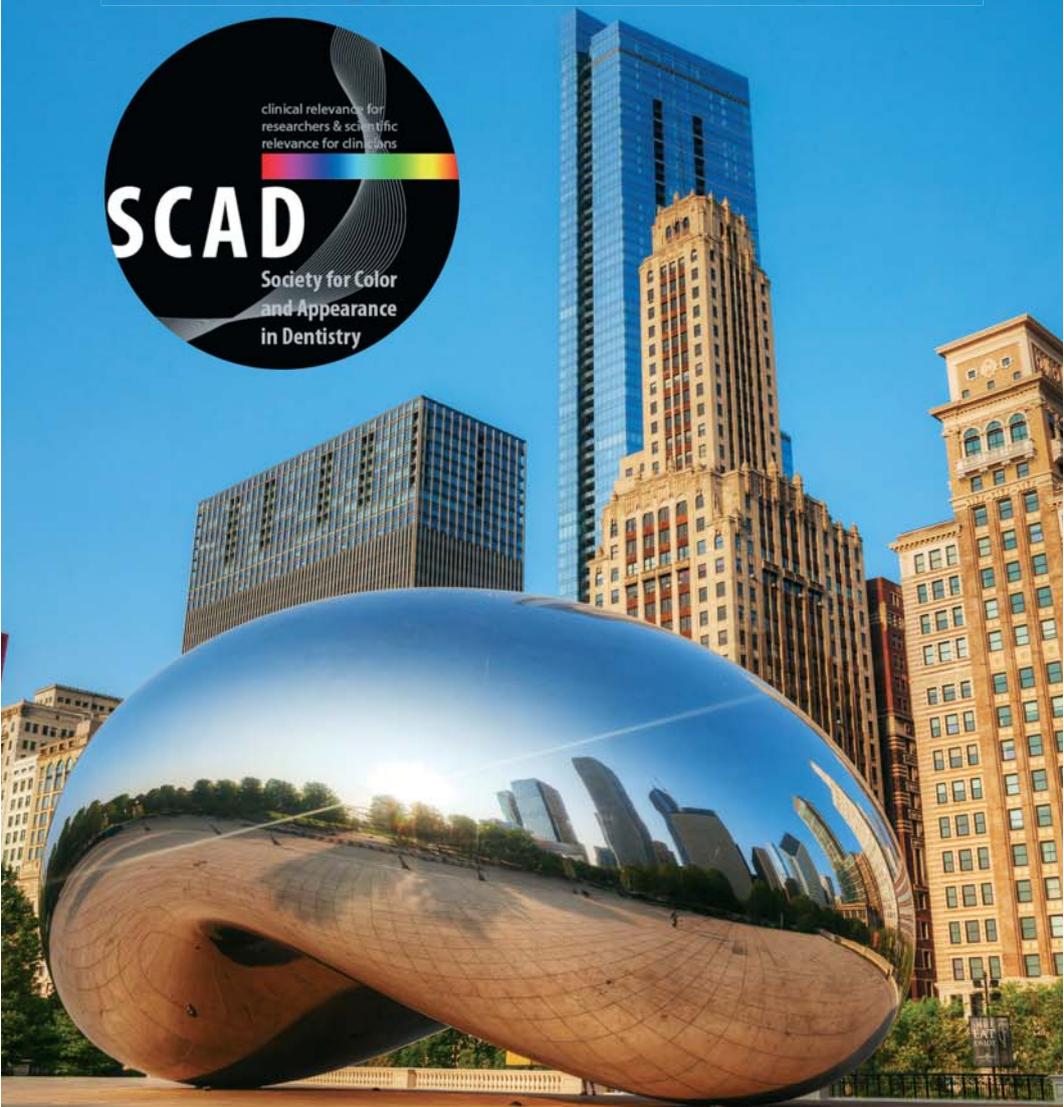
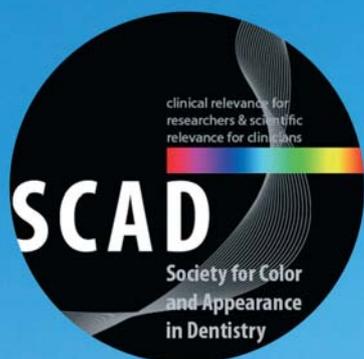
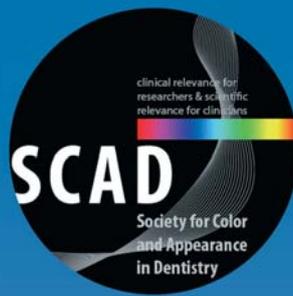


Synergy for Success

6th Annual Conference of the Society for
Color and Appearance in Dentistry (SCAD)



October 2-4, 2014 • Sofitel Hotel Chicago
www.scadent.org • info@scadent.org



Synergy for Success

6th Annual Conference • Sofitel Hotel Chicago, October 2-4, 2014

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Recommended Attire

Welcoming reception and educational sessions: Business casual
 President's Dinner: Black tie

The formal continuing education programs of Vident are accepted by AGD and ADA CERP for Fellowship/Membership credit. The current term of acceptance extends from 7/1/2013 to 5/1/2016. This activity is designated for 16 continuing education credits.

ADA CERP® | Continuing Education Recognition Program



The 6th Annual Conference of the Society for Color and Appearance in Dentistry (SCAD) will comply with appropriate disclosure policies as set forth by the American Dental Association's code of ethics and professional standards. The SCAD speakers will verbally disclose any material, financial or other relationships that pose a potential conflict of interest. Speakers will also disclose any unapproved use of products or devices that they will be discussing. Disclosure requirements are not intended to imply any impropriety, but rather to inform the audience that they exist.

Contact info:

Society for Color and Appearance in Dentistry
 5116 Bissonnet #394 • Bellaire, TX 77401, USA
 Phone +1.281.687.8752 • Fax +1.877.255.6075
www.scadent.org • info@scadent.org

A Message from the President



Dear Colleagues,

The Executive Board of the Society for Color and Appearance in Dentistry (SCAD) cordially welcomes you to our 6th Annual Conference at the Sofitel Water Tower Hotel in Chicago, IL on October 2-4, 2014. This meeting features high-quality, evidence-based information on color-related issues in dentistry presented by many of the leaders in this field (up to 16 CE hours), including:

Dario Adolfi • Harald Baumgarten • Lorenzo Breschi
Sabiha Bunek & John M. Powers • Murilo Calgaro
Newton Cardoso • Ricardo Carvalho • Lyndon Cooper
Jungo Endo • Newton Fahl • Federico Ferraris
Russell Giordano • Stefano Gracis • Gavin Heymann
Stefano Inglese • Sidney Kina • Domenico Massironi
Edward McLaren & Johan Figueira • Richard Price
Andrea Ricci • André Ritter • Claude Sieber
Roberto Spreafico • Christian Stappert

Our poster session will be an additional valuable source of evidence-based information. We will announce new recipients of SCAD VITA Award for Excellence in Research Related to Color and Appearance in Esthetic Dentistry (pre-doctoral students, graduate students, and non-tenured junior faculty), and first recipients of newly established Larsen-Chu Award for Excellence in Dental Technology.

Welcome to SCAD 2014!

A handwritten signature in black ink that reads "Edward J. Swift, Jr." in a cursive style.

Edward J. Swift, Jr., DMD, MS
President, Society for Color and Appearance in Dentistry

Program

Thursday, October 2, 2014

7:00-9:00pm Welcoming reception, Registration

Friday, October 3, 2014 – Italy vs. Brazil

7:00am-4:00pm Registration

7:00-8:00 Breakfast

8:00-8:15 Opening ceremony

8:15-8:40 Newton Cardoso: *Composite resin-ceramic Interface: Indications and techniques*

8:40-9:05 Domenico Massironi: *Color, esthetics, materials: The game starts with the preparation phases*

9:05-9:30 Andre Ritter: *Direct composites for appearance-minded patients*

9:30-9:55 Roberto Spreafico: *Color and functional aspects in restorative dentistry using composite materials*

9:55-10:35 Q/A, Break, Larsen-Chu Award Case Viewing/Grading

10:35-11:00 Ricardo Carvalho: *The bond between adhesive procedures and scientific evidence*

11:00-11:25 Lorenzo Breschi: *How to achieve bond stability: Scientific evidence*

11:25-11:50 Sidney Kina: *Ceramic veneers and all-ceramic crowns*

11:50-1:00 Q/A, Lunch (Lunch & learn, Melanie Perbey: *Aesthetics for a Successful Smile*)

1:00-1:25 Stefano Gracis: *The influence of abutment color on the choice of prosthetic restorative materials*

1:25-1:50 Murilo Calgario: *Esthetics - Materials and Lab. Techniques*

1:50-2:15 Stefano Inglese: *Color and appearance in dental technology: Morphological and optical aspects*

2:15-2:40 Dario Adolfi: *Treatment planning for full mouth rehabilitation*

2:40-3:20 Q/A, Break Larsen-Chu Award case viewing/Grading, Poster viewing

- 3:20-3:45** Andrea Ricci: *Appearance needs soft tissue harmony around beautiful teeth!*
- 3:45-4:10** Newton Fahl: *Direct-indirect class V technique for non-carious cervical lesions*
- 4:10-4:35** Federico Ferraris: *Chromatic behavior and clinical implications of composites with different refractive index*

4:35-4:45 *Q/A, Mini break*

4:45-5:00 *SCAD open meeting*

7:00-10:00 *Cocktail, President's dinner*

Saturday, October 4, 2014 – Where Art Meets Science

7:00-8:00 *Registration, Breakfast*

8:00-8:45 Edward McLaren & Johan Figueira: *Creating color: the integration of color and translucency in dental ceramics*

8:45-9:10 Russell Giordano: *Enamic: A novel ceramic system*

9:10-9:35 Richard Price: *Appropriate light curing: A vital step to a successful restoration*

9:35-10:00 Gavin Heymann: *New horizons for orthodontic enhancement of dentofacial appearance*

10:00-10:40 *Q/A, Break,
SCAD VITA Award recipients' poster viewing*

10:40-11:05 Sabiha Bunek & John M. Powers: *Clinical and laboratory properties of resin cements and milled restorative materials*

11:05-11:50 Claude Sieber: *Clinical and technical aspects for the new generation of all-ceramics*

11:50-1:00 *Q/A, Lunch*

1:00-1:25 Jungo Endo: *How to achieve life like gingival ceramics with implant restorations?*

1:25-1:50 Harold Baumgarten: *From hopeless to beautiful: Transitioning the terminal dentition with technology-assisted implant solutions*

1:50-2:15 Lyndon Cooper: *Impact of optical and mechanical properties in the selection of esthetic milled restorative materials*

2:15-2:40 Christian Stappert: *Successful appearance of single implant restorations: Novel biological and material considerations*

2:40 *Closing Ceremony*

Meeting Sponsors and Corporate Members

General Sponsors

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VITA ENAMIC®: creates a new definition for resistance

The first hybrid ceramic with dual network structure for unsurpassed absorption of masticatory forces



VITA ENAMIC sets new standards for reliability by combining strength and elasticity and providing unsurpassed absorption of masticatory forces. Enamic restorations mill in as little as 4 minutes and provide increased efficiency by allowing up to

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Meeting Media Partner



SCAD Mission and Goals

The Society for Color and Appearance in Dentistry (SCAD) was founded in 2008 as a consortium of dental professionals and other experts interested in this area of esthetic dentistry specifically related to scientific investigation and application of color and appearance.

The goals of SCAD are as follows:

- To serve as a uniting force in the profession by promoting and fostering greater awareness of color and appearance in dentistry;
- To advance multidisciplinary collaboration and discovery among industrial and institutional researchers, clinicians, laboratory technicians and others with an interest in color and appearance in dentistry;
- To create and implement educational and training programs on color and appearance for dental professionals and students;
- To promote dental health for the general public through the advanced art and science of color and appearance in dentistry.

SCAD Membership

The membership of this Corporation consists of dentists, researchers, and other persons whose qualifications and classifications are as established in the Bylaws.

The members of this Corporation are classified as follows:

Associate Member shall be a person ineligible for any other type of membership in the Corporation.

Active Member in the Corporation is a distinctive honor. It shall comprise persons invited by the Executive Committee or Associate Members nominated and endorsed by at least three (3) Active Members in good standing.

Fellows A Fellowship may be bestowed on any Active Member by majority vote of the Board of Directors for such term as the Board of Directors may determine.

Corporate Members are available to organizations associated with color and appearance in dentistry, and which support the purposes of the Corporation.

For more details on SCAD membership classifications and requirements, please refer to our bylaws available online at <http://www.scadent.org/about-scad/scad-bylaws>

SCAD Governance

EXECUTIVE COMMITTEE

President (2012-2014) Edward J. Swift, Jr.
President-Elect (2012-2014) Dan Nathanson
Vice-President (2012-2014) William M. Johnston
Secretary (2012-2014) Joe C. Ontiveros
Treasurer (2012-2016) John M. Powers
Immediate Past (2012-2014) Stephen J. Chu

Board Members-at-Large

Shigemi Nagai (2010-2014)
Esam Tashkandi (2011-2015)
Newton Fahl (2012-2015)
Aki Yoshida (2012-2016)

Executive Director

Rade D. Paravina

REGIONAL COUNCILORS

Andrey Akulovich, Russia (2012-2014)
Luiz Narciso Baratieri, Latin America (2012-2014)
Alvaro Della Bona, Latin America (2010-2012)
Federico Ferraris, Europe (2012-2014)
Yumiko Hosoya, Asia-Pacific (2010-2012)
Gerard Kugel, North America (2012-2014)
Esam Tashkandi, Africa & Middle East (2012-2014)

Funding Opportunities

SCAD VITA Research Award

Society for Color and Appearance in Dentistry (SCAD) has established the VITA Award for Excellence in Research Related to Color and Appearance in Esthetic Dentistry (SCAD VITA Award) to acknowledge the successful professional collaboration with and the long-term support of VITA Zahnfabrik.

Three categories of applicants are eligible for the awards: predoctoral students, graduate students, and non-tenured junior faculty. In 2014 we will have new recipients of SCAD VITA Award. The 2015 applicants are required to submit an application and abstract following the instruction provided at the SCAD website (www.scadent.org) by August 15, 2015. All awardees will be announced at the annual meeting and each recipient will receive a \$1,500 stipend.



CDT COMPETITION: 2015 LARSEN-CHU AWARD FOR EXCELLENCE IN DENTAL TECHNOLOGY

**New opportunity for junior laboratory technicians:
funding, recognition, continuing education & travel**

In memory of Arne Larsen, CDT, Dr. Stephen J. Chu generously offered to support further development of dental technology through the SCAD. As this perfectly fits our mission and goals, SCAD decided to establish the Larsen-Chu Award for Excellence in Dental Technology (Larsen-Chu Award). The purpose of the award is to acknowledge and promote young dental technicians who have less than 10 years in practice.

Applicants need to duplicate one natural tooth based on pictures that will be posted on SCAD web site: it can be done on a die or fabricated solid (root is optional), complete the application form and send JPG images of their work.

The Larsen-Chu Award Committee, Chaired by Mr. Aki Yoshida, RDT, will review the submissions and send acceptance/rejection notice to all applicants. Authors of accepted submissions must attend the annual meeting, and display their work.

All Larsen-Chu Award competitors will receive a discounted registration rate for SCAD 2015. The 2015 Larsen-Chu Award recipient will receive a \$2,000 stipend, SCAD certificate, and complimentary registration for the 2016 SCAD annual meeting, while the 2nd and 3rd place winners will receive SCAD certificates. In addition, Vita Zahnfabrik will provide a free three-day trip to Bad Säckingen, Germany for hands-on training for three awardees.

