Color and Appearance for Lasting and Functional Beauty

7th Annual Conference of the Society for Color and Appearance in Dentistry (SCAD)

September 24-26, 2015
Radisson Blu Aqua Hotel, Chicago
www.scadent.org • info@scadent.org

clinical relevance for researchers & scientific relevance for clinicians

SCAD

Society for Color and Appearance in Dentistry

Color and Appearance for Lasting and Functional Beauty

7th Annual Conference • Radisson Blu Aqua Hotel, Chicago, September 24-26, 2015

Table of Contents

Recommended Attire

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

The formal continuing education programs of VITA North America are accepted by AGD and ADA CERP for Fellowship/Membership credit. The current term of acceptance extends from 7/1/2013 to 7/1/2017. This activity is designated for 16 continuing education credits.

ADA C·E·R·P® | Continuing Education Recognition Program

Academy of General Dentistry

The 7th 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 7th Annual Conference at the Radisson Blu Aqua Hotel in Chicago, IL.

As in previous years, our 2015 Annual Meeting features a full program of high-quality, evidence-based information on color-related and appearance topics in dentistry, presented by outstanding national and international leaders in their fields. Detailed information about the presenters and their topics, including educational objectives, is provided in this brochure. The program will provide up to 16 CE credit hours.

Besides the frontal presentations our poster session will be an additional valuable source of evidence-based information. For our annual competitions we will announce the 2015 recipients of SCAD-VITA Award for Excellence in Research Related to Color and Appearance in Esthetic Dentistry (open to pre-doctoral students, graduate students, and junior faculty), and the 2015 recipients of the Larsen-Chu Award for Excellence in Dental Technology.

We are delighted to have you at our 2015 SCAD meeting and wish you a pleasant and fulfilling educational and social experience. Welcome to SCAD 2015!

Dan Nathanson, DMD, MSD
President, SCAD

Program

Thursday, September 24, 2015

2:00pm-8:30pm	*Registration Open*
6:00-8:00pm	*Opening reception*

Friday, September 25, 2015

7:00am-4:00pm	*Registration*
7:00-8:00	*Continental Breakfast*
8:00-8:15	Opening ceremony
8:15-9:00	Stephen J. Chu: *Prosthetic Strategies for Achieving and Sustaining Ideal Soft Tissue Aesthetics Around Single Tooth Implants in the Esthetic Zone*
9:00-9:30	Sillas Duarte, Jr.: *Optical Properties and Esthetic Considerations for CAD/CAM Restorations*
9:30-10:00	David M. Sarver: *The Complete Esthetic Analysis-Macro-Mini-and Microesthetics*
10:00-10:30	*Q/A, Break, Larsen-Chu Award Case Viewing/Grading*
10:30-11:00	Harald O. Heymann: *Abfractions: Reality or Myth?*
11:00-11:30	Claude Sieber: *The Art of Seeing the Invisible*
11:30-12:00	Nicola Pietrobon: *Color and Material Selection an Inter-Disciplinary Approach Between Dentist and Technician*
12:00-1:00	*Q/A Lunch, Lunch & Learn –* Joe C. Ontiveros: *Basics of Color and Clinical Color Matching: An Update*
1:00-1:30	Peter Pizzi: *Nature's Influence on the Optical Properties of Todays Materials*
1:30-2:00	Alessando Vichi: *Scientific Facts for Clinical Selection of CAD/CAM Materials*
2:00-2:30	Michel Roge: *Realism, the Essence of Dental Esthetics*
2:30-3:00	*Q/A, Break Larsen-Chu Award Case Viewing/ Grading, Poster viewing*

3:00-3:45 Mauro Fradeani: *A Modern Approach to Esthetic Rehabilitation*

3:45-4:30 Nitzan Bichacho: *Managing the Abutment-Crown Complex of Different Abutment Types in the Same Smile – Concepts and Strategies*

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

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

7:00-10:00 *Cocktail, Presidents Dinner*

3:00-6:00 *Breakout CE Session* – Claude Sieber: *Applying Artistry into a Digital Workflow*

Saturday, September 26, 2015

7:30am-4:30pm *Registration Open*

7:00-8:00 *Continental Breakfast*

8:00-8:45 John C. Kois: *Myth of Anterior Guidance*

8:45-9:15 Rade D. Paravina: *Color Difference Thresholds for Dentistry*

9:15-9:45 Yu Zhang: *The Quest for Strong and Aesthetic Ceramics*

9:45-10:15 *Q/A, Break, SCAD VITA Award recipients' poster viewing*

10:15-11:00 Branko Bojovic: *Facial Transplantation: The Ultimate Functional and Aesthetic Challenge*

11:00-11:30 Hans-Peter Weber: *Implant Abutments in the Esthetic Zone – Choices, Questions and (Some) Answers*

11:30-12:00 Clark M. Stanford: *Integrating Predictable Esthetics into Clinical Practice*

12:00-1:00 *Q/A, Lunch*

1:00-1:30 Panaghiotis Bazos: *The Spectrum and Applications of Cross-Polarized Imaging*

1:30-2:00 Edward J. Swift, Jr.: *At-home Bleaching: A 25-Year Retrospective – What We Know Now that We Didn't Know Then*

2:00-2:45 Carlo Poggio: *Vertical or Shoulderless Preparations in Contemporary Prosthodontics*

2:45pm *Closing Ceremony*

Meeting Sponsors and Corporate Members

GENERAL SPONSORS

VITA

www.vita-zahnfabrik.com

VITA

NORTH AMERICA

www.vitanorthamerica.com

Shade-taking made easier.

VITA Linearguide 3D-MASTER®

The VITA Linearguide 3D-MASTER enables the quick determination of precise tooth shades and uses the same scientific principles and 29 shades found in the popular VITA 3D-MASTER shade guide. Even difficult intermediate shades can be precisely determined in two simple steps.

- Sleek, linear arrangement of VITA 3D-MASTER shades
- Measure precise VITA shades in two simple steps
- Prescribe a full range of precisely matched VITA restorative materials

VITA shade, VITA made. VITA

facebook.com/vitanorthamerica

www.vitanorthamerica.com | 800-828-3839

PLATINUM SPONSOR

COSMEDENT®

www.cosmedent.com

GOLD SPONSORS

ivoclar vivadent
passion vision innovation

www.ivoclarvivadent.com

P&G
Procter & Gamble

www.pg.com

SILVER SPONSORS

3M ESPE

www.3m.com

BISCO

www.bisco.com

THE DENTAL ADVISOR

www.dentaladvisor.com

GC

www.gc-dental.com

Heraeus

www.heraeus.com

Hu-Friedy
How the best perform

www.hu-friedy.com

kuraray

kuraraydental.com

Meisinger Since 1888

www.meisingerusa.com

SDI

www.sdi.com.au

Tokuyama

www.tokuyama-us.com

EXIBITOR

ADDENT Customer Store

www.addent.com

MEETING PUBLISHER

QUINTESSENCE PUBLISHING

www.quintpub.com

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 aesthetic dentistry specifically related to scientific investigation and application of color and appearance in dentistry.

The SCAD goals are as follows:

- To serve as a uniting force in the profession by promoting and fostering greater awareness for color and appearance;
- 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 Governance

EXECUTIVE COMMITTEE

President: Dan Nathanson
Vice-President: William M. Johnston
Secretary: Esam Tashkandi
Treasurer: John M. Powers
President-Elect: Newton Fahl
Immediate Past President: Edward J. Swift, Jr.

Board Members-at-Large

Sabiha Bunek
Shigemi Nagai
Joe C. Ontiveros
Aki Yoshida

Executive Director

Rade D. Paravina

REGIONAL COUNCILORS

Andrey Akulovich, Russia
Luiz Narciso Baratieri, Latin America
Federico Ferraris, Europe
Yumiko Hosoya, Asia-Pacific
Ernesto Lee, North America
Esam Tashkandi, Africa & Middle East

Poster Session

For the 2015 annual meeting, a total of 18 abstracts have been accepted for the Poster Session, a very important segment of our program. The emphasis for selection of presentations was on clinical, laboratory and educational research involving color and appearance in dentistry.

If you are involved in such research, we urge you to submit an abstract for consideration for poster presentation at the 8th Annual Conference the Society of Color and Appearance in Dentistry to be held in Chicago on September 15-27, 2016 at the Radisson Blu Aqua Hotel in Chicago, IL

We strongly encourage eligible applicants to consider applying for

SCAD VITA Research Award

SCAD VITA Award for Excellence in Research Related to Color and Appearance in Esthetic Dentistry has been established to promote young researchers and 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. The 2016 applicants are required to submit an application and abstract following the instruction provided at the SCAD website (www.scadent.org). All awardees will be announced at the annual meeting and each recipient will receive a $1,500 stipend.

Dental Technician Awards

The Society for Color and Esthetics in Dentistry (SCAD) is conducting two competitions for excellence in dental technology in 2016:

- Larsen-Chu Award: Open to dental technicians who have less than 10 years in practice
- Virtuoso Award: Open to dental technicians who have 10+ years in practice

Applicants must duplicate a natural tooth using any material and technique of their choice. It can be fabricated on a die or as a solid replica (root is optional).

See www.scadent.org for high-quality pictures, additional information, and the application form. Submission deadline: August 10, 2016

JERD Issues on Color and Appearance

Starting 2014, our Journal partnered with Journal of Esthetic and Restorative Dentistry (JERD), the longest standing peer-reviewed journal devoted solely to advancing the knowledge and practice of esthetic dentistry. *It is our pleasure to inform you that there are two JERD issues dedicated to color and appearance in 2015, and we will keep having two issues per year.* We cordially invite you to keep submitting your manuscripts to us, as we intend to keep being the most competitive comprehensive resource when it comes to color and appearance in dentistry.

Stephen J. Chu, DMD, MSD, CDT

Dr. Chu, received his undergraduate degree from Brown University and his Doctor of Dental Medicine degree from the University of Pennsylvania. He obtained his Master's of Science degree in Restorative Dentistry and completed the Advanced Education Program in Prosthodontics at the University of Washington, in Seattle. Dr. Chu subsequently became a board-certified dental technician in ceramics and obtained a Master's degree in Dental Technology from the New York University College of Dentistry (NYUCD). He is the former Director of the Continuing Education Program in Advanced Aesthetic Dentistry at NYUCD. He is also presently an Associate Clinical Professor in the Department of Prosthodontics and is the Director of Aesthetic Education at the Columbia University College of Dental Medicine. Dr. Chu has authored two textbooks on color and aesthetic/cosmetic restorative dentistry and has contributed chapters to several others. He has published numerous articles in the dental literature and is the section editor for one dental journal and on the editorial board of four others. He is a much sought-after teacher and a worldwide lecturer in aesthetic/cosmetic restorative dentistry and implant dentistry.

Oral Presentations

Friday, September 25
8:15-9:00

Prosthetic Strategies for Achieving and Sustaining Ideal Soft Tissue Aesthetics Around Single Tooth Implants in the Esthetic Zone

Stephen J. Chu, DMD, MSD, CDT

Lecture Description
Implant dentistry is continuously evolving offering new and more predictable forms of therapy with minimally invasive protocols. Innovative techniques now allow for better esthetics, decreased treatment times, and greater patient comfort. However, these new techniques and therapies continue to raise questions and concerns regarding the risk and rewards of each. Specifically, controversial issues regarding immediate postextraction socket implant placement in relationship to survival and esthetic outcomes. Immediate provisional restoration of immediate implants placed into healed [delayed] or augmented sites will be presented.
In addition, this lecture will address current concepts [i.e. platform switching], techniques, clinical research, histologic evidence, and innovations in immediate implant placement and provisional restoration and how they can enhance treatment procedures, time, and clinical outcomes for greater patient comfort, care, and satisfaction.

Objectives
After this presentation, the attendee should be able to understand the following concepts associated with immediate implant placement and provisional restoration:

- The prosthetic and biologic impact on hard tissue buccal contour change
- The prosthetic and biologic impact on peri-implant soft tissue thickness
- Abutment selection criteria
- Impression-making and cementation techniques

Oral Presentations

Friday, September 25
9:00-9:30

Optical Properties and Esthetic Considerations for CAD/CAM Restorations

Sillas Duarte, Jr. DDS, MS, PhD

Lecture Description
Novel esthetic restorative materials for in-office CAD/CAM are available and able to provide a variety of treatment modalities for a large range of clinical situations including some that until recently were not considered possible. This lecture will provide a systematic and scientific approach for selecting esthetic treatment modalities using different in-office CAD/CAM materials based on original research data with special emphasis on the optical properties of these novel restorative materials.

Objectives
- To contrast the challenges and benefits of esthetic CAD/CAM techniques.

