

**MINIMALLY INVASIVE DENTISTRY AND RESPONSIBLE ESTHETICS:
IS THIS A NEW CONCEPT?
AN INTERVIEW WITH DR. NEWTON FAHL JR. AND DR. LORENZO VANINI
CONDUCTED BY DR. FRANK J. MILNAR**



by Newton Fahl, Jr., DDS
Curitiba, Brazil
www.fahl.com.br

Lorenzo Vanini, DDS, MD
San Fedele Intelvi, Italy
www.lorenzovanini.it

Frank J. Milnar, DDS, AACD
Accredited Member (AAACD)
St. Paul, MN
www.milnardds.com

INTRODUCTION

The core ideology of the American Academy of Cosmetic Dentistry (AACD) states that we will encourage treatment protocols that are evidence-based and minimally invasive. Our goal is to minimize the loss of healthy tooth structure and tissue while providing treatments that are predictable and result in long-term functioning restorations and patient satisfaction. All dentists are exposed to materials science during training. Information about newer materials, as well as clinical technique refinements, is highly in demand. Speakers who can effectively teach and demonstrate each of these aspects have been a hallmark of the Annual AACD Scientific Sessions.

I have always enjoyed working with form and color and the inner journey through which art-related subjects often led me. (NF)

As a co-chair of the Professional Education Committee (PEC) for this year's Scientific Session in Grapevine, Texas, I felt it was essential to invite individuals who embrace the Responsible Esthetics philosophy and have practiced it throughout their entire careers. The PEC specifically chose Drs. Newton Fahl and Lorenzo Vanini to use an innovative venue incorporating presentation, interactive discussion, and live technique demonstration to educate and stimulate our members. While from different parts of the world—Dr. Fahl from Brazil and Dr. Vanini from Italy—they are both recognized by their colleagues and the profession as masters of composite art. Why should you come to Grapevine and learn from these two masters? Both will lecture, provide a combination lecture/live demonstration, and conduct hands-on workshops. For all general members and Accreditation candidates, this truly is a “can’t miss” opportunity!



Figure 1



Figure 2

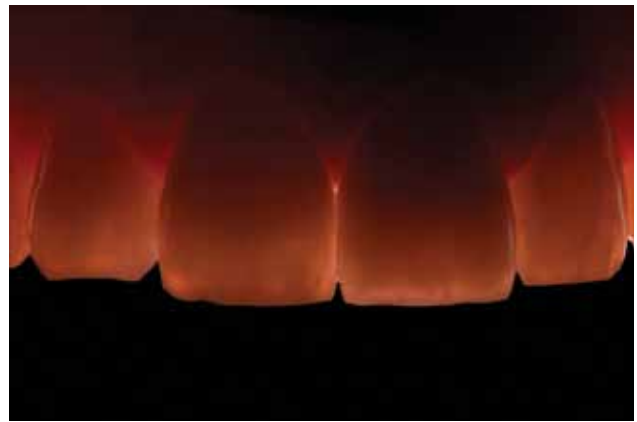
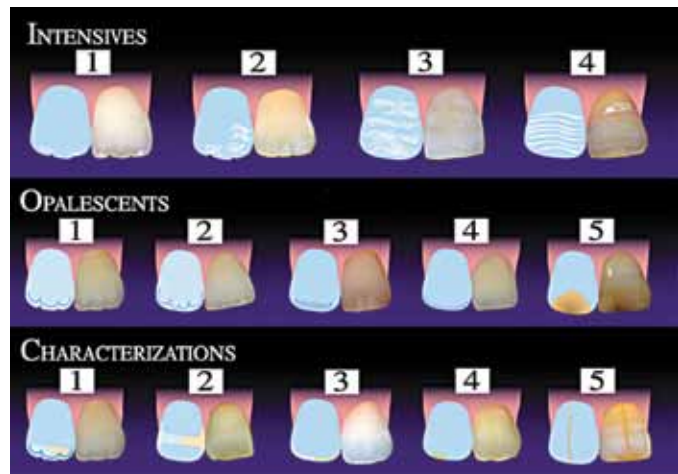
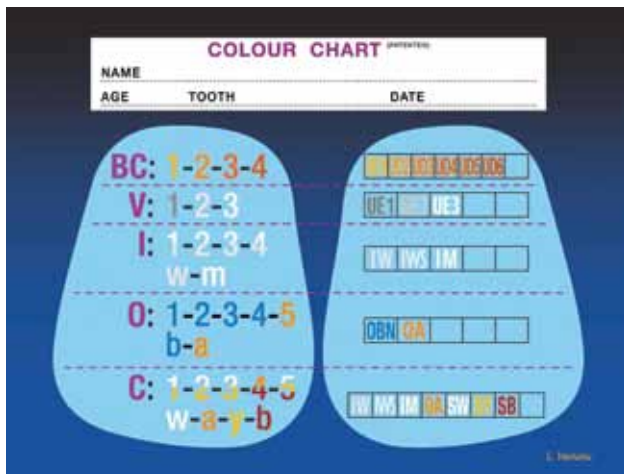