Submission deadline: Aug 15, 2015.

The additional info and application form will be posted at www.scadent.org.



The 2014 task tooth: form and characterization • Photo by Aki Yoshida

Announcing our publishing partnership!



We are very excited to announce that the *Journal of Esthetic and Restorative Dentistry* is now the new “home” and official publication of the *Society for Color and Appearance in Dentistry*. *Color and Appearance in Dentistry* issues will be published within the *JERD* semi-annually (once as a regular issue and once as E-issue only) to further promote and highlight the best in laboratory and clinical research and practice related to color and appearance in esthetic dentistry.

The *Journal of Esthetic and Restorative Dentistry* is the longest standing peer-reviewed journal devoted solely to advancing the knowledge and practice of esthetic dentistry. The addition of this prestigious annual issue focused on Color and Appearance in Dentistry will bring further distinction to the *JERD*.

Rade D. Paravina, DDS, MS, PhD

Editor, Issues on *Color and Appearance in Dentistry*

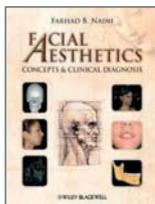
Harald O. Heymann, DDS, MEd

Editor-in-Chief, *Journal of Esthetic and Restorative Dentistry*

Attend SCAD's meeting in Chicago

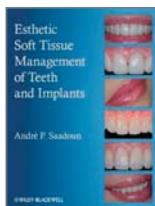
7th Annual Conference of the Society for Color and Appearance in Dentistry
September 24- 26, 2014, Chicago, IL,
Radisson Blu Aqua Hotel
www.scadent.org • info@scadent.org

To celebrate the introduction of these important new issues, Wiley is pleased to offer SCAD members a 20% discount on any of Wiley's 350 dentistry books. Simply go to www.wiley.com/go/dentistry, select your books and use promo code **VBH98**. Offer valid until 12/31/14.



Facial Aesthetics: Concepts and Clinical Diagnosis

Farhad B. Naini
ISBN: 978-1-4051-8192-1
454 pages
March 2011



Esthetic Soft Tissue Management of Teeth and Implants

Andre P. Saadoun
ISBN: 978-1-118-30115-9
190 pages
November 2012

Now accepting submissions for the 2015 SCAD VITA research awards (for undergraduate and graduate students and young faculty), and Larsen-Chu award for junior laboratory technicians.

www.scadent.org



JERD

WILEY



Newton Cardoso, DDS

Graduated Universidade de Santo Amaro 1991 São Paulo Brazil.

Brazil Program Director NYU College of Dentistry since 1993.

Post Graduation Program NYU – Implantology & Oral Reahabilitation 1993.

Post graduation Program NYU – Esthetic Dentistry 1998.

Assistant Adjunct Professor NYU College of Dentistry Department of Cariology and Comprehensive Care since 2003.

Visiting Lecturer Advanced Esthetic Program NYU College of Dentistry.

Brasil Program Director – Geneva Smile Center Geneva Switzerland.

Private Practice São Paulo Brazil.

Oral Presentations

Friday, October 3
8:15-8:40

The Composite Resin-Ceramic Interface: Indications and Techniques

Newton Cardoso, DDS

Description

Nowadays with so many different materials and techniques we are pleased to make great improvements and changes without destroying the natural dentition! The idea is to share some info and clinical cases where very conservative approach was applied and successful outcome was achieved and why.

Objectives

Will be discussed:

- Direct/indirect mock up
- Direct bonding class IV
- Very thin prep less veneers
- Complete conservative oral rehabilitation

Oral Presentations

Friday, October 3
8:40-9:05

Color, Esthetics, Materials: The Game Starts with the Preparation Phases

Domenico Massironi, DMD

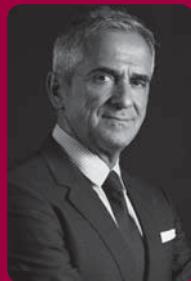
Description

The color integration required in the past deep preparations of abutment, in order to mask the opaque substrate of indirect restoration as PFM crowns and bridges. Nowadays the modern dentistry is oriented to a minimally invasive approach, and this concept starts from the planning and the preparation phases. The modern materials are useful to achieve this goal, but on the other hand the clinician has to consider the correct shape and volume for a proper abutment.

Especially the preparation of the cervical third of the crown is a crucial aspect to consider, with a standardized protocol that considers both rotary, oscillating and manual instruments. Last but not least to manage all these steps with high magnifications allows to better control the result.

Objectives

- Managing of the prosthesis preparation
- Managing of the relation between hard and soft tissues
- Using of rotary, oscillating and manual instruments for preparation..



Domenico Massironi, DMD

Dr. Domenico Massironi graduated with honours in Medicine and Surgery from the University of Pavia and specialized in Dentistry at the same University with honours.

He holds lectures and courses in the most prestigious Dental Congresses worldwide.

Diplomate of ICOI (International Congress of Oral Implantologists) Active Member of EAED (European Academy of Esthetic Dentistry) and Member Emeritus Amici di Brugg, Founder CAD CAM Academy.

He is a member of the editorial board of EJED (The European Journal of Esthetic Dentistry) and MICRO (the International Journal of Micro Dentistry).

He divulges extensively worldwide his method in fixed prosthodontics and innovative treatment modalities in preparation teeth phase and aesthetic dentistry, in the field of dental implant therapy, before prominent university faculties, national and international dental academies, and professional institutions, for which he has gained widespread recognition internationally.

Author of several articles and two books, among which "Precision in prosthetic restoration", written in co-operation with the dental technicians Mr. Alberto Battistelli and Mr. Romeo Pascetta published by Quintessence, and "Precision in dental aesthetics" written in co-operation with Mr. Romeo Pascetta and Giuseppe Romeo published by Quintessence and translated in numerous languages.

He maintains a private practice limited to prosthodontics and implant dentistry in Melegnano Italy.

He uses the stereomicroscope since 1988.



André V. Ritter, DDS, MS, MBA

Dr. Ritter is Professor and Chair, Department of Operative Dentistry at the University of North Carolina School of Dentistry, in Chapel Hill, NC. He received his dental doctorate degree from the Federal University of Santa Catarina, Brazil (UFSC), in 1987 and a MSD degree from the University of North Carolina at Chapel Hill (UNC) in 2000. Dr. Ritter also has two Certificates in Operative Dentistry, from UFSC and UNC, and an MBA with concentration on Healthcare Management from Northeastern University (2013). He is actively involved in clinical and laboratory research, particularly in the areas of biomaterials and caries risk assessment and management. He also maintains a part-time intramural practice devoted to restorative and esthetic dentistry. Dr. Ritter has published numerous journal articles, research abstracts, and book chapters. He is a member of several dental organizations, including the American and International Associations for Dental Research, the European Caries Organization, and the International College of Dentists. Dr. Ritter has presented many scientific papers and continuing education courses regionally, nationally, and internationally.

Oral Presentations

Friday, October 3

9:05-9:30

Direct Composites for Appearance-Minded Patients

André V. Ritter, DDS, MS, MBA

Description

Direct composites are widely used for restorations in both anterior and posterior teeth. In patients of all ages, direct composites represent an excellent material choice owing to their ease of use, bonding potential and esthetics. When correctly used in the proper indications, composites can result in excellent and long-lasting restorations. This presentation will summarize the current uses of direct composites in anterior and posterior teeth in the adolescent patient, and discuss clinical solutions for common problems inherent with the use of composites. Among the topics covered, the presentation will emphasize factors affecting longevity of direct composite restorations. The presentation will be illustrated with clinical cases in which the materials and techniques used are demonstrated.

Objectives

After attending this presentation, participants will be able to:

- Understand the advantages and disadvantages of current resin composite systems used for anterior and posterior restorations.
- Apply clinical solutions to address common problems associated with the use of anterior and posterior composites in the adolescent and young adult patient.
- Understand factors that affect the longevity of direct composite restorations.

Oral Presentations

Friday, October 3
9:30-9:55

Color and Functional Aspects in Restorative Dentistry using Composite Materials

Roberto Carlo Spreafico, DM, DMD

Today's dentist has a wide choice of restorative materials available when replacing missing or damaged tooth structures.

Since introduction in dentistry of composite resins, those materials have undergone a tremendous development and their adhesive properties on both enamel and dentin have been constantly improved, allowing a more conservative approach during the tooth preparation. Patients' demands for a more aesthetic and metal-free restoration on posterior and anterior teeth increased during the last decade focusing the interest of the dental profession towards aesthetic restorations with composite resins.

However, it is vital that the treating clinician have a thorough understanding of the principles that lead to a successful outcome.

Naturally appearing and problem free outcome can be achieved if certain rules are followed by a conscientious operator.



Roberto Carlo Spreafico, DM, DMD

Dr. Roberto Spreafico obtained his DM degree at Turin University, Italy, in 1982. In 1986, he obtained a DMD degree, at Geneva University, Switzerland. He is now a private practitioner, in Busto-Arsizio, near Milan, Italy. He is active member of: Accademia Italiana di Conservativa, European Academy of Esthetic Dentistry.

Founder and active member of Italian Academy of Esthetic Dentistry. Founder of Digital Dental Academy, Founder of International Academy for Digital Dental Medicine. Associate Editor of "European Journal of Esthetic Dentistry". Member of the editorial board of: Journal of Adhesive Dentistry; Dr Spreafico presently conducts a number of courses in the field of esthetic dentistry throughout Italy and abroad. He is also author of numerous clinical papers on this topic. Author of 16 book chapters. Co-authored the book "Adhesive Metal-Free Restorations: current concepts for the esthetic treatment of posterior teeth." by Quintessence Publishing Group (1997).

Oral Presentations

Friday, October 3
10:35-11:00

The Bond between Adhesive Procedures and Scientific Evidence

Ricardo M. Carvalho, DDS, PhD



Ricardo M. Carvalho, DDS, PhD

Dr. Carvalho has clinical, teaching and research experience in Operative Dentistry and Fixed Prosthodontics. His research has mostly focused in resin-dentin bonds and how to improve the quality and durability of adhesive interfaces..

Adhesive procedures are an integral part of current direct and indirect aesthetic dentistry. Although regarded as an ordinary clinical step, the achievement of optimal bonding to different substrates, particularly dentin, is difficult and dependent on several factors largely disregarded by clinicians. This presentation will explore details of clinical steps in adhesive restorations that permit the achievement of optimal bonding and present the rationale for the procedures with supporting scientific evidence.

Objectives

- To demonstrate how scientific evidence should be the guidance for directing clinical adhesive procedures.

Oral Presentations

Friday, October 3
11:00-11:25

How to Achieve Bond Stability: Scientific Evidence

Lorenzo Breschi, DDS, PhD

Aim of the presentation will be a critical review of the latest improvements of dental bonding systems. Chemical background and physical characteristics of the adhesives will be assayed to understand the clinical capabilities and the possible role of the clinician to obtain the highest bonding performances, in terms of improved bond strength, extended durability and reduced post-op sensitivity. The lecture will also clarify the mechanisms that affect the stability of the adhesive interface over time, analyzing the role of different degrading phenomena synergistically contributing to degrade the hybrid layer.

Objectives

- The lecture will provide clinical step-by-step procedures along with “tips and tricks” to achieve the highest clinical success in terms of aesthetic requirements, biomechanical properties of adhesive restorations, bond strength and stability of the adhesive interface over time.



Lorenzo Breschi, DDS, PhD

Dr. Lorenzo Breschi received his DDS degree cum laude in 1994 and PhD in Human Morphological and Molecular Sciences in 1998 at the University of Bologna (Italy). He is now Associate Professor of Restorative Dentistry and Dental Materials at the Department of Biomedical and Neuromotor Sciences at the University of Bologna (Italy).

Dr. Lorenzo Breschi is member of the editorial board of international journals, actively involved in research on the ultrastructural aspects of enamel and dentin and their interactions with dentin bonding systems. Dr. Lorenzo Breschi has published more than 200 original papers and review articles on peer-reviewed journals on different aspects of adhesion and restorative materials.

Dr. Lorenzo Breschi is the current President of the Academy of Dental Materials, President Elect of the Italian Academy of Conservative Dentistry, Associate Editor of the Journal of Adhesive Dentistry.



Sidney Kina, DDS, MS

Sidney Kina, DDS, MS, graduate from the Santa Catarina School of Dentistry, Florianópolis, Brazil, and earned an MS degree from Unicamp University, Piracicaba, Brazil. He is the author of the books *Invisible Esthetic Ceramic Restorations* (Artes Médicas, 2007) and *Equilibrium Adhesive Ceramic Case Book* (Artes Médicas, 2009). Dr. Kina is an honorary member of the Brazilian Society of Esthetic Dentistry. He lectures nationally and internationally on esthetic dentistry. He maintains a private practice in Maringá and São Paulo, Brazil.

Oral Presentations

Friday, October 3
11:25-11:50

Ceramic Veneers and All-Ceramic Crowns

Sidney Kina, DDS, MS

The use of ceramic restorations is a well-documented, effective, and predictable treatment option. This predictability results from the physical properties of the ceramic, which remain stable in terms of color and shape as long as proper treatment planning is carried out. Nevertheless, in many situations we encounter difficulties in deciding the application of these restorations in partially as laminate veneers or total restorations such as crowns. The remaining dental and occlusal patterns and different types of ceramics are the variables to be discussed to compose a comprehensive guide to direct clinical decisions.

Objectives:

- To contrast classic dental preparations and preparations for adhesive dental ceramic restorations.
- Discuss planning and strategies in for different ceramic restorations.

Oral Presentations

Friday, October 3
1:00-1:25

The Influence of Abutment Color on the Choice of Prosthetic Restorative Materials

Stefano Gracis, DMD

In the recent years, the indications for the use of all ceramic restorations have expanded also due to the increase in the range of opacities/translucencies of many metal-free materials. As a matter of fact, part of a restoration's esthetic success depends on the ability of the technician to reproduce not only the natural tooth's color, but also its correct translucency. Especially when dealing with highly translucent teeth, the color of the underlying tooth structure or preprosthetic restoration may have a negative impact on the esthetic outcome if the prosthetic material is not able to mediate or hide dark substrates while providing the proper degree of light transmission/reflection. This lecture will illustrate the optical behavior of different all ceramic materials and provide some recommendations when dealing with dark abutments.

Objectives

The participant will learn:

- The differences among all ceramic materials as far as their range of opacities/translucencies is concerned.
- The space requirements for the different all ceramic materials when the abutment color is normal.
- The strategies to adopt when dealing with dark substrate prosthetic abutments.



Stefano Gracis, DMD

Stefano Gracis received his DMD degree in 1986 from the University of Pennsylvania (Philadelphia, Pennsylvania, USA) and, in 1987, from the University of Pavia (Pavia, Italy). In 1990, under the guidance of Prof. Ralph Yuodelis, he obtained the certificate in Prosthodontics with an M.S.D. degree at the University of Washington in Seattle. He is an active member and future President of the European Academy of Esthetic Dentistry (EAED) and the Past President of the Italian Academy of Prosthetic Dentistry (AIOP). He is on the Editorial Board of the International Journal of Prosthodontics and European Journal of Esthetic Dentistry. He has contributed several articles and chapters in the field of restorative dentistry and he lectures and gives courses regularly, both nationally and internationally, on topics related to fixed prosthodontics and implant prosthodontics. He practices in his own clinic in Milan, Italy, limiting his activity to prosthodontics and restorative dentistry.



Murilo Calgario, CDT

Murilo Calgario graduated in Dental Technology at the School of Dental Technician Senac Sao Paulo in 2002. He is a member of the Brazilian Academy and Society of Esthetic Dentistry.

In 2005, Murilo Calgario opened a private lab, and a training center, Studio Dental in Curitiba (Brazil).