Sillas Duarte, Jr. DDS, MS, PhD

Dr. Sillas Duarte, Jr., is associate professor and Chair, Division of Restorative Sciences, Ostrow School of Dentistry University of Southern California, Los Angeles, California. Dr. Duarte is the Director of the Advanced Program in Operative Dentistry at USC and the Editor-in-Chief of Quintessence of Dental Technology (QDT). Dr. Duarte has served on the editorial boards of other journals, and has lectured and performed hands-on courses nationally and internationally on esthetic dentistry and adhesion. He has been involved in teaching cutting-edge clinical techniques and technologies related to aesthetic and adhesive dentistry. Dr. Duarte's scientific work has been supported by governmental and commercial grants and he serves as a consultant for several manufacturers. His research and clinical work focus on bonding to dental structures, composites, and ceramics.

David M. Sarver, DMD, MS

Dr. Sarver received his DMD from The University of Alabama School of Dentistry and M.S. in Orthodontics from the University of North Carolina in 1979.

In addition to his private practice, Dr. Sarver has authored or co-authored over 60 scientific articles, 16 book chapters, and 3 textbooks. He is a Fellow in the American Academy of Esthetic Dentistry. Dr. Sarver has been featured on NBC's "The Today Show", ABC's "The View", and Fox National News.

Oral Presentations

Friday, September 25
9:30-10:00

The Complete Esthetic Analysis-Macro-Mini-and Microesthetics

David M. Sarver, DMD, MS

Lecture Description
In restorative dentistry, esthetics is evaluated in terms of anterior tooth display and smile design. For orthodontists and oral surgeons, the focus is on the facial profile. Interdisciplinary treatment in dentistry has progressed enormously in the past two decades, with collaboration among dentists, orthodontists, periodontists, and oral surgeons resulting in vastly superior results compared to those achieved working without collaboration. But our vision can, and should, still expand to broader appearance issues. With the assessment and treatment of other dimensions of the smile and facial esthetics, the target is the ultimate dentofacial esthetic outcome. This lecture will demonstrate the coordination of care between the disciplines of dentistry and facial plastic surgery, resulting in gratifying enhancement of our esthetic and functional results.

Objectives
- Cover the principles of multidisciplinary care with the global esthetic view
- Illustrate application of these principle
- Emphasize a new level of interdisciplinary collaboration

Oral Presentations

Friday, September 25
10:30-11:00

Abfractions: Reality of Myth?

Harald O. Heymann, DDS, MEd

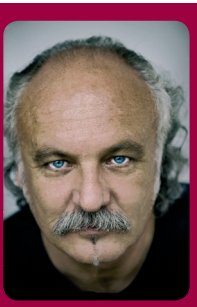
Lecture Description
This presentation will provide a provocative and controversial look at the area of non-carious cervical lesions concentrating on the concept of abfractions. This clinical phenomenon is of interest across disciplines with regards to causes, prevention and treatment. Studies have shown that teeth experience flexural deformation during parafunction. This evidence-based presentation will critically examine the effects of tooth flexural biodynamics as well as other contributing co-variables in the complex etiology of non-carious cervical lesions. Do abfractions really exist? You decide.

Objectives
Following attendance to this course, the participant should be able to:

- Distinguish among the various types of NCCLs based on primary etiology, and focus on the bioengineering factors associated with each.
- Critically review the relevant research regarding the in vitro, in vivo, and epidemiologic evidence involved in the etiology of NCCLs.
- Discuss the controversial concept of abfractions and highlight the associated research supporting the various contributing co-variables.
- Describe the various clinical options for treating non-carious cervical lesions and the indications for each.

Harald O. Heymann, DDS., MEd

Dr. Heymann is the Thomas P. Hinman Distinguished Professor of Operative Dentistry at the University of North Carolina School of Dentistry. He is a Fellow in the ICD, ACD, Academy of Dental Materials, and is a Fellow and Past-President of the American Academy of Esthetic Dentistry. Dr. Heymann is Co-Senior Editor of Sturdevant's Art and Science of Operative Dentistry textbook and is a consultant to the ADA. He has authored over 190 scientific publications, given over 1,400 lectures worldwide, is Editor-in-Chief of the Journal of Esthetic and Restorative Dentistry, and has received the Gordon J. Christensen Award for excellence as a CE speaker.



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 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 lenght with Professor Olympio Pinto, perfecting his style of natural tooth simulation. Claude Sieber has been the owner of a specialised dental laboratory in Basel Switzerland since 1984 and in 1990 he dedicated a training facility

to the advancement of Expert Dental Ceramists. He is working for dentists worldwide and focuses special interest on interior tooth replacement. Claude has lectured extensively throughout the world and his original work in the fine Arts and Photography are prominent in his visual and physical presentations. Claude Sieber was instrumental in the development of Vitas Spinell porcelain, Vitadur Alpha, Akzent Stains, Interno Colour Effects, Omega 900 Porcelain Systems, the 3-D Master Color Shade Guide and the new VM Material.

Oral Presentations

Friday, September 25
11:00-11:30

The Art of Seeing the Invisible

Claude Sieber, MDT

Lecture Description
We should not loose individuality and emotion in our work; originality and creativity are essential . We must continue to observe and use our talents
and knowledge to replicate nature.

- The primary determinants of natural tooth aesthetics
- Methods to incorporate these determinants into restorations
- The VITA VM Material and it's application
- Options and possibilities
- Clinical cases
- Various aspects of intra-oral dental photography

Breakout CE Session (20 attendants)

Friday, September 25
3:00-6:00

Applying Artistry into a Digital Workflow

As the dental market shifts to automation due to the increase of CAD/CAM applications and pressure to reduce costs, digital dentistry has significantly been an attractive alternative to conventional layered ceramics. A drawback to automated restorations is the inherit loss of individualization and esthetics demanded by many dentists and patients seeking a natural "Hollywood" smile. During this demonstration Mr. Claude Sieber, a world leader in esthetic dentistry, will share with the audience his journey of introducing the artistic "zing" needed to produce a natural milled restoration. Mr. Sieber will guide you through pre-op treatment planning to include identifying the right millable material of choice by indication, material shade selection, designing, milling, and how minimal layering ceramics and some external characterization can achieve the perfect artistic smile every patient desires.

Oral Presentations

Friday, September 25
11:30-12:00

Color and Material Selection an Inter-Disciplinary Approach between Dentist and Technician

Nicola Pietrobon, CDT

Lecture Description:
The rapidly changing face of restorative Dentistry today presents us with new developments and techniques providing an ever expanding armamentarium to help us meet the challenges presented to us in the Dental laboratories. An inter-disciplinary approach, sound knowledge and awareness of new materials are essential if we are to strive optimal function and aesthetic harmony with long term predictability. This presentation will shortly review aspects in shade and material selection, and the necessity of a close dentist-technician relationship.

Objectives
Upon completion of this presentation, participants should be able to:

- discuss aspects in selecting the restorative materials to use;
- identify the predictability of different materials;
- discuss the necessity of a close dentist-technician collaboration

Nicola Pietrobon, CDT

Upon completion of his professional training in 1985, Nicola Pietrobon worked in various laboratories as a dental technician. Between 1988 and 1990 he attended continuing education courses in Advanced Dental-Technology at the University of Zürich, Switzerland under the guidance of Prof. P. Scharer M.S.

Between 1990 and 1993, he worked at the private clinic of Prof. Dr. K. Malament and Prof. Dr. D. Nathanson, in Boston, MA, USA. In 1991 Nicola Pietrobon received the "Young Speaker of the Year Award" of the International Society for Dental Ceramics (ISDC), New Orleans, LA, USA. Between 1993 and 2000, he worked as the head of the Dental Technology Laboratory, Department of Removable Prosthodontics and Dental Materials, at the University of Zürich (Director Prof. Dr. P. Schärer, after September 2000, Prof. Dr. Ch. Hämmerle).

In 1998 he joined forces with Reto Michel to open a private dental laboratory in the heart of Zürich, becoming fully established there in the spring of 2001; the laboratory specialises in aesthetic dentistry and implantological restorations.

Nicola Pietrobon is an active member of the European Academy of Esthetic Dentistry. Furthermore, he is Associate Editor of the International Journal of Esthetic Dentistry and a member of the editorial staff of Quintessenz der Zahntechnik. He is an internationally renowned and appreciated author and presenter in the fields of aesthetic prosthodontics, dental teamwork and oral implantology.

Peter Pizzi, CDT, MDT

As an educator of dental technology and operatory procedures peter has found an easy transition into the lecture/clinician circuit. His personal appreciation and expertise on all phases of crown and bridge, porcelain, Implantology, muscle function, mandibular physiology, Ceramics and photography have made him a source of knowledge and motivation for his peers to draw from. Peter currently lectures nationally and internationally to both technicians and dentists for the communication process and a predictable outcome of success for the patient. A technician since 1984 and a business owner and manager of Pizzi Dental Studio

Inc. A member of the American Academy of Esthetic Dentistry. Graduate, Recognized specialist and Mentor of The Kois Center for Dental Excellence. Board member of ASMDT (Association of Master Dental Technicians) Teacher and educator in Master Dental technician program (New York University) Technical Fellow of the NGS (Northeastern Gnathalogical Society) Faculty, NYU school of dentistry Executive Board Member of the NGS Editorial Board of IDT, [Inside Dental Technology] Editorial Board of Spectrum Dialog Peter has lectured to doctors and technicians throughout the United States, Europe and Asia on several different topics. He also continually studies with some of the world's top speakers and clinicians.

Oral Presentations

Friday, September 25
1:00-1:30

Nature's Influence on the Optical Properties of Todays Materials

Peter Pizzi, CDT, MDT

Lecture Description
Nature influence plays a significant role in todays material selections. With past materials namely porcelain to metal restorations our goal was to create depth over our substructure and allow light into the root area to create gingival harmony. Todays material options allow us to work in a more minimally invasive space and still use natures influence to optimize the restorative options. Our understanding of the inherent color influence of natural teeth and the optical material choices needed harmonize is more critical than ever. What will separate and define the technician/clinician teams of tomorrow will be our understanding of material selection and natures influence on them.

Objectives:
- To discuss material selection in modern dentistry
- To discuss options to mimic nature with dental restorations

Oral Presentations

Friday, September 25
1:30-2:00

Scientific Facts for Clinical Selection of CAD/CAM Materials

Alessandro Vichi, DDS, MSc, PhD

Lecture Description
Digital Dentistry represents the future of prosthetic dentistry. The progressive introduction of improved optical impression devices and techniques, of CAD-CAM systems with different workflows, as well as of several new materials widened the possibility for the dentist especially in the direction of metal-free restorations. This "fast and furious" innovation generated the need for the clinicians of new rationale and new knowledge. The purpose of the lecture will be to give an updated overview of the options and innovations available on the market mainly focusing on materials. Their characteristics will be critically discussed and related to their selection for a clinically effective use. This is indeed considered one of the key-factor for the success of CAD-CAM based prostheses.

Objectives
After the lecture, the participants should:

- Improve their knowledge about mechanical properties of CAD-CAM materials.
- Improve their knowledge about optical properties of CAD-CAM materials.
- Comprehensively consider mechanical and aesthetic aspects, in order to appropriately select the materials for clinical purposes, with particular concern for monolithic use.

Alessandro Vichi, DDS, MSc, PhD

Alessandro Vichi is Research Professor and Chair of Clinical Prosthetic Dentistry at the Department of Medical Biotechnologies of the University of Siena, Italy. He has authored over 150 scientific publications and given over 500 lectures and courses worldwide, concerning with Dental Materials, Restorative and Prosthetic Dentistry. He is reviewer for several journals. He is member of CED-IADR, Fellow and board member of several national scientific society, and Fellow and board member of the Academy of Dental Materials.

Michel Roge, DDS, MSD

Professional education:

Ecole dentaire de Montpellier, FRANCE 1976-1981

Certificate in Bacteriologie and Virologie, Faculté de Médecine de Montpellier 1980

Diplôme de docteur en chirurgie dentaire (DDS) 1982

Certificate in Prosthodontics 1983-1985

"Goldman School of Dentistry" Boston University Boston, MA, USA

Master of Science in Education (MSD) 1985-1986 University of Southern California (U.S.C.) Los Angeles, CA, USA

Perceptorship – School of Dentistry, Dental Esthetics 1985-1986

University of Southern California (U.S.C.) Los Angeles, CA, USA

"Certificat d'Etudes Supérieures en Prothèse fixée" 1986-1987 Ecole Dentaire de Montpellier

Professional activities:

Private practice limited to Prosthodontics

Former Visiting Professor in the Prosthodontic department and U.S.C. Los Angeles, CA, USA

Oral Presentations

Friday, September 25
2:00-2:30

Realism, the Essence of Dental Esthetics

Michel Roge, DDS, MSD

Lecture Description
"Dental art or odontological sciences, realism or artifice, personalization or standardization, so many dilemmas which highlight the philosophical dimension of our practice".
It is through a confrontation between tooth supported and implant supported prostheses that an answer is provided to theses questions.