Figure 3

Figures 1-3 (NF): If selected according to the correct physical and optical properties, composite resins can be implemented for even greater challenges, such as crown buildups.



Figures 4 & 5 (LV): Color chart for color mapping (front and back).

I thought it would be enlightening to ask Drs. Fahl and Vanini questions that are germane to our Scientific Session, their individual philosophies, and their views on the direction of and education about composite materials. Also, their responses will include clinical examples of their techniques and procedures that will be demonstrated in Grapevine.

FM: *What inspired you to master composite materials?*

NF: Initially, it was the ability to be the purveyor of my own art. I have always enjoyed working with form and color and the inner journey through which art-related subjects often led me. When I was exposed to the universe of restorative possibilities that adhesion could afford, I instantly connected the two areas. However, the most important factor was having studied under the mentorship of Professor Gerald E. Denehy during my MS program at the University of Iowa. His ability to instill knowledge and passion, which are the prerequisites of a true educator, was fundamental in my decision to continue to learn about this fascinating field.

LV: I started to work with composite materials in 1981 and I immediately understood their potential and importance for our work. However, at that time there wasn't a specific technique of use based on a method of color determination and stratification that was reproducible and within the reach of everybody. From there I began to study color in dentistry, and I developed my

theory about color and stratification and the anatomic stratification technique with silicone stent.

FM: *What attracted you to be part of the AACD Scientific Session, and what are your expectations?*

Nowadays, composite materials have mechanical characteristics that are absolutely better than in the past, and all of them exhibit good wear resistance, cohesion, and smooth surfaces. (LV)

NF: The AACD has always endeavored to break new ground germane to enlightening the dental community, and the 2010 meeting has captured my attention because of its educational format. Specifically regarding the program that I will be teaching, I expect the attendees to benefit tremendously from the lecture/live demonstration sessions from different presenters' points of view, because it will cause them to contemplate distinct concepts.

LV: I'm honored that you invited me; I'm always glad to receive invitations from prestigious international academies. I will present at my personal best and share my wealth of clinical experience and research with the AACD.

FM: *While some dentists believe that "a composite is a composite," what are characteristics of materials introduced in the past couple*

years that make them superior to materials introduced more than five years ago?

NF: The industry is striving to produce universal-type composites, which should provide both high strength and excellent polish. Concerning physical properties, nanotechnology has allowed tremendous improvement in both areas by increasing the filler content and particle morphology. Several companies have come out with new chemistry for the organic phase, in an attempt to reduce polymerization shrinkage and enhance sculptability. From an optical properties standpoint, improvements on levels of opacity/translucency and refractive indices have permitted the synthetic materials to blend in more naturally with the tooth structures, making achieving lifelike restorations more predictable (Figs 1-3).

LV: Nowadays, composite materials have mechanical characteristics that are absolutely better than in the past, and all of them exhibit good wear resistance, cohesion, and smooth surfaces. In speaking about real innovation and improvement in esthetics, we have to consider two groups of composites: Ena HRI (Enamel Plus HRI in Europe) by Micerium SpA (Avegno, Italy), and the rest of composites. Ena HRI is a system born from a new theory about color and stratification. It was the first composite in the world to have characteristics of fluorescence similar to the natural tooth, the first that

developed three enamels with different values calibrated on the age biotype and one universal dentin shade, it is the only system that offers a color chart based on the new color theory that foresees five dimensions, and the first that introduced a heater to warm up the composite bodies before use. The Ena HRI research team (Dr. Thomas Niem and I) developed a new enamel with the same refraction index of natural enamel; this makes the system unique and highly innovative. Ena

HRI has been constantly evolving for almost 15 years to stay updated; it is the composite that others try to emulate (Figs 4 & 5).

FM: *Is there a non-clinical process you go through to evaluate a composite material's benefits and limitations for cosmetic procedures, and is this something you can demonstrate live in Grapevine?*

NF: For every composite system that I evaluate, I make discs of varying thickness to be able to ascertain the effect of thick-

ness in opacity/translucency, as well as chroma and value changes. This is a practical adjunct that aids the clinician in visualizing pre-clinically the optical changes that the material to be used intraorally will undergo. I can certainly show that (Figs 6 & 7).

LV: It will be sufficient to build up a tooth copying a natural element and, after, compare the likeness in relation to the color dimensions and the anatomic shape (Figs 8 & 9).



Figures 6 & 7 (NF): The perception of a "color from the surface" on the natural enamel suggested the use of chromatic enamels for both Class IVs and direct veneers.



Figures 8 & 9 (LV): Fractured incisor restored with composite. The contrasting effect created by the white characterization of mamelons and the blue incisal halo is evident.



Figure 10



Figure 11



Figure 12

Figures 10-12 (NF): "Blend in" effect of a composite resin is crucial for making the restoration inconspicuous in cases where both natural and artificial enamels can be seen. Diastema closure is a typical example of when thin layers of composite virtually disappear over the natural tooth structures.

FM: *There are many, many composite materials available today and they are constantly changing. Considering evidence-based dentistry and Responsible Esthetics, how can a dentist select materials to use that will provide them a high confidence level of esthetics/cosmetics and functional success over time?*

NF: The best way is to study scientific journals and be critical when evaluating data provided by independent researchers. Understanding

and interpreting materials and methods can prove elusive at times, so my advice is to compare test results; for example, wear, strength, color properties, etc., referring to a specific composite resin, from different sources and researchers (Figs 10-12).

LV: In my opinion, the dentist must first learn how to determine tooth color in a more precise way and stop improvising. A good esthetic restoration is born from a good knowledge of color and

a reproducible stratification technique, and each composite should be developed from a specific theory of color and stratification. A composite material that does not have this type of support is missing personality and character, and usually is used in different and improper ways. From the esthetic point of view, the modern nanofilled composites offer enamel body that is too opaque because of the high filler content that stops the passage of light, and



Figures 13 & 14 (LV): Preoperative; non-vital discolored incisor. Postoperative; after bleaching and composite restoration of the incisal corner.

because they have a refraction index different from that of natural enamel (Figs 13 & 14).

FM: *Considering any material improvements in the past year or two, how have they impacted your clinical techniques to maximize your esthetic results?*

NF: I have been very comfortable using composite resins that have been on the market for over 30 years because of the excellent optical and physical properties, which remain unchanged. I also try and experiment with as many new systems as I possibly can to absorb the best and the worst each can provide. My school of thought and teaching philosophy is not locked into a system because it is considered "state-of-the-art." I teach colleagues to think about the ideal properties a composite has to have and select from among the myriad of available products on the market. For instance, an "outdated" restorative composite may have a great dentin shade in terms of opacity, chroma, and

strength but cannot be used as artificial enamel because it lacks ideal optical properties and polishability.

For every composite system that I evaluate, I make discs of varying thickness to be able to ascertain the effect of thickness in opacity/translucency, as well as chroma and value changes. (NF)

LV: Material improvements didn't impact my technique. I have been working with Ena HRI for 15 years and my techniques influenced the development of materials, giving suggestions to the chemists to develop new bodies or improve the already existing one. Those who read my book will understand this.

FM: *What are a couple areas for improvement you feel are possible for future composite materials?*

NF: The first one is actually conceptual. I really feel strongly about the industry coming up with a standardized nomenclature for dentin and enamel

shades. As an example, having an artificial dentin be called "Opaque," "Opacious," "Body," or "Dentin" becomes exceedingly confusing for the general dentist who is just starting to venture into the use of layering techniques. Although each company has its own marketing agenda, I think everyone would benefit if they reached a consensus, as is done with feldspathic porcelain and ceramics. Dentin is "Dentin" and enamel is "Enamel"—how hard is that? Secondly, there is enough evidence that there is no need for the many shades that most systems often provide for artificial enamel and artificial dentin, which, too, can be cumbersome and misleading. Regardless of the technique employed and who teaches it, the universe of shades necessary for restoring most anterior cases is in fact really narrow.

LV: The connection between organic matrix and filler should be improved to give more cohesion to the material; the



Figures 15 & 16 (NF): Veneering a single discolored tooth to match the adjacent dentition requires knowledge of color theory applied to the selection of nature-mimicking composites, in addition to having a deep knowledge of anatomy.

high filler content needed to guarantee resistant surface and high physical properties should be bonded with higher force with the organic matrix, thus reducing the chipping and fracture of the material.

FM: *Since you have shared your ideas and techniques with each other, what do you have in common and what are your contrasting views?*

NF: I have learned many enlightening concepts from Lorenzo, which I have incorporated into my practice and my courses, and I will be forever grateful to him. His brilliant concept of the use of achromatic enamels to modulate the chroma and value truly mimics the way natural teeth are composed. There is tremendous worth in his approach and it can be extremely effective in the hands of those who are knowledgeable about color and are trained to use the system he has developed. On

the other hand, I subscribe to a technique that may be more encompassing when it comes to the use of both chromatic and achromatic enamels. Although all clinical cases can be solved through the use of achromatic enamels, I find that the implementation of chromatic enamels may provide more predictable results in some clinical challenges. In addition, the vast majority of composite systems use the chromatic (Vita [Vident; Brea, CA]) designation, whereas there are only a few that use the achromatic enamel (non-Vita) approach. From a teaching standpoint, the latter technique may be far more outreaching (Figs 15 & 16).

LV: We both love what we do. I use a composite system I developed over 15 years of continuous research, while Newton uses different parts of different systems. We follow different paths, but I respect and admire him as a man and as a dentist (Figs 17 & 18).

FM: *What do you feel are the two or three most important attributes of direct composite materials, and is there a possibility you could do a live demonstration in Grapevine of some of the more popular materials to show how they stack up to these attributes?*

NF: In order to switch from the restrictive and outdated "direct bonding" paradigm to the newer, bolder, and more fulfilling "composite artistry" arena (as I think the proper use of composite resins for minimally invasive esthetic dentistry ought to be called), the clinician has to select a system or systems that, individually or combined, will provide the following properties: a) sculptability, b) fracture and wear resistance, c) polishability, and d) natural optical and color properties. During my presentation in Texas, I will discuss these attributes as they pertain to various systems—addressing the chromatic enamel versus achromatic enamel approach—as



Figures 17 & 18 (LV): Preoperative; non-vital discolored incisor. Postoperative; the element was restored with composite material after bleaching. Natural translucency and opalescence of the incisal halo are perfectly reproduced.



Figures 19 & 20 (NF): A combination of properly selected achromatic enamels and artificial dentins of correct opacity and chroma determined a natural blending of color. Macro and micro texture realization was key to a seamless tooth-composite transition.

I demonstrate live on an acrylic model the buildup of two central incisors from start to finish (Figs 19 & 20).

LV: The most important attributes are the technique for the color determination and stratification, and the dentist's skill. I will show this in a live demonstration (Figs 21 & 22).

FM: *To become a "Master of Composite Art" involves discipline, humility, and self-confidence. What advice can you offer*

those that wish to follow in your footsteps?

NF:

1. Find a true teacher who can mentor and inspire you throughout your journey.
2. Read all you can about the subject, take all things into consideration, retain the good and discard the bad information.
3. Attend as many practical, hands-on courses as possible.

4. Practice the techniques learned to exhaustion and, when you think you have mastered them, practice some more.
5. Never consider yourself a master; no matter how good you may have become, knowledge should never surpass wisdom.
6. Be appreciative of and thankful to all those giants on whose shoulders you have



Figures 21 & 22 (LV): Tooth buildup in composite and section of composite restoration on an extracted tooth.

stood to get a better view of the horizon.

LV: Go, as I did, to dental laboratories to identify one's potentialities, improve them, and develop a project with firm belief. Time rewards willpower and sacrifice.

CONCLUSION

Based on the information shared by Drs. Fahl and Vanini, our Academy is indeed fortunate to have both of these masters at our Scientific Session in Grapevine, Texas. The blueprint for the PEC Committee was "Responsible Esthetics." Both

of these clinicians embraced responsible and minimally invasive dentistry well before it became in vogue for our profession. Don't miss this opportunity to learn from the true masters of composite art. This is their first appearance together at an international conference. It may be the opportunity of a lifetime.

AACD Acknowledgment

The American Academy of Cosmetic Dentistry recognizes Dr. Frank J. Milnar as an AACD Accredited Member (AAACD), Accreditation Examiner, and PEC Co-Chair.

