FLORIDA'S OUTLOOK ON THE DENTAL LABORATORY PROFESSION
4th Quarter 2021
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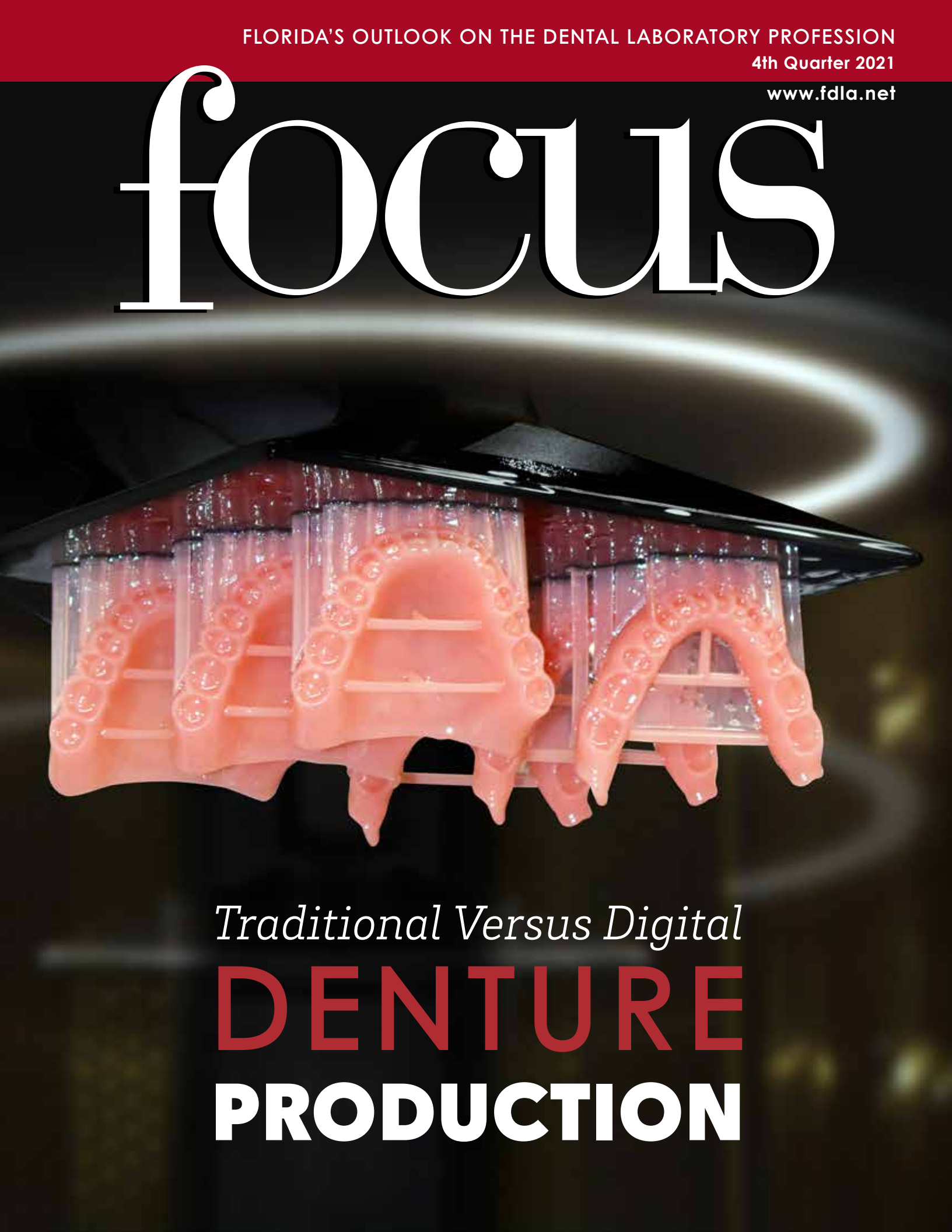

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