Oral Presentations

Friday, September 25
3:00-3:45

A Modern Approach to the Esthetic Rehabilitation

Mauro Fradeani, DMD

Lecture Description
The presentation will discuss the fundamentals required to accomplish a pleasing, functional and long lasting esthetic outcome: treatment plan, team collaboration, understanding of the patient's needs and selection of restorative materials. Nowadays an innovative operative protocol allows to face highly compromised clinical situations, with a minimally invasive prosthetic procedure (MIPP) that guarantees an excellent, long lasting esthetic result and a better acceptance of the treatment by the patient.

Objectives:
- How to minimize the invasiveness of the prosthetic treatment and still obtain an ideal esthetic result
- How to optimize esthetics and function thanks to innovative prosthetic procedures.

Mauro Fradeani, DMD

Past President of European Academy of Esthetic Dentistry (2003/2004). Visiting Associate Professor in Prosthodontics at Louisiana State University - New Orleans (USA) from 1999 until 2008, Active Member of the AAED, he maintains membership in the AAFP. He is Founder and Director of ACE Institute, Advanced Continuing Education centre in Pesaro, Italy and Founder of Mauro Fradeani Education group.

Author of the book "Esthetic Rehabilitation in Fixed Prosthodontics"Vol 1 and Vol 2, edited by Quintessence. He runs a private practice limited to prosthetics on natural dentition and on implants in Pesaro (Italy).

Nitzan Bichacho, DMD

Nitzan Bichacho, D.M.D. is the head of the Ronald E. Goldstein Center for Aesthetic Dentistry at the Hadassah Medical Campus, holding the post of expert in prosthodontics at the rank of professor, at the Faculty of Dental Medicine, Hebrew University, Jerusalem, where he graduated, in 1984.

He is Past President and a Life Member of the European Academy of Esthetic Dentistry (EAED) and is a Diplomate of The International Congress of Oral Implantologists. He also serves at the editorial boards of leading international dental journals.

He is a co-inventor of the Nobel Active Implant System, the V3 implant system (MIS) and other novel techniques, materials and systems that have become widely used around the world.

Prof. Bichacho has been publishing and lecturing extensively worldwide in the fields of dental implant therapy, fixed prosthodontics, interdisciplinary treatments and innovative treatment modalities in esthetic dentistry.

His private practice in Tel Aviv focuses on interdisciplinary treatments, where he collaborates with multinational world renowned leading colleagues and world master dental technicians.

Oral Presentations

Friday, September 25
3:45-4:30

Managing the Abutment-Crown Complex of Different Abutment Types in the Same Smile – Concepts and Strategies

Nitzan Bichacho, DMD

Lecture Description
In order to achieve a harmonious esthetic result of a restored dentition at the smile zone the operators should not only choose the material of the restoration, but also analyze and relate to the abutment type and color.
Indirect fixed restorations might be either of a natural tooth (vital or non-vital), of an implant or of a pontic at an edentulous site. In cases where different types of abutments should be restored, at the same arch, one should plan ahead the different phases of the restorative treatment in order to end up with a harmonious esthetic natural looking result, by choosing the most suitable materials for each indication, so that the combined abutment-crown complexes will blend naturally with each other and with the adjacent dentition.
State of the art strategies will be presented where cases of multiple different abutment types were to be restored, utilizing diverse laboratory and intra-oral restorative materials and customized techniques.

Objectives
- The concepts of Abutment Type Based Restoration and Restorative Based Abutment Modification will be presented and analyzed in a variety of complex esthetically challenged clinical cases.

Oral Presentations

Saturday, September 26
8:00-8:45

Myth of Anterior Guidance

John C. Kois, DMD, MSD

Lecture Description
An articulator has a limited ability to duplicate or mimic patient's functional movements. This creates a disadvantage for the laboratory technician to provide a significant collaborative role. In addition, the role of anterior guidance is an assumption based on the concept of "Mutual Protection" not biology. The problem of resolving biological concerns with mechanical solutions is not logical. When our patients undergo mastication the guidance we create may overload the anterior teeth leading to excessive friction, structural failure, tooth mobility, spacing, and temporomandibular dysfunction. This lecture will explore this paradox and develop better ways to reduce these risks by understanding our individual patient's masticatory system and provide better communication keys to the laboratory.

Objectives
- Understand the envelope of function specific to the patient being treated.
- Create the communication keys necessary for the laboratory technician.
- Material selection cannot overcome improper occlusal management.

John C. Kois, DMD, MSD

Received his D.M.D. from the University of Pennsylvania, School of Dental Medicine and Certificate in Periodontal Prosthodontics with a M.S.D. degree from the University of Washington, School of Dentistry. He maintains a private practice limited to Prosthodontics in Tacoma and Seattle and is an Affiliate Professor in the Graduate Restorative Program at the University of Washington. Dr. Kois continues to lecture nationally and internationally, is a reviewer for many journals and is the co-Editor in Chief for The Compendium of Continuing Education in Dentistry. Dr. Kois is the recipient of the 2002 Saul Schluger Memorial Award for Clinical Excellence in Diagnosis and Treatment Planning, and received a Lifetime Achievement Award from both the World Congress of Minimally Invasive Dentistry and the American Academy of Cosmetic Dentistry. Additionally, he is the recipient of the 2014 Dr. Thaddeus V. Weclew Award, which is presented annually to a dedicated educator who embodies the spirit of comprehensive dental care. He is the past President of both the American Academy of Restorative Dentistry and American Academy of Esthetic Dentistry, and a member of numerous other professional organizations. In addition, he continues to work with restorative dentists at the Kois Center, a didactic and clinical teaching program.

Rade D. Paravina, DDS, MS, PhD

Rade D. Paravina, DDS, MS, PhD is a tenured Professor at the University of Texas School of Dentistry at Houston and Director of Houston Center for Biomaterials and Biomimetics (HCBB). He also holds the Ralph C. Cooley, DDS Distinguished Professorship in Biomaterials, an endowment created by world-renowned heart surgeon Denton A. Cooley, MD. Dr. Paravina has authored/co-edited two books, two software programs, one educational CD, and more than 200 other peer-reviewed publications.

Dr. Paravina designed/developed several dental products and tests. Together with Vita Zahnfabrik he designed two shade guides, Linearguide 3D Master and Bleachedguide 3D Master. He has developed Dental Color Matcher, a free online and offline educational and training program for esthetic dentistry, and the scientific protocol for evaluating "chameleon effect" of dental materials.

Dr. Paravina is Founder and Past President of the Society for Color and Appearance in Dentistry (SCAD). He is a recipient of the 2011 E. B. Clark Award, SCAD award for lifetime achievement, and the 2014 Jerome M. and Dorothy Schweitzer Research Award of the Greater New York Academy of Prosthodontics. He serves as editor of the Color and Appearance in Dentistry, a permanent bi-annual issue of the Journal of Esthetic and Restorative Dentistry, and editorial board member for the Journal of Dentistry, Clinical Oral Investigations, Journal of Prosthodontics, Journal of Esthetic and Restorative Dentistry, and the American Journal of Dentistry.

Dr. Paravina lectures nationally and internationally on various topics associated with color and appearance in esthetic dentistry.

Oral Presentations

Saturday, September 26
8:45-9:15

Color Difference Thresholds for Dentistry

Rade D. Paravina, DDS, MS, PhD

Lecture Description:
Credible numerical values for visually perceptible and acceptable color differences, 50:50% perceptibility threshold (PT) and 50:50% acceptability threshold (AT) are needed in order to quantify and define color match in dentistry. A prospective multi-center study, performed on different continents, combined visual and instrumental methods on monochromatic ceramic specimens fabricated within the tooth color range. A total of 3 sets of specimen pairs were created, with 20 pairs per set. A total of 175 individuals with normal color vision (25 per research site) participated in visual judgments: dentists, dental students, dental auxiliaries, dental technicians, and laypersons. The frequency level of perceived/accepted color differences was determined. Takagi-Sugeno-Kang (TSK) Fuzzy Approximation was used to perform the fitting of the percentages of answers against the instrumentally measured color differences: A 50:50% perceptibility and acceptability thresholds were significantly different. Observer groups and sites showed a high level of statistical difference in all thresholds. Based on the results, a $\Delta Eab=2.7$ is proposed as 50:50% acceptability threshold in dentistry.

Objective

- To understand the role of color difference thresholds in quality control, selection and evaluation of dental materials, and interpretation of visual and instrumental findings in clinical dentistry, dental research, and subsequent standardization.

Oral Presentations

Saturday, September 26
9:15-9:45

The Quest for Strong and Aesthetic Ceramics

Yu Zhang, PhD

Lecture Description:
The quest for an aesthetic yet strong restorative material has led to the development of two state-of-the-art materials in lithium disilicate and zirconia. While it is more aesthetically pleasing, lithium disilicate glass-ceramics possess modest mechanical properties, which have limited the range of their clinical indications. Zirconia, on the other hand, is the strongest and toughest of all ceramics used in dentistry. However, its relatively low translucency, limited shade options, and poor cement bonding properties have hindered the widespread clinical application of zirconia. This presentation examines the advantages and disadvantages of lithium disilicate glass-ceramics relative to zirconia.

Objectives
- Discuss strategies to maximize the potential of lithium disilicate, based on the unique physicomechanical properties, for minimally invasive treatments
- Analyze strategies to increase the translucency of zirconia, as well as to improve the shade options and cementation properties of zirconia viasurface modifications

Yu Zhang, PhD

Dr. Yu Zhang received his Ph.D. in Materials Science and Engineering from Monash University, Melbourne, Australia. From 2002 to 2005, he worked as a Postdoctoral fellow at Materials Science and Engineering Laboratory, National Institute of Standards and Technology, Gaithersburg, MD. In Feb. 2005, Dr. Zhang joined New York University College of Dentistry and now he is an Associate Professor in the Department of Biomaterials and Biomimetics. He has published over 70 high quality journal articles and holds 3 US patents. Dr. Zhang has received a number of awards including Arthur R. Frechette Award, Goddard Junior Faculty Fellowship Award, and Borland Research Forum Award. He has served as a PI on 4 NIH and NSF funded projects. Dr. Zhang has also served as a PI on a number of industry-sponsored research projects.

Branko Bojovic, MD

Dr. Bojovic is an expert in adult and pediatric craniofacial surgery and microsurgery. He is a graduate of the Harvard Combined Program in Plastic Surgery and completed his fellowship in craniofacial microsurgery at the Johns Hopkins Hospital and the R Adams Cowley Shock Trauma Center where he is currently an Assistant Professor. He is presently the Surgical Director of the Composite Vascularized Allotransplant and Face Transplant Program at the University of Maryland Medical Center and a member of the team that performed the most comprehensive face transplant to date in March of 2012.

Oral Presentations

Saturday, September 26
10:15-11:00

Facial Transplantation: The Ultimate Functional and Aesthetic Challenge

Branko Bojovic, MD

Lecture Description
The central face high-energy avulsive injury has been frequently encountered and predictably managed at the R Adams Cowley Shock Trauma Center. However, despite significant surgical advances and multiple surgical procedures, the ultimate outcome continues to reveal an inanimate, insensate, and suboptimal aesthetic result. To address this challenging deformity, a comprehensive multidisciplinary approach was devised. A total face, double jaw, and tongue transplantation was performed on a 37-year-old man with a central face high-energy avulsive ballistic injury, representing the most comprehensive transplant performed to date. Through a systematic approach and clinical adherence to fundamental principles of aesthetic surgery, craniofacial surgery, and microsurgery, and the innovative application of technologies, restoration of human appearance and function for individuals with a devastating composite disfigurement is now a reality.

Objectives
At the conclusion of this talk, attendees should be able to:

- Describe the world's most comprehensive and extensive facial transplantation to date.
- Discuss state-of-the-art techniques used in facial transplantation.
- Describe innovative technologies being used in facial transplantation to date.

Oral Presentations

Saturday, September 26
11:00-11:30

Implant Abutments in the Esthetic Zone – Choices, Questions and (Some) Answers

Hans-Peter Weber, DMD

Lecture Description
Abutment selection is a key component in implant prosthodontics and requires special considerations in esthetic sites. Compared to prefabricated abutments, custom abutments offer the choice of various materials and the possibility to individualize position, angulation, contour, margin location, and even color. Mucosal thickness presents one of the determining factors when choosing abutments for implant restorations in the esthetic zone. Titanium abutments have the advantage of proven mechanical stability long-term. But they tend to induce a noticeable color change in thin labial peri-implant mucosa. Abutments made of zirconia fair much better in this regard. However, their long-term performance in the oral environment remains unproven. Colored metallic abutments are offered as an alternative and may combine proven mechanical long-term behavior with uncompromised esthetics. It is the purpose of this presentation to review the current understanding of the relationship of abutment color and mucosal thickness and make evidence based clinical recommendations for indication specific abutment selection in implant prosthodontics.

Objectives
- Assess advantages and disadvantages of metal vs. ceramic abutments
- Use peri-implant tissue thickness as an abutment selection criterion in the esthetic zone
- Define indications for various abutment choices.

Hans-Peter Weber, DMD

Dr. Weber is Professor and Chair of the Department of Prosthodontics at Tufts University, School of Dental Medicine. He holds dental degrees from the University of Berne, Switzerland (Dr. med. dent., 1976) and the Harvard School of Dental Medicine (DMD, 1990), as well as Certificates in Prosthodontics (1979) and Periodontology (1984) from the University of Berne. Dr. Weber's professional activities include teaching, patient care and clinical research in prosthodontics and implant dentistry. He has made numerous contributions to the scientific literature and is a regularly invited panelist at national and international meetings. Dr. Weber is an active member in several professional organizations. He is a Past President of the Academy of Prosthodontics and an Honorary Fellow of the American College of Prosthodontists. He serves as Co-Editior of "Clinical Oral Implants Research" and is a reviewer for several other peer-reviewed journals.

Clark Stanford, DDS, PhD

Dr. Clark Stanford is Dean, University of Illinois College of Dentistry in Chicago, Illinois. He was Associate Dean for Research and Centennial Fund Professor for Clinical Research, at the College of Dentistry, University of Iowa until October 2014. He holds a secondary appointment the Department of Biomedical Engineering. Dr. Stanford received his BS (1984), DDS (1987), Certificate in Prosthodontics and Ph.D. (Cell Biology; 1992) from the University of Iowa. He was on the Iowa faculty from 1992-2014. He is the author of 18 book chapters, 111 published papers and more than 140 published research abstracts. He receives research funding from NIH, Foundations and from industry. He currently serves on multiple national and international committees. He is the recipient of 15 academic awards including the 2007 State of Iowa Regents Award for Faculty Excellence and the IADR Distinguished Scientist Award (2007).

Oral Presentations

Saturday, September 26
11:30-12:00

Integrating Predictable Esthetics into Clinical Practice

Clark Stanford, DDS, PhD

Lecture Description:
Tooth replacement with dental implants is complemented by assessment of patient-specific risk factors. Stable outcomes include appropriate site development and communication amongst the entire team. Flexibility in Prosthetic design, materials and application is vital for predictable outcomes as well as managing Prosthetic complications. Predictability is enhanced through applications of new technologies, expanding our protocols for implant therapy.

Objectives
- Communication and workflow in patient risk assessment,
- Risk Factor assessment in predicable outcomes,
- Evaluating the impact of risk factors on patient outcomes.

Oral Presentations

Saturday, September 26
1:00-1:30

The Spectrum and Applications of Cross-Polarized Imaging

Panaghiotis Bazos, DDS

Lecture Description
Over the last decade there has been profound interest in newer photographic illumination techniques aimed at increasing the accuracy and objectivity of dental diagnostic ability, shade evaluation and laboratory communication.
In order to minimize the user-dependent error in clinical practice, it is necessary to develop reproducible imaging modalities and objective image analysis methods. Reflective cross polarized light photography mitigates unwanted specular reflections and hot spots in addition to spectral highlights which obscure the fine details of hard and soft dental structures, whilst providing a high contrast / hyper-saturated dental image to be objectively analyzed. This imaging technique, which is non contact and non invasive is used to enhance the visibility when assessing dental images and has many translation applications.

Objectives
- Distinction between reflective and transmissive cross polarized imaging modalities.
- Expand upon the spectrum of applications of cross polarization.
- Understand the direct benefits of cross polarization imaging in the clinical and technical realms.

Panaghiotis Bazos, DDS

Dr. Bazos received his DDS from the University of Southern California School of Dentistry in 2000. He served as an Assistant Professor at the Herman Ostrow School of Dentistry of USC, Division of Primary Oral Health, Los Angeles, CA. from 2005-2007, mentoring undergraduate dental students in the disciplines of Esthetic and Restorative Dentistry. Upon returning to Europe, he maintained a private practice limited to esthetic and restorative dentistry in Athens, Greece. Currently he is completing his postgraduate degree in Orthodontics and Dentofacial Orthopaedics at the University of Edinburgh, Scotland.

Edward J. Swift, Jr., DMD, MS

Dr. Ed Swift received his D.M.D. degree from the Medical University of South Carolina and a master's degree in Operative Dentistry from the University of Iowa. He practiced general dentistry for several years in South Carolina, and has taught at the University of Mississippi and the University of Iowa. He is currently a professor in the Department of Operative Dentistry and the Associate Dean for Education at the University of North Carolina School of Dentistry, Chapel Hill, North Carolina.

Dr. Swift is a member of various professional organizations including the American Dental Association, Academy of Operative Dentistry, and International Association for Dental Research. He is a fellow of the American Academy of Esthetic Dentistry and the Academy of Dental Materials, and a founding member and immediate past president of the Society for Color and Appearance in Dentistry. He is also a member of the Dentsply Corporate Education Advisory Board and the 3M ESPE Scientific Dentistry Board.

Dr. Swift serves on the editorial boards of Operative Dentistry and American Journal of Dentistry and is the sole associate editor for the Journal of Esthetic and Restorative Dentistry.

Dr. Swift has published over 200 journal articles and is a co-editor of a leading dental textbook, Sturdevant's Art and Science of Operative Dentistry. He has presented many continuing education courses and scientific papers regionally, nationally, and internationally. He has been an invited speaker for several professional organizations and was recognized as one of the "Annual Leaders in CE" by Dentistry Today for several consecutive years.

Oral Presentations

Saturday, September 26
1:30-2:00

At-home Bleaching: A 25-Year Retrospective – What We Know Now that We Didn't Know Then

Edward J. Swift, Jr., DMD, MS

Lecture Description
At-home bleaching was first introduced to the dental profession a quarter-century ago, but with very little understanding of the process. This presentation will provide an overview of what research and clinical experience have taught us about at-home bleaching, including its mechanism of action, duration of treatment effects, safety issues and side effects, and other relevant topics.

Objectives
The attendee will:

- Understand how at-home bleaching works and how long its effects last.
- Learn more about side effects such as tooth sensitivity and other side effects of bleaching.
- Understand whether and how tetracycline stains can be treated with at-home bleaching.

Oral Presentations

Saturday, September 26
2:00-2:45

Vertical or Shoulderless Preparations in Contemporary Prosthodontics

Carlo E. Poggio DDS, MSc, PhD

Lecture Description
Tooth preparations without a defined finish line have been termed in several different ways, such as knife edge, feather edge, or shoulderless. With slight differences between each other, all this preparation types may be defined "vertical" as opposed to "horizontal" ones (shoulder, chamfers) and since the introduction of metal ceramic they have been almost abandoned, with limited exceptions (i.e.: periodontically involved abutments). From a biological standpoint, preserving a maximum amount of sound tooth structure, as it is done in vertical preparations, might also offer a more conservative alternative to a horizontal margin design in other clinical conditions such as endodontically treated teeth, vital teeth in young individual, teeth affected by caries at the cervical third. Vertical margins on zirconia crowns have been tested in vitro and clinical reports have been published. A re-evaluation of possible advantages and shortcomings of vertical preparation design in contemporary prosthodontics will be presented in light of recently published literature.

Objectives
Course objectives that attendees can expect to learn from the presentation:

- To define geometrical and biological characteristics of vertical preparations as compared to horizontal ones.
- To analyze current in vitro literature regarding zirconia and vertical preparations.
- To evaluate available clinical data regarding zirconia and vertical preparations.

Carlo E. Poggio DDS, MSc, PhD

Carlo E. Poggio holds a DDS, a PhD in Anatomy and a MSc in Orthodontics. After completion of academic studies he underwent clinical training in Prosthodontics, Implant and Perio surgery and Adult Orthodontics, and focused himself on interdisciplinary treatment of complex and high esthetic demands patients. He is a Visiting Professor at the Department of Prosthodontics Eastman Institute for Oral Health, University of Rochester (NY) and a Visiting Professor for Interdisciplinary Treatments at the University of Milan. Active Member of the Italian Academy of Prosthetic Dentistry (AIOP), of the Italian Society of Orthodontics (SIDO) and of the Italian Society of Periodontology and Implantology (SIdP), member of the Cochrane Oral Health group (Manchester, UK), member of DentalXP. He is a member of the Executive Board of AIOP and of CIC (Italian Committee representing Dental Scientific Societies) and Chairman of the International Committee of the American Prosthodontic Society (APS).

Joe C. Ontiveros, DDS, MS

Dr. Ontiveros received his D.D.S. degree from the University of Texas Health Science Center at San Antonio where he served as a Clinical Instructor in the Division of Esthetic Dentistry. He received his Master's in Oral Biomaterials from the University of Texas Graduate School of Biomedical Science at Houston. Dr. Ontiveros is past Scientific Editor for *Reality* Publishing and past Director of Research for *Reality* Research Lab. He is the author of numerous publications related to esthetic biomaterials and a contributor to text book, Esthetic Color Training in Dentistry–Communication of Color and Appearance. Dr. Ontiveros is currently an Professor and Head of Esthetic Dentistry at the University of Texas Health Science Center School of Dentistry at Houston, and Head of the Oral Biomaterials Division for the Houston Center for Biomaterials and Biomimetic.

Lunch & Learn

Friday, September 25, 2015
12:00-1:00

Basics of Color and Clinical Color Matching: An Update

Joe C. Ontiveros, DDS, MS

This presentation will provide an overview of the basic principles of color and review how they relate to shade matching in dentistry. The fundamentals never change but applications must remain current with modern technology and the clinical realities of the contemporary dental practice.

Objectives

- Review proper method for shade matching
- Learn different shade guides and their various indications
- Update your knowledge on digital shade determination
- Hands on with current systems for shade communication.

Shade Measurement – Simplified

Instantly determine and verify shade with the all-new VITA Easyshade® V

*Rebate will be issued following completion of a VITA North America online shade certification training webinar.
For details visit: **www.vitanorthamerica.com/courses-ce.**

INTUITIVE

Touch-screen color LED display and inductive charging base

INSTANTLY MEASURE

Verify VITA classical A1-D4® and VITA 3D-MASTER® shades at the push of a button

BETTER COMMUNICATION

Between lab and doctor with the Bluetooth® interface and VITA Assist PC software

VITA shade, VITA made. VITA NORTH AMERICA

facebook.com/vitanorthamerica 800-828-3839 | **www.vitashades.com**

Abstracts • Poster Presentations

Chair, Raymond G. Koeppen

Abstract #1 • **2015 SCAD VITA Award for Excellence in Research**

Color Compatibility of VITA Classical A1-D4 and Composite Systems

N. Pereira Sanchez, J. M. Powers, R.D. Paravina
Department of Restorative Dentistry and Prosthodontics
UTHealth School of Dentistry, Houston, TX

Objective: To evaluate color compatibility between VITA Classical A1-D4 shade guide (VC, VITA Zahnfabrik, Bad Säckingen, Germany) and three Classical-based composite shade systems.
Methods: Three composite systems were evaluated: dual-layered Filtek Supreme Ultra (FS, 3M ESPE, St. Paul, MN) and Clearfil Majesty ES-2 Premium (CM, Kuraray America, New York, NY), and single-layered Venus Diamond (VD, Heraus Kulzer, Hanau, Germany). Tooth shaped specimens (n=5) were polymerized for 40 seconds using a halogen lamp (Optilux 501 Kerr, Orange, CA). The facial surface of each specimen was polished for 30s using PoGo polisher discs (DENTSPLY Caulk, Milford, DE). Data were collected using PR-670 spectroradiometer (PhotoResearch, Chatsworth, CA), using D65, 2°. Color differences (ΔE*) between VC and composite tabs of same shade designation, and the best matches were calculated. Means and standard deviations were calculated and data were analyzed by analysis of variance with Tukey-Kramer multiple-comparison tests (α=0.05). Literature finding on 50:50% acceptability threshold of ΔE*=2.7 was a supplementary tool in result interpretation.
Results: Mean ΔE* values (s.d.) between VC tabs and corresponding FS, VD and CM shades were 5.8 (3.1), 5.3 (3.0) and 6.9 (2.5), respectively. Corresponding values between VC tabs and best matching shades of FS, VD and CM were 2.4 (1.4), 3.5 (1.8) and 5.5 (2.4), respectively. Tukey-Kramer intervals for comparisons among corresponding and best matches was 2.6 and 1.4, respectively, revealing non-significance between color differences of corresponding shades, and significant differences between best matches between FS-CM and VD-CM ($p<0.0001$).
Conclusions: Color compatibility between VITA Classical A1-D4 and corresponding shades of three composite shade systems was above the 2.7 threshold. Much better results were obtained for comparisons of VC and the best matches from each composite system, demonstrating superiority of the later approach over the usage of corresponding shades.
Acknowledgments: Products were donated by manufacturers.

Abstracts • Poster Presentations

Abstract #2

Color-matching and Blending-effect of Universal-shade Bulk-fill-composite-resin in Composite-resin-Models and Natural-Teeth

R.M. Abdelraouf, N.A. Habib
Faculty of Oral and Dental Medicine, Cairo University, Egypt

Objectives: To assess visually color-matching and blending effect (BE) of a universal-shade bulk-fill-composite-resin placed in teeth-like composite-resin models with different shades and cavity sizes and in natural teeth.
Methods: Following a modified method adopted by Paravina-et-al-2006, composite-resin discs (10mmx1.5mm) were prepared of universal-shade bulk-fill-composite-resin and composite-resin of shades: A1, A2, A3, A3.5 and A4 (Voco, Germany, n=5/shade). Visual-assessment was performed by seven normal-color-vision observers to determine the color-matching between the universal-shade and each shade. Color-matching scores were expressed numerically as follows: 1) Mismatch/totally-unacceptable, 2) Poor-Match/hardly-acceptable,3) Good-Match/acceptable,4) Close-Match/small-difference, and 5) Exact-Match/no-color-difference.
Teeth-like composite-resin models with shades A1, A2, A3, A3.5 and A4 were constructed, n=10/shade. Occlusal cavities of different sizes (small and large, n=5/shade-size) were prepared in the different models. The cavities were filled by universal-shade-composite-resin. The same scale was used to score color-matching between the restorations and models. BE was calculated as difference in mean-visual-scores in models-or-teeth and that of discs. Natural-teeth (shade-A4) with two-different class-I-cavity sizes were prepared, filled by universal-shade-composite and assessed similarly, (n=5/size). Spectrophotometric-color-measurement was performed to calculate color-difference (AE) between the universal-shade and shaded-composite-resins discs.
Results: Tables: Mean Visual-Scores (VS), AE, Blending Effect (BE)

	A1	A2	A3	A3.5	A4
Discs	VS=4.2±0.5 (ΔE=4.8±0.3)	VS=3.2±0.5 (ΔE=9±0.6)	VS=3±0.5 (ΔE=10.8±0.6)	VS=1.4±0.5 (ΔE=14.8±0.9)	VS=1.2±0.4 (ΔE=17.4±0.9)
Models: small-cavity	VS=4.8±0.4 BE =0.6	VS=4.7±0.5 BE= 1.5	VS=4.6±0.7 BE=1.6	VS=4.2±0.9 BE=2.8	VS=4.1±0.9 BE=2.9
Models: large-cavity	VS=4.7±0.5 BE=0.5	VS=4.5±0.4 BE=1.3	VS=4.2±0.6 BE=1.2	VS=4.1±0.8 BE=2.7	VS=4±0.8 BE=2.8

	A1	A2	A3	A3.5	A4
Natural-Teeth: small-cavity	VS=3.7±0.6 BE=2.5	VS=3.9±0.8 BE=2.7	VS=4.1±0.8 BE=2.9	VS=4.2±0.7 BE=3	VS=4.4±0.6 BE=3.2
Natural-Teeth: large-cavity	VS=3±0.9 BE=1.8	VS=3.1±0.8 BE=1.9	VS=3.2±0.6 BE=2	VS=3.3±0.6 BE=2.1	VS=3.5±0.8 BE=2.3

Conclusion:

1. When measuring separate discs, there was large difference in color-matching.
2. In composite-models and natural-teeth: universal-shade bulk-fill-composite showed good-to-close color-matching regardless of cavity-size and surrounding-shade.
3. Because the base-line of color-matching-scores decreased with darker-shades, it wasn't possible to compare BE among different shades as it may give misleading values, rather BE may be valuable within the same shade.

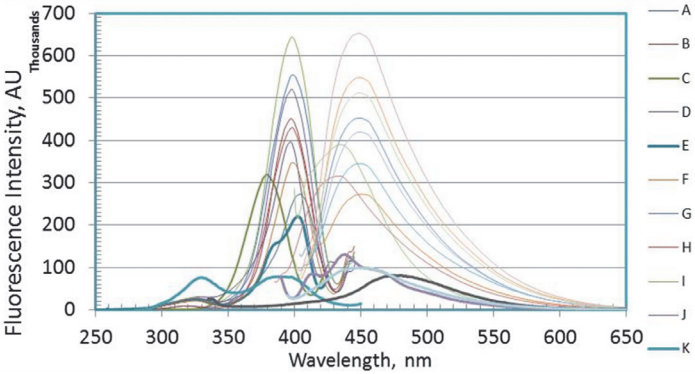
Abstract #3

Fluorescence of Resin Composites

A. Aleksic, R.G. Koeppen, R-M. Fay, A. Angelova, R.D. Paravina
Department of Restorative Dentistry and Prosthodontics
The University of Texas School of Dentistry at Houston

Objective: To determine fluorescence parameters of resin composites.
Methods: Disk-shaped specimens (10 mm in diameter and 2-mm thick, n=5) were fabricated using 11 resin composites (2 shades/composite: 1,2): A – Clearfil Majesty ES2 (A1,A2); B – IPS Empress Direct (A1E,A2E); C – Estelite Omega (EA1,EA2); D – Hri ENA (UE2,UE3); E – Herculite Ultra (A1E,A2E); F – Renamel Micrihybrid (A1B,A2B); G – Venus Pearl (A1,A2); H – EsthetX HD (A1,A2); I – Gradia Direct (A1.A2); J – CG Kalore (A1,A2); and K – Filtek Supreme Ultra (A1B,A2B).
Fluorescence was measured using a steady state spectrofluorometer Quanta Master 400 (PTI, Birmingham, NJ) equipped with front face solid sample holder capable of both linear and rotational travel. Photodetector with extended wavelength range photomultiplier (R928P) was used. Excitation and emission fluorescence spectra, wavelength of the maximum excitation (Ex λmax), wavelength with highest intensity in emission spectra (Em λmax), intensity at Em λmax and total intensity (area under the curve), were recorded.
Results: Excitation spectra (left) and emission spectra (right) of tested resin composites are shown in the figure.
Fluorescence data for evaluated resin composites, wavelength at maximum intensity of emission (Em λmax, nm), wavelength of the maximum excitation (Ex λmax, nm), and maximum intensity (Imax, arbitrary units), are shown in the table.
Conclusions: Eight of eleven tested composites exhibited similar fluorescence; the remaining three had differed in intensity. Wavelength at maximum intensity of emission and excitation ranged from 433 to 453 nm, and from 390 to 404 nm, respectively.

Abstracts • Poster Presentations



Parameter	Em λ_{max}	Ex λ_{max}	$I_{max} \times 10^3$	
Sample	$1,2_{average}$	$1,2_{average}$	1_{aver}	2_{aver}
Clearfil Majesty ES2	452	404	275	208
IPS Empress Direct	449	398	453	423
Estelite Omega	453	399	317	308
HRi ENA enamel	434	397	390	418
Herculite Ultra	438	404	370	238
Renamel Micrihybrid	450	399	345	291
VENUS Pearl	450	399	549	492
EsthetX HD	450	398	420	322
Gradia Direct	449	398	653	576
CG KALORE	449	397	512	453
Filtek	450	390	99	81

Acknowledgments: Supported in part by Procter & Gamble.

Abstract #4

Color Compatibility of Healty Human Gingiva and Gingiva Colored Dental Materials

N.D. Sarmast[1], N. Angelov[1], J.M. Powers[2], R.D. Paravina[2]
[1] Department of Periodontics and Dental Hygiene, UTHealth School of Dentistry, Houston, TX
[2] Department of Restorative Dentistry & Prosthodontics, UTHealth School of Dentistry, Houston, TX

Objective: To evaluate color compatibility, expressed through coverage error (ΔE^*_{COV}), between healthy human gingiva and different gingiva-colored dental materials. .
Material and Methods: Previously compiled database on color of healthy human gingiva in-vivo (238 subjects) was compared to

Abstracts • Poster Presentations

five commercial gingival shade systems: Gradia (GR, shades G21-24, GC America, Alsip, IL), Ceramage Gum (CM, shades Y, D, OR, L, Shofu, Kyoto, Japan), VITA VM 9 (VM, shades G1-G5, VITA North America, Yorba Linda, CA), IPS d.SIGN and IPS e.max (DS and EM, shades G1-G5, Ivoclar Vivadent, Amherst, NY). Disk shaped specimens, 10 mm in diameter and 2 mm-thick (n=5) were made using fabrication methods provided in manufacturers' recommendations. Data were collected using PR-670 SpectraScan Spectroradiometer (Photo Research, Chatsworth, CA), D65, 2°. Coverage Error was calculated as mean of best matches (smallest ΔE*) between each healthy human gingiva and all shades of gingiva-colored dental materials – the best color match corresponded to the smallest ΔE^*_{cov}. Means and standard deviations were calculated. Data were analyzed by analysis of variance with Tukey-Kramer multiple-comparison tests ($p<0.05$).

Results: Coverage error values between healthy human gingiva and five gingival shade systems and shade frequency in percentages are listed in table.

	GR	CM	VM	EM	DS
ΔE^*_{cov}	5.8 (3.1)	8.4 (2.8)	4.4 (1.9)	8.6 (4.2)	7.5 (2.2)
	G-21/18.9	T/42.4	G1/16.0	G1/0.4	G1/9.2
	G-22/0.8	D/1.3	G2/21.8	G2/52.9	G2/0.0
Shade/Freq.	G-23/76.5	OR/10.5	G3/13.0	G3/0.0	G3/11.8
	G-24/3.8	L/45.8	G4/47.1	G4/44.1	G4/76.9
			G5/2.1	G5/2.5	G5/2.1

Tukey/Kramer intervals for comparisons of ΔE^*_{cov} of gingival shade systems was 0.7, revealing significant differences among all systems ($p<0.0001$, Power 1.0), except Ceramage and IPS e.max.

Conclusions: The best (smallest) coverage error between healthy human gingiva and gingiva-colored dental materials was recorded for VITA VM 9, followed by Gradia, IPD d. SIGN, and Ceramage=IPS e.max. Uneven shade distribution within each material was observed.

Acknowledgement: Products were donated by manufacturers.

Abstract #5

Bleaching efficacy between VOCO Perfect Bleach 16%® and Perfect Bleach Office+®

M. Bayadse, C. Igiel, M Weyhrauch, K.M. Lehmann, H. Scheller
Department of Prosthodontics, University Medical Center of Johannes Gutenberg-University Mainz, Germany

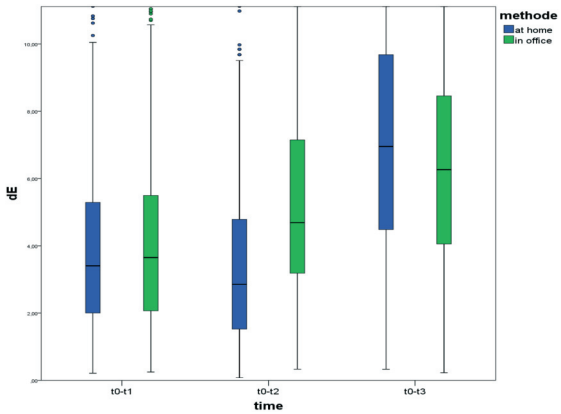
Objective: The Dentists are more confronted with the wish of patients of whiter teeth. Because nature white teeth are related beauty, healthy and success, therefore market production of Bleaching gel raise. There are different methods of tooth whitening; Home-Bleaching and In Office-Bleaching are the most com-

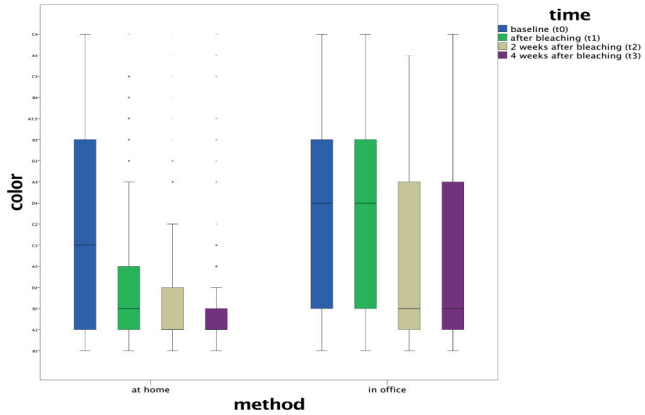
Abstracts • Poster Presentations

mon methods for vital teeth. The aim of this study was to analyze the efficacy of two different external tooth-whitening agents of VOCO (VOCO GmbH, Cuxhaven, Germany).

Method: After positive approval of IRB, 50 patients were randomly divided into two groups. The inclusion criterions were: no restorations, fillings, increased tooth sensitivity or internal/external tooth structure anomalies. After the initial professional tooth cleaning 25 patients were bleached in office und the second group of 25 patients were bleached at home. The in office bleaching was performed once for 15 minutes with Perfect Bleach Office+® 35% hydrogen peroxide. The at home bleaching group was bleached using Perfect Bleach 16%® for 7 days and 2 hours a day after individual instruction. The shade determination was performed 4 times with a spectrophotometric device (VITA esayshade advanced, VITA Zahnfabrik, Bad Säckingen, Germany); baseline (t_0), after bleaching (t_1), after two weeks (t_2), after four weeks (t_3). The Color differences, as well as the differences of the coordinates (ΔE, ΔL, ΔC, Δh, Δa, Δb) were calculated.

Results:





Conclusion: The results of the investigated methods show continuous whitening of teeth during the observation period. There are significant changes in dE directly after bleaching and continuously increasing to over dE=6. After 4 weeks; the at home bleaching® method is more efficient than the in office® method. Within the limitations of the study it could be summed up that the duration and repetition is more crucial than the concentration.

Abstract #6

Color Stability of Resin Cements after Staining

Y. Ceyhan, C. Clark, R. Quock, M. Eldiwany
Department of Restorative Dentistry and Prosthodontics, University of Texas Health Science Center at Houston, School of Dentistry

Objectives: Marginal discoloration of luting cement may affect the appearance of esthetic restorations. This study evaluated color stability of several adhesive resin cements after immersion in coffee, wine and deionized water (control).
Methods: Two dual-cured resin cements (RelyX Ultimate, RU) and Clearfil Esthetic cement, CE) and one light-cured resin cement and RelyX Veneer, RV) were examined. Disc shaped specimens (10 mm in diameter, 2mm-thick, n=5 per cement & condition) were polymerized for 20 seconds. Color measurements were taken at baseline using a spectrophotometer (Color-Eye 7000, X-Rite) and after exposure to coffee, wine and deionized water for 1-week. Means and standard deviations were determined. Analysis of variance was applied to the data. Tukey/Kramer intervals at a 0.05 level of significance were determined for mean ΔL*, Δa*, Δb* and ΔE* values.
Results: Color parameter changes are listed in the table.

Cement	ΔL*	Δa*	Δb*	ΔE*
		Coffee		
CE	4.1(0.5)	-1.2(0.1)	-3.7(1.4)	5.8(1.0)
RV	-0.8(1.1)	0.2(0.4)	-5.4 (2.8)	5.7(2.4)
RU	-0.7(3.0)	-1.7(0.8)	-2.5(2.4)	4.5(1.6)
		Wine		
CE	2.5(0.5)	-0.6(0.1)	-2.9(0.4)	3.9(0.5)
RV	-1.6(1.2)	3.1(0.2)	-19.4(2.3)	19.8(2.2)
RU	-2.5(1.7)	0.1(0.2)	0.0(1.8)	3.8(0.4)
		Deionized Water		
CE	-0.6(1.3)	-0.8(0.2)	-1.2(0.8)	2.0(0.2)
RV	-4.3(0.6)	-0.6(0.2)	0.1(0.2)	4.4(0.6)
RU	-4.7(1.1)	-0.8(0.1)	1.0(0.6)	4.9(1.2)

Tukey/Kramer intervals for ΔL* comparisons among products and staining solutions were 0.9 and 0.7, respectively. Corresponding

values for Δa* were 0.7 and 0.5, for Δb* 1.7 and 1.3 and for ΔE* 1.4 and 1.1. VE stained with wine displayed the highest color shift followed by RC stained with wine.

Conclusions: The effects of staining solutions on color of resin cements were material and solution dependent. RelyX Veneer displayed greater color change when stained with wine compared to staining in coffee, while Clearfil Esthetic and RelyX Ultimate exhibited greater color change when stained with coffee compared to staining in wine.

Abstract #7

Clinical Evaluation of the Role of Background/Surroundings on Color Matching

D. Dudea[1], C. Gasparik[1], A. Irimie[1], C. Alb[1], R.D. Paravina[2]

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

[2] Houston Center for Biomaterials and Biomimetics, Department of Restorative Dentistry and Prosthodontics, University of Texas School of Dentistry at Houston, United States

Objective: to assess the role played by the color of the background/surrounding area upon the results of the shade matching.

Methods: The shade in the central area of three anterior maxillary teeth was assessed in one patient, by 10 calibrated observers, with Vita Classical and 3D Master Shade guide; five different backgrounds where used: gray, black (with respective contrastors), blue (rubberdam), red (against the lower lip) and white (against the lower dental arch). The reference color was measured with the Vita Easyshade (Vita) in "tooth single mode". The precision in color matching was expressed as the difference between the reference color coordinates L_1*, a_1*, b_1* and the color coordinates L_2*, a_2*, b_2* of the tabs selected by the observers. The average ΔE*76 and ΔE*00 were calculated for both Vita Classical and Vita 3D Master shade guides , for the five backgrounds. Data were analyzed using Univariate Anova test (α=0.05) and multiple comparisons were adjusted using the Bonferroni method.

Results: For Vita Classical shade guide, means and standard deviations of ΔE* values for the five backgrounds were: grey ΔE*76 =1.62(2.55), ΔE*00 =1.11(1.59); blue ΔE*76 =1.94(2.96), ΔE*00 =1.32(1.95), red ΔE*76 =2.03(3.15), ΔE*00 =1.40(2.08); black ΔE*76=2.59(2.90), ΔE*00 =1.79(1.88); white ΔE*76 =3.97(3.43), ΔE*00=2.66(2.28),whilst for 3D Master, the values were: grey ΔE*76 =4.47(2.88), ΔE*00 =2.80(1.80); blue ΔE*76 =5.69(2.67), ΔE*00 =3.61(1.70), red ΔE*76 =4.03(2.71), ΔE*00 =2.64(1.77); black ΔE*76=3.37(3.03), ΔE*00=2.17(1.94); white ΔE*76=6.58(1.94),

ΔE*00=4.18(1.29). A significant statistical difference was found between the backgrounds ($p<0.05$), for both ΔE*76 and ΔE*00 values. However, for Vita Classical shade guide, multiple comparisons showed a significant difference only between grey and white backgrounds ($p<0.05$). More statistically significant differences were found between backgrounds when 3D Master shade guide was used.

Conclusions: In clinical circumstances, the color of the background did influence the color matching, for both Vita Classical and 3D Master shade guides.

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

Abstract #8

In Vitro Study of a Natural Extract-based Experimental Bleaching Gel

C. Gáspárik[1], A. Irimie[1], D. Mada[1], M. Moldovan[2], D. Dudeai[1]

[1] Dept. of Prosthetic Dentistry and Dental Materials, Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

[2] Raluca Ripan Institute of Chemistry Research, Cluj-Napoca, Romania

Objectives: to evaluate the bleaching effect of 1 experimental (based on natural extracts) and 3 commercial bleaching gels based on carbamide peroxide (CP) or hydrogen peroxide (HP) used in different protocols (simulating "at home" and "in office" applications), upon composite resins.

Methods: 30 resin composite disks (A3 body shade Filtek Supreme, 3M Espe), polished to a uniform flat surface were immersed for 3 days in coffee solution; CIE L*a*b* parameters were recorded with a dental spectrophotometer and the disks were divided into 6 groups (n=5): (1) control and 5 test groups. Each test group underwent a bleaching protocol: (2) experimental gel based on natural extracts (5 applications/6h), (3) CP 16% (Opalescence, Ultradent) (5 applications/6h), (4) CP 45% (Opalescence quick 45% PF, Ultradent) (2 applications/30min), (5) CP 45% and CP 16% (Opalescence quick 45% PF and Opalescence 16% (2 applications/30min and 5 applications/6h respectively), (6) HP 6% (Philips Zoom DayWhite 6% HP light-activated (2 applications/30min). CIE L*a*b* parameters were recorded after each bleaching protocol and color difference (ΔE76) was calculated; between the sessions the disks were stored in distilled water at room temperature. One-way repeated measures ANOVA was used to analyze data and multiple comparisons were adjusted by Bonferroni method ($p<0.05$).

Results: The average color differences at the end of the bleaching protocols were as follows: 1: ΔE*=1.40, 2: ΔE*=3.76, 3: ΔE*=5.13, 4: ΔE*=4.79, 5: ΔE*=5.44, and 6: ΔE*=6.83. Overall, a significant statistical difference was found between the groups ($p<0.05$).

However, multiple comparisons showed no significant difference between groups based on CP (3, 4, and 5) ($p>0.05$).
Conclusion: the most effective protocol was the "in office" method based on HP light-activated. The natural extract based gel was less efficient than CP and HP groups; however, ΔE* was above the acceptability threshold.
Acknowledgment: This study was supported by Research Project PN-II-PT-PCCA-2011-3-2-1275.

Abstract #9

Reproducing A1; The Ability of 4 Dental Shade Matching Devices to Measure a Visually Selected A1

C. Igiel, M. Weyrauch, H. Scheller, K-M. Lehmann
Department of Prosthetic Dentistry, University Medical Center Mainz, Germany

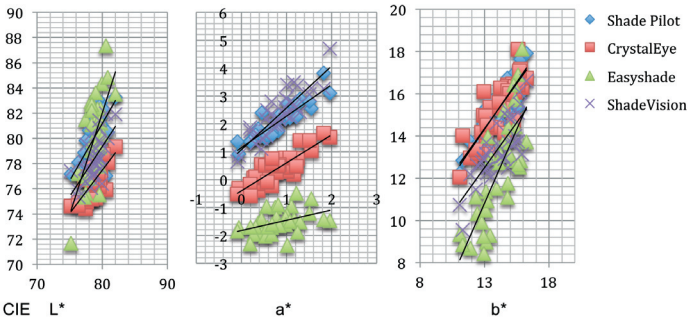
Objectives: The use of different color measurement devices in the fabrication process of dental ceramics could lead to unacceptable results. The instrumental devices differed in measuring geometry, sensor technology, data acquisition and therefore process the color information differently. The aim of this study was to compare he performance of 4 commercially available dental color measuring devices to match a visually selected A1.
Methods: 100 teeth's with the VITA classical tooth color A1 were collected. Therefore the upper anterior teeth of 61 dental students were visually screened. Two calibrated operators chose in each other's agreement the tooth color using the VITA classical shade guide. After confirming the tooth color A1, one trained operator performed the electronic shade measurement. Devices used were the Degudent Shadepilot (MHT Spectroshade), Olympus Crystaleye, Vita Easyshade compact and X-Rite Shadevision. The percentage of agreement between visual and instrumental shade tap selection was recorded. For the cases were all devices selected A1 a linear regression model was designed for CIE L*a*b* and the correlation coefficients were calculated.
Results: 35,6 % of the teeth represents a tooth color that is independently confirmed by 2 human operators and 4 dental color-measuring devices, to be an A1.

Device	Shadepilot	Crystaleye	Easyshade	Shadevision
Agreement (%) with visual selection	72,7	64,4	52,1	38,4
Cases were all devices select A1 (%)		35,64		

In between the cases of complete agreement, the correlation between the CIE L*a*b* color coordinates of the different devices

Abstracts • Poster Presentations

are displayed against the overall mean color coordinates and the correlation coefficients (R^2) are calculated.



Color/R^2	Shadepilot	Crystaleye	Easyshade	Shadevision
CIE L*	0.461	0.506	0.453	0.415
CIE a*	0.816	0.767	0.186	0.767
CIE b*	0.814	0.786	0.594	0.649

Conclusions: The result of this study indicates, that there is a significant difference between the CIE color coordinates of the measured teeth between the devices examined. However, there is a lack of consistency in conversion of the spectrophotometric/colorimetric data into the shade tab information that is commonly used for visual color determination. Therefore, the exchange of the CIE L*a*b* coordinates between different devices, even when the same shade is selected, would not be meaningful.

Abstract #10

Evaluation of the Coloring Liquid Infiltration into Dental Monolithic Zirconia Ceramics

H-K. Kim[1], S-H. Kim[2], J-B. Lee[2], J-S. Han[2], I-S. Yeo[2]
[1] Department of Prosthodontics, Veterans Health Service Medical Center, Seoul, Republic of Korea
[2] Department of Prosthodontics and Dental Research Institute, School of Dentistry, Seoul National University, Seoul, Republic of Korea

Objective: This study was designed to assess the depth of coloring liquid infiltration into dental monolithic zirconia ceramics by using brush-application technique.

Methods: One-hundred sixty-five monolithic zirconia specimens (16.3 mm × 16.3 mm × 2.0 mm, BruxZir, Glidewell Laboratories, Newport Beach, CA, USA) were divided into 5 groups according to the number of coloring liquid applications; Group I (one time of application) to Group V (five times of application) (Tanaka ZirColor, A2, Tanaka Dental, Skokie, IL, USA). Each group was then

divided into 11 subgroups by reducing the thickness in 0.1-mm increments; Subgroup 0 (no reduction), Subgroup 1 (0.1 mm reduction) to Subgroup 10 (1.0 mm reduction) (n = 3). Colors were measured according to CIELAB on a reflection spectrophotometer. All measurements were performed on five different areas of each specimen. Data were analyzed with one-way ANOVA and multiple comparison Scheffé test ($\alpha = 0.05$).
Results: Group II exhibited significant changes in a* and b* values down to 0.2 mm reduction and Group III; to 0.3 mm reduction, Group IV; to 0.6 mm reduction, and Group V; to 0.5 mm reduction. There was no distinct difference in a* and b* values among groups after around 0.6 mm reduction.
Conclusions: The more coloring liquid is applied, the deeper the coloring liquid infiltrates into monolithic zirconia ceramics. Within the limitation of this study, one time of coloring liquid application could infiltrate 0.1 mm deep through monolithic zirconia ceramics while four or five times of application, around 0.6 mm deep.

Abstract #11

Coverage Error of Compositesystems Compared with Natural Teeth

R.G. Koeppen, J.M. Powers, R.D. Paravina
Department of Restorative Dentistry & Prosthodontics
The University of Texas School of Dentistry at Houston

Objective: To evaluate color compatibility between natural teeth and three composite systems and among the composite systems. The null hypothesis was that there were no differences in color compatibility between natural teeth and composite systems and among the composite systems.
Material and Methods: A previously compiled database on in-vivo color of human teeth (529 subjects) was compared with three composite shade systems: dual layered Filtek Supreme Ultra (FS, 3M ESPE, St. Paul, MN) and Clearfil Majesty ES-2 Premium (CM, Kuraray America, New York, NY), and single layered Venus Diamond (VN, Heraus Kulzer, Hanau, Germany). Five tooth shaped specimens for each shade were fabricated using a silicone-synthetic rubber mold (Smile Line, Wheat Ridge, CO). Manufacturer's instructions were followed for shade combination for single- and dual-layered composite samples. All specimens were cured for 40 seconds using a halogen lamp (Optilux 501 Kerr, Orange, CA). The curing light energy extended between 600 and 760 mW/cm^2. After trimming flash, the facial surface of each specimen was polished with PoGo polisher discs (Dentsply, York, PA) and a conventional contra angled low-speed handpiece using light pressure. The databases of the color of human teeth and three composite shade systems were produced using PR-670 SpectraScan Spectroradiometer (Photo Research, Chatsworth, CA), with standard illuminant D65 and

2° Standard observer. Coverage error (ΔE*cov) was calculated as mean of best matches (smallest ΔE* values) between each natural tooth and all shades in composite system. Lower coverage error corresponded to better match. Means and standard deviations were calculated and data were analyzed by analysis of variance with Tukey/Kramer multiple-comparison tests (α = 0.05). Literature finding on 50:50% acceptability threshold of ΔE*=2.7 was a supplementary tool in result interpretation.

Results: Coverage error (s.d.) of FS, VD and CM to natural teeth was 3.7 (1.8), 4.4 (2.4) and 3.5 (2.0), respectively. Tukey/Kramer interval for comparisons among composite systems was 0.3, revealing significant differences ($p<0.0001$) between FS-VD and between VD-CM. Coverage errors among the composite systems were as follows: FS to VN = 2.2 (1.5), VN to FS = 3.2 (1.7); FS to CM = 2.7 (1.0), CM to FS = 3.4 (1.4); and VN to CM = 3.4 (1.8), CM to VN = 3.2 (1.7). Tukey/Kramer interval for comparisons of coverage errors among composite systems was 1.0. Significant differences ($p<0.05$) were recorded only between FS-VD and VD-FS, FS-VD and CM-FS, and between FS-VD and VD-CM.

Conclusions: Coverage error between composite shade systems and the database of natural teeth was as follows: (lowest) CM = FS > VN (highest). As far as the comparison of pairs of composite shade systems are concerned, the best results were recorded for FS, with the coverage error to VN and CM below or at the 50:50% acceptability threshold. Other ΔE^*_{COV} values recorded in this study were above the 50:50% acceptability threshold, but the values were fairly close to the threshold value (the greatest ΔE^*_{cov} was 4.4). However, due to color adjustment potential (chameleon effect) that the majority of resin composites exhibit, these differences are reduced in clinical settings.

Abstract #12

Effect of a Natural Bleaching Agent on Various Restorative Materials

M. Moldovan[1], C. Prejmerean[1], S. Cuc[1], D. Prodan[1], C. Agapescu[2]
[1] Department of Polymer Composites, Babes Bolyai University, "RalucaRipan" Chemistry Research Institute, Cluj-Napoca, Romania
[2] SC RemedProdimpex, Bucuresti, Romania

Objectives: The objective of this manuscript was to study the influence of various whitening agents (experimental natural bleaching gel G24 and commercial BrightBleach®, bleaching gel) on surface morphology and color of various restorative materials (Nanofill®,Schulzerand 3 experimental nanocomposite (P11, P31, P61)).

Materials and Method: Each type of nanocomposite prepared in Teflon molds (1 × 1,5 mm), was further divided into three groups [n = 5 controls were placed in artificial saliva and the other two groups

Abstracts • Poster Presentations

of n = 5 were placed in coffee, for 10 and 30 days and bleached with experimental and commercial gel]. The measurements were performed with a UV-Vis spectrophotometer (UNICAM) and from the reflection spectrum were determined the color coordinates (Δa^*, Δb^*, ΔL^*) and the color difference ($\Delta E_{a,b}$) comparative with digital images, *an original software application "Discolor"* is used. Color measurements were made before and after immersion in solutions and after bleaching. The two-way ANOVA test was used to evaluate the results. The surface morphology was measured before and after bleaching gel application by scanning electron microscopy (SEM-FEI).

Results: All nanocomposite samples immersed in coffee showed significant coloration compared to baseline values ($P<0.05$). Discoloration in samples immersed in artificial saliva was not significant compared to baseline ($p>0.05$). Immersion period and solutions were significant factors for the color recovery procedure ($p<0.002$). The interaction between immersion time and bleaching gel type was also significant ($p<0.002$). ΔE values obtained from the UV-Vis spectra and digital imagine, was significantly different to all four types of nanocomposite stored in coffee ($p<0.05$); while no significant difference was observed in those stored in artificial saliva ($p>0.05$).

Conclusions: Bleaching treatments with experimental natural gel can lead to a coloring reduction, also not exist change of surface morphology to the dental composites.

Acknowledgments: This work was supported by the Romanian Project PNII no. 165/2012 and 191/2014.

Abstract #13

Reliability of Tooth Shade Selection with a Corrected-light Device

S. Najafi-Abrandabadi[1], F. Vahidi[1], M. N. Janal[2]

[1] Department of Prosthodontics, New York University College of Dentistry, New York, NY, USA

[2] Department of Epidemiology and Health Promotion, New York University College of Dentistry, New York, NY, USA

Objective: One of the key parameters in fabrication of an esthetically successful restoration, is the correct tooth shade selection. Numerous attempts have been made to eliminate the variables in order to increase the reliability of tooth shade selection. One of these recommendations is utilization of a corrected lighting source. The purpose of this study was to evaluate the effects of a corrected light device (Rite Lite 2-Addent; Danbury, CT) and different viewing backgrounds on reliability between raters in a test of shade tab matching.

Methods: In this in-vitro double-blinded study, 4 faculty members measured the shades of 10 shade tabs. All evaluators were tested for color blindness and were calibrated prior to this study. Shades were

selected in 4 different conditions, evaluating 4 variables: with and without corrected light device, pink and light blue backgrounds. These sets of sessions were repeated after one month to evaluate the degree of intra-rater agreements. The intra-rater agreement among the examiners was assessed with the Kappa statistics.
Results: The Kappa indices for each of the 4 conditions were measured for value, hue and chroma. Among all conditions, the highest kappa index was with pink background and corrected light device, however this difference was not statistically significant except for "chroma".
Conclusions: Utilizing the corrected light device with a pink background when selecting shades improved the reliability of the selections, which this was clinically significant.
Clinical Significance: Utilizing the corrected light device (Rite-lite 2) with the pink background which are provided in its kit, can improve the reliability of shade selections.

Abstract #14

Shade Matching Using CIELAB & CIEDE2000 Color Difference Formulas

M.M. Perez[1], O.E. Pecho[1,2], R.I. Ghinea[1], R. Alessandretti[2], A. Delia Bona[2]
[1] University of Granada, Spain
[2] University of Passo Fundo, Brazil

Objectives: To compare visual and instrumental shade matching performances using two shade guides and three color difference formulas.
Methods: One hundred dental students (DS) volunteers (35 males and 65 females) with normal color vision participated in the study. The spectral reflectance of four extracted human upper central incisors (UCI) and shade tabs from the two most used shade guides (VC- Vita Classical and 3D- Vita Toothguide 3D-Master) were measured using a spectroradiometer (SP) PR-704 (Color Research, USA) under D65 illuminant (diffuse/0° geometry) inside a viewing booth (CAC D60, VeriVide, UK) with a gray background. Color coordinates (CIE L*, a*, b*, C* and h°) were calculated according to CIE D65 illuminant and CIE 2° Standard Observer. Color coordinates of UCIs and all shade tabs were also evaluated using a dental spectrophotometer (EA- Easyshade Advance). VC and 3D nominal shades were also recorded by the EA from each UCI. DS used VC and 3D to visually select the best shade match for each UCI, under same experimental conditions used for the SP evaluation. Three color difference metrics (CIELAB, CIEDE2000(1:1:1) and CIEDE2000(2:1:1)) were used to calculate the best instrumental shade matching based on minimum color difference (ΔE^*_{ab}, ΔE_{00}(1:1:1) and ΔE_{00}(2:1:1), respectively).

Abstracts • Poster Presentations

Results: The percentage of best match for the visual assessment was more consistent using VC (23-55%) than 3D (19-34%). The agreement between visual and instrumental shade matching was greater using SP (25-75%) than EA (0-25%). Considering the best performance (using SP and VC), the CIEDE2000(2:1:1) color difference formula showed the best estimate to the visual perception from dental students.
Conclusions: The combination of using the measurements performed by a spectroradiometer, CIEDE2000(2:1:1) color difference formula and Vita Classical shade guide most closely represented the visual perception of dental students. Instrumental shade determination should be always accompanied by experienced human visual perception.
Acknowledgments: The authors acknowledge funding support from CNPq do Brasil (304995/2013-4), CAPES do Brasil (PNPD 42009014007P4), FAPERGS (396-2551/14-1) and the research project JA TEP-1136 from "Junta de Andalucia", Spain and MAT2013-43946R from the Spanish Ministry of Economy and Competitiveness.

Abstract #15

Comparative Translucency of Graphene-silica Experimental Nanocomposites and Esthetic Composite Materials

C. Sarosi[1], M. Rosu[2], L. Silaghi-Dumitrescu[1], V. Prejmerean[3], M. Moldovan[1]
[1] Departament of Polymer Composites, Babes Bolyai University - Raluca Ripan Chemistry Research Institute, Cluj-Napoca, Romania
[2] National Institute for Research and Development of Isotopic and Molecular Technologies, Cluj-Napoca, Romania
[3] Babes-Bolyai University, Faculty of Mathematics and Computer Science, Cluj-Napoca, Romania

Objectives: This study sought to evaluate how artificial accelerated aging (AAA) and filler composition affected translucency for four dental nanocomposites (3 experimental and one commercial-Herculite XRV Ultra, Kerr) through two methods of investigation.
Methods: Three experimental nanocomposites (GS1, GS2, N), two with graphene-silica nanoparticles (GS1, GS2) in different percent and one commercial (Herculite XRV Ultra, Kerr) were selected. For each material ten discs were made (2 mm x 30 mm), cured with a LED lamp (Woodpecker) 180s in a teflon mould. The samples were divided in two groups, one group (n=5) as control and one (n=5) accelerated aging at UV lamp (denumire) for 4 and 336 hours. The translucency was measured by two methods: *UV-VIS spectrophotometer*, and the reflection spectrum was recorded in the 380-770 nm region on white and black, compared with a SPECTRALON standard white and *Transluc software* application which determine the translucency of a material by comparing

the colors of the two corresponding areas of the two images on a white and black background, respectively.
Results: The majority of composites had translucency values within the wider range of values observed for human dentin. The translucency parameters calculated (CHROMA coordinates) from the reflection-registered spectra of GS1, GS2, N1 and Herculite investigated samples are quite similar. This behavior indicates that the addition of graphene-silica nanoparticles has strong influence on the translucent characteristic, by reducing the translucency. The Herculite XRV nanocomposite present a better translucency compared with those experimental. The results obtained by *Transluc software* application is comparable with those obtained through UV-VIS.
Conclusions: An original software application has been developed in order to determine and compare with UV-VIS method the translucency of some experimental dental nanocomposites.
Acknowledgments: This work was supported by the Romanian Project PNII no. 230/2014 and 127/2014.

Abstract #16

Impact of Simulated Gastric Acid on the Optical Properties of Monolithic Zirconia

T. Sulaiman[1,2], A. Abdulmajeed[1,2], T. Donovan[2], P. Vallittu[1], T. Närhi[1]
[1]University of Turku, Finland, [2] University of North Carolina, USA

Objectives: To evaluate optical properties of monolithic zirconia after immersion in simulated gastric acid.
Materials and Methods: Four partially stabilized (PSZ) and one fully stabilized (FSZ) zirconia materials were selected for the study: Prettau (PRT, Zirkonzahn), Zenostar (ZEN, Ivoclar), Bruxzir (BRX, Glidewell), Katana (KAT, Noritake) and FSZ Prettau Anterior (PRTA, Zirkonzahn). IPS e.max (Ivoclar) was used as a control. The specimens (10x10x1.2 mm, n=5 per material) were cut, sintered, polished and cleaned before immersed in 5 ml of simulated gastric acid solution (Hydrochloric acid (HC1) 0.06 M, 0.113% solution in deionized distal water, pH 1.2) for 96 hours in a 37°C incubator. Surface gloss and translucency parameter (TP) values were determined by a reflection spectrophotometer before and after acid immersion. The data was analyzed by one-way ANOVA followed by Tukey's HSD post hoc test ($p<0.05$).
Results: TP values increased significantly for PRT, ZEN and IPS e.max ($p<0.05$), while the surface gloss of ZEN, PRTA and IPS e.max increased ($p<0.05$).
Conclusion: Monolithic zirconia materials show some surface alterations in an acidic environment with minimum effect on their optical properties. Whether a smoother surface is in fact a sign of true corrosion resistance or is purely the result of an evenly progressive corrosive process is yet to be confirmed by further research.

Abstracts • Poster Presentations

Abstract #17

Evaluation of Eye Fixations of Four Different Test Groups on an Esthetic Smile Analysis Using an Eye Tracking System

M. Weyhrauch, K. M. Lehmann, F. Burkard, C. Igiel, H. Scheller
Department of Prosthodontics, University Medical Center of Johannes Gutenberg-University Mainz, Germany

Objectives: The perfect smile is one of the most important aspects in patient's contentment. The aim of this study was to evaluate, how different groups of observers (layperson, trained laypersons, dental student, dentist) analysis a picture of upper incisors with various configurations and modification of the picture.
Methods: Twenty pictures of upper anterior teeth would be prepared in Photoshop, that every picture showed the same size and cleavage of the mouth. Some pictures were modified to show a golden proportion; some teeth were whitened. The pictures were populate into the software Nyan 2.0^{XT}. 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 four groups of observers divided into laypersons, trained laypersons, dental students and dentists. Also the sex and the age were differenced. The trained laypersons were skilled by a PowerPoint presentation, which shows what should be taken notice of. 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.
Results:
Table 1. Rating of the pictures divided by the groups of observers.

Picture	Rating laypersom	Rating trained layperson	Rating dental student	Rating dentist
1 original	8.13	8.13	7.93	7.27
2 original	6	5.93	6.8	6.33
1 mirrored	7.67	7.13	7.67	6.87
2 golden cut	6.4	6.2	7.4	6.53
3 original	4.87	3.8	4.27	3.8
4 original	5.6	5.2	5.07	5.47
3 whitened	7.07	5.67	5.53	5
4 whitened	7.93	6.47	6.47	6.2
6 original	5.6	5.47	6.33	6.27
7 original	4.67	4.47	4.93	5.2
6 mirrored	5.8	6.13	6.67	6.73
10 original	5.47	5.53	6.2	6.27
6 whitened	7.07	8.2	7.07	8
8 original	4.33	4.73	5.53	5.13

Picture	Rating laypersom	Rating trained layperson	Rating dental student	Rating dentist
6 whitened + mirrored	8	8.73	8	8
9 original	6.13	7.87	7.4	7.27
8 whitened	6.27	6	5.8	5.53
11 original	2.27	2.4	7.73	2.27
9 mirrored	6.4	7.2	7.73	6.73
11 mirrored	3.87	3.8	3.8	4.73

Conclusions: There are differences in the assessment especially of the modifications of the pictures. So it could conclude that whitening of the teeth effect the assessment of the observers particularly.

Abstract #18

Translucency Parameter, Color, Flexural Strength and Modulus of CAD/CAM Zirconia

R. Yapp[1], M. Cowen[1], R.D. Paravina[2], J.M. Powers[1]
[1] The Dental Advisor, Dental Consultants, Inc.
[2] Department of Restorative Dentistry and Prosthodontics, UT School of Dentistry, Houston, TX

Objectives: To measure the translucency parameter (TP) and color (ΔE*) at two thicknesses and flexural strength (FS) and modulus (FM) of several CAD/CAM zirconia products.
Methods: The following zirconia ceramics were tested: BruxZir Solid Zirconia (BSZ, Glidewell Dental Laboratories), LavaPlus (LP, 3M ESPE), YZ Disc HT (YZHT, Vita North America), Origin Live HT (OLHT, B&D Dental Technologies), Nacera Pearl (NP, Doceram Medical Ceramics), and Origin Beyond (OB, B&D Dental Technologies). Specimens (n=5) were square (12 mm×12 mm ± 0.5 mm) with thicknesses of 0.5 and 1.0 mm ± 0.05 mm post sinter. Translucency parameter (TP, color difference the same specimen recorded against white and black backgrounds), ΔTP, and color (ΔE*) measurements were performed using a Color-Eye 7000 spectrophotometer (X-Rite). ΔTP and ΔE* (white background) were the difference of those variables at 0.5 and 1.0 mm thickness. Three-point flexural strength and modulus testing was performed on 2×4×25 mm sintered specimens (n=10). 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.

Abstracts • Poster Presentations

Results: Means (SD) of TP, ΔTP, ΔE*, FS and FM are listed in the Table.

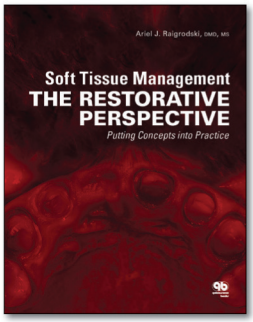
Zirconia	TP (SD)	ΔTP (SD)	ΔE (SD)	FS, MPa (SD)	M, GPa (SD)
BSZ-0.5	10.5 (0.5)	2.6(0.5)	3.3(0.6)	1098(86)	138.3(3.9)
BSZ-1.0	7.9 (0.2)				
LP-0.5	10.7(0.2)	2.8(0.4)	6.2(1.2)	811(116)	135.5(4.8)
LP-1.0	8.0(0.4)				
YZHT-0.5	10.1(0.3)	2.4(0.3)	1.8(0.4)	989(77)	141.3(3.9)
YZHT-1.0	7.7(0.1)				
OLHT-0.5	10.2(0.2)	2.8(0.4)	3.1(0.4)	1096(87)	135.3(4.6)
OLHT-1.0	7.8(0.3)				
NP-0.5	10.7(0.2)	1.7(0.3)	9.4(0.4)	1061(51)	135.7(2.7)
NP-1.0	9.0(0.1)				
OB-0.5	12.8(1.3)	4.0(1.3)	3.7(1.8)	802(61)	143.9(2.1)
OB-1.0	8.8(0.1)				

Conclusions: Specimens of the zirconia products were more translucent at 0.5 mm thickness (range 10.1 to 12.8) than at 1.0 mm thickness (range 7.7 to 9.0). Color change (ΔE*) was affected by thickness and highly influenced by change in lightness when measured on a white background. FS and FM were not correlated with TP.

Acknowledgments: Funding and products were provided by the manufacturers.

NEW TITLES

Esthetics & Dental Technology
from QUINTESSENCE



Soft Tissue Management: *The Restorative Perspective—Putting Concepts into Practice*

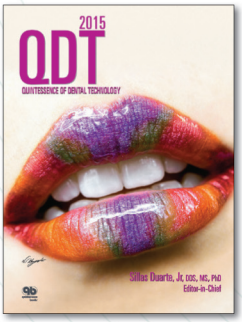
Ariel J. Raigrodski

208 pp; 779 illus; ©2015;
ISBN 978-0-86715-691-1 (B6911); **US $132**

Digital Dental Revolution: *The Learning Curve*

Alessandro Agnini and
Andrea Agnini with Christian Coachman

416 pp; 1,498 illus; ©2015;
ISBN 978-88-7492-017-4 (B9532); **US $228**

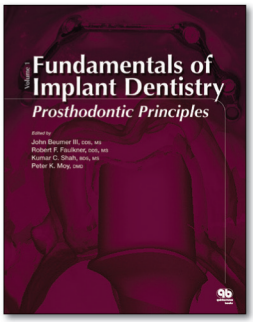


Quintessence of Dental Technology 2015

Editor: Sillas Duarte, Jr

2015 (Vol 38); 220 pp; 915 illus;
ISBN 978-0-86715-689-8 (J0626); **US $132**

Featured authors include: G. Chiche, P. Kano, N. Hayashi, S. Duarte, I. Contreras Molinas, L. Narciso Baratieri, V. Clavijo, J.-H. Phark, N. Sartori, H. Kuday, M. Magne, G. Dazhaev, T. Singh, O. Scopin de Andrade, C. Soares, and Y. Tsuzuki



Fundamentals of Implant Dentistry, vol 1: *Prosthodontic Principles*

Edited by John Beumer III, Robert F. Faulkner, Kumar C. Shah, and Peter K. Moy

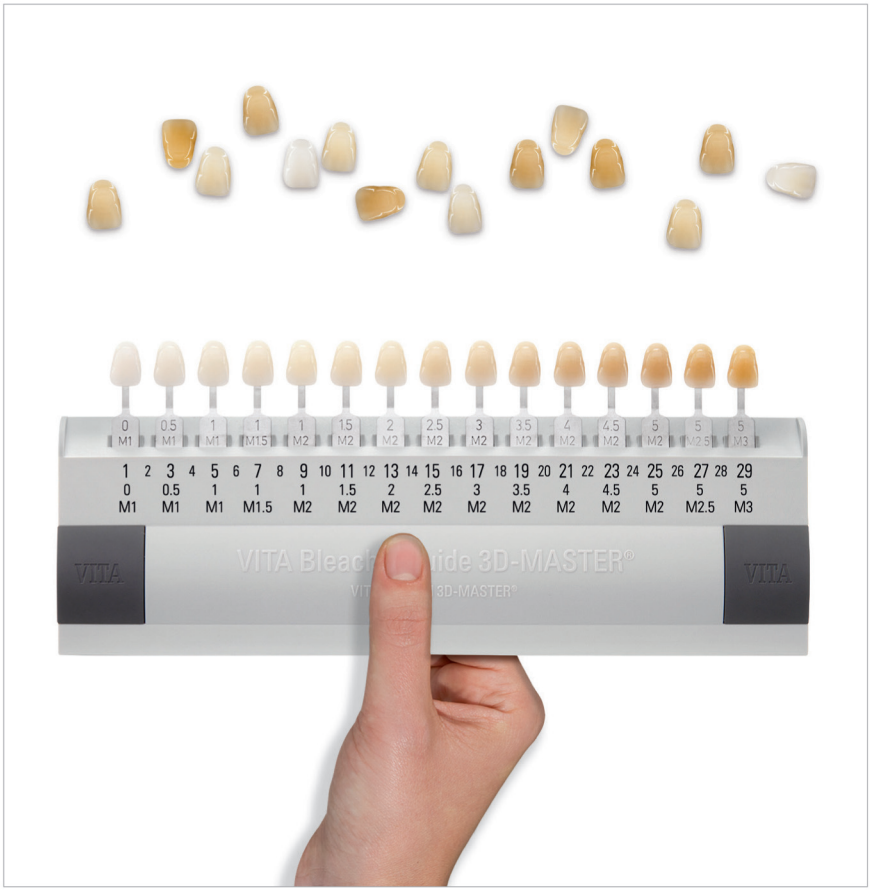
456 pp; 1,105 illus; ©2015;
ISBN 978-0-86715-585-3 (B5853); **US $168**

quintessence books

CALL: (800) 621-0387 (toll free within US & Canada) • (630) 736-3600 (elsewhere) 09/15
FAX: (630) 736-3633 **EMAIL:** service@quintbook.com **WEB:** www.quintpub.com
QUINTESSENCE PUBLISHING CO INC, 4350 Chandler Drive, Hanover Park, IL 60133

At last: An easy way to track tooth whitening!

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



VITA shade, VITA made. **VITA**

- Ideal for patient tooth whitening assessment and treatment planning
- Select the starting shade and measure progress during the whitening regimen
- Measure and maintain patient whitening at the optimal level
- Integration of 29 shade levels defined by the American Dental Association (ADA)

facebook.com/vitanorthamerica www.vitanorthamerica.com | 800-828-3839

clinical relevance for researchers & scientific relevance for clinicians

SCAD

Society for Color and Appearance in Dentistry

SAVE THE DATE

SCAD 2016, September 15-17
Radisson Blu Aqua Hotel, Chicago, IL

Contact info:
SCAD
5116 Bissonnet #394
Bellaire, TX 77401, USA
+1.281.687.8752 (Phone)
+1.877.255.6075 (Fax)
www.scadent.org
info@scadent.org