In 2007 Murilo Calgario was invited to be part of the team of ceramists of Eric Van Dooren in Antwerp Belgium where he became his master ceramist from 2008 until 2011.

Currently Murilo Calgario opened a new Lab, and training center in Curitiba Brazil (Murilo Calgario Dental Design Institute) where he has a training program for Dental Technicians and Dentist's. He also became member of Oral Design group, invited by Mr. Willi Geller in 2013.

Oral Presentations

Friday, October 3
1:25-1:50

Esthetics - Materials and Lab. Techniques

Murilo Calgario, CDT

Excellence in dental aesthetics today has become very predictable with the aid of technology and new materials. To achieve success in esthetic restorations, the communication between the dentist and the technician is one of the key factors to make this whole process easier. Also the materials and techniques available today can provide us amazing results, and techniques that allow the technician to produce more with better predictability. My purpose in this lecture is to show the finalization of clinical cases with different techniques and materials, sorting them by aesthetic advantage, productivity, opacity and translucency.

Oral Presentations

Friday, October 3
1:50-2:15

Color and Appearance in Dental Technology: Morphological and Optical Aspects

Stefano Inglese, CDT

The creation of lifelike dental restorations is a difficult and complex task, especially in the anterior region.

The determining factors of a successful restoration include the tooth shape, surface characterization, and propagation of light inside the restoration.

The ability of the human eye to perceive LIGHT-SHADOW contrast, which is the perception of the shapes, is far greater than its ability to perceive colors.

Small changes in morphology and value are immediately perceived, whereas minor changes in chroma and hue remain undetected.

Color, the translucency, fluorescence, opalescence, light reflection and deflection can greatly influence both our impression on optical shape and size of the teeth.

Furthermore, art and science, technology, knowledge, and technical skill are contributing factors to realization and individualization of aesthetic and lifelike restorations.

Objectives:

- Underline the importance of color and translucency, and light reflection and deflection, on tooth appearance
- Management of morphology and perception of illusion.



Stefano Inglese, CDT

After receiving his degree in Dental Technology, Stefano Inglese has always shown a strong interest for the exact aesthetic and functional reproduction of dental restorations, concentrating his dental work in ceramics.

Thanks to his passion for art, science, numerous courses and work experiences aboard with renowned master technicians and clinicians, Stefano has perfected his technique and precision in aesthetics, function and biologic integration.

He is the owner of a dental laboratory in Pescina (Aq) Italy and one of the founding members of "Dental Excellence International Laboratory Group".

In 2003 he won second prize in the International competition for dental technicians "Occlusal Compass" and First prize for the best scientific and photographic documentation.

He is an active member IAED – Italian Academy Esthetic Dentistry.

Stefano writes for national and international dental publications, in particular QTD "Quintessence of dental technology" 2012 and 2014, Quintessenz Zahntechnik and he coauthored with Dr. Anthony Sclar in the book "Interdisciplinary Treatment Planning II" edited by Cohen. He presents at conferences and collaborates with clinicians of international fame, in Italy and abroad.

Stefano is the author of the book "Aesthetic Dental Strategies" published by Quintessence in 2013.



Dario Adolfi, DDS

Dr. Dario Adolfi received his D.D.S. at University of São Paulo in 1979. He is a Dental Technician and large experience in ceramic field. He is the director of Spazio Education in São Paulo, adviser for ceramics companies. Dr.Adolfi has published extensively many articles and author of book Natural Esthetics in Portuguese, English, Spanish and Russian published by Quintessence International. Lecturer, practical courses and hands on demonstration in Asia, Europe, Australia, South America and United States.

Oral Presentations

Friday, October 3
2:15-2:40

Treatment Planning for Full Mouth Rehabilitation

Dario Adolfi, DDS

The success of an esthetic rehabilitation depends on the dental team's knowledge of the biologic considerations related to teeth and implants as well as the communication maintained between the prosthodontist, oral surgeon, and dental technician.

In the case of full-mouth rehabilitation, a suitable restorative protocol is crucial, and a logical sequence must be followed to optimize the treatment.

This lecture will describe all clinical and laboratory steps for a functional and esthetic protocol for full-mouth rehabilitation that promotes together with CAD/CAM technology predictable outcomes.

Objectives

- How clinical and laboratory steps for a functional and esthetic protocol for full-mouth rehabilitation promotes predictable outcomes.
- How the success of a full rehabilitation will depend directly on the high quality of provisional restorations.
- How CAD/CAM technology provide the combined advantages of strength and esthetics,

Oral Presentations

Friday, October 3
3:20-3:45

Appearance Needs Soft Tissue Harmony Around Beautiful Teeth

Andrea Ricci, DDS

Achieving esthetics in dentistry is one of the most challenging issues in dentistry and has become a persistent topic in all specialties of dentistry. The patient seeks not only a functional restoration or an implant that is osseointegrated, but also an optimal esthetic result; therefore, we are facing everyday higher and higher patients' demands. Inadequate relationship between soft tissue and teeth and/or restorations may determine an unnatural, non-pleasing, smile. Modern techniques and materials can be useless if the final outcome doesn't achieve the patient esthetic expectations. This presentation will focus on the solutions of these problems, on an adequate diagnosis of the different sites, on the forecast of the clinical outcome and on the technical solutions, which, in most cases, requires a multidisciplinary approach and a thorough knowledge of the restorative materials and protocols which involve the effort of the entire dental team.

Objectives

- Establish the esthetic objectives.
- Understand the limitations caused by soft tissue alterations
- Forecast the outcome of surgical and restorative treatments
- Understand the protocol and materials that could help us in achieving a predictable outcome.



Andrea Ricci, DDS

Dr. Andrea Ricci graduates from University of Perugia in 1996. After a three years training program he achieved the Certificate in Advanced Prosthodontics at the University of Southern California in Los Angeles. Since 1999 he limits his practice to prosthodontics, periodontology and implant dentistry with special emphasis to the aesthetic areas. His office is one of the Leading Dental Centers of the World. He is the Scientific Director of IDEAT (Institute of Dental Education and Therapy). He is an Active Member of the European Academy of Esthetic Dentistry (EAED), Associate Member of the American Academy of Restorative Dentistry (AARD), Active Member of the Italian Academy of Esthetic Dentistry (IAED) and Active Member of the Italian College of Prosthodontics (ICP). Co-author of several papers published in international journals, he has lectured extensively in Europe, United States, Cina, Singapore, Saudi Arabia and in Japan.



Newton Fahl, Jr, DDS, MS

Dr. Newton Fahl, Jr. received his DDS degree from Londrina State University, Brazil, in 1987. In 1989 he received the Certificate in Operative Dentistry and Master of Science degree from the University of Iowa, USA.

Dr. Newton Fahl, Jr. is a member of the American Academy of Esthetic Dentistry (AAED), and founding member and past-president of the Brazilian Society of Aesthetic Dentistry (BSAD). He is a MCG-Hinman Foundation fellow. Dr. Fahl is the recipient of the American Academy of Esthetic Dentistry (AAED) 2008 President's Award for Best Teacher and the 2011 American Academy of Cosmetic Dentistry (AACD) Excellence in Cosmetic Dentistry Education Award.

Dr. Fahl has published extensively on direct and indirect bonding techniques. He is on editorial board of several peer-reviewed journals. Dr. Fahl lives in Curitiba, Brazil, where he maintains a private practice emphasizing esthetic dentistry. He is director of the Fahl Center in Curitiba, Brazil where he conducts hands-on courses on direct and indirect adhesive restorations.

Oral Presentations

Friday, October 3
3:45-4:10

Direct-Indirect Class V Technique for Non-Carious Cervical Lesions

Newton Fahl, Jr, DDS

Noncarious cervical lesions present a high prevalence and may have different etiologies. Notwithstanding their origin, which encompasses acid erosion, abrasion, and abfraction, restoring such lesions may pose clinical challenges. Difficulties and challenges faced by clinicians include access to the lesion, field control, material placement and handling, marginal finishing, patient discomfort, and restorative chairside time, which are inherent to direct restorative approaches with composites for Class V defects. This presentation describes a new technique for optimizing the restoration of NCCLs: the Class V Direct-Indirect Restoration.

Objectives

- How to achieve perfect margins with NCCLs composite restorations.
- How to select proper restoratives for NCCLs.
- How to optimize restorative effectiveness with NCCLs

Oral Presentations

Friday, October 3
4:10-4:35

Chromatic Behavior and Clinical Implications of Composites with Different Refractive Index

Federico Ferraris, DDS, MS

To obtain a proper esthetic integration with composite materials, the clinician has to manage correctly morphology and superficial texture. But another important aspect is how to emulate the color of the natural tooth managing the restorative material with different value, chroma and thickness. Tooth colour is the result of the interaction of enamel, dentin and pulp with light. These tissues have different structural characteristics and, consequently, they exhibit different light wave characteristics. The optical properties and the thickness of these tissues determine the final tooth colour.

The refractive index of the resin based composite materials is usually different compared to the natural enamel and this can create a different behaviour on the optical perception considering different thicknesses. The composite with high refractive index look behave differently compared to the other materials and this can be a crucial point to reach the perfect esthetic integration. It will be shown the appearance of a high refractive index material compared to a more classic material modifying the thickness and in term of translucency as well.

Objectives

- Color behaviour of natural enamel at different thickness
- Changing in value and chroma of different composite thickness (high refractive index and not high refractive index)
- Different translucencies of different composites (high refractive index and not high refractive index).



Federico Ferraris, DDS

Born on 10th of August 1974 in Alessandria, Italy. Graduated in Dental School at Genoa University as DDS in 1999.

National President of AISO (Italian Association of Dental Students) in 1997-99. Visiting Professor in Operative Dentistry at Genoa University in 2002/03

Co-author of several Italian and International scientific publications including the book on Prosthodontics "Precision in Dental Esthetics" by D. Massironi, R. Pascetta, and G. Romeo published in 2004.

Active Member of EAED (European Academy of Esthetic Dentistry) since 2006. Active Member of AIC (Italian Academy of Conservative) since 2007.

Active and Founder Member of GICC (Interdisciplinary Gymnasium CAD CAM) since 2007.

Active member of IAED (Italian Academy of Esthetic Dentistry) since 2011.

Visiting Professor in Esthetic Dentistry at the CEU San Pablo University in Madrid since 2011.

Visiting Professor at the University in Almeria (España) and in Pisa (Italy) in 2013. Regional Councilor for Europe of SCAD (Society for Color and Appearance in Dentistry) for the biennium 2013/14.

Member of IAAD (International Academy for Adhesive Dentistry) since 2013. Member of the Editorial Board of IJED (International Journal of Esthetic Dentistry) since 2010.

Speaker at dental congresses and courses in more than twenty different Countries.

Dental practice in Alessandria which specialises in Operative Dentistry and Prosthodontics.

Collaboration with dental clinic of Dr. Giulio Rasperini (Piacenza) from 2007 to 2011.

Collaboration with dental clinic of Dr. Giano and Dr. Andrea Ricci (Florence) since 2008.



**Edward A. McLaren,
DDS, MDC**



**Johan Figueira,
DDS**

Dr. McLaren is a Prosthodontist, Professor and director of Post Graduate Esthetic Dentistry at the UCLA school of Dentistry. He is the director of the UCLA Center for Esthetic Dentistry, a full time didactic and clinical program for graduate dentists, and founder and director of the UCLA Master Dental Ceramist program. The residency program is a full time master ceramist program for dental technicians featuring extensive experience with the newest esthetic restorative systems. Dr. McLaren maintains a private practice limited to prosthodontics and esthetic dentistry in which he does all of his own ceramics.

Dr. McLaren is actively involved in many areas of prosthodontics and materials research and has authored over 80 articles. He has presented numerous lectures, hands-on clinics and post-graduate courses on ceramics and esthetics across the nation and internationally. He recently published a book, on his ceramic techniques and features dental photographic art, entitled "The Art of Passion: Ceramics, Teeth, Faces, and Places."

Dr. Johan Figueira graduated from School of Dentistry at the Central University of Venezuela in 2009.

In 2010 Dr. Johan received acceptance into the Esthetic Restorative Program at the U.C.L.A. Center for Esthetic Dentistry where he continues his studies under leadership of preminent Prosthodontic and Master Ceramicist, Dr. Edward McLaren. Dr. Johan graduated in "Advanced Esthetic Dentistry" / Center for Esthetic Dentistry in 2013.

Dr. Figueira is a member of the American Academy of Cosmetic Dentistry. Currently, Dr. Johan is faculty at "Center for Esthetic Dentistry" at UCLA. He presents numerous lectures & hands-on clinics internationally.

Oral Presentations

Saturday, October 4
8:00-8:45

Creating Color: The Integration of Color and Translucency in Dental Ceramics

**Edward A. McLaren, DDS, MDC
Johan Figueira, DDS**

The presentation will emphasize how to assess the four 4 dimension of color (hue, value, chroma and translucency) , how these dimensions of color interact to give a final perceived shade, and how the dentist and ceramist should interpret the shade information to achieve success in the final restoration.

Objectives

- Understand the optical properties of enamel and dentin.
- Understanding the fourth dimension of color: Translucency.
- Understand "color: light and optical behavior" and the relationship of the thickness of dental ceramics affect the final perceived shade.
- Understand how to apply sciences principles into artistic principles for optimal esthetic results.
- Enhance the Communication between dentist and ceramist trough a protocol for different clinical situation.

Oral Presentations

Saturday, October 4
8:45-9:10

Enamic: A Novel Ceramic System

Russell Giordano II, DMD, DMS

Conventional ceramics and composite resins both have several advantages and disadvantages. An ideal material combines the best properties of both into a single material. Research conducted over the past several years led to the production of a material with ideal properties for milled restorations. The unique combination decreases edge chipping, mill time, and restoration thickness. This session will review Enamic's structure, properties, and indications for clinical use.

Objectives

- Understand the differences between interpenetrating phase materials and conventional composite resins.
- Learn the relative properties of various chairside machinable materials.



Russell Giordano II, DMD, DMS

Dr. Russell Giordano II is an Associate Professor and Director of Biomaterials at the Boston University Goldman School of Dental Medicine and an Associate Professor in Materials Science and Engineering. He directs numerous research projects on a variety of dental materials, presents didactic materials science courses, and supervises the use of CEREC in the postdoctoral clinics.

Dr. Giordano received a DMD, certificate in prosthodontics and D.Med.Sc. at the Harvard School of Dental Medicine and is a Fellow of the Academy of Dental Materials. Dr. Giordano worked on the development of the CEREC Vitabloc MKII at the Massachusetts Institute of Technology as a postdoctoral student. Since 1987, he has been actively involved in materials development and testing for CAD/CAM systems, tissue engineering, and restorative materials at M.I.T., Harvard, and Boston University. Research in materials at Boston University led to the development of Enamic, a novel machinable block material.

Dr. Giordano lectures nationally and internationally and serves on the editorial board of several journals including the Journal of Dentistry and Journal of Biomedical Materials. He is active in the development of US and International standards for dental materials. He serves as the chairman of the ADA CAD/CAM Standards Committee for zirconia and serves as the U.S. expert on dental ceramics.



Richard Price, DDS, MS, PhD

Dr. Richard Price BDS, DDS, MS, FRCD(C), FDS (Edin), PhD received his BDS from the University of London in 1979 and his DDS from Dalhousie's Faculty of Dentistry in 1988. He completed his MS in Restorative Dentistry at the University of Michigan in 1984 and his PhD at the University of Malmö, Sweden in 2001. Dr. Price runs the Advanced Restorative Elective for the Fourth Year Dental Students and also works as a Prosthodontist in the Faculty of Dentistry practice at Dalhousie University. Dr. Price is the inventor of the MARC system for teaching effective light curing and is actively involved in research on dental resins and dental curing lights. He has made numerous CDE presentations and has also been author of more than 80 peer-reviewed articles. Recently he organized a symposium on Light Curing in Dentistry at Dalhousie University that was attended by over 40 Key Opinion Leaders.

Oral Presentations

Saturday, October 4
9:10-9:35

Appropriate Light Curing: A Vital Step to a Successful Restoration

Richard Price, DDS, MS, PhD

The dental curing light has become an essential part of every dental office and yet many dental professionals have received little training how to use or choose a curing light. This presentation will provide an insight into how you can improve your bond strength results, color stability of your restorations, and the properties of your light cured resin restorations.

Objectives

- Understand how inadequate light curing adversely affects the bond strength, color stability, and the properties of your light cured resin restorations.
- Understand why the commonly used single irradiance number from a curing light is meaningless.
- Understand the potential for eye damage from dental curing lights.
- Describe clinical techniques that will contribute to successful light curing of your resins.

Oral Presentations

Saturday, October 4
9:35-10:00

New Horizons for Orthodontic Enhancement of Dentofacial Appearance

Gavin Heymann, DDS, MS

The potential for orthodontic treatment to positively affect the perception of anterior dental appearance has been well documented. Furthermore, when orthognathic surgical procedures are integrated into comprehensive orthodontic treatment, the envelope of enhancement may be expanded beyond the dental esthetic zone to encompass the face as a whole. More recent approaches to specific orthodontic problems have opened new avenues for favorably altering both dental and facial appearance while avoiding surgical alteration of the maxillo-mandibular complex. Orthodontic temporary anchorage devices (TADs) provide a means to achieve difficult or otherwise impossible dental movements, and offer novel approaches to clinical problems for which excellent treatments outside of invasive surgical procedures were previously nonexistent. This lecture will explore the potential for enhancement of dentofacial appearance through orthodontic and orthopedic changes accomplished by leveraging TADs.

Objectives

- Describe ways in which orthodontic treatment may enhance facial appearance beyond the dental esthetic zone.
- Identify specific applications for temporary anchorage devices to enhance dentofacial appearance.
- Relate how the novel approaches described compare to their more conventional treatment alternatives.



Gavin Heymann, DDS, MS

Dr. Heymann earned his DDS and MS in Orthodontics at the University of North Carolina School of Dentistry. He received the Kramer Award of excellence and was elected as an alumni member of Omicron Kappa Upsilon. He is the recipient of the American College of Dentists Leadership Award, and was a Thomas P. Hinman scholar. He has conducted clinical research in the use of temporary anchorage devices in orthodontics and novel treatment techniques for management of pre-adolescent Class III patients, and has authored multiple peer-reviewed publications. For his research endeavors he was recognized with the UNC Orthodontic Alumni Association Research Award, and was the recipient of Helen and BF Dewel Award as a co-author of the highest rated clinical research paper by the American Journal of Orthodontics and Dentofacial Orthopedics in 2012. Dr. Heymann is an editorial reviewer for multiple orthodontic and dental journals, is an adjunct assistant professor in the UNC Department of Orthodontics, and lectures nationally to orthodontic and dental audiences alike. He maintains a private orthodontic practice in Chapel Hill and Durham, NC.

Oral Presentations

Saturday, October 4

10:40-11:05

Clinical and Laboratory Properties of Resin Cements and Milled Restorative Materials

Sabiha S. Bunek & John M. Powers



**Sabiha S. Bunek,
DDS**



**John M. Powers,
PhD**

Dr. Sabiha S. Bunek is Editor-in-Chief of *The Dental Advisor*, leading a team of researchers and clinicians in reporting evidence-based clinical and laboratory properties of dental products and equipment. She earned her DDS from the University of Michigan School of Dentistry and maintains a private practice in Ann Arbor, MI, where she focuses on esthetic and comprehensive restorative dentistry. Dr. Bunek lectures on topics related to adhesives, ceramics, cementation, and CAD/CAM technology. She is a published author and has been nationally recognized by Dental Products Report, who named her one of the top 25 Women in Dentistry in the areas of research and education.

Dr. Powers graduated from the University of Michigan with a B.S. in chemistry in 1967 and a Ph.D. in dental materials and mechanical engineering in 1972. He received an honorary Ph.D. from the Nippon Dental University in 2011. He received the *E.B. Clark Award* from the Society for Color and Appearance in Dentistry in 2012. He received the *2013 IADR Distinguished Scientist – Wilmer Souder Award*. Dr. Powers is Senior Editor of *The Dental Advisor* and Clinical Professor of Oral Biomaterials, Department of Restorative Dentistry and Prosthodontics, at the University of Texas School of Dentistry at Houston. Dr. Powers has authored more than 1000 scientific articles, abstracts, books, and chapters. He is co-author of the textbook, *Dental Materials - Properties and Manipulation*, and co-editor of *Craig's Restorative Dental Materials and Esthetic Color Training in Dentistry*.

A paradigm shift has occurred in recent years regarding the cementation and bonding of all-ceramic restorations. Modern materials require knowledge of the interaction of various substrates with priming, bonding, and cementation. Milled restorations have added an additional layer of complexity to the equation. Ideal outcomes for long-term clinical performance and esthetics can be affected by a number of factors. Drs. Powers and Bunek will discuss laboratory and clinical properties of adhesive and self-adhesive resin cements and all-ceramic restorative materials. Collaborative research between The Dental Advisor Biomaterials Research Center and the Houston Center for Biomaterials and Biomimetics will be presented. Focus will be placed on color properties and long-term clinical performance of resin cements and milled ceramics.

Objectives

- Learn in-vitro color stability properties of adhesive and self-adhesive resin cements.
- Learn long-term clinical performance of adhesive and self-adhesive resin cements used with all-ceramic restorations.
- Learn in-vitro color stability and mechanical properties of milled resin-ceramic materials.
- Learn long-term clinical performance of milled resin-ceramic and full-contour zirconia restorations.

Oral Presentations

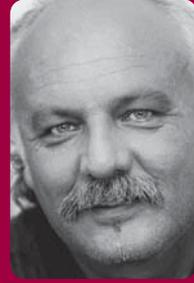
Saturday, October 4
11:05-11:50

Clinical and Technical Aspects for the New generation of All-Ceramics

Claude Sieber, MDT

Important aspects for the new generation ceramic
Light transmission and it's influence to any front tooth restoration
Observations of Enamel structures
The influence of the enamel and translucency, color and the value of a tooth
The new VM 11 Material and it's application.

- Objectives
- Essential points.
- Visual impact.
- Emotion.



Claude Sieber, MDT

Claude Sieber began his career by completing his studies in Art. During the early 1970's he earned his professional certification from the government of Switzerland, completing his apprenticeship in a small dental laboratory in Basel.

Over the next few years, he worked for several dental laboratories gaining additional work experience. His practicum took him as far as Rio de Janeiro, Brazil, where he worked at length with Professor Olympio Pinto.

Claude Sieber has been the owner of a specialized dental laboratory in Basel, Switzerland since 1984. In 1990 he dedicated a training facility to the advancement of Expert Dental Ceramists. He works with dentists worldwide, and he focuses on his special interest of anterior tooth replacement.

Claude has lectured extensively throughout the world and his original work in Fine Arts and Photography are prominent in his visual and physical presentations. Since 2005 Claude is teaching photography classes across the globe.

Claude Sieber was instrumental in the development of Vita's Spinell porcelain, Vitadur Alpha, Akzent stains, Luminaires, Interno Color Effects, the Omega 900 porcelain systems, the 3-D Master Color Shade Guide and the new VM Material.



Jungo Endo, RDT

Jungo Endo, R.D.T. is dental technician born and raised in Japan. He graduated from the Yamagata Dental Technician School in 1995. Upon completing his studies at Yamagata Dental Technician School, he went on to complete a post-graduate master ceramics course at the Osaka Ceramic Training Center from 1998 to 1999. There, he studied under Mr. Shigeo Kataoka, a renowned author of Nature's Morphology (Quintessence). Mr. Endo received the prestigious Shigeo Kataoka Award upon his matriculation in 1999. At the culmination of his studies in Japan, Mr. Endo worked in a private lab in Los Angeles for 6 years where he caught the eyes of Dr. John Beumer, III, DDS, MS. He joined the University of California Los Angeles (UCLA) in 2005 as a master ceramist and co-instructor of UCLA Advanced Prosthodontics Laboratory Training Program.

He specializes in ceramics on highly esthetic implant supported restorations.

Mr. Endo is a renowned lecturer both nationally and globally on esthetics of complex implant-supported restorations.

In October 2012, He owned Jungo Endo Dental Studio in Santa Monica, California. In 2013, Mr. Willi Geller selected Jungo Endo to be a member of Oral Design.

In 2014, become member of Bio_Emulation.

Oral Presentations

Saturday, October 4
1:00-1:25

How to Achieve Life Like Gingival Ceramics with Implant Restorations?

Jungo Endo, RDT

Traditionally an unaesthetic outcome for partially and edentulous patients with implant rehabilitations was created due to the excessive use of tooth colored ceramics and a limited utilization of soft-tissue colors. Using both tooth and soft tissue colored ceramics allows for a more desirable esthetic outcome by creating a mirror of pre-existing soft and hard tissue that was previously there. This type of treatment takes into account lip support and loss of biological tissues as well. Today, patients' high esthetic demands require us to push the envelope of desire to recreate periodontal tissues and teeth once lost, in turn, giving restorations a more natural look with proper esthetic contours. In this lecture, Jungo Endo RDT will explain to you what possible problems may present in highly esthetic demanding cases and how to solve them.

Objectives

- How to create life-like implant restoration with gingival porcelain.
- How to take correct shade from natural gingiva.
- How to control the value,color and translucency of gingival ceramics.

Oral Presentations

Saturday, October 4
1:25-1:50

From Hopeless to Beautiful: Transitioning the Terminal Dentition with Technology-Assisted Implant Solutions

Harold S. Baumgarten, DMD

Reconstructing the terminal dentition can present the clinician with many difficulties. These can range from treatment planning to fabrication and maintenance of the final restoration. This lecture will discuss the myriad of digital technologies that can aid the clinician in achieving a superior functional and aesthetic result.

Objective

- To describe the capabilities and limitations of digital technologies in the planning and reconstruction of the terminal dentition.



Harold S. Baumgarten, DMD

Dr. Baumgarten received his DMD, Certificates in Periodontics and Periodontal Prosthesis/Fixed Prosthodontics from the University of Pennsylvania. He is currently a Clinical Professor in the Department of Periodontics at the University of Pennsylvania and in private practice with the Amsterdam Dental Group in Philadelphia, PA.



Lyndon F. Cooper, DDS, PhD

Dr. Lyndon Cooper DDS, PhD is the Stallings Distinguished Professor of Dentistry of the Department of Prosthodontics at the University of North Carolina at Chapel Hill where he serves as Director of Graduate Prosthodontics. Dr. Cooper is a Diplomate of the American Board of Prosthodontics and served as the 2010 President of the American College of Prosthodontics. He present serves on the Academy of Osseointegration Board of Directors. He received the ACP's 2004 Clinician/Researcher Award and the IADR's 2009 Distinguished Scientist Award for Prosthodontics and Implantology. Dr. Cooper's Bone Biology and Implant Therapy Laboratory focuses on bone biology, adult stem cell bone regeneration, and clinical evaluation of dental implant therapies. The laboratory receives funding through NIH and by industry collaboration. Their research findings have been presented in over 115 publications and numerous national and international presentations. These efforts integrate basic and clinical research to improve patient care.

Oral Presentations

Saturday, October 4
1:50-2:15

Impact of Optical and Mechanical Properties in the Selection of Esthetic Milled Restorative Materials

Lyndon F. Cooper, DDS, PhD

The use of ceramic materials in esthetic dentistry has evolved with technology. One approach to creating single tooth restorations involves CAD CAM. A number of materials are available for laboratory milling of inlays, onlays, veneers and crowns. This lecture will explore the selection of materials and their use in daily practice. Fundamental to their successful application is an understanding of the optical properties of these materials and the related advantages and disadvantages the present. When selecting CAD CAM ceramic substrates for single tooth restorations, color selection must be integrated with knowledge of the bulk material properties. Clinical examples of single crown and veneer restorations as they are used as typical solutions in daily practice will be presented.

- Objectives
- Understand the importance of translucency of bulk materials in the management of color when using CAD CAM ceramic substrates for single tooth restorations.
 - Be able to select among different CAD CAM ceramic substrates when planning single tooth restorations on teeth and implants.
 - Appreciate the different approaches to characterization of single tooth restorations when using CAD CAM ceramic substrates.

Oral Presentations

Saturday, October 4
2:15-2:40

Successful appearance of single implant restorations: Novel biological and material considerations

Christian F.J. Stappert, DDS, MS, PhD

The evolution of implants has revolutionized our ability to restore patients. As we have become more sophisticated we look for systems that are aesthetic, follow proper tissue contour and preserve bone height. How can we create natural looking restorations of high durability and healthy soft tissue conditions similar to natural teeth? Biomechanical limitations and biological treatment concepts impact on the clinical long-term success of single implant rehabilitations. New CAD-CAM systems promise more predictable and reliable work-flow and customized implant restorations. How successful are recent treatment concepts, how reliable are restorative material choices and abutment designs for esthetic single implant restorations? What changed and what is here to stay? 'LESS is MORE'.

Objectives

- In comparison to the past - What changed and what is here to stay?
- Principles of aesthetic single implant rehabilitation with ceramic materials.
- Implant abutment choices, durability and interface concepts.
- Surgical timing and minimal invasive tissue management in aesthetic implant sites – the Periosteal Lock® technique.



Christian F.J. Stappert, DDS, MS, PhD

Dr. Christian Stappert is Professor and Director of Periodontal Prosthodontics at the University of Maryland School of Dentistry. He served several years as Director of Aesthetics and Periodontal Prosthodontics at the Department of Periodontology & Implant Dentistry associated with the Department of Biomaterials & Biomimetics at New York University College of Dentistry. He is Professor and former Director of postgraduate Prosthodontics at the Albert-Ludwigs University of Freiburg. Dr. Stappert is cross-trained in Prosthodontics and Periodontics as well as Implant Surgery and graduated 'Master of Science - Biomaterials and Biomimetics' at New York University. His research interests involve the reliability of dental materials and clinical restorations, as well as tissue management and the peri-implant interface. Dr. Stappert has published over 90 scientific papers, book chapters and peer reviewed publications. He is editorial board member and reviewer of numerous scientific dental journals, and active member inter alia at the IADR, AO, AAED as well as GNYAP.



Melanie Perbey, CDT

Melanie Perbey came to Vident, A VITA Company, in January 2014 after working as a Product Marketing Manager for VITA Germany since 2011. Melanie is a Certified Dental Technician trained in Berlin and also holds a diploma in business administration and marketing. Her unique skill set provides a deep knowledge and balanced approach to marketing and dental technology, giving her the ability to create solution based campaigns which meet the needs of the dental industry.

Lunch & Learn

Friday, Oct 3
12:00-1:00

Aesthetics for a Successful Smile

Melanie Perbey, CDT

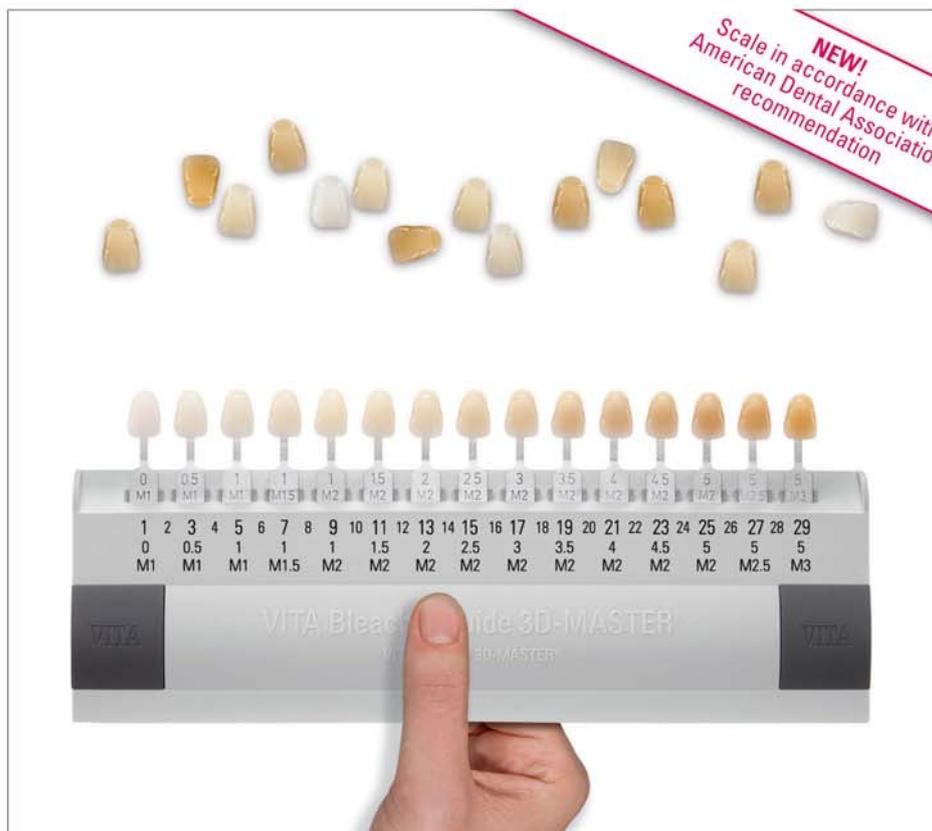
Denture teeth can be beautiful! While comfort and function are requirements for every denture, it is the excellent aesthetics that make for a truly successful prosthetics. The goal of every tooth manufacturer is to give back the patient their self-confidence and provide them with natural, functional prosthetics. This presentation will address the necessary features and function of the tooth as well as the importance of translucency. You will learn how natural and lifelike denture teeth can look in all conditions due to the unique manufacturing process of the teeth.

Objectives

- Learn the characteristics that make denture teeth aesthetic.
- Explore the importance of esthetics and function.
- Learn unique manufacturing processes that guarantee value for your patients.

At last: An easy way to track tooth whitening!

VITA Bleachedguide 3D-MASTER® – professional and easy.



VITA®

VITA shade, VITA made.

The VITA Bleachedguide 3D-MASTER is ideal for patient tooth whitening assessment and treatment planning. It's as simple as selecting the starting shade and measuring progress during the whitening regimen, whether bleaching is done in-office or at home. And once complete, the VITA Bleachedguide

is a handy tool to help measure and maintain patient whitening at the optimal level. In addition, the 29 shade levels used by the American Dental Association guidelines are integrated in the VITA Bleachedguide 3D-MASTER, assuring a structured, repeatable protocol for all of your patients.



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Poster Presentations

Abstract #1 • Applicant, SCAD VITA Award competition,
Young Faculty Category

Shade Matching Performance Using a New Light-correcting Device

C. Gáspárik¹, A.G. Grecu¹, B. Culic¹, M.E. Badea², D. Dudea¹

¹ Department of Prosthetic Dentistry and Dental Materials, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

² Department of Conservative Dentistry, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

Objectives: to evaluate the shade matching performance of dental students when using a new light-correcting device with polarization filter.

Methods: 21 novice dental students were asked to assess the shade of upper frontal teeth in one patient using VITA Classical and 3D Master shade guides. Shade matching was performed in a dental office under three illumination conditions: daylight (A), daylight and the light correcting device (SmileLite, Switzerland) (B), daylight and the light-correcting device with a polarization filter attached (C). All the original markings of the tabs were covered, so that neither the students, nor the patient knew the selected shades. Matching scores were calculated as a sum of the color differences between the correct shades and the selected shades ($\Sigma\Delta E$), lower scores meaning a better matching. Data was analyzed using ANOVA test ($\alpha=0.05$).

Results: a significant difference was found between the shade matching scores under the three illumination conditions ($p<0.001$). However, pairwise comparisons showed that between A ($\Sigma\Delta E_A = 873.6$) and C ($\Sigma\Delta E_C = 2019.2$) there was no significant difference ($p>0.05$). The lowest score was calculated for B ($\Sigma\Delta E_B = 1652.6$). When the matching scores were compared by the shade guide used, the VITA classical lead to the lowest scores, as compared to the 3D Master ($p<0.001$). Moreover, the differences between the scores for the cervical, middle, and incisal third of the frontal teeth were significant, highest scores being calculated for the incisal third ($p<0.01$).

Conclusions: within the limitations of this study, the dental students' shade matching ability was better when the new light-correcting device was used. The polarization filter is useful for a better visualization of the translucency areas, but did not improve the overall results of the color selection. The lack of training may explain the results when 3D Master shade guide was used.

Acknowledgments: This study was supported by Research Project PN-II-PT-PCCA-2011-3-2-1275.

Poster Presentations

Abstract #2 • **Applicant, SCAD VITA Award competition, Graduate Student Category**

Tailoring Tooth Shade Using Magnesium Ions

M-N. Abdallah¹, H. Eimar¹, D.C. Bassett², M. Schnabel¹, V. Nelea¹, M.D. Mckee Md¹, M. Cerruti³, J.E. Barralet¹, F. Tamimi¹

¹ Faculty of Dentistry McGill University, Montreal, QC, Canada

² Department of Physics, Norwegian University of Science and Technology (NTNU), Trondheim, Norway

³ Department of Mining and Materials Engineering, McGill University, Montreal, Canada

Tooth enamel is a mineralized tissue made almost entirely of apatite nanocrystals. Dimensions of these apatite crystals determine the physical properties of teeth. Teeth with small crystals are harder, more resistant to fracture and have a lighter shade than those made of larger crystals. Tooth enamel can undergo multiple ionic substitutions which affect its physical attributes, such as crystal size. Magnesium ions can influence the crystallographic structure of synthetic apatites. However, to the best of our knowledge, the effect of incorporating magnesium ions directly on teeth has not been investigated.

Objectives: This study was designed to assess the reactivity of magnesium ions with enamel apatite and its effect on the crystallographic and optical properties of teeth.

Methods: A sample of 120 sound anterior teeth was treated with either saturated solutions of magnesium ions or deionized-distilled water (as a control). We assessed the elemental and physical properties before and after each specific treatment. We assessed the elemental and crystallographic composition and the mechanical and optical properties before and after each specific treatment using the following techniques: scanning electron microscopy & energy dispersive spectroscopy (SEM-EDS), x-ray photoelectron spectroscopy (XPS), inductively coupled plasma-optical emission spectroscopy (ICP), x-ray diffraction (XRD), Raman spectroscopy, high-resolution transmission electron microscope (HRTEM), atomic force spectroscopy (AFM), surface area measurements, helium pycnometry, microcomputed tomography (μ CT), tooth shade measurements, and Vickers microhardness measurements.

Results: Here we show that magnesium ions reacted with tooth enamel and by doing so modified its crystallographic structure. Magnesium ions decreased significantly crystal size and crystallinity of enamel apatites ($p < 0.05$), while increasing the specific surface area of enamel ($p < 0.05$). This change in crystallographic structure affected the optical and mechanical properties of enamel making it whiter and harder ($p < 0.05$).

Conclusion: Crystallographic ultrastructure plays a key role in defining tooth shade, which can be tailored through ionic substitution.

Poster Presentations

Abstract #4 • Applicant, SCAD VITA Award competition,
Graduate Student Category

Effect of Veneer Shade on Opacity and Transmission

S. Khatib, R. Il Giordano, R. Pober

Boston University, Hemy M. Goldman School of Dental Medicine
Department of Restorative Materials and Biomaterials
Houseman Medical Research Center, USA

Objective: To examine opacity and direct transmission of different veneer shades using different spectrophotometers.

Materials and methods: In-Ceram YZ (Vita Zahnfabrik) blocks were used as a core material in this study, they were sectioned into 0.5mm thickness tiles and sintered in a YZ Zyrcomat furnace at 1530°C. 12 specimens were veneered with a combination of 1 mm of shade 1M1 Vita VM9 base dentin porcelain with 0.5 mm ENL Enamel Vita VM9 (Group 1), and 12 specimens were veneered with a combination of 1 mm shade A2 Vita VM9 base dentin porcelain with 0.5 mm ENL Enamel Vita VM9 (Group2). Porcelain was applied according to manufacturer's instructions; wash layer fired first, then 1mm base dentine fired at 910°C, and a final layer of enamel fired at 900°C in a Vita Vacumat 900 furnace. In all specimens In-Ceram YZ core layer was 0.5mm and veneer layer was 1.5 mm. All specimens were measured using Color i5 spectrophotometer and an EasyShade compact. Opacity or Contrast ratios (CR) were calculated from the luminous reflectance of the specimens on a black surface (R_o) compared to the luminous reflectance on a white surface (R_w), ($CR= R_o/R_w$). Direct transmission defined as "light going through a material unchanged" was measured using a Color i5 spectrophotometer only.

Statistical analysis: Two-way-analysis of variance was performed with Tukey's multiple-comparison test to analyze the data at $p \leq 0.05$ level.

Results: Two-way ANOVA test revealed significant differences between different veneer shades and for the two spectrophotometers. The mean opacity value of veneer shades, by spectrophotometer interaction, is not significant. Direct transmission showed no significant differences between different veneer shades.

Table 1. Opacity and Direct Transmission Values

| Group | Color I5 Spectrophotometer | | |
|---------|----------------------------|------------|---------------------|
| | Easyshade | CR Opacity | Direct Transmission |
| 1 (1M1) | 91.8900 | 87.6567 | 5.00 |
| 2 (A2) | 94.2267 | 90.4642 | 6.42 |

Conclusion: Veneer shade affects opacity significantly but not direct transmission.

Poster Presentations

Abstract #5 • Applicant, SCAD VITA Award competition,
Graduate Student Category

Long-Term Evaluation of Acrylic Resin Denture Teeth: Stability and Stainability

I.V. Marques¹, V.A.R. Barão¹, E.S. Ogawa¹, A. Moreno²,
W.G. Assunção³, M.F. Mesquita¹, C. Sukotjo⁴

¹ Department of Prosthodontics and Periodontology, Piracicaba Dental School, University of Campinas (UNICAMP), Piracicaba, Sao Paulo, Brazil

² Department of Pathology, Oral Surgery and Dentistry Clinical, Dental School, Federal University of Minas Gerais (UFMG) Belo Horizonte, Minas Gerais, Brazil

³ Department of Dental Materials and Prosthodontic, Araçatuba Dental School, Univ Estadual Paulista (UNESP), Araçatuba, Sao Paulo, Brazil

⁴ Assistant Professor, Department of Restorative Dentistry, University of Illinois at Chicago, College of Dentistry, USA

Objectives: This study evaluated the long-term clinical stability and stainability of acrylic resin denture teeth in complete denture wearers over a period of 5 years.

Methods: Fifty patients rehabilitated with complete dentures between 2008 and 2013 were selected. The demographic data and the clinical characteristics of patients were recorded. Color change (ΔE) was evaluated by spectrophotometry using the CIE $L^*a^*b^*$ system. Patients were asked whether they had noticed any changes in the coloring of the teeth in their dentures. The hierarchical clustering analysis was used to identify groups formed from variables related to demographic questions and color analysis. Two-way ANOVA ($\alpha=.05$) among the color cluster groups was performed and the Tukey-Kramer test was used as a post-hoc test.

Results: Four clusters groups from 50 participants were identified in the clustering analysis. The ΔE was statistically significant on the interaction between the three thirds of the tooth and cluster groups ($P<.001$). Cluster groups 1 and 4 exhibited statistically higher ΔE values than cluster groups 2 and 3 ($P<.05$). Greater chromatic alterations was noted in the incisal third of the teeth in comparison with the cervical and medium thirds in the cluster groups 1 ($\Delta E=11.03\pm 1.22$) and 3 ($\Delta E=4.14\pm 1.14$) ($P<.05$). There was no correlation between patients' personal opinions and color change ($P>.05$).

Conclusion: Although the acrylic resin denture teeth exhibited color instability in vivo, the patients had no discernment to identify the color change. The cluster groups with higher values color change presents consumption color solutions.

Acknowledgement: Supported by grant No. 12/14045-3 from the Sao Paulo State Research Foundation (FAPESP), Brazil.

Poster Presentations

Abstract #6 • Applicant, SCAD VITA Award competition,
Graduate Student Category

Reliability and Validity of the VITA Easyshade Advance

N. Uelker, C.H. Kuepper, A. Guentsch, H. Kuepper

Clinic of Prosthodontics, Center of Dentistry, Jena University

Objectives: The reproduction of patients own tooth color has a significant impact on the examination of restorative treatment procedures. With the intention to reduce sources of error compared to conventional visual methods, digital color determining devices such as VITA Easyshade Advance (V-EA) (Vita, Bad Säckingen, Germany) are strongly recognized. Aim of this *in-vivo*- and *in-vitro*-study was to verify the reliability and validity of the V-EA.

Methods and Material: In measuring $n=27$ manufactured dental ceramic blocks 10 times per sample with different tooth colors and producers (VITAblocks (Vita, Bad Säckingen, Germany) and IPS Empress (Ivoclar Vivadent, GmbH, Ellwangen, Germany)) an *in-vitro*-pool could be provided. An adjustment for the measurement mode was on „ceramic restoration“. The *in-vivo*-study included $n=15$ probands with healthy front-teeth (positive ethics vote and written consent was documented). Each measurement was repeated 6 times in the „basic shade“ mode on the central area of the tooth. Templates and splints ensured standardized measurements. Reliability was tested through Intraclass correlation coefficient (ICC) in both examined groups, and validity was tested as κ -coefficient after Cohen in the *in-vitro*-study. The determination of appropriate p-values supplemented the statistical evaluation for both quality criteria.

Results: Reliability of the *in-vivo*-study was determined with ICC-values within a range of 0.839-1.000. For *in-vitro*-measurement, the ICC-values were found to be 0.902-0.991. Both reliability findings were estimated as „excellent“. Each associated significant p-value was documented consistently at $p<0.001$. Captured through the Kappa-maximum-value ($\kappa= 1.000$), the *in-vitro*-validity-examination was determined to be „(almost) perfect“. Also, in this measurement quality area, the p-value was significant ($p<0.001$). The prefabricated tooth color had no influence on validity.

Conclusion: With precise measurements, the V-EA was found to be reliable in both study set-ups. Also, in the *in-vitro*-validity analysis, the V-EA reproduced the result which was given by the manufacturer.

Poster Presentations

Abstract #7 • **Applicant, SCAD VITA Award competition,
Pre Doctoral Student Category**

Implication of Color Dimensions on Tooth Shade Preferences

A. Al-khateeb, S. Del Monte, F. Tamimi

Faculty of Dentistry, McGill University, Montreal, Canada

Objective: Correct tooth shade selection is challenging in edentulous patients due to the absence of remaining teeth. Without this reference, shade selection becomes highly subjective. This study was conducted to determine the population's preference for tooth shade to ultimately help clinicians selecting the most appropriate one for their patients, taking into consideration observers and patients factors.

Method: We created a sexually neutral image of a smile framing the perioral area. Both skin and tooth color of the images were digitally modified to create a total of 54 combinations that included six skin tones and seven different tooth shades from the Vita Toothguide 3D-MASTER to evaluate the individual impact of each tooth color component separately [brightness (2M1, 3M1, 4M1), hue (3L1.5, 3M1, 3R1.5) and chroma (3M1, 3M2, 3M3)]. Fifty individuals completed a survey in which they rated the images according to their preference for these three tooth color parameters. Friedman's test was used to assess the effect of participants' demographics (gender, age, education, profession, and ethnicity) on perception of tooth color esthetic while linking their preferences to the skin tone of the images. An intra-examiner reliability test was carried out to ensure consistency of the survey's results.

Results: Analysis indicated that all three components of color have an impact on perception of tooth color esthetic. In fact, there are lightness, hue and chroma values that everyone prefers regardless of gender, age, education, profession, and ethnicity. Respondents' opinions were not influenced by skin tone variations of the images. The general consensus revealed that people prefer a lightness of high value, a hue that is more yellowish and a more saturated chroma ($p < 0.005$).

Conclusion: This study provides evidence that the public prefers specific tooth shades irrespective of both its demographic characteristics and skin tones of patients. The most preferred tooth shades are those with high value, yellowish hue and saturated chroma.

Poster Presentations

Abstract #8 • Applicant, SCAD VITA Award competition,
Pre Doctoral Student Category

Evidence-Based Esthetics of the Smile: a Systematic Review

S. Del Monte¹, E. Emami², V. Campanella³, F. Tamimi¹

¹ Predoctoral student, Faculty of Dentistry, McGill University, Montréal, Canada

² Department of Restorative Dentistry, Faculté de Médecine Dentaire, Université de Montréal, Montréal, Canada

³ Department of Dental Science, Faculty of Dentistry, University of Rome "Tor Vergata", Rome, Italy

Objectives: Management of esthetics in dental practice is mostly subjective and based on clinicians' perceptions. Although some studies have measured the characteristics of esthetic smiles by taking account of some dental parameters, an evidence-based definition of a beautiful smile cannot be found in the literature. Therefore, the aim of this practice-relevant review was to systematically search the literature to find out the best parameters that can be used by clinicians to define a beautiful smile.

Methods: We searched the literature (Medline, Embase, Web of Science and Cochrane database for systematic review) for three groups of keywords for terms associated with: "Esthetic", "Evaluation" and "Parameters" in order to identify survey studies that used digitally modified images to quantify the population's preferences on specific smile parameters.

Results: A title and abstract screening of a total of 6464 study reports, allowed to include 35 studies for systematic review according to inclusion criteria. From these reports, 24 quantitative parameters were extracted to define an esthetics smile and they are summarized in the following guidelines. Central incisors should have a width-to-length proportion of 75-85% and should be 135-200% wider and 1.0-1.8 mm more incisal than lateral incisors. The gingival margins of central incisors should not have discrepancies larger than 1.5-2.1 mm and should be 0.4-0.6 mm apical to the laterals gingival margins. While smiling the lip should not cover more than 4 mm of central incisors or display more than 4.5 mm of gingiva. The maxillary midline should not have a discrepancy of more than 2.9 mm with the facial midline and 3.6 mm with the mandibular midline, nor a diastema larger than 1.5-2.0 mm. The buccal corridors should not exceed 22% of the line connecting the commissures of the smile.

Conclusions: This systematic review suggests that a beautiful smile can be defined by objective and quantitative parameters that could be used as guidelines for evidence-based dental esthetic treatments.

Poster Presentations

Abstract #9 • **Applicant, SCAD VITA Award competition, Pre Doctoral Student Category**

Change in Light Transmittance During Photo-polymerization of Resin Composites Containing Different Photo-initiators

D.C.R.S. de Oliveira, M.A.C. Sinhoreti, J.L. Ferracane

Piracicaba Dental School - UNICAMP, Piracicaba, SP, Brazil
Oregon Health and Science University, Portland, OR, USA

Objective: To evaluate the change in light transmittance during photo-polymerization of resin composites containing different photo-initiators.

Methods: Nine experimental resin composites with the same resin blend/filler content and containing different photo-initiator systems (CQ+DMAEMA; CQ+EDAB; CQ+DMPOH; PPD; PPD+DMAEMA; PPD+EDAB; PPD+DMPOH; TPO or BAPO) were light-cured in 1 mm thick Delrin disks (6 mm diameter; $n = 3$) with the bottom surface placed over the sensor of a MARC Resin Calibrator (Blue Light Analytics) to measure irradiance. Two LEDs with different wavelength ranges (Radii, SDI, $\lambda=420-540$ nm and Bluephase G2, Ivoclar Vivadent: $\lambda=380-420$ nm and $420-540$ nm) were used with same irradiance (1300 mW/cm²) for 10 seconds; then specimens were re-irradiated for 10 seconds two more times. Data were analyzed by ANOVA/Tukey's test ($\alpha = 0.05$).

Results: Increases in irradiance during the initial 10 seconds of photo-curing varied significantly with photo-initiator: CQ (50-80%: $170-190$ mW/cm²) > PPD (8-30%: $30-130$ mW/cm²) > BAPO (7-20%: $40-100$ mW/cm²) \geq TPO (7-20%: $30-100$ mW/cm²). The greater change for CQ relates to its enhanced absorption compared to the other photo-initiators in $420-540$ nm range. Higher light transmittance increases during photo-curing were observed with the light emitting exclusively in the $420-540$ nm range, regardless of the photo-initiator. Additional changes in irradiance during subsequent exposures were observed (5-25%), likely related to further changes in the degree of conversion leading to an increase in the refractive index match between the resin and filler during curing. The kinetics of conversion will be evaluated to verify this.

Conclusion: Light transmittance increased during curing regardless of the photo-initiator system or the light-curing unit evaluated. Resin composites containing CQ showed higher light transmittance increases during photo-curing compared to the other photo-initiator systems evaluated, especially when a light employing the $420-540$ nm wavelength range exclusively was used for photo-activation.

Poster Presentations

Abstract #10

Color Differences between Different Shades within One Type of Resin-Composite Using Vita-Easyshade, Standard Spectrophotometer and Visual Assessment

R.M. Abdelraouf, N.A. Habib

Faculty of Oral and Dental Medicine, Cairo University, Egypt

Objectives: Vita-Easyshade spectrophotometer is a convenient color measuring device for dentists and researchers. Yet, it is not obvious whether it will coincide with a standard spectrophotometer and visual assessment in evaluating the color difference between different shades within one type of resin-composite.

Methods: Twenty-one discs (10mm x 1.5mm) were prepared from resin-composite (Filtek Z350 XT, 3M ESPE, USA). Seven different shades (A1, A2, A3, A3.5, A4, B1 and B2) were used (n=3/gp). Vita-Easyshade spectrophotometer (Vita Zahnfabrik, Germany) and a standard spectrophotometer (UV- Shimadzu 3101 PC-Spectrophotometer, Japan) were used to measure the color parameters of resin-composite specimens. Color difference (ΔE) were calculated between shade A1 and the other shades according to the following equation: $\Delta E = [(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]^{1/2}$. The previous color differences were arranged in ascending order for both spectrophotometers. For visual assessment, three normal color-vision dentists participated in the study. The observers were asked to arrange the resin-composite specimens of different shades in an ascending order compared to shade A1. Then, results of visual assessment were checked for agreement with the two spectrophotometers.

Results: Color differences (ΔE) between shade A1 and the other shades were shown in the following table:

| ΔE compared to shade <u>A1</u> | A1 | A2 | A3 | A3.5 | A4 | B1 | B2 |
|--|----|---------|----------|----------|--------|---------|----------|
| VitaEasy Shade spectrophotometer | – | 8.6±0.3 | 13.3±0.3 | 18.8±0.3 | 22±0.8 | 5.1±0.4 | 10.1±0.5 |
| Standard spectrophotometer | – | 5.6±0.5 | 5.3±0.3 | 11.5±0.9 | 14±0.2 | 2.7±0.2 | 8.6±0.3 |

For Vita-Easyshade spectrophotometer, color differences in ascending order: B1, A2, B2, A3, A3.5, and A4.

For standard spectrophotometer in ascending order: B1, A3, A2, B2, A3.5 and A4.

Visual assessments by the three observers were arranged in ascending order: B1, A2, B2, A3, A3.5, and A4.

Conclusions: Both types of spectrophotometers showed obvious color differences between the different resin-composite shades. Vita-Easyshade gave consistent color difference measurements with more systematic arrangement than the standard spectrophotometer. Visual assessment showed more agreement with the Vita-Easyshade.

Poster Presentations

Abstract #11

Comparison of Composite Shades with a Shade Guide after Aging**V.P. Ahid¹, L.M. Gonçalves², L.R. Schliebe¹, N. Fahl Jr.³, B.M.A.H. Silva¹**¹ Federal University of Maranhão, Brasil² Ceuma University, Brasil³ Fahl Center Institute, Brasil

Objectives: This study compared the different shades of a composite with the corresponding Vitapan Classical Shadetabs (VCST) after accelerated aging.

Methods: A nanohybrid composite enamel shades A1, A2, A3 and A3,5 were used to fabricate the specimens. Three specimens of each shade were fabricated using a silicone matrix obtained by the impression of VCST. Polymerization was conducted at cervical, medium and incisal thirds of specimen for 20 seconds, followed by finishing and polishing with Soflex discs and brush carbide. After, each specimen was measured using a digital caliper respecting the dimensions of VCST. For accelerated aging, specimens were stored in distilled water for 28 days at 37°C. After each 7 days, the color of specimens were assessed using a spectrophotometer EasyShade[®] in triplicate. The color difference between the VCST and the corresponding composite was calculated using the formula $\Delta E = [\sqrt{(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2}]$. Data were analyzed by repeated measures two-way ANOVA followed by Tukey's test ($p < 0.05$).

Results: A1 and A2 shades presented the higher values of ΔE ($p < 0.05$), with no differences between them ($p > 0.05$). There were no differences of ΔE for A3 and A3,5 shades ($p > 0.05$). ΔE values of all shades were significantly different from the corresponding VCS ($p < 0.05$). Overall, the accelerated aging process did not influence ΔE values of shades ($p > 0.05$).

Conclusion: It was concluded that there was a correspondence of color perception between similar chromas; however all chromas differed from VCS corresponding shade. This result suggests the importance of fabricating a personalized shade scale with the various chromas used in clinical practice.

Poster Presentations

Abstract #12

Aging and Staining Dependent Color Stability of Dental Cements

S.S. Bunek^a, B. Trifkovic^b, R. Yapp^a, J.M. Powers^a, R.D. Paravina²

^aDental Consultants, Inc., Ann Arbor, MI

^bThe University of Texas School of Dentistry at Houston, Houston, TX

Objective: to compare the color stability of four resin cements after artificial aging and staining in coffee.

Methods: The self-adhesive resin cements were: RelyX Unicem 2 Automix and Maxcem Elite. The adhesive resin cements tested were: RelyX Ultimate and NX3 Nexus Third Generation. The cements were a translucent shade. Disk-shaped specimens (10 mm diameter and 1 mm thick, n=10) were light polymerized against smooth Mylar sheets with glass backing on top and bottom. Specimens were immersed in water at 37°C for 24h to achieve optimal polymerization. Color was measured using a bench-top spectrophotometer at baseline (after 24 hours in distilled water) and after exposure to the following conditions: (a) accelerated aging - 150 kJ/m² and (b) coffee- specimens were placed in small receptacles (50 mL) containing coffee for 3 days. The coffee solution was replaced after each 24 hours of staining. Means and standard deviations were determined. Data were analyzed by analysis of variance. Fisher's PLSD multiple comparison intervals were calculated at the 0.05 level of significance.

Results: DeltaE* for the self-adhesive resin cements ranged from 1.7 to 20.1 for accelerated aging and from 12.4 to 24.0 for staining by coffee. DeltaE* for the adhesive resin cements ranged from 3.8 to 4.9 for accelerated aging and from 9.5 to 10.6 for staining by coffee.

Conclusions: Between the self-adhesive resin cements tested under accelerated aging conditions, RelyX Unicem 2 Automix was color stable, whereas Maxcem Elite had large changes in color, becoming darker and more yellow. Between the adhesive resin cements tested under accelerated aging conditions, RelyX Ultimate and NX3 Nexus Third Generation had color changes slightly above the 50:50% acceptability threshold. All four cements became darker and more yellow when stored in coffee. This research was supported in part by 3M ESPE.

Poster Presentations

Abstract #13

Aesthetic Crown Lengthening Using Erbium4YAG Laser Technology

V. Cambra, E. Lee

University of Pennsylvania

Department of Periodontics/Prosthodontics

USA

Objectives: The objective of this case report is to demonstrate the predictability in the use of the Erbium YAG laser for crown lengthening purposes, both hard and soft tissue.

Methods: A 44 year old AA female diagnosed with excessive gingival display and APE is Treatment planned for Aesthetic crown lengthening of the upper anterior teeth. Using the Erbium YAG laser and a HiKRes CBCT to locate the CEJ, a one stage approach crown lengthening of teeth #6 to 11 was performed.

Conclusion: With the use of HiKRes CBCT and the Erbium YAG laser, predictable and precise results can be accomplished in cases where Aesthetic Crown Lengthening is needed.



Poster Presentations

Abstract #14

Effect of Tooth Whitening on Enamel and Dentin Fluorescence

T.M.F. Canappele, E. Brescianim A.B. Borges, C.R.G. Torres

UNESP - Univ Estadual Paulista, Department of Restorative Dentistry, Brasil

Objectives: The aim of this study was to evaluate the effect of whitening on the fluorescence of inorganic components of enamel and dentin and organic component of dentin, individually. And also to evaluate the effect of whitening on the fluorescence and color of bovine enamel and dentin without components separation.

Methods: One hundred and twenty dentin discs and 80 enamel discs with 6mm of diameter and 1mm thick were obtained. Forty enamel and forty dentin specimens were deproteinated (NaOCl) and forty dentin specimens were demineralized (EDTA). In deproteinated and demineralized specimens only fluorescence was measured. In the remaining samples, color (Spectrophotometer) and direct fluorescence (Spectrofluorophotometer) were assessed. After color and fluorescence baseline measurements, half of the specimens were immersed in 35%Hydrogen Peroxide (HP) solution for 1 hour (experimental groups) and the remaining specimens were immersed in water. This procedure was repeated after 7 days. Color and fluorescence measurements were performed after second immersion. Data were submitted to analysis of variance test ANOVA ($p < 0.05$).

Results: For color analysis, the color difference (ΔE_{ab}) was 10.37 for dentin and 8.31 for enamel. For fluorescence analysis, dentin demineralization produced a significant decrease in fluorescence ($p < 0.001$). Whitening decreased the fluorescence of dentin on all experimental conditions.

Conclusions: Whitening decreased significantly the fluorescence of organic and inorganic components of dentin and inorganic components of enamel. When the specimens were analyzed without separation of the components, dentin specimens presented greater color change than enamel and the fluorescence was affected only in dentin specimens.

Poster Presentations

Abstract #15

Clinical Evaluation of Computer Software for Tooth Color Matching

**B. Culic¹, V. Prejmorean², C. Gasparik¹, C. Culic¹, C. Dragos²,
D. Ducea¹**

¹ Department of Prosthodontics, School of Dentistry, University of Medicine and Pharmacy "Iuliu Hatieganu", Cluj-Napoca, Romania

² Faculty of Mathematics and Computer Science, Babeş-Bolyai University of Cluj-Napoca, Romania

Objective: The aim of this study is the clinical testing of computer software developed for clinical tooth color matching, from routine clinical digital images.

Material and methods: 100 frontal teeth, from 50 patients were used in this study, and analyzed with Toodont v3.0 software. Digital images were taken using Nikon D600 Body, 100mm macro lenses, and R1C1 bilateral flash. In each image a customized jig containing a grey card (18%) and a shade tab were placed. After color calibration, manual area selection of the involved tooth was realized. Color analysis was performed and the results were expressed in CIE L*, a*, b* values on cervical, middle and incisal areas. Tooth color chart was also obtained.

Vita EasyShade spectrophotometer (Vita, Germany) was used to obtain CIE L*, a*, b*, values from the same teeth in the cervical, middle and incisal area. Shade Vision colorimeter (X-Rite, USA) was used in order to obtain tooth color chart.

The results obtain from the digital images were compared with the data obtained from the spectrophotometer and colorimeter.

Results: Delta E was calculated using L, a, b values obtained from the images and spectrophotometer, for the same tooth, in the cervical, incisal and middle areas. ΔE below the 2.7 reference value, was obtained 95.5, 92.34 and 81.1% in middle, cervical and incisal areas respectively. A very strong correlations was obtained, Spearman's rank correlation = 0.923 ($p < 0.001$) when applied between the results expressed in 3D master shades obtained from program color chart, when compared with Shade Vision results.

Conclusions: The program is much easier to use in compare with the previous versions. Accurate results in color selection, were obtained, when compared to Vita EasyShade spectrophotometer and Shade Vision colorimeter.

The program can be used as a powerful and reliable tool for clinical color selection.

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Poster Presentations

Abstract #16

Color Range and Color Distribution of Human Gingiva: a Prospective Clinical Study

M.S. Eldiwany¹, L.J. Herrera², D.T. Ho¹, R. Ghinea², M.M. Perez², N. Angelov¹, R.D. Paravina¹

¹ University of Texas, School of Dentistry, Houston, USA

² University of Granada, Spain

Objectives: To evaluate color range and color distribution of human gingiva in a prospective clinical study.

Methods: A total of 239 subjects were organized into 10 groups as follows: four age groups [18-30 years old (1); 31-45 (2); 46-60 (3); and 61 and up (4)], 2 groups based on gender (F, M), and 4 groups based on ethnicity [(African American (AA); Asian (AS); Caucasian (CO); and Hispanic (HP)], were recruited. All subjects were 18 or older and had healthy gingiva above the upper central incisors. Spectral reflection of the attached gingiva 2-3 mm apical to the crest of marginal gingiva was measured using a spectroradiometer and the CIE recommended 45°/0° illumination/measuring geometry. CIE L*a*b* values were calculated according to the CIE 1931 2° Standard Observer and CIE D65 Illuminant. Anonymized data were analyzed. Means and standard deviations were calculated. Kruskal-Wallis test was used to compare L*a*b* values at $\alpha = 0.05$. Correlation coefficients (R-values) between pairs of color coordinates were calculated.

Results: CIE L*a*b* color coordinate ranges with means and standard deviations (SD) for subjects in for each of 10 groups and all subjects together, are presented in the table.

| Group | Color coordinates | | | | | |
|-------|-------------------|------------|-----------|------------|-----------|------------|
| | L* | | a* | | b* | |
| | Range | Mean (SD) | Range | Mean (SD) | Range | Mean (SD) |
| 1 | 39.6-63.2 | 51.2 (5.2) | 13.4-31.7 | 24.2 (3.4) | 10.5-22.2 | 15.2 (2.0) |
| 2 | 37.2-62.2 | 53.4 (5.2) | 13.6-29.9 | 23.5 (3.2) | 9.2-18.9 | 14.8 (1.8) |
| 3 | 41.6-64.0 | 54.3 (4.8) | 13.8-31.6 | 22.3 (3.6) | 9.3-19.7 | 14.8 (2.1) |
| 4 | 44.2-62.6 | 54.4 (4.2) | 17.9-29.0 | 22.1 (2.7) | 11.0-18.6 | 14.1 (2.0) |
| F | 37.2-64.0 | 53.0 (5.3) | 13.4-29.9 | 22.9 (3.4) | 9.2-20.0 | 15.2 (2.0) |
| M | 38.5-63.2 | 52.8 (5.0) | 13.8-31.7 | 23.9 (3.2) | 10.7-22.2 | 14.4 (1.9) |
| AA | 37.2-61.7 | 50.6 (6.2) | 13.4-27.2 | 20.4 (3.3) | 9.2-17.5 | 14.3 (2.0) |
| AS | 38.5-62.8 | 50.8 (5.5) | 17.9-30.0 | 24.8 (3.1) | 10.7-22.2 | 15.7 (2.1) |
| CO | 43.2-64.0 | 54.7 (3.9) | 13.8-29.0 | 23.3 (2.9) | 11.0-19.7 | 14.4 (1.8) |
| HP | 43.8-63.2 | 53.8 (4.4) | 18.4-31.7 | 24.1 (3.1) | 11.3-19.2 | 15.1 (1.7) |
| All | 37.2-64.0 | 52.9 (5.2) | 13.4-31.7 | 23.3 (3.4) | 9.2-22.2 | 14.9 (2.0) |

Lightness range (ΔL^*) for all subjects was 26.8 units. Corresponding a* and b* ranges (Δa^* and Δb^*) were 18.3 and 13.0 units, respectively. P-values for the Kruskal-Wallis test were as follows: age – L*=0.02, a*=0.001; b*=0.02; gender – L*=0.58, a*=0.05, b*=0.00; and ethnicity – L*=0.00, a*=0.00, b*=0.00. R-values between color coordinates were 0.07 (L*/a*), 0.18 (L*/b*), and 0.35 (a*/b*).

Conclusions: Significant differences were recorded among different color coordinates, compared by age, gender and ethnicity. A very weak correlation was recorded between pair of color coordinates. Creating a database on color ranges and distribution of human gingiva presents the first step in developing of models of gingival shade guide.

Poster Presentations

Abstract #17

Surface Roughness of CAD/CAM Ceramics**GN Frey, JC Ontiveros, R Yapp, JM Powers, RD Paravina**

Institute of Medical Sciences, Tzu Chi University, Hualien City, Taiwan

Purpose: To measure the surface roughness (Ra, μm) of CAD/CAM ceramics.**Methods:** Zirconia [BruxZir(BZ), Lava Plus(LP), Nacera Pearl(NP), NexxZr-T(NT), Zenostar Zr(ZZ), NexxZr Smile(NS)]; resin ceramics [CeraSmart(CS), Lava Ultimate(LU)]; and lithium disilicate [IPS e.max CAD(EC)] were tested. Specimens (n=5) were square (12 × 12 mm) with a thickness of 1.0 mm ± 0.05 mm (parallel faces). Each material was sintered using the heating and cooling profile recommended by the manufacturer. Before polishing, each specimen was sandblasted for 20 seconds over the entire surface with a sandblaster with a silica-modified aluminum oxide at an air pressure from 0.55-0.70 MPa. Specimens were polished using Dialite ZR/LD kits (P1) and Luster Zirconia/e.max kits (P2) with a lab motor and electrical hand piece at 12-15,000 rpm with medium hand pressure. Measurements (Ra) were obtained using a surface profilometer (Digiprofilo I). Means and standard deviations were determined. Data were analyzed by ANOVA and Fisher's PLSD test at the 0.05 level of significance.**Results:** Ra values (μm) are listed.

| Material | Code | P1 | P2 |
|--------------------|------|--------------------------|--------------------------|
| Zirconia | BZ | 0.11(0.03) ^{af} | 0.13(0.04) ^{ag} |
| | LP | 0.12(0.02) ^{bf} | 0.13(0.02) ^{bg} |
| | ZZ | 0.13(0.04) ^f | 0.10(0.01) ^g |
| | NP | 0.13(0.02) ^{cf} | 0.15(0.04) ^{cg} |
| | NT | 0.13(0.04) ^{df} | 0.15(0.02) ^{dg} |
| | NS | 0.15(0.02) ^{ef} | 0.14(0.02) ^{eg} |
| Resin Ceramic | CS | 0.46(0.09) | 0.35(0.11) ^h |
| | LU | 0.39(0.12) | 0.34(0.07) ^h |
| Lithium Disilicate | EC | 0.28(0.08) | 0.37(0.05) ^h |

*Means with standard deviations in parentheses. Fisher's PLSD intervals at the 0.05 level of significance for comparisons of means between polishers and among products were 0.02 and 0.05 μm , respectively. Means with the same superscripted letters are statistically the same.

Conclusions: Surface roughness produced by P1 and P2 among zirconia products was similar. P2 produced smoother surfaces for the resin ceramics than P1 but a rougher surface for the lithium disilicate. Polished zirconia specimens were smoother than the resin ceramics and the lithium disilicate.

Acknowledgement: Financial support and/or materials proved by Brasseler USA, Doceram, GC America, Glidewell Laboratories, Ivoclar Vivadent, Meisinger, and Sagemax.

Poster Presentations

Abstract #18

Color measurements and shade matching with a mobile device

R. Ghinea^{1,2}, O.E. Pecho³, A.M. Ionescu¹, J.C. Cardona¹, R. Pulgar¹, M.M. Perez^{1,2}, L.J. Herrera¹

¹ University of Granada, Spain

² University of Texas, School of Dentistry, Houston, USA

³ Dental School, University of Passo Fundo, Brazil

Objectives: The aim of this study was to perform accurate color measurements and to test dental shade matching capabilities of a mobile device.

Methods: Spectral reflectance of 49 tooth-shaped dental composite samples and all 16 tabs from a dental shadeguide (VC - VITA Classical, Vita Zahnfabrik, Germany) was measured using a spectroradiometer (SR - PR 704, Color Research, USA), a viewing booth (CAC D60, VeriVide, UK), the D65 illuminant and the d/0° geometry. Color coordinates CIE L*a*b* were calculated according to the D65 illuminant and the CIE 2° Standard Observer. Subsequently, color of all samples inside the viewing booth and under the same experimental conditions was registered using a mobile device (iP5 - iPhone 5, Apple Inc., USA) and a custom built software (Everyware Technologies S.L., Spain) (Figure 1). A polynomial optimization of the CIE L*a*b* coordinates of the dental composites samples as measured by iP5 was performed based on the color of the 16 shades of VC. Optimized color coordinates were then used to shade match the tooth-shaped dental composite samples according to observations performed by a panel of 10 experienced observers under the same experimental conditions explained above.

Results: After the optimization, the average color differences between the CIE L*a*b* values measured with iP5 and SR among all 49 samples were $\Delta E^*_{ab}=2.76$ units and $\Delta E^*_{00}=2.22$ units, both smaller than the corresponding acceptability threshold for dental materials. In terms of shade matching, after performing the optimization, iP5 was able to correctly color match in 51% of all cases (25 of 49 dental composite samples).

Conclusions: By jointly using the mobile device and the custom built software (app), we were able to measure color coordinates of 49 dental composite samples within acceptability limits, when compared with spectroradiometric measurements. For shade matching, although the results were promising, the algorithm requires improvements before considering further clinical use.

Acknowledgement: This study was supported by Granada International Campus of Excellence CEI-BioTic-2013-P94 grant and Andalusian Ministry of Economy, Innovation and Science TIC 2082 grant.



Figure 1. a.) Image of the experimental set-up used for color measurements with the mobile device; b-d.) Screenshots of the software application during different stages of image capturing and processing.

Poster Presentations

Abstract #19

Development of a Customized Whiteness Index for Dentistry Based on CIELAB Color Space

L.J. Herrera¹, M.J. Rivas¹, A. Yebra¹, A.M. Ionescu¹, R. Ghinea^{1,2}, R.D. Paravina², M.M. Perez^{1,2}

¹University of Granada, Spain

²University of Texas, School of Dentistry, Houston, USA

Objectives: To develop a customized whiteness index (WI_D) that correlates to perception of tooth whiteness, based in CIELAB color space.

Methods: A total of 50 observers were asked to rank 29 porcelain shade tabs of the VITA Toothguide 3D-MASTER in order of perceived whiteness. Specimens were measured inside of a color-assessment cabinet (CAC 60, Verivide Limited). Illuminating/measuring configuration was CIE d/0°. A D65 CIE illuminant and the CIE 1931 Standard Colorimetric Observer were used to calculate color CIELAB coordinates. The ordinal-scale rank data were then converted into interval-scale z scores; the higher the value of the z score, the greater the perceived whiteness. The Pearson correlation coefficient and the average percent of wrong decisions (%error) for observers were computed as a measure of goodness of the model: $WI_D = P a^* + Q b^* + R L^*$, where P, Q, and R are the optimized coefficients of the index. The model was compared with previous indices based on this color space (W_{Lab} , T_{Lab} , W^*) and validated throughout other psychophysical experiments.

$$W_{Lab} = 2.41L^* - 4.45b^*[1 - 0.0090(L^* - 96)] - 141.4$$

$$T_{Lab} = -1.58a^* - 0.38b^*$$

$$W^* = [(L^* - 100)^2 + (a^*)^2 + (b^*)^2]^{1/2}$$

Results: The optimized whiteness index for dentistry ($r^2=0.977$, %error=5.27) is shown in the next equation:

$$WI_D = 0.5861 L^* - 2.3482 a^* - 1.2008 b^*$$

The comparison between the determination coefficients and % wrong decisions of indexes over the validation group are shown in Table 1.

| | WI_D | W_{Lab} | T_{Lab} | W^* |
|---------|--------------|-----------|-----------|-------|
| R^2 | 0.957 | 0.930 | 0.909 | 0.912 |
| % error | 5.67 | 6.43 | 9.90 | 10.10 |

Conclusions: A newly-proposed CIELAB based whiteness index (WI_D) for dentistry outperformed previous indices. This new index can be very useful due to the wide use of CIELAB both in research and clinical practice.

Acknowledgements: This study was partially supported by JA TEP-1136 grant from the Andalusian Ministry of Economy, Science and Innovation.

Poster Presentations

Abstract #20

Comparison of the bleaching efficacy between VOCO Perfect Bleach 16%® and Perfect Bleach Office+®

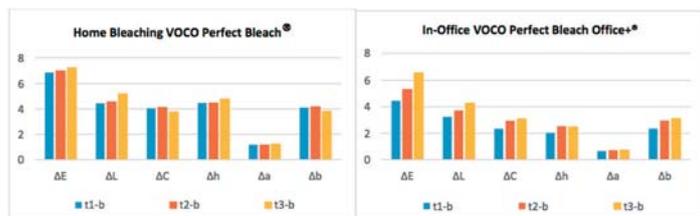
C. Igiel, M. Bayadse, A. Herzog, M. Weyrauch,
H. Scheller, K-M. Lehmann

University Medical Center of Johannes Gutenberg-University Mainz,
Department of Prosthetic Dentistry, Mainz, Germany

Objectives: Tooth whitening has become one of the most demanded dental procedures in the past decades. Therefore many choices for tooth whitening are available, these include home-based products as well as in-office based systems. The aim of this study was to analyze the efficacy of two different external tooth-whitening agents of VOCO (VOCO GmbH, Cuxhaven, Germany).

Methods: After positive approval of the IRB, 50 patients were randomly divided into two groups. The inclusion criteria were: no restorations, fillings, increased tooth sensitivity or internal/external tooth structure anomalies. Initially every participant receives a professional tooth cleaning. 25 Patients were bleached in-office with Perfect Bleach Office+®, according to the guidelines of the manufacturer every patient was bleached once for 15 minutes with 35% hydrogen peroxide. The other 25 Patients were bleached at home using Perfect Bleach 16%® for 7 days and 2 hours a day after individual instruction. The tooth color was measured 4 times with a spectrophotometric device (VITA easshade advanced, VITA Zahnfabrik, Bad Säckingen, Germany); before Bleaching (b), after Bleaching (t1), after two weeks (t2) and after four weeks (t3). The color differences, as well as the difference of the color coordinates (ΔE , ΔL , ΔC , Δh , Δa , Δb) were calculated. Additionally changes in VITA classic shade groups were recorded.

Results:



Conclusions: The results of In-Office and At-Home bleaching methods investigated show continuous whitening of the teeth during the observation period. Hereby, 54% of the Perfect Bleach Office+® patients change into brighter VITA classic parameter, respectively 45% of the Perfect Bleach 16%® group. Patient without changes in VITA classical parameter already have A1 or B1 colors in 43% (Perfect Bleach Office+®) and 50% (Perfect Bleach 16%®) of the cases.

Poster Presentations

Abstract #21

Does the Shape of the Tabs Influence Shade Matching?

A. Irimie, C. Gasparik, A. Grecu, A. Burde, B. Culic, D. Dudea

Department of Dental Propaedeutics, 'Iuliu Hatieganu'
University of Medicine and Pharmacy, Cluj-Napoca, Romania

Among the factors that influence the accuracy of the color selection are the shade guides' shortcomings: their inconsistency to uniformly cover the dental color space, as well as the material, thickness and shape of the tabs that lack to mimic adequately both the teeth, and the restoration's properties.

Objective: To assess the influence of the shape of the samples, as well as of the subjects' gender and color competency discrimination on the accuracy in color matching.

Methods: Twenty participants with average and superior color discrimination (ISO TR 28642:2011) were asked to match pairs of differently colored artificial ceramic right maxillary teeth : incisors (I), canines (C) (Vita Lumin® Vacuum, 185) and first molars (M) (Vita® Lumin Vacuum, Cuspiform, 44C), as follows : I-I, I-C, I-M, C-C, M-M. Each group was made of 10 samples: A1-A3.5, B2, B3, C1,C2, D2, D3; two similar groups were available for each type of teeth. The artificial teeth were previously verified with a dental spectrophotometer (VitaEasyshade®). The color matching was performed in a viewing booth (JUST LED Color Viewing Light, JUST Normlicht, Weilheim/Teck, Germany), at a distance of 30 cm, using 0°/45° optical geometry, D65 light source, on neutral gray). The results were statistically analyzed (Mann-Whitney U test, $\alpha=0.05$)

Results: The matching scores were: I-I: 94%; C-C:83%; M-M 83,5%; I-C: 41%; I-M 36.5%. Statistically significant differences were obtained between I-I vs. I-C, I-I vs. I-M, C-C vs. I-C, M-M vs. I-M, ($p<0.0.5$). The gender or the color competency of the participants did not influence the results.

Conclusion: Under the limitations of this study (differences between ceramic teeth belonging to the same kit) the shape of the samples did influence the results of the color matching. Further studies, with more homogenous colored samples, will give additional information about the benefit of shade tabs with different configurations.

Poster Presentations

Abstract #22

Translucency of CAD/CAM Ceramics

S.S. Bunek¹, A. Baumann¹, R. Yapp¹, R.D. Paravina², J.M. Powers¹

¹Dental Consultants, Inc., Ann Arbor, MI

²The University of Texas School of Dentistry at Houston, TX, USA

Objective: To measure the translucency parameter (TP) of CAD/CAM ceramics.

Methods: Four unshaded zirconia ceramics (BruxZir, Lava Plus, NexxZr T, Zenostar Zr) were tested. The specimens (n=5) were square (12mm x 12mm ± 0.5mm) with thicknesses of 0.5 and 1.0mm ± 0.05mm. The specimens were cut to approximate length and width dimensions using 1.5-inch diamond-cutting wheel. They were then sliced to a thickness 0.2mm greater than required using a diamond saw. Based on previously determined shrinkage factors, the specimens were ground with 600-grit SiC paper to the thickness needed to attain final sintered dimensions. Each material was sintered using the heating and cooling profile recommended by the manufacturer. Color measurements were performed using a spectrophotometer. The translucency parameter (TP) was calculated as the difference in L*a*b* readings of specimens recorded against white and black backgrounds in reflectance mode. The differences between the reflection values against the two backgrounds were calculated at every 10 nm within the 360-750 nm range. Means and standard deviations were determined. The data were analyzed by analysis of variance. Fisher's PLSD multiple comparison test was calculated at the 0.05 level of significance.

Results: Specimens of the zirconia products were more translucent at 0.5 mm thickness than at 1.0 mm thickness. At the 0.5 mm thickness, the translucency parameter ranged from 10.3 to 10.7, and BruxZir was significantly more translucent than the other three products. At the 1.0 mm thickness, the translucency parameter ranged from 7.1 to 7.8, and BruxZir was significantly more translucent than Zenostar Zr and Lava Plus.

Conclusions: Translucency parameter was a function of wavelength when measured between 360-750 nm in reflection. This research was supported in part by Glidewell Laboratories.

Poster Presentations

Abstract #23

Differences in Color Perception of Various Composites with Shade Guide

B.M.A.H. Silva¹, L.R. Schliebe¹, V. P. Ahid¹, L. M. Gonçalves², N. Fahl Jr.³

¹ Federal University of Maranhão, Brasil

² Ceuma University, Brasil

³ Fahl Center Institute, Brasil

Objectives: This study compared the final shade of different composites with the corresponding Vitapan Classical shade (VCS) after accelerated aging.

Methods: Five composites enamel shade A2 were used: Opallis[®], Natural Shade[®], Empress direct[®], Filtek Z250[®], Filtek Z350XT[®]. Three specimens were fabricated using a silicone matrix obtained by the impression of VCS. Polymerization was conducted at cervical, medium and incisal thirds of specimen for 20 seconds, followed by finishing and polishing with Soflex discs and brush carbide. After, each specimen was measured using a digital caliper respecting the dimensions of VCS. For accelerated aging, specimens were stored in distilled water for 28 days at 37°C. After each 7 days, the color of specimens were assessed using a spectrophotometer EasyShade[®] in triplicate. The color difference between the VCS and the corresponding composite was calculated using the formula $\Delta E = [\sqrt{(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2}]$. Data were analyzed by repeated measures two-way ANOVA followed by Tukey's test ($p < 0.05$).

Results: Natural Shade[®], Empress direct[®] and Filtek Z350XT[®] presented the higher values of ΔE ($p < 0.05$), with no differences between them ($p > 0.05$). Also, there were no differences of ΔE for Opallis and Filtek Z250XT[®] ($p > 0.05$). ΔE values of all composites were significantly different from the corresponding VCS ($p < 0.05$). For all composites investigated, the accelerated aging process did not influence ΔE values ($p > 0.05$).

Conclusion: It was concluded that the color perception of investigated composites did not correspond with VCS, and that the aging did not influence the color measures. This result suggests the importance of fabricate a personalized shade scale for each composite used in clinical practice.

Poster Presentations

Abstract #24

The Color and Translucency of Monolithic Zirconia

S-H. Kim, H-K. Kim, J-B. Lee

Department of Prosthodontics, Seoul National University Dental Hospital, Seoul, Republic of Korea

Objectives: This study was designed to evaluate the effect of the amount of thickness reduction on the color and translucency of monolithic zirconia.

Methods: One-hundred sixty-five monolithic zirconia specimens (16.3 mm × 16.3 mm × 2.0mm) were fabricated and divided into 5 groups according to the number of A2-coloring liquid applications (Group I to V). Each group was divided into 11 subgroups according to the amount of thickness reduction in 0.1-mm increments until final thickness was 1.0 mm (Subgroup 0 to 10, n=3). Color and spectral distribution of five different areas of each specimen were measured according to CIELAB color space relative to the standard illuminant D65 on a reflection spectrophotometer. Color difference (ΔE^*ab) and translucency parameter (TP) were calculated. Data were analyzed using one-way ANOVA followed by multiple comparison Scheffé's test, Pearson correlations and linear regression analysis ($\alpha=0.05$).

Results: There were significant differences in CIE L* values between Subgroup 0 and other subgroups in all groups. As the amount of thickness reduction increased, CIE a* values increased in all groups ($0.52 < R^2 < 0.73$), while CIE b* values decreased in all groups ($0.00 < R^2 < 0.74$). Perceptible color differences ($\Delta E^*ab > 3.7$) were obtained between Subgroup 0 and other subgroups. TP values generally increased as the amount of thickness reduction increased in all groups ($R^2 > 0.89$, $P < 0.001$).

Conclusions: Increased thickness reduction reduces lightness and increases the reddish and bluish appearance, and translucency of monolithic zirconia.

Poster Presentations

Abstract #25

Evaluation of Eye Movement on an Esthetic Smile Analysis using an Eye Tracking System**M. Weyhrauch, K.M. Lehmann, G. Docken, C. Igiel, C. Erbe, H. Scheller**

University Medical Center of Johannes Gutenberg-University Mainz, Department of Prosthetic Dentistry, Mainz, Germany

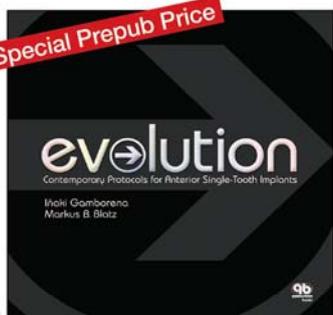
Objectives: The perfect smile is one of the most important aspects in patient's contentment. Therefore esthetic tooth-position is a more decisive factor for the white esthetics and the regular progression of the gingival the factor for the pink esthetics. The aim of this study was to evaluate, how different groups of observers (layperson, dental student, dentist) analysis a picture of upper incisors with various configurations and esthetic degradation.

Methods: Twenty pictures of upper anterior teeth would be prepared in Photoshop, that every picture showed the same size and cleavage of the mouth. The pictures were populate into the software Nyan 2.0^{XT}. They showed different prosthetic and restorative restorations and natural teeth without any restorations. The Observer sat in a determinate distance towards the monitor and prior the tests has been calibrated. The eye tracking system calibrated the right position of the iris in the x-axis and the y-axis. After calibration the pictures were shown the observer. Each picture appeared for 10 seconds. Next the observer has to assess the esthetic appearance of the front teeth on a visual analog scale from 0 to 10, whereby 0 is a deficient esthetic and 10 a high esthetic score. There were three groups of observers divided into dentists, dental students and laypersons. Also the sex and the age were differentiated. The Nyan 2.0^{XT} software illustrated after the test where the observer looked at and how long. Furthermore the software registered the path of the eye movement during the ten seconds. Every Picture was systematically dissected in an esthetic smile analysis. The pictures with deficient esthetics like black triangle, diastema, gingival recession, insufficient denture or restoration were specially marked.

Results: It could be assumed that 80% of the laypersons, 83% of the dental students and 85% of the dentists fixes on the esthetic loss first. In this case women recognized the esthetic loses in 88% and men in 64%. The red esthetic loses were more often detected (47%), than white esthetic loses (23%).

Conclusion: There are differences in the assessment of esthetic analysis demand on the esthetic loses (red & white esthetics) and the status of the observer (layperson, dental student, dentist).

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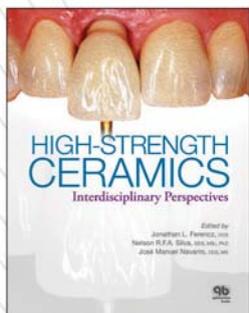


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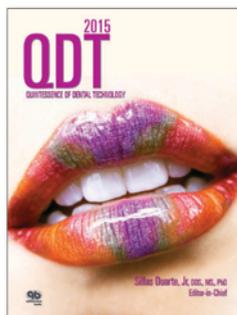
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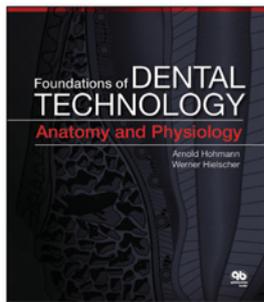


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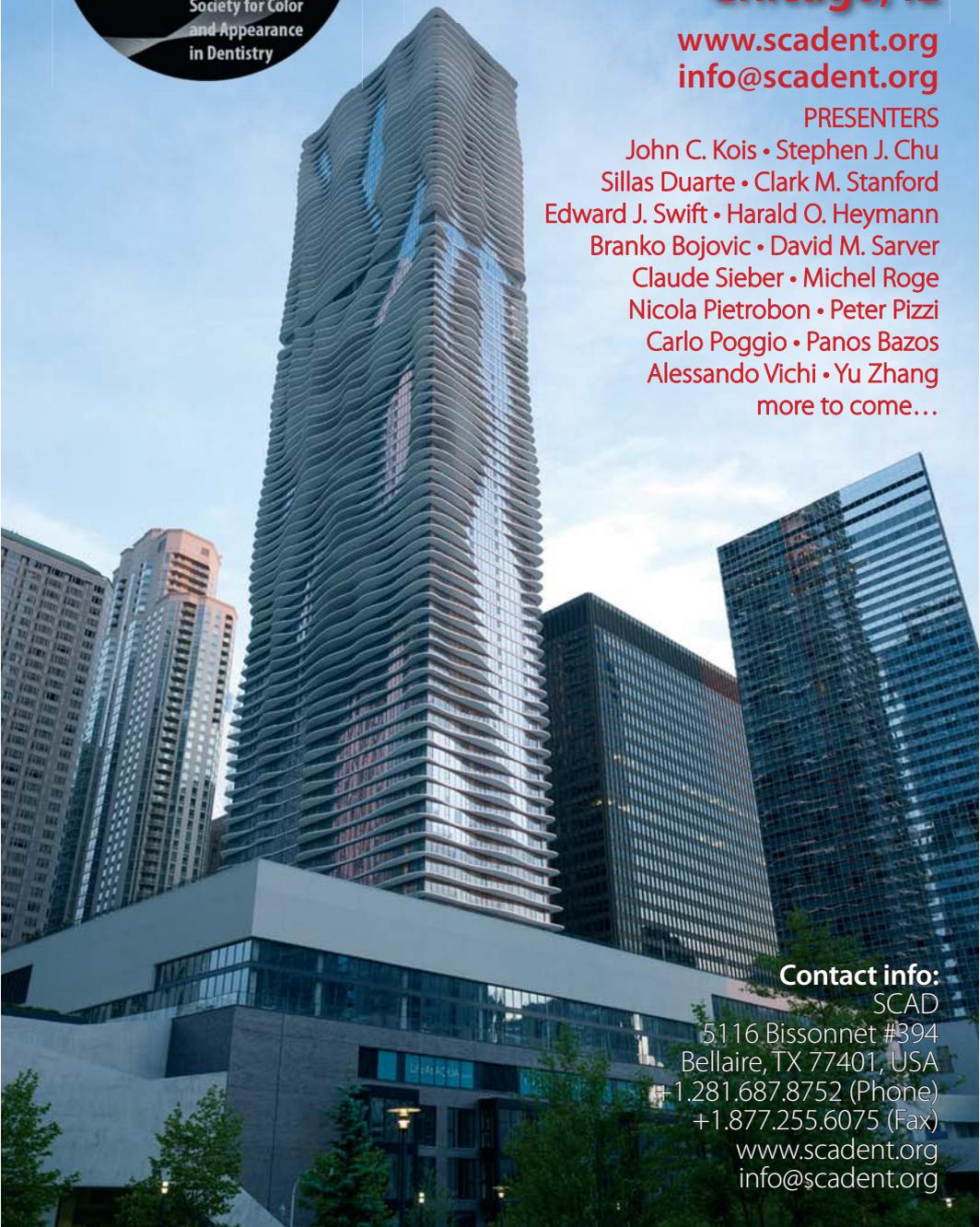
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