FLORIDA'S OUTLOOK ON THE DENTAL LABORATORY PROFESSION
2nd Quarter 2021
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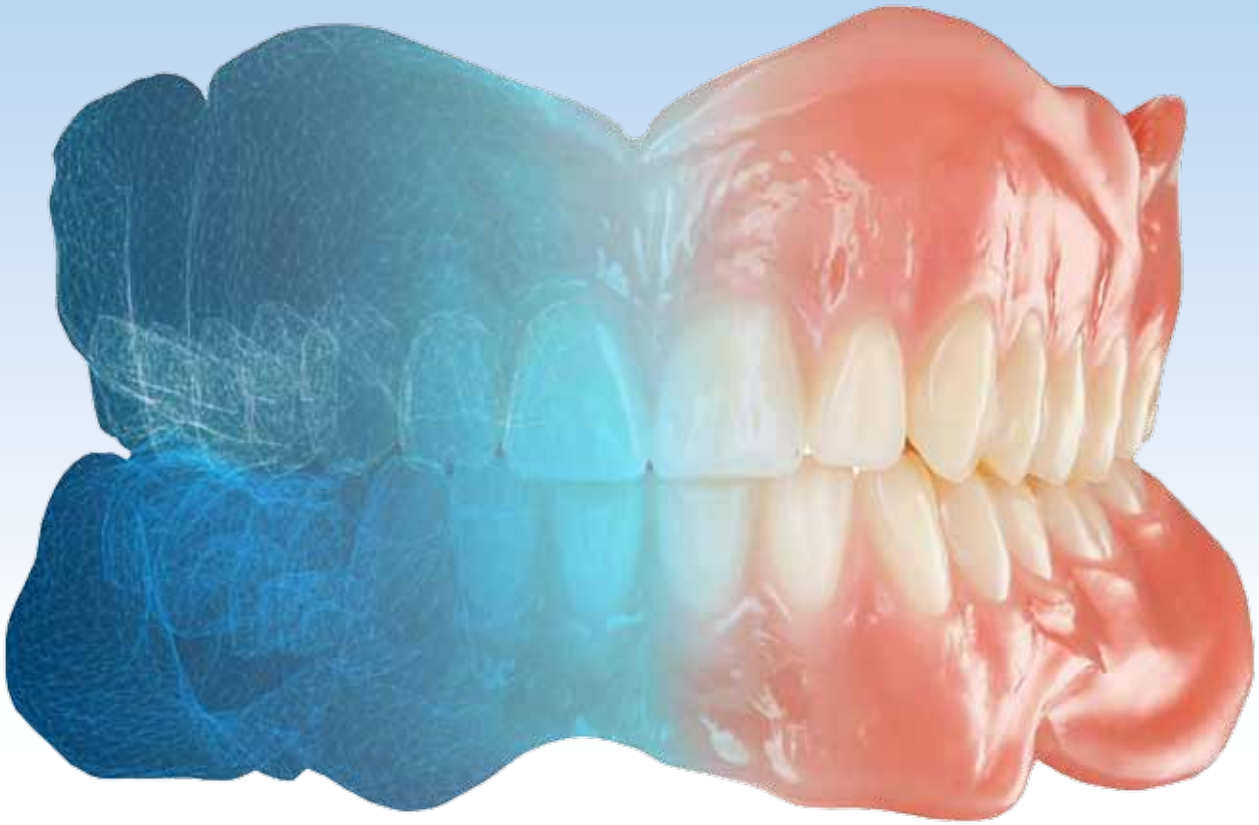
# focus



# DIGITAL DENTURES

## *A Fresh Look at* AUTOMATION

Southern States SYMPOSIUM & EXPO
*presented by* FDLA

**JUNE 11–12, 2021**
RENAISSANCE ORLANDO AT SEAWORLD • ORLANDO, FL

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*Baltic Denture System from Merz Dental Germany*




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# Face the New Normal

**by Alexander Wünsche, CDT, ZT**
***FDLA President***

*I am especially excited that we are able to face the new normal and offer a two-day in-person conference...*

This message is a very special one as it is my last message as the president of the FDLA. My time serving the FDLA is quickly coming to an end after experiencing these life-changing times. Since the pandemic made it impossible to hold our Symposium & Expo last year, I remained as president for two tenures. I feel very humbled and honored to have served our members for not just one year, but two!

Having said this, I am sad to leave, but also satisfied and happy that the FDLA made it to 2021. We are looking forward to holding our Symposium & Expo in June. It has a new date, but same location and will hopefully be well-attended. I am especially excited that we are able to face the new normal and offer a two-day in-person conference with all safety measures in place, so our members remain safe and sound from beginning to end.

The last two years were very interesting to say the least. The first year, the board was able to prepare the chairside services legislation. In the second year, we were able to secure it and saw it successfully enacted. Immediately after, the pandemic interrupted all our lives and literally put a hold on the many things we used to think of as normal to have or to do.

I wish nothing more than to see the FDLA succeed through this time in front of us by growing and reaching new goals. I want to remind everybody that we are one of the largest dental laboratory associations in the United States and hold one of the biggest conferences. I am confident in the future of this organization.

I want to say thank you for the trust you put in me and I am proud I was able to serve as your FDLA President.

FDLA

**FDLA Mission**
Serving Florida's dental technology professionals as a valued part of the dental team enhancing oral health care.

**FDLA Vision**
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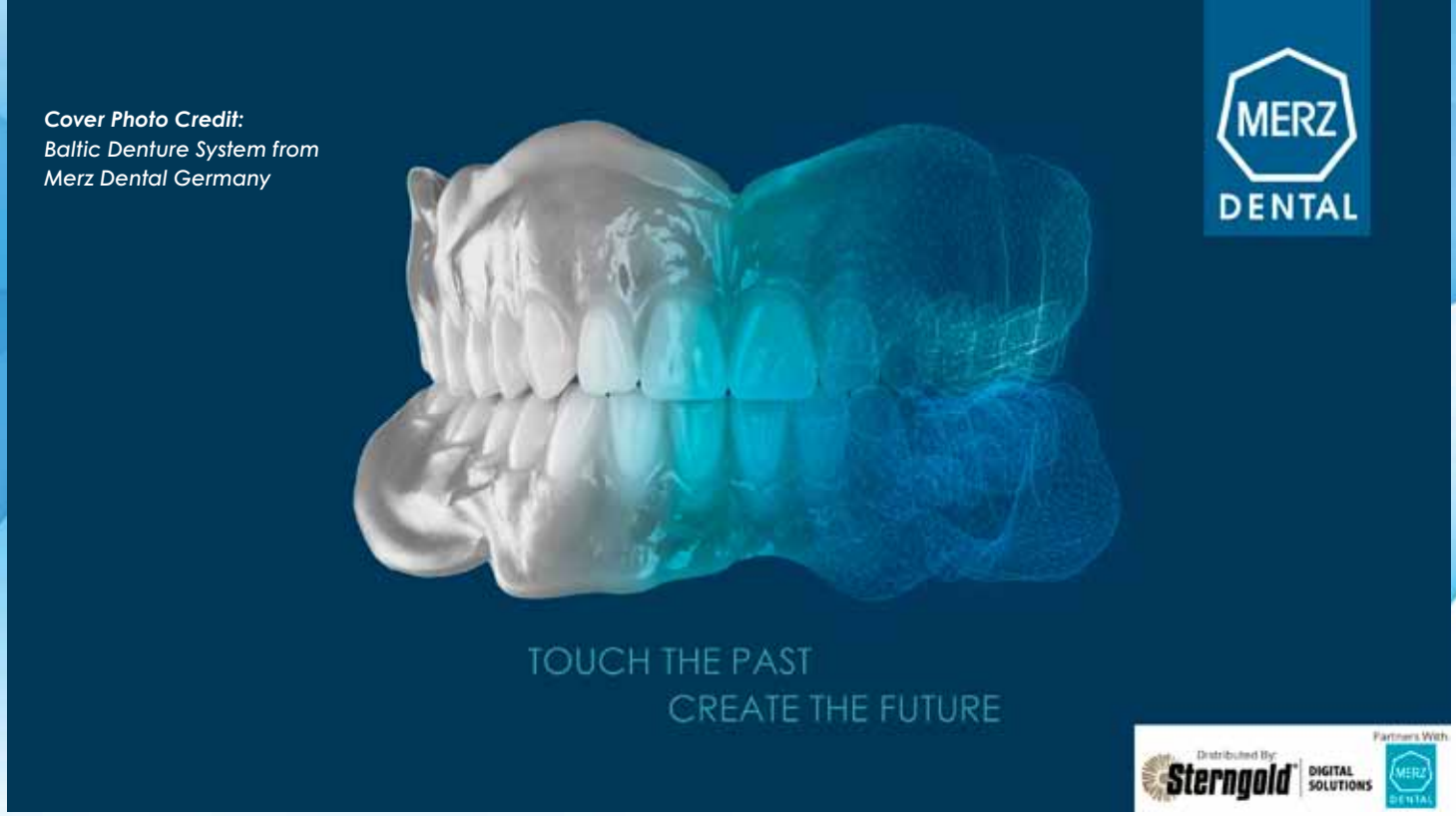



***Cover Photo Credit:***
*Baltic Denture System from Merz Dental Germany*

*Simple, Predictable, and Versatile Premium Digital Denture Creation:*

# A FRESH LOOK AT **AUTOMATION** IN **DENTURE MAKING**

**By Gene Peterson, CDT**

## *"Today's" Digital Denture*

"Everything is going digital" seems to be the quote of the decade. Digital technologies in dentistry have come to be known for their streamlined workflows, accuracy, efficiencies, and their sense of automation of the overall process. The goal of technology is to continue improving to make things faster, easier, and cheaper, which results in natural automation. More important, the timeline of improvement is faster than most can keep up. Digital denture technology is no different. While there is not yet a magic wand amongst the various systems to create a digital denture without human input, a certain level of automation in digital dentures can now be realized through a system's simplicity, versatility, and predictability.

The development of digital dentures over the last 10 years has revolutionized the way technicians, clinicians, and patients view and approach the subject of complete dentures. The fact is, it is still rapidly evolving. What started out as teeth being bonded into precise positions in a milled base has evolved into more sophisticated attempts to create quality final prostheses; some being much better than others. The same holds true with the software used to design digital dentures. Design software has increasingly advanced via open source or proprietary digital design packages, each requiring varying levels of expertise to master. Even the types of equipment used to create a digital denture (scanners, milling machines, 3D printers) and accompanying materials improve faster than the customer's ability to realize a true ROI on their investment. Finally, the "digital denture workflow" is becoming codified as more and more systems are learning to take advantage of the common benefits of embracing digital. So, what's the next evolution? What separates all the players? It comes down to a straightforward question. What do technicians and clinicians want and expect in a digital denture system?

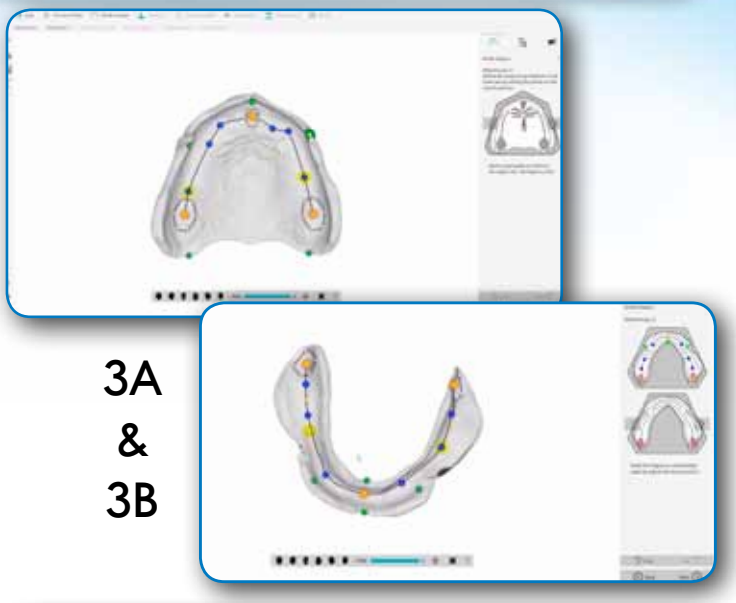


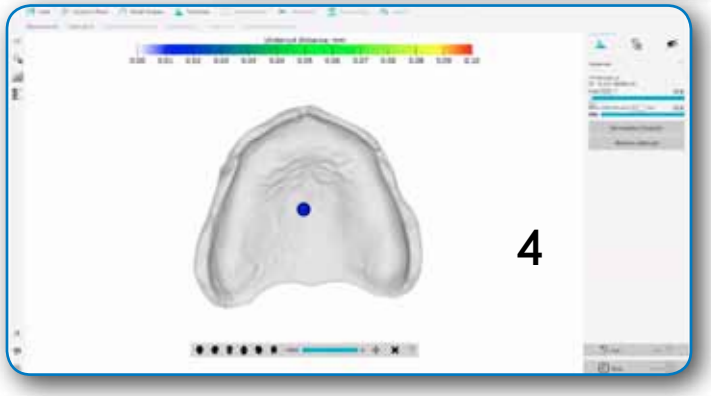
The answers are clear. Whether laboratory technician or clinician, if you are going into the digital world fresh, you want a system that is simple, straightforward, user-friendly, versatile and also allows you to easily bridge the gap from conventional to digital. Equally important, you must be able to predictably produce a quality digital prosthesis that adds value to your reputation and provides the best product and care for the patient and/or customer. Most important, you want a system that can help you reach your digital goals in an affordable manner.

## *Keeping it Simple AND Complete*

Digital systems and workflows in dentistry have become quite sophisticated by automating the process as much as possible. The problem is that some of the systems have become quite difficult to master, especially for those who may not be accustomed to digital. The key is to keep it simple and logical, yet still complete. A digital denture system does not need to solve all of the technician's problems with endless features. They do need, however, to provide enough options to deliver clinically appropriate outcomes, hopefully with a short learning curve. As digital denture designers, we want to be able to assimilate what we already know and trust into the use of new digital tools. Digital denture systems available today offer proprietary software as well as open source or commonly used programs, and this is good if they meet the objective. An example of a proprietary and open digital denture design software is BDCreator® PLUS, part of the Baltic Denture System® (BDS) from Merz Dental. This example demonstrates certain key features you would want in a simple and complete digital denture design system.

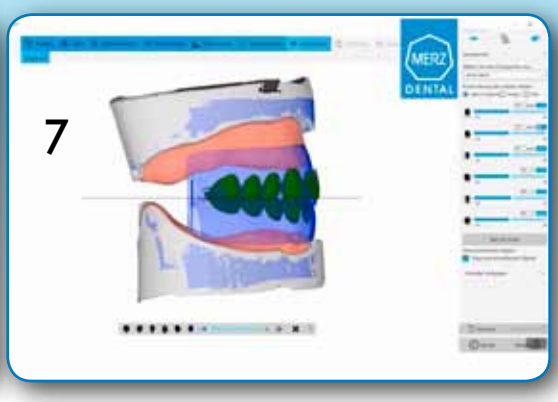
One user-friendly feature is the "Design Wizard," where the designer is easily and logically guided through laid out, concise work steps to ensure that each digital design results in a clinically correct proposal ready for manufacture. This type of intuitive prompting is also available in other digital denture design systems. Beginning with scanning (**Fig. 1**) and data import, .STL record files of the final impressions and interocclusal records are registered and prepared in the background




by the software and readied for design. Some systems require these steps be done outside the software, which may necessitate further training (**Fig. 2**). An esthetic reference is extremely useful and should be visible for key steps in the identification of clinical landmark and tooth setting. Model analysis is an excellent and useful feature that allows the designer to identify the force bearing areas of the ridges and establish stable alignment between the arches (**Figs. 3a-b**). An automated way to identify the correct clinical path of insertion and block out undercut areas is even more critical in digital dentures due to the accurate fit of the intaglio surfaces of the base to the tissue (**Fig. 4**). Borders are defined by






the software and control needs to be given to the designer to define the denture's peripheral borders as clinically required, including the ability to reproduce the contours of a fully border molded impression if needed (**Fig. 5**). Automated base creation ensures minimum thickness and anatomical coverage requirements (**Fig. 6**). There are a variety of approaches to setting the teeth amongst the available digital denture design systems. Advanced systems can use model analysis data and previously placed landmarks and esthetics data to automatically create clinically acceptable proposals. It is common that a variety of digital tools are required to make changes to the setup if necessary. A most desirable feature is that the teeth be fully integrated, one with another, thus maximizing the efficiency of the overall setup process by avoiding single tooth changes; this could take forever (**Fig. 7**). More advanced systems automatically generate a fully contoured and esthetic base ready for export and milling and best of all, require minimal finishing time (**Figs. 8-9**). When evaluating a digital denture design program, carefully consider the level of automation that comes in the software. Does it offer simplicity, ease of use, and a quick learning curve? You want a software that will "pull you through." Such a system should allow you to complete the entire design process in about 10 minutes, which brings a new level of efficiency and productivity to your denture department.

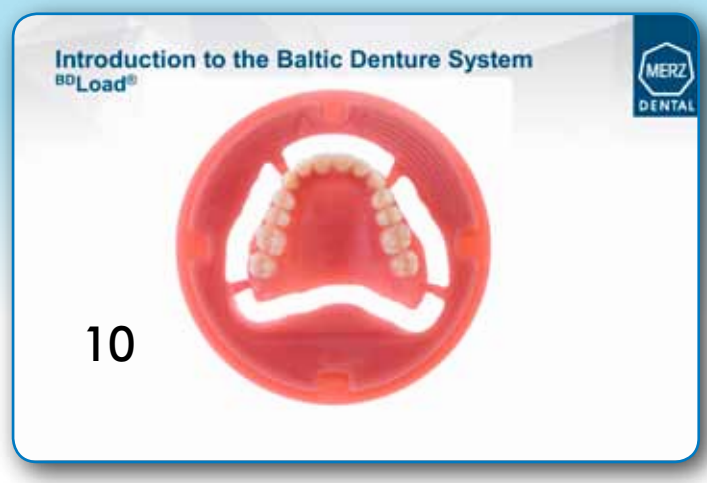

## *Confident Predictability*

Certainly, a common major factor in the hesitancy to adopt a new digital technology, especially digital dentures, is the concern of doing something new for fear it does not fit within our comfort zone. Denture technicians and clinicians are creatures of habit when it comes to dentures. We want things to be predictable; we know what works. Whatever system you eventually adopt, you want to ensure it provides a sense of automation and the confidence that the final product will meet and exceed your and your customer's expectations.

Fundamentally, digital dentures are dependent on seven critical components to ensure success. First and foremost, accurate centric records and final impressions are required. Equally critical are six clinical (chairside) esthetic elements accurately identified by the clinician. These include the second through seventh components: midline, incisal edge, lip support, tooth size, gingival height, and horizontal plane of occlusion. This can be provided in whichever choice of record you choose, so long as it is correct. Two-appointment digital dentures are entirely achievable if this information is correct, and successful delivery becomes predictable and most likely assured.

A mandatory requirement of predictability is the quality of the final prosthesis. With several milled and 3D printed options available to manufacture a digital denture, the material's overall esthetics and material properties are paramount. Prices of finished dentures in general run the spectrum, dependent on the utilization of less sophisticated methods to high-quality processing techniques, materials, and customization. This is also true with digital dentures. A variety of materials and techniques are being used and improved daily. Pricing for these digital systems varies greatly as does the overall quality and esthetics. Many who have the high standard of providing premium final dentures have made premium investments with the hope of providing the same level of satisfaction in a premium digital denture.

Unfortunately, due to the ongoing development and improvement of dental materials and their physical properties, several digital denture systems, although very promising, do





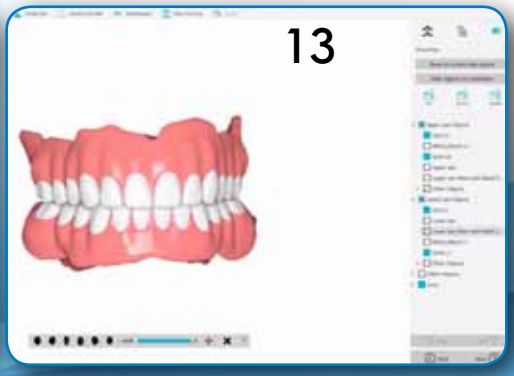
not qualify for the status of premium digital denture. Factors including overall esthetics, porosity, strength, staining, wearability, longevity in the mouth, and bio-hygienic characteristics, among other things, must be taken into consideration when attempting to provide a premium final product. While most techniques will eventually achieve this status, as of today and arguably, the milled digital denture made from known high-quality materials without the bonding of teeth is the best option. Carefully compare the processes of each system. The desired characteristics of a premium digital denture include a final prosthesis from a highly cross-linked, high-impact, minimal porosity, minimal residual monomer, PMMA-base material and fully integrated, highly esthetic, lifelike, multi-layered, highly cross-linked and wear-resistant teeth. Some manufacturers offer the advanced process of integrating the teeth into the base material, which chemically results in a PMMA interface that constitutes a monolithic structure. This does not entertain the idea of delamination; it is one continuous solid material with no risk of "pop-outs" (**Figs. 10-11**). The ability to deliver a quality product naturally creates confidence and predictability with your customer.

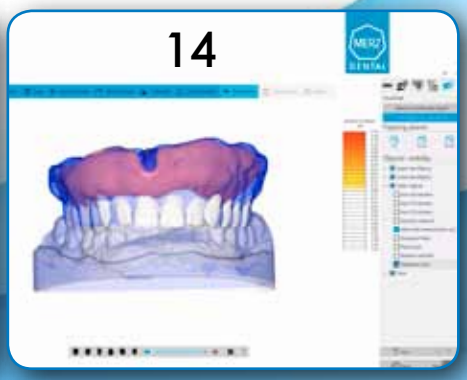
## *It Must Be Versatile*

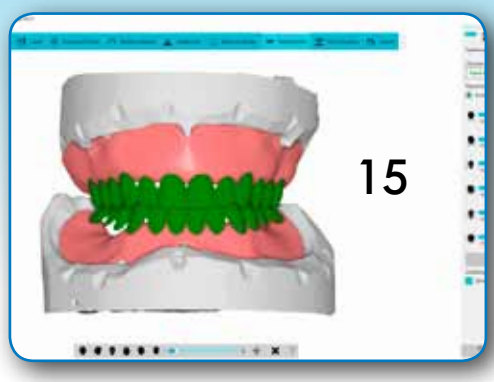
Another key consideration when evaluating a digital denture system is the ability to easily integrate what you offer and offer it digitally. Look for a system that allows you the ability to produce a variety of digital denture products and other advanced features that cover your needs and that you feel comfortable adopting. A major convenience factor is the ability to "jump in" at any entry point of the design or manufacturing process. You also want to have the flexibility to choose your equipment options or to use compatible equipment you already utilize.

Regarding the ease of "jumping in" to the digital denture workflow, once you have decided to create a digital denture, the system must allow you the ability to accept any form of denture record set. To create a digital denture, the minimum required records include accurate final impressions (antagonist if creating a single arch) and an accurate centric relation record. This may be predictably provided in many forms. It may be an existing denture with a bite and wash impression, a duplicate denture with the same, a wax rim and final impressions or full wax-up (tried-in) with bite (**Fig. 12**). Digital scan files created in the lab or clinic can also easily be used. Remember, its communication of the correct information is vital to the success of any digital denture.

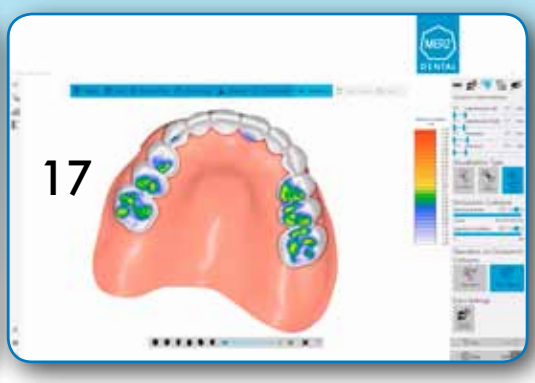
In today's denture market, with about 15 percent of the population requiring at least one denture, we know there are a lot of possibilities in treatment planning for the average denture patient. It is imperative that the digital denture system you invest in has flexibility to create digital dentures for every individual's situation. This includes full-over-full (**Fig. 13**), single arch (**Fig. 14**) and immediate complete digital

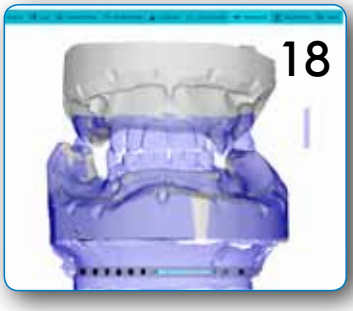



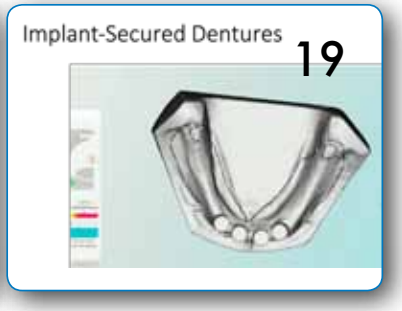







dentures (**Fig. 15**). Many systems have the advanced feature of setting the occlusion inside a fully integrated articulator (**Fig. 16**) and milling dynamic adjustments into the occlusion against the opposing arch (**Fig. 17**). Another useful advanced feature is the ability to digitally extract teeth when creating immediate complete dentures with the ability to perform digital alveoloplasty (**Fig. 18**) to the ridges where more room is needed. Depending on the system, you could subsequently create a bone reduction guide, which could be 3D printed or milled using the .STL file. Other great advanced options of select systems include the ability to create a try-in or create digital pockets for overdentures attachment housings (**Fig. 19**). All of these features result in a final premium digital denture (**Fig. 20**).





## A Fresh Look

It is an exciting time in the world of denture creation; the digital denture revolution is here and evolving fast. The digital denture workflow is proven. If the financial and professional decision is made to produce a digital denture, make sure the system will ensure a quick transition with ease and meets your needs. Digital denture automation has been redefined through its simplicity, predictability, and versatility. It will allow you to create greater efficiency and maximize your productivity and profitability.

## About the Author

*Gene Peterson, CDT, Director of Technical Development and Learning*

Gene oversees all aspects of Sterngold's technical department, leading digital development efforts, product offering pipeline, and educational methods and content directives, working closely with sales, marketing, and customer service. With over 30 years of experience, Gene has an extensive and diverse background in the dental industry, covering R&D, clinical and dental laboratory workflows and protocols, production, and facility management. After owning and operating a dental laboratory for 18 years, he spent the last nine years with a major digital denture and technology company. As a subject matter expert, he has co-written research and white papers on digital dentures and other technical subjects. Gene is involved with several professional organizations, including the NADL, ACP, APS, and the Academy for BioEsthetic Dentistry. He serves as Co-Chair of the Advisory Board and is a guest lecturer for the Dental Laboratory Technology program at Pima Community College in Tucson, Arizona. Fluent in English and Spanish, he is often called upon as a national and international guest lecturer.

# Southern States SYMPOSIUM & EXPO

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# JUNE 11–12, 2021

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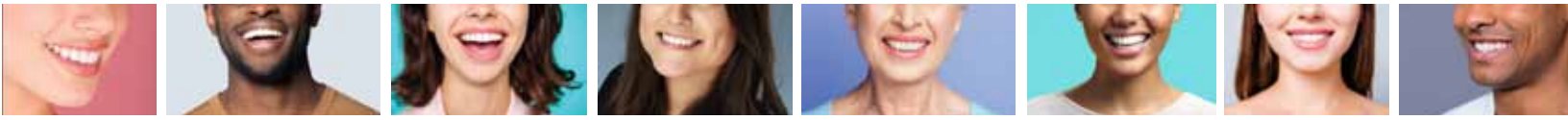

# FACE TO FACE | REDEFINE & RENEW YOUR FOCUS

**"FACE TO FACE – REDEFINE & RENEW YOUR FOCUS"** is the theme for the 2021 Southern States Symposium & Expo. Connecting and networking with your peers face to face is the best learning environment. We are taking every precaution and we are ready to meet together again and help you redefine and renew your focus both personally and professionally.

## KEYNOTE ADDRESSES

### Surface: THE FINAL TOUCH

*Presented by: Ed McLaren, DDS, MDC*

***Sponsored by: VITA North America***

This presentation will cover the final touches of contour, texture, surface colorants, and polish that can take an average looking porcelain, or monolithic glass ceramic and focus on the new generation glass ceramic, Zirconia Reinforced Lithium Silicate "Suprinity."

### A Collaboration of Beauty, Antifragility and Innovation

*Presented by: Jessica Birrell, MOM, CDT, MUA*

***Sponsored by: EnvisionTEC***

As technology advances, our approach to aesthetics and time management can simplify without compromising beauty or overextending ourselves financially. Explore your digital options and ways to create an antifragile business.

➔ ***See page 28 for hotel information.***

## PANEL PRESENTATION

### Facing the Future

PANELISTS:

*Jessica Paulen Goldich – New Image Dental Laboratory*
*Shawn Nowak – Nowak Dental Supplies, Inc.*
*Danielle Wünsche – Zahntechnique, Inc.*

MODERATOR:

*Chris Peterson, CDT – Peterson Dental Laboratory*

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Goldich

Nowak

Peterson

Wünsche

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For the health and safety of all FDLA Symposium attendees, FDLA is complying with applicable health and safety requirements and CDC recommendations to hold the in-person event. Please review and submit the required meeting registration form.

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By Chucri Chemali, TPAD, DTG

# CASES THAT MAKE YOU GO "Hmmm!"

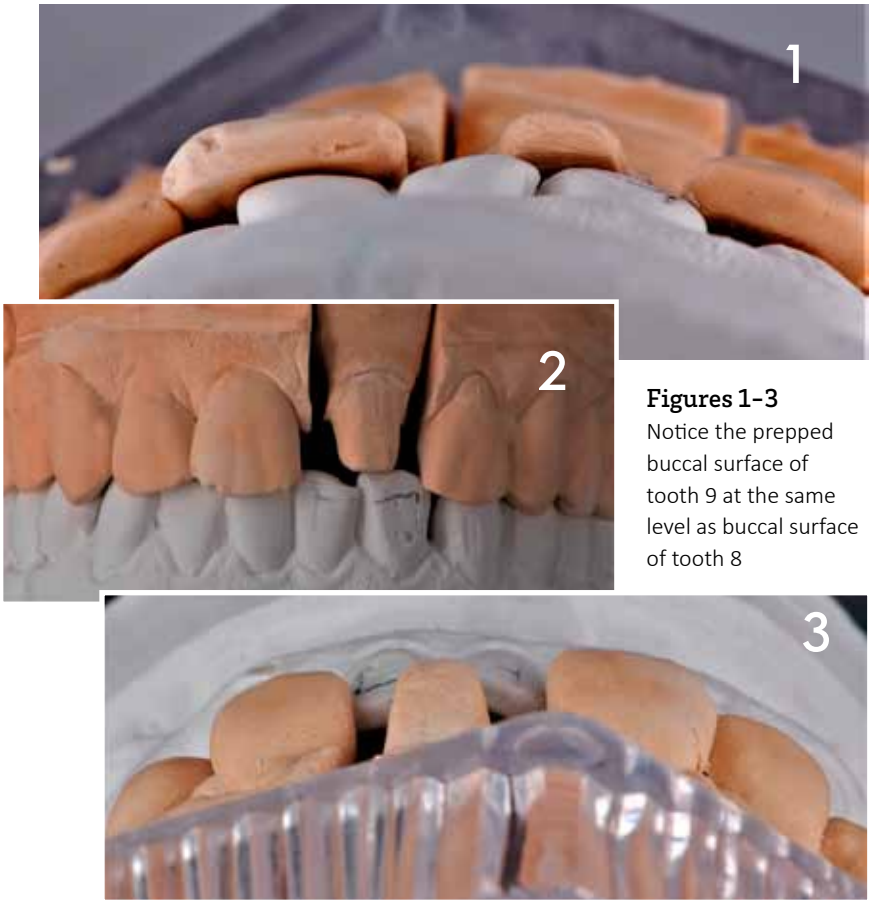
Chroma, value, opalescence, light absorption, reflection and of course surface texture are some of the most important criteria that must be observed to achieve natural results. To get there, available space for ceramic is crucial.

*I needed to create waves in my layering so light could be diffused in multiple directions*

I would like to present a case in which space for ceramic was very limited, or should I say, non-existent (**Figs. 1-3**).

The surprise came the second I looked at the models. Then I called the dentist to discuss.

"Can't grind more" was his answer, followed by the usual, "I trust you, you can do it!"




**Figures 1-3**
Notice the prepped buccal surface of tooth 9 at the same level as buccal surface of tooth 8

We all get those answers from time to time, don't we?

So I understood that I had two choices: I could refuse the case as it was proposed, or accept it and follow my techniques used for cases with ceramic thickness limitations. You guessed right...I decided to give it a shot.

I invited the patient to the lab for color selection. We discussed the diastema and missing mesial and distal corners on tooth eight, and I explained the circumstances that might affect luminosity and translucency on the final restoration (**Fig. 4**).

Let me explain how I planned my ceramic bakes and layers.

My first concern was to achieve the right chroma in that thin buccal area, hide the zirconia substructure and assure myself that the powders I applied stayed fixed during subsequent bakes.


**Figure 4**
Basic shade is A2 with chroma and value variations.



**Figures 5-9**
SO 37 from GC Initial Zr-FS was applied on an A2 zirconia substructure




Any idea which powder, when layered very thin, would have enough opacity to hide substructures, show exact chroma and keep its shape even after multiple bakes?

Some of you might think of using deep dentine powders. Not me. I go for shoulder porcelain and the reason is very simple, yet extremely important. It is baked at a higher temperature. This means that its shape and chroma will not change while other powders are baked on top of it and at lower temperatures.

Notice that the shoulder porcelain layer also serves as a wash bake. Therefore, no extra time, bakes or effort are wasted.

GC Initial Zr-FS powders are presented in the following photos. If you do not use these powders, please refer to GC website for more details on the mentioned powders (**Figs. 5-9**).

After that quick shoulder porcelain bake, I checked the chroma to see if an internal stain bake was needed. In this particular case it was, so I completed this step (**Fig. 10**).

Once the chroma was achieved, I proceeded with my layering (**Fig. 11**).

The thin area of shoulder porcelain in Fig. 11 was not covered. There was no room for additional dentine powders in that spot, so the shoulder porcelain was left exposed at this stage.

Light absorption is critical in thin areas and I had to use light to my advantage. I needed to create waves in my layering so light could be diffused in multiple directions, thus simulating fake depth (**Figs. 12-15**).

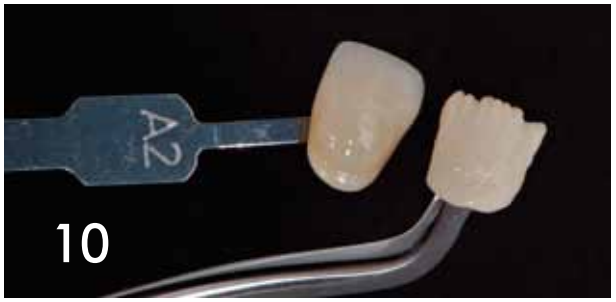


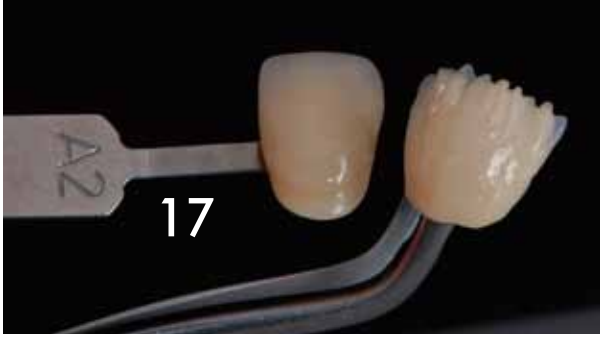

**Figure 10**
Internal stain using Lustre paste A & D mixed 25%/75%

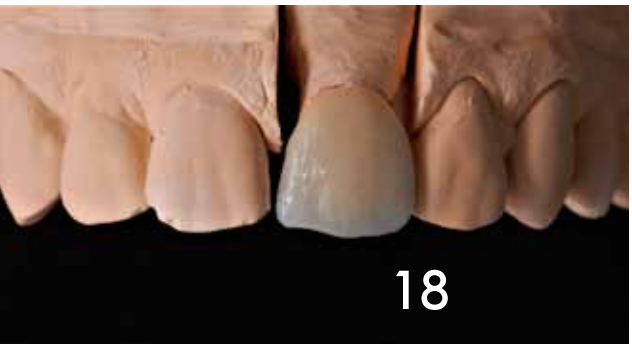
**Figure 11**
Dentine A2, contour with ½ TM-01 + ½ TO






**Figures 12-15**
(1/3CT22 + 1/3TO + 1/3DA2) applied in-between the (1/2TM-01 + 1/2TO), CLF on top of DA2




**Figures 18-20**
CT23 at the gingival third, EOP-4 at the mid-third, E57 on mesial and distal corners and EI-12 at the mid-incisal third

*Not all teeth or scenarios are the same and that is the beauty of our craft.*

Again, I checked to see if I was on the right track with the chroma and all internal effects. If needed, internal staining can be helpful in a case like this; remember, there was no room for layering (**Figs. 16-17**). The second ceramic bake helped achieve the right value, translucency and opalescence (**Figs. 18-20**).

Surface texturing was mandatory prior to the stain and natural glaze bake (**Figs. 21-23**). Remember, surface texturing is not shaping. It's giving life to the shape!

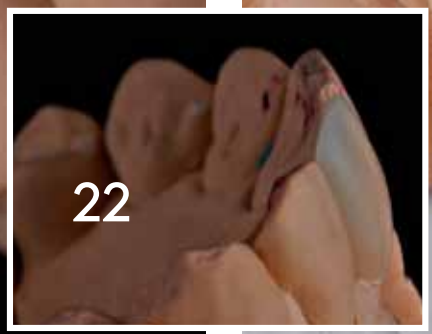
Manual polishing and de-glazing were completed after the natural glaze bake. High shining different transition angles was carefully performed on the ceramic surface to expose its texture and control how internal effects would react to light and saliva. For example, a very shiny area will act to reflect light, thus preventing the eye from seeing internal effects (**Figs. 24-27**).

**Figures 28-30** show the final result in vivo after my first try in. No adjustments were needed for this case and our dear patient left happy and satisfied. I was also content with the result given the circumstances of this particular case.

## In conclusion:

Not all teeth or scenarios are the same and that is the beauty of our craft. The alternative would be terribly boring if what we did was a non-stop cycle of repetition.

Before you hold your brush and start layering, make sure you think of the following for each




**Figures 24-27**
Total thickness of Zr and ceramic in the thin incisal area: 0.6mm



and every case you do: Always plan every single bake's end result and choose each powder that is to be used according to its characteristics, where it will be applied and in which thickness.

Finally, I would like to thank the clinical team and the patient for their collaboration and trust. I have a lot of appreciation for the variety of powders from GC Initial that help boost my creativity on a daily basis and of course, thank you for taking the time to read my article. I sincerely hope that I succeeded in giving you few tips to help make your daily work easier.

## About the Author

M. Chucri Chemali, TPAD, DTG, graduated from the dental technology program at Edouard Montpetit College, Montreal Canada, in 1994. Chucri managed a private dental laboratory in a reputable dental clinic, where a close collaboration with dentists and patients allowed him to develop his techniques to fully meet and satisfy their expectations. He started Chemali Dental Laboratory Inc. in 1999, offering high-quality and esthetic ceramic restorations. M. Chemali is an official member of the Dental Technician Guild DTG, the Canadian Key Opinion Leader for MPF Brush Co., the Canadian Key Opinion Leader for GC America Inc., the founder of the Canadian DTG Study Club, the past vice-president of the Dental Technician Order of Quebec and the recipient of the 2019 Quebec Inter-professional Council (CIQ) award.




**Figures 28-30**
Finished restoration

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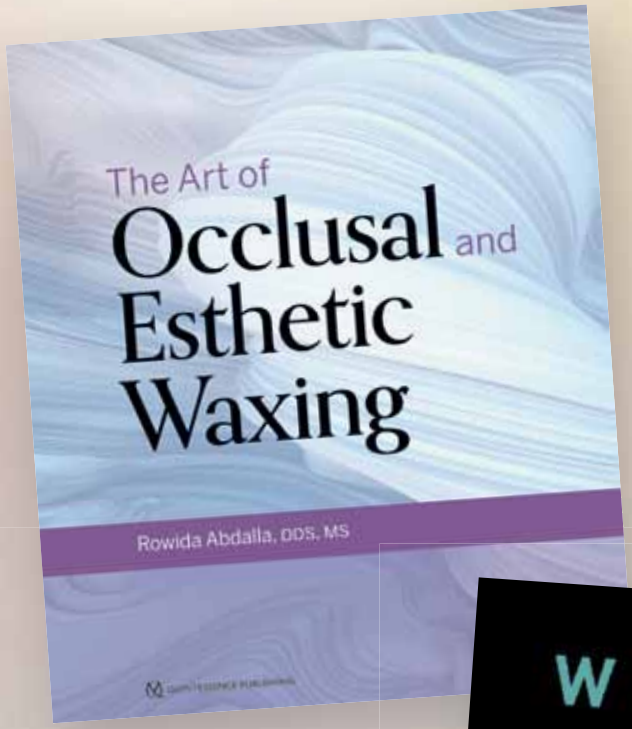


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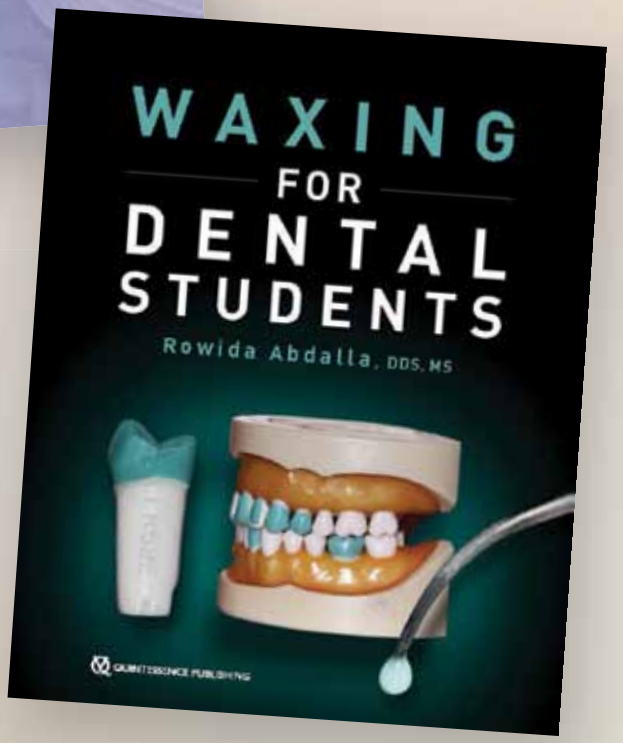


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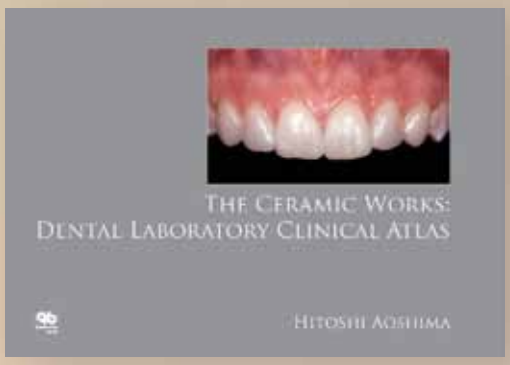


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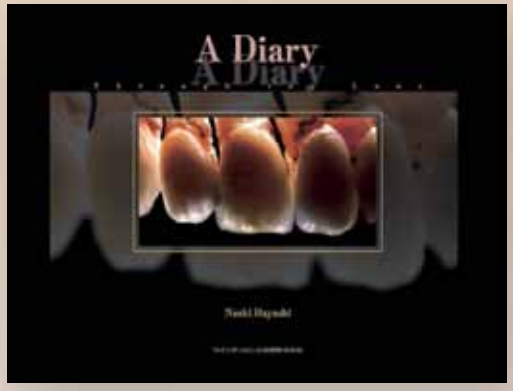


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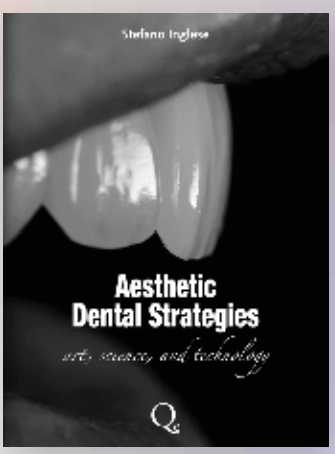


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By Jessica Birrell, MOM, CDT, MUA

# AN EXPLORATION:
# The Magic and Science in Restorative Dentistry, Simplifying and Enhancing Natural Aesthetics VOL. 2

***Welcome back!*** *In this article, we will study the characteristics of shape and form that enhance internal and external natural beauty as we increase our knowledge of nature's anatomy.*


Dentistry has been studied for centuries, but really began to evolve in the 1920's as many sought to define anatomy and build terminology. According to the ADA library on dental history, here are some fun advancements and milestones in dentistry. You may visit the link for the full history of dentistry according to the ADA (https://www.ada.org/en/member-center/ada-library/dental-history).

**5000 BC —** A Sumerian text of this date describes "tooth worms" as the cause of dental decay.

**2600 BC —** Hesy-Re, an Egyptian scribe, often called the first "dentist" passed away. An inscription on his tomb includes the title, "the greatest of those who deal with teeth, and of physicians." This is the earliest known reference to a person identified as a dental practitioner.


1

**1700-1550 BC —** An Egyptian text, the Ebers Papyrus, refers to diseases of the teeth and various toothache remedies (**Fig. 1**).

**166-201 AD —** The Etruscans practice dental prosthetics using gold crowns and fixed bridgework.

**1210 AD —** This was the guild of Barbers in France. Barbers eventually evolve into two groups: surgeons, who were educated and trained to perform complex surgical operations and lay barbers, or barber-surgeons, who performed more routine hygienic services including shaving, bleeding and tooth extraction (**Fig. 2**).

**1746 —** Claude Mouton recommends white enameling for gold crowns for a more esthetic appearance.

**1801 —** Richard C. Skinner writes the Treatise on the Human Teeth, the first dental book published in America.



**1825 —** Samuel Stockton begins commercial manufacture of porcelain teeth. His S.S. White Dental Manufacturing Company establishes and dominates the dental supply market throughout the 19th century.

**1833-1850 —** The Crawcours (two brothers from France) introduce amalgam filling material in the United States under the name Royal Mineral Succedaneum. The brothers were charlatans whose unscrupulous methods spark the "amalgam wars," a bitter controversy within the dental profession over the use of amalgam fillings.

**1840 —** The American Society of Dental Surgeons, the world's first national dental organization, is founded. The organization dissolves in 1856.

**1855 —** Robert Arthur originates the cohesive gold foil method fabricated by annealing, a process of passing gold through a flame making it soft and malleable.

**1864 —** Charles Goodyear invents the vulcanization process for hardening rubber. Dentures are patented, but the dental profession fights the onerous licensing fees for the next twenty-five years (**Fig. 3**).

**1903 —** Charles Land devises the porcelain jacket crown.

**1907 —** William Taggart invents a "lost wax" casting machine, allowing dentists to make precision cast fillings.

**1937 —** Alvin Strock inserts the first Vitallium dental screw implant. Vitallium is the first successful biocompatible implant metal.

**1990 —** New tooth-colored restorative materials plus increased usage of bleaching, veneers, and implants inaugurate an era of esthetic dentistry.

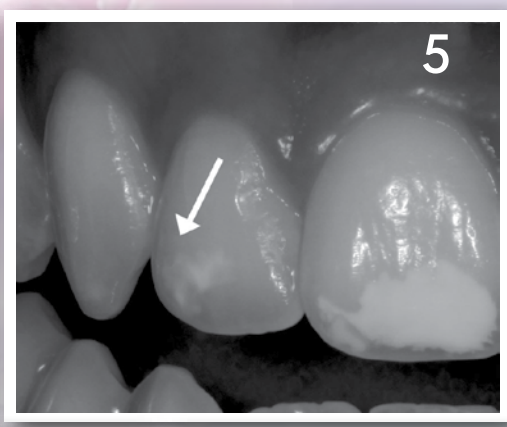
In the last 100 years, dentistry has evolved dramatically and our knowledge and methods of restorative dentistry have significantly increased. In the late 1990's early 2000's, aesthetic dentistry was refined by "golden proportions." Dentists and technicians looked to enhance shape and size by the use of the golden mean gauge and golden proportion ratios. To some, mathematical balance was often so extreme that measurements were provided by clinicians to the laboratory with specific lengths requiring a digital gauge to get the exact decimal points and fractions of millimeters.

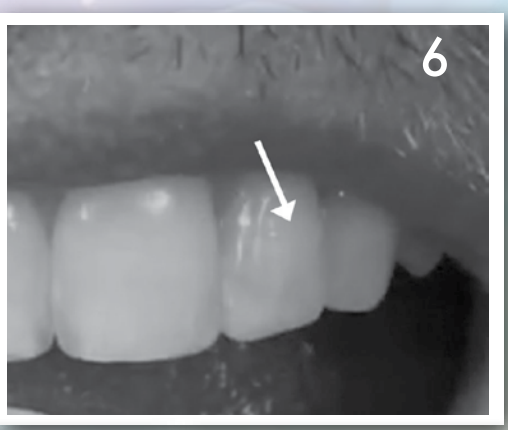
Now as the desire and awareness for "natural beauty" has increased, many of us have adopted the golden proportions as a foundation and at times, break the rules to create natural balance. As one of my favorite Picasso quotes reads, "Learn the rules like a pro so you can break them like an artist" and that becomes our approach to natural aesthetics. Once the foundation of Golden proportions is learned, you can create subtle imbalances to soften the mathematical appearance and enhance individual character. Let's explore shape and form.

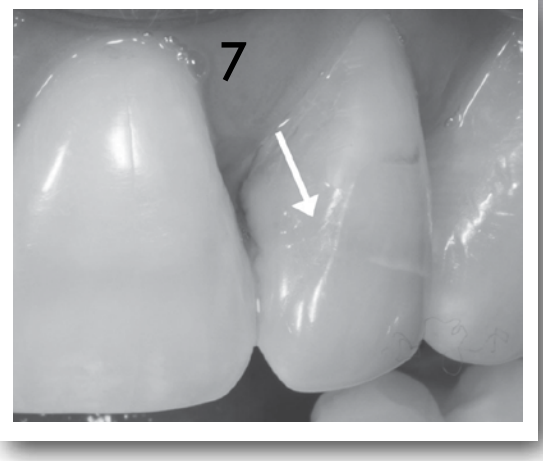
## Defining Shape and Form in Dental Anatomy

If you really want to further your knowledge and advance in the dental geek club, check out the studies of dental anthropologists Richard G. Scott and Christy G. Turner, II. One of my favorite books of theirs is The Anthropology of Modern Human Teeth, which explores the variations of shape and form in depth, available on Amazon (https://www.amazon.com/Anthropology-Modern-Human-Teeth-Evolutionary/dp/1316626482).

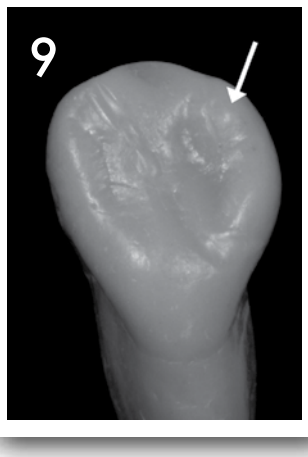
One of the main questions we find when designing for men versus women, is the stereotype that men have square/triangular teeth and women have softer, more rounded teeth. As we explore this idea, we find there is little to no support for this. Women can have square centrals and some men have very rounded teeth. Does this mean we should abandon this idea? No. Yes, a man's smile can look stronger or more prominent with strong line angles and mesial rotation of the laterals to highlight mesial lobes with distal tucking (**Figs. 6-8**). A woman's smile can be softened with mesial tucking and distal flare (**Figs. 4-5**), but still there are other factors to consider. Shape is factored by a combination of variables, such as face shape and size, width of the arch, and existing character of the natural anatomy. Is there a difference between ethnicities and man versus woman? "All human dentitions are basically the same. The differences between individuals are in the number and extent of the primary and secondary characters of the tooth groups, which in turn are reflections of genetic constitution of the individual," writes Dahlberg (1951:140) in The Anthropology of Modern Human Teeth. To summarize, teeth are not defined by gender, but



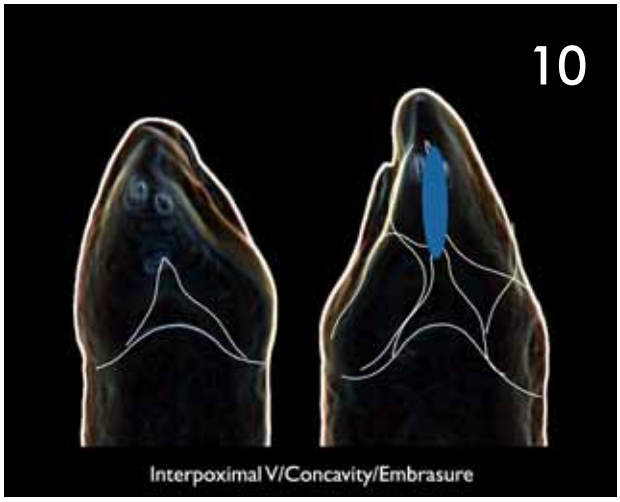


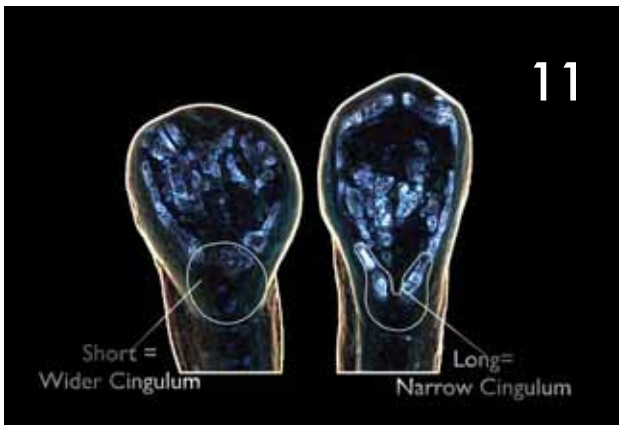

by our genetic constitution. The main difference between men and women that has been documented by anthropologists is that men typically have larger canines, 7-9 percent larger and an extra accessory ridge on the disto-lingual surface of a canine, which can be more prominent (**Fig. 9**).

## Shape and the Inter-Proximal V

The inter-proximal V is one of the most overlooked and possibly ignored surfaces of a tooth, often due to its positioning and lack of exposure in the oral environment due to adjacent teeth.

The inter-proximal V provides us with a wealth of information; let's take a closer look at the cementum enamel junction (CEJ). Follow the CEJ from buccal to lingual (**Fig. 10**). As you travel along the CEJ, notice that the line begins to arc on the anterior teeth at the apex, the highest point positioned slightly more distally. As you observe the arc of the CEJ, you'll notice the concavity directly above it. The space where the buccal and lingual lobes meet creates a concavity, the inter-proximal V. This area varies depending on the shape of the tooth. If the tooth is more triangular, the inter-proximal V becomes deeper, which then means the buccal and lingual lobes will be more elevated, prominent. If the tooth is more round, the peak of the CEJ is not as high, meaning the inter-proximal V will not be as concave and the buccal and lingual lobes will be less prominent with softer highlights when viewed from the facial. This area is critical to define when designing restorations as the buccal and lingual contours and character of the tooth are defined here.




Another area to analyze when determining character is the cingulum, the bulbous area on the lingual surface. Is this shape more of a U or a V (**Fig. 11**)? The V-shaped cingulum is a triangular characteristic, with characteristics such as elevated marginal ridges/mesial and distal lobes and a deeper lingual concavity. The U-shaped cingulum is the characteristic of a square/round tooth.

Its characteristics are full, larger, often rounded cingulum, with less shoveling of the lingual surface as you move from square to round. Often two fingers come off the center of the cingulum into the lingual concavity. This is your key to discovering what characteristics, whether triangular, square, round or a combination, belong to each patient. Study the characteristics of each shape and analyze the occlusal surface to see if the second bicuspids are either oval or exaggerated rugged line angles. If the maxillary second bicuspids are oval, then your anterior teeth will be more rounded with overall softened detail, line angles and texture. If the second bicuspid is exaggerated with stronger line angles, the molars will have extra detail on the anatomy and the anterior teeth will be more square and triangular.

## Internal Cutbacks

Now that you have a better understanding of the external shape of a tooth, you can easily manipulate the height, width, and positioning of the line angles to design the appearance of the restoration (**Fig. 13**). A similar approach is utilized when designing a cutback. If I want the tooth to appear triangular, the mesial and distal cutbacks will be triangular (**Fig. 14**). If I am limited on the width of space mesial to distal and would like my tooth to appear rounded and curved on the distal, a rounded cutback, curved contour on the distal lobe will create the illusion of fullness (**Fig. 15**). This cutback tells the eyes how to perceive the tooth, controlling the shadows and highlights that control the appearance of shape.

The outlined reflective zone, character zone can be manipulated to change the appearance/shape of a tooth (**Fig. 12**).

The edge of the dentin, which equals opacity/highlights/elevation of dentin with the translucent distal border are outlined in **Figure 13.** Notice the shape of the lines. This area is where dentin elevations drop off and depth and translucency begin.

The appearance of the tooth can be changed by the shape of your cutback. **Figure 14** shows straighter line angles creating the appearance of a triangle tooth.

A rounded cutback can be exaggerated by increasing the indent on the distal surface closest to the papilla or point of the tissue (**Figure 15**). Round the distal contour to enhance overall roundness of the tooth. This can be accomplished in circumstances when the width is limited/narrow, allowing the tooth to appear fuller on the distal lobe.

In challenging situations such as in **Figure 16**, the tooth is too long with the reflective zone/highlight positioned high.

To reduce the appearance of height in **Figure 17**, move the elevation incisally, controlling the focal point of height.

Continue to move the elevation/highlight lower in **Figure 18**. By adding translucency and chroma gingivally, you can shorten the appearance more. Emphasizing a strong highlight to the distal lobe will enhance this.


Gingival blending to enhance natural aesthetics can be controlled by increasing or decreasing depth and translucency. This translucency can shorten the height of the tooth or lengthen it depending on placement. It is critical to place a band of translucency in this area as translucency absorbs the surrounding color, allowing improved blending into the gingiva (**Figs. 19-20**).

When examining cutbacks, creating depth and elevations will control the appearance of the shape, size, and intensity of the internal characteristics. The closer the elevation is to the final contour, the brighter it will appear and the deeper the cutback, shadow and depth increases. When placed directly next to each other, as seen on the distal lobe in **Figure 21**, you will see increased contrast, which can enhance the appearance and strength of internal detail. This restoration is not layered but simply cutback to mimic the flow of natural dentition to achieved desired characteristics.

For topical applications of porcelain, remember, refraction and fluorescence, or the ability to vary and scatter the light, is key. For stain and glaze restorations, use a fluorescing glaze. When layering, use fluorescing glaze or opalescents internally, then apply porcelains such as the Ivoclar Vivadent Ceram Selection, Diamond porcelain powder (diamond power can be mixed into laying powders approximately 10-20 percent for shades A1 and darker). There are several brands similar to this that refract the light distribution, scatter the light and allow our restorations to appear more lifelike, similar to that of a natural tooth.

As we continue to evolve and study dental anatomy, I challenge you to see what nature lays in front of us. Do not rely on memory alone; gather photos and models to assist in design and avoid repetitiveness. Analyze the surrounding anatomy to determine characteristics and seek to discover as if beholding for the first time. For in youthful eyes, all things are new and exciting and imagination flows freely without the limitations often molded through time.

## About the Author

Jessica Birrell, MOM, CDT, MUA, CEO and owner of Capture Dental Arts, brings genuine passion, imagination, natural inspiration, and heart to the dental industry with her extremely creative touch. With over 22 years in the dental industry and 12 years of laboratory ownership, Jessica's portfolio includes educational dental books, publications, courses, and lectures, dental photography, makeup artistry, and product research, advancing the study of aesthetics and dental anatomy. Jessica serves on the advisory board for Spectrum Dialogue magazine, IDT magazine, and JDT magazine and is a Certified Dental Technician, and Certified Makeup Artist with her most cherished title held, MOM.

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1864 Charles Goodyear invents the vulcanization process for hardening rubber https://interestingengineering.com/charles-goodyear-the-father-of-vulcanization

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By Dory Sartoris

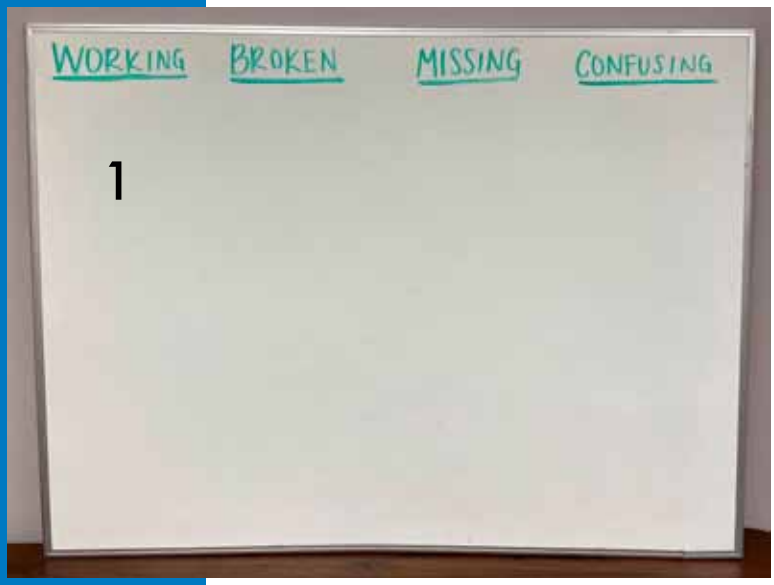
# STRATEGIC GOAL SETTING **for Success**

While attending a past FDLA Symposium & Expo, I heard someone say the primary reason dental labs close is not from insufficient quality or turnaround time, but because of bad business. That statement has always resonated with me, as at the time I had just committed to working in my parent's lab that I unexpectedly inherited due to a sudden loss. I was not a technician and I was searching for a way I could contribute to the family business.

*Once we have all of our ideas on the board, as a team we decide our top three priorities for the quarter.*

I read management books, listened to podcasts, visited other labs and attended courses. I quickly discovered many lab owners, including my father, made these same efforts but struggled with the implementation. My dad was a lab technician at heart. He did what he knew to do, became a better technician, produced a great product and kept the doctors happy. The rest just seemed to come. Fortunately, he was a natural leader, but never formalized these processes.

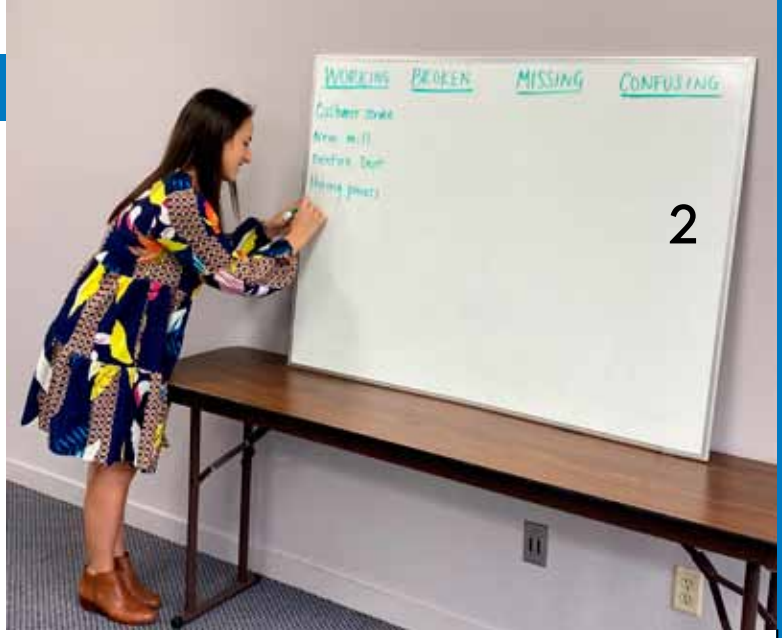
When I acquired the lab, it was up to me to figure out how to make it work in my own way. I was 21 and fresh out of college. I was blessed to have a team of great technicians and a group of loyal clients. No one, however, had been managing or goal setting in years. The lab had already established why we exist (Mission), what we stand for (Values) and where we are going (Vision). The missing component was how we were going to get there…the strategy! About three years ago, I decided to develop a "Strategic Team" within the lab. Hence, the "Strategic Team" was born. The team is made up of six leaders, including myself, who are committed to taking time out of working "in" the business to help work "on" the business.




Our "Strategic Team" meets four times per year for a half-day session and then every other week for short follow-up meetings. The quarterly meeting is where we brainstorm and set goals for that quarter. Ideally, this is off-site where we can really unplug from the constant interruptions that happen in the lab. The purpose of the follow-up meetings throughout the quarter is to hold each other accountable and make sure we are staying on track with the goals we have set.

During the half-day quarterly session, the largest segment is the goal setting. We have a giant white board where we do a "strategic priorities" workshop, an exercise I learned from Dave Ramsey's leadership courses. In four columns, we list what is working, broken, missing and confusing within the lab (**Fig. 1**). This is ultimately just brainstorming and writing out all of our thoughts and concerns.

Under the working category, we write anything we think is working or going well. What's bro-



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ken is anything we believe is broken in our business, such as a specific workflow, communication, etc. Under the missing category, we put anything we feel is currently missing from the way we are doing things, such as a product or procedure. Last, we address what is confusing either for our clients or for our team. What needs to be clarified? It is important not to get caught up in the semantics of whether an issue is broken or confusing. The key is to just get it written on the board (**Fig. 2**)!

Once we have all of our ideas on the board, as a team we decide our top three priorities for the quarter. This might include some healthy, appropriate and respectful debate. For example, one team member may believe a new piece of equipment should be a priority, whereas another team member believes client retention should be first. We talk it out as a team and decide collectively which ideas are most important (**Fig. 3**).

When we have our three priorities identified, we start setting goals based on exactly what we think needs to happen in order to be "winning" with each priority. Our goals must meet the "SMART" principle (Specific, Measurable, Attainable, Relevant and Time-bound). **Figure 4** shows a few examples of what this might look like.

I believe our "Strategic Team" and goal setting has made a huge impact on the morale of the lab, not to mention we finally have a direction. It has been said that without a direction, you may end up where you don't want to be. Since establishing the "Strategic Team," I have personally grown and learned how to more effectively lead our team. In addition, the team has grown and learned accountability and responsibility. I will be the first to admit we have our ups and downs, but each session has been a learning opportunity. I'm not saying this is a foolproof plan for success, but I will say it works for us. By focusing on strategic planning, we've come much farther than we ever would have!

**2021 Q3 Goals**

4

**Priority: Improve Client Retention**

- Update new doctor onboarding procedure by July 1
- All cases for new doctors to go in pink pans for first 90 days
- First case for new doctors to be delivered by Dale (local clients)
- Develop client satisfaction survey by July 15
  - Surveys distributed by August 1 (hand delivered & emailed)
  - Create action plan for survey results by September 1

**Priority: Increase Positive Atmosphere & Culture**

- Encourage team buy-in with overall team goals
  - Financial goal to be communicated at quarterly team meeting
  - Tiered reward system for reaching / exceeding goal
  - Misty to update the team on progress every Monday
- Internal compliment box to boost team morale
  - Compliment box stationed in common area by July 15
  - Encourage team to share positive feedback in person but also write in compliment box
  - Dory to share compliments with team weekly over intercom
- Grow inter-personal relationships outside of work
  - Plan team outing (bowling or baseball game) by August 1

## About the Author

Dory Sartoris is the president and owner of DCS Dental Laboratory in Jacksonville, Fla. DCS is a full-service lab founded in 1988 by her father, Dennis Charles Sartoris. In 2013, Dory received her Bachelor of Science degree from Georgia Southern University. She was featured as a second-generation lab owner in the JDT 2019 "Who's Hot" issue. Dory has had the privilege to serve on the board of directors for the Florida Dental Laboratory Association since 2015 and currently holds the position of president-elect.

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850-224-0711 advertising@fdla.net

### Help Wanted

The PRIDE Dental Lab is located in northern Florida - inside Union Correctional institution, Raiford, FL. The Dental Lab is full service. Manager supervises production process that fabricates dental prosthetic appliances –removable and fixed. With staff of eight works and trains 72 inmate workers in preparation for becoming CDTs. Establishes budget and achieves financial goals working. Must be a Certified Dental Technician (CDT) with five years of experience working in dental lab setting, and five years' management experience. Must have experience with CAD/CAM procedures and equipment. Must pass Level II background check. Salary range $85,000 to $90,000. Send Resume to bwignall@pride-enterprises.org.

### Wanted Removal Technician in Fort Lauderdale

Small lab in prime location! Close to our beautiful beaches and near South Beach. It is a great place to work and play! Room to advance in this company. Applicant must be proficient in all phases of denture construction. 4 ½ day work week, paid vacation and holidays. If you are interested, please call 954-491-8410.

### DIRECTOR OF DIGITAL DENTAL LABORATORIES

This full-time faculty position will oversee in-house production and education for all digital dental services, manage and ensure compliance with digital workflows, organize digital equipment maintenance, and facilitate all laboratory services. The appointee will also coordinate training on equipment and software for faculty and students on digitally designed and fabricated restorations.

Requirements:

- CDT (Certified Dental Technician).
- 5+ years of dental laboratory experience in digital technology (Education may count towards experience).
- Outstanding communication skills and teaching/trainer experience.
- Technical competency with computers, databases, electronic folders and records organization.
- Ability to work in a highly collaborative, fast-paced, technical environment.
- Ability to work independently and to manage people and processes with minimal oversight.
- Familiarity with an electronic health record databases and HIPAA regulations.

You can explore the job description by clicking this link:
https://bu.silkroad.com/epostings/index.cfm?fuseaction=app.jobinfo&id=23&jobid=306242&company_id=15509&version=1&source=ONLINE&JobOwner=1016383&level=levelid2&levelid2=20820&startflag=3

Company: Boston University Henry M. Goldman School of Dental Medicine
Location: 72 East Concord Street, Boston, MA 02118
Contact: Milly Koo
Email: mykoo@bu.edu
Phone 617-358-1848
Website: https://bu.silkroad.com/epostings/index.cfm?fuseaction=app.jobinfo&id=23&jobid=306242&company_id=15509&version=1&source=ONLINE&JobOwner=1016383&level=levelid2&levelid2=20820&startflag=3

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As a pioneer in dental CAD/CAM technology, Amann Girrbach is one of the leading innovators and preferred providers in digital dental prosthetics. With its high degree of expertise in development and commitment to customer orientation, the ambitious company creates sophisticated system solutions for tomorrow's practice routine.

## Argen Corporation
**Phone: 858-455-7900 Fax: 858-626-8658 www.argen.com**
Argen Corporation provides a wide range of alloys to meet any need, as well as refining services.

## Atlanta Dental Supply
**Phone: 800-218-5447 Fax: 877-614-0597 www.atlantadental.com/lab**
Atlanta Dental Supply Lab Division is an employee-owned company servicing the dental lab market for over 145 years. Specializing in denture teeth by Dentsply TruByte, Kulzer, Ivoclar, as well as lab supplies by Modern Materials, Garreco, Whip Mix, S S White, Keystone, GC, Dedeco and Shofu. Atlanta Dental also offers lab scanning solutions.

## DDS Lab, Inc.
**Phone: 813-249-8800 www.ddslab.com**
DDS Lab is a full-service, NBC-certified, national dental lab that employs innovative, digital dental technologies and Best in Class customer service. While producing top quality, custom dental prosthetics for our dentists, our focus remains on Service and Customer Communications. Providing large DSO and independent dental offices with a local lab approach allows them to stay committed to what they do best, caring for their patients.

## Ivoclar Vivadent, Inc.
**Phone: 800-533-6825 Fax: 770-935-4794 www.ivoclarvivadent.com**
Leading international manufacturer of high quality dental materials for preventative, restorative and prosthetic dentistry.

## Kulzer
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## Panthera Dental
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## Smart Dentistry Solutions, Inc.
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Smart Dentistry Solutions was established in 2019 to provide premium digital CAD/CAM solutions to Dental Laboratories. Our flagship products LayZir (All Indication Layered Zirconia Discs) and LitZir (All Ceramic Finishers) are manufactured in state-of-the-art OEM facilities throughout Japan. Additionally, we are proud to serve as authorized distributors of select products for a growing list of prestigious manufacturing partners such as: Shofu Inc., Merz Dental, Canon, and Dekema in the United States.

## VITA North America
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These companies support the Florida Dental Laboratory Association in our vision to advance the individual and collective success of Florida's dental technology professionals in a changing environment. They are FDLA's Business Partners, and have pledged their support to Florida's dental laboratory profession. Become an FDLA Business Partner Today! Call FDLA at (850) 224-0711 or e-mail membership@fdla.net.

Robert Gitman, NADL President

# Together Again at Vision 21

NADL's Vision 21 meeting was held April 8-10 at the Gaylord Opryland Resort in Nashville, Tenn. The attendees were excited to share in the experience of learning and networking together again. Keynote speaker Marko Vujicic, Ph.D. addressed how the COVID pandemic has impacted the U.S. dental economy and reviewed the latest data regarding the dental market, changes in the dental workforce and projections for dental spending in 2021. Steve Diggs, CSP, founder of six successful businesses including The Fast-Forward Leadership Platform™, revealed the eight traits of radical leadership resilience. There were also workshops and panels addressing the challenges this industry is facing and how to overcome them. Robert Gitman, general manager of NDX Thayer, CDL, Mechanicsburg, Pa. was officially welcomed as the president of NADL after already serving as president since January 2021. The other 2021 officers include President-Elect Tad Friess, Treasurer Heather Voss, CDT, and Secretary Denise Burris, CDT. NADL took every precaution to provide a safe environment for attendees and was proud to be one of the first industry meetings. More than any other year, attendees truly valued the opportunity to talk to each other and be connected in their struggles and successes.

V21
NADL's Vision 21 Meeting

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*See page 11 for more information.*

# HOTEL INFORMATION

## RENAISSANCE ORLANDO AT SEAWORLD

The 2021 FDLA Southern States Symposium & Expo will be held at the Renaissance Orlando at SeaWorld.

Make your hotel reservations directly with the Renaissance by calling **407.351.5555**. The FDLA has secured a special reduced rate of $174 inclusive of resort fee. Be sure to mention you are with FDLA and make your reservations by **Wednesday, May 19, 2021** to receive this special reduced rate.


***Please continue your support of the FDLA Southern States Symposium & Expo by staying at the Renaissance Orlando at SeaWorld, the appointed FDLA host hotel.***

**QUESTIONS?** For more information, please contact FDLA at 850.224.0711 or meetings@fdla.net.

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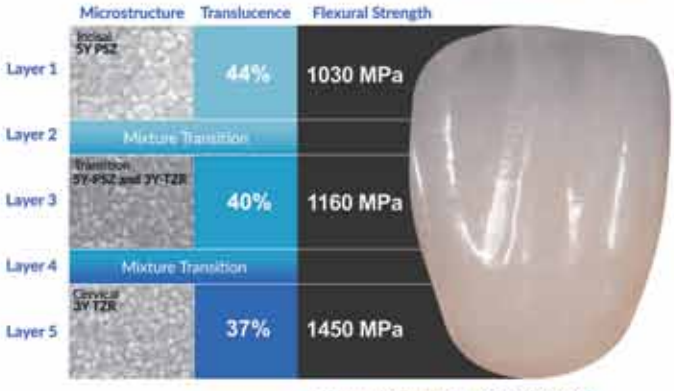


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# Growing a Healthy Business

**John Hanna**, *VP Operations/Lab Division Manager at Atlanta Dental Supply in Duluth, Ga. talks about changes in the industry and how to survive and thrive.*

*A healthy business has to be growing, so always work to increase your customer base.*

### What measures has Atlanta Dental Supply taken in order to overcome the challenges from COVID-19? Did your business strategies change?

Since some labs aren't comfortable having outside people enter their businesses, we have been working more via email and phone. It is a challenge not having the freedom to stop by someone's lab to see how they are doing, or to go and show someone a new product. Back in the beginning, we also experienced a mad scramble to get gloves, masks, etc. for our customers. Not only did we struggle with getting enough supplies in, but then we had to ration it out fairly among our clients. We had long-term existing customers that needed it, and new customers that also needed it.

### Where do you see the industry headed in the next five years?

We see an increased amount of additive manufacturing and digital workflow in general, and the continual erosion of analog dentures. While we do believe there will be an increase in digital dentures, we think it is going to be a long, slow process. Some labs have been slower to embrace technology, but all labs are also going to adopt it more as time goes on.

### What advice would you give to laboratory owners to survive and thrive in today's environment?

Stay positive and don't be too conservative. Even if you are happy with what you have, in reality, if you aren't growing you are really shrinking. You never know when you might lose a client. Sooner or later you will. If you are having problems growing your business, you have to focus some on marketing, referrals, and alternate methods to gain new customers. A healthy business has to be growing, so always be working to increase your customer base.

### Why is being an FDLA Business partner valuable to you?

Being able to participate at the annual symposium in Orlando is the biggest value for us. I've been leading the lab division of Atlanta Dental for 15 years, and when I started, we didn't have very many labs in Florida. Once we started going to that show, we started gaining more customers, and now it is more like going to a family reunion. There's nothing like seeing both old and new customers face-to-face, and we can't wait for that opportunity again!

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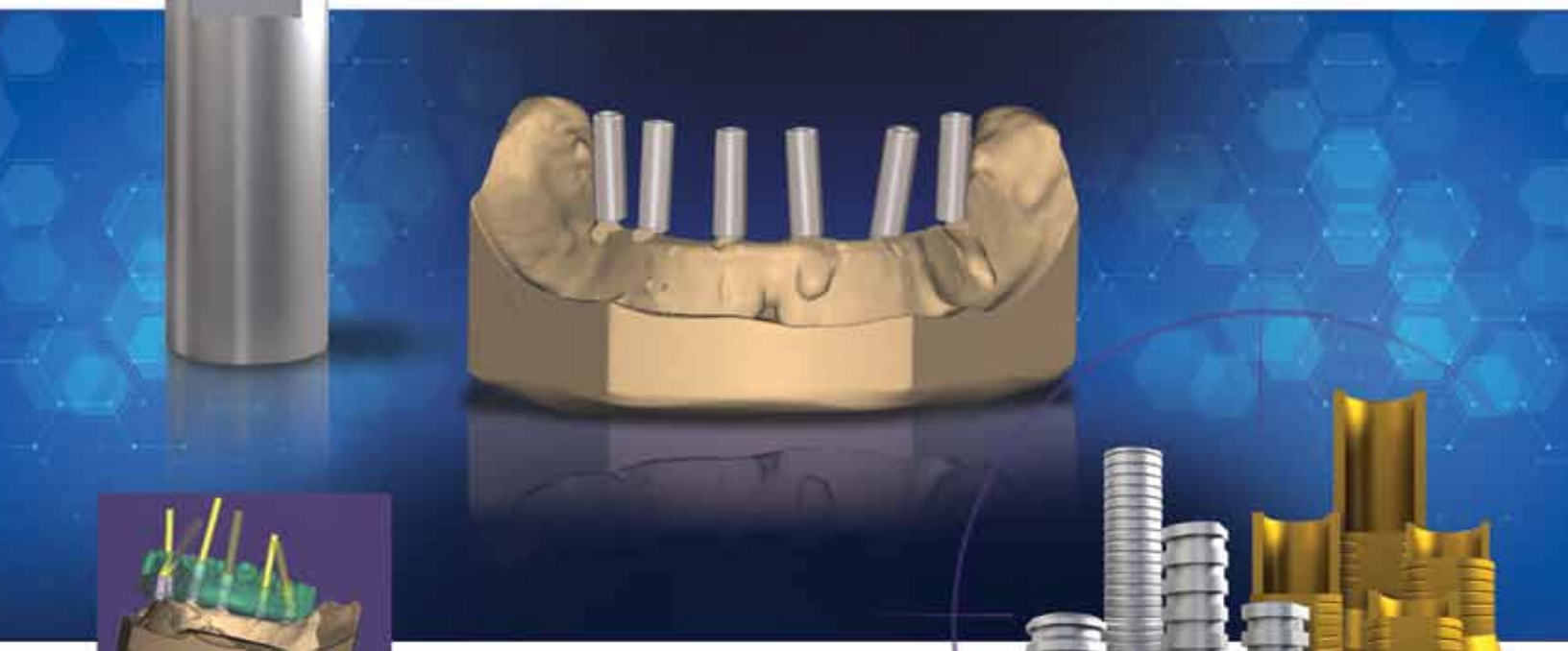



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