research. The report that reflects the results of the outcomes discussion is included in this publication, as are the names of the members of the group.

The agenda addressed by the outcomes breakout group included:

1. Overview of the outcomes discussion from each of the technology groups by a targeted outcomes representative for each group
2. Identification of common critical outcome needs and any unique to specific technologies
3. Discussion of the following topics:
   - The need for/value of a core set of outcomes for clinical studies in dental implant therapy
   - Desired domains for the outcome measures to represent (following the HTA model)
   - Ways to create consensus for a broad range of outcome measures along with a recommendation for a preferred method

At this point, the biotechnology breakout groups reconvened, minus the outcomes participants, to address another set of common questions. Those questions were:

1. What additional evidence should be gathered to enhance development and enable transfer of the new technology?
   a. Technical properties
   b. Safety
   c. Efficacy and effectiveness (physiologic, clinical, functional, patient perspectives, etc)
   d. Economic factors
   e. Legal/ethical issues

A final plenary session was then convened for each group to again present the results of their discussions to the entire group. In this plenary session, a wireless system called the Audience Response Technology (ART) was used to poll participants on their opinions regarding the Summit content. The ART questions for the biotechnology areas were a common set and the outcomes segment had a separate set of questions on which to poll the participants. The results of the polling are included in this publication.

The ART statements used to poll participants on each of the biotechnologies were:

1. There is a significant dental implant patient population that could benefit from this technology. [Strongly Disagree to Strongly Agree]
2. This technology has the potential to significantly improve clinical outcomes with dental implants. [Strongly Disagree to Strongly Agree]
3. This technology has the potential to significantly improve physical health outcomes for dental implant patients. [Strongly Disagree to Strongly Agree]
4. This technology has the potential to significantly improve quality of life outcomes (eg, function) for dental implant patients. [Strongly Disagree to Strongly Agree]
5. The potential benefit of this technology will justify its estimated cost. [Strongly Disagree to Strongly Agree]
6. This technology has the potential to have a significant impact on dental implant therapy in: [Less than 5 to more than 20 years]

ART questions for outcomes were:

1. When assessing a technology for implant therapy, it is important to include more than just the standard clinical measures of implant survival/success (ie, implant in function, no mobility, no pain, no infection, and minimal bone loss). [Strongly Disagree to Strongly Agree]
2. It is essential to identify and measure technology assessment outcomes that include life quality, function (as rated by the patient), cost, and preference. [Strongly Disagree to Strongly Agree]
3. A consensus on the appropriate outcomes for implant technology assessment should be developed. [Strongly Disagree to Strongly Agree]
4. An essential aim in the assessment of an implant technology includes the prediction (or modeling) of individual therapeutic benefits. [Strongly Disagree to Strongly Agree]
5. It is fundamental to maximize resource allocation for the selection and development of implant technology. [Strongly Disagree to Strongly Agree]

For future planning purposes, the participants were also asked which areas of implant dentistry would be the priority for the AO to focus on in future meetings. The results of that polling indicated that treatment of peri-implantitis and vertical ridge augmentation were the two that ranked the highest. This polling was considered in the development of the AO's strategic plan to convene annual focused workshops on critical topics in implant dentistry.

The Summit concluded with summary and call to action presentations by respected representatives of the three major implant dentistry specialties:

SPECIALTY CALL TO ACTION SPEAKERS

Oral and Maxillofacial Surgery

Michael S. Block, DMD

Periodontics

Myron Nevins, DDS

Prosthodontics

Thomas D. Taylor, DDS, MSD

The Summit successfully provided the profession with a better understanding about how the clinical application of nanotechnology, biologics, and genomic medicine research will enhance the regeneration of lost soft and hard tissue for the optimal placement and restoration of dental implants to enhance function, oral health, and patient well being.

In addition, there was very high interest among the participants to create core focus groups to concentrate on specific areas of research correlating the four fields of biotechnologies to specific areas of need in implant dentistry, as well as establishing registries to document true survival and/or success rates for dental implants. In developing the registries, researchers and clinicians may, in the future, alter the course of patient treatment to improve treatment outcomes for patients, thus improving their quality of life.

The Academy is proud to have held this Summit to commemorate the Silver Anniversary of the Academy of Osseointegration. It has reinforced the AO's leadership position in implantology education by providing its members with the latest information on current and future applications in their practices.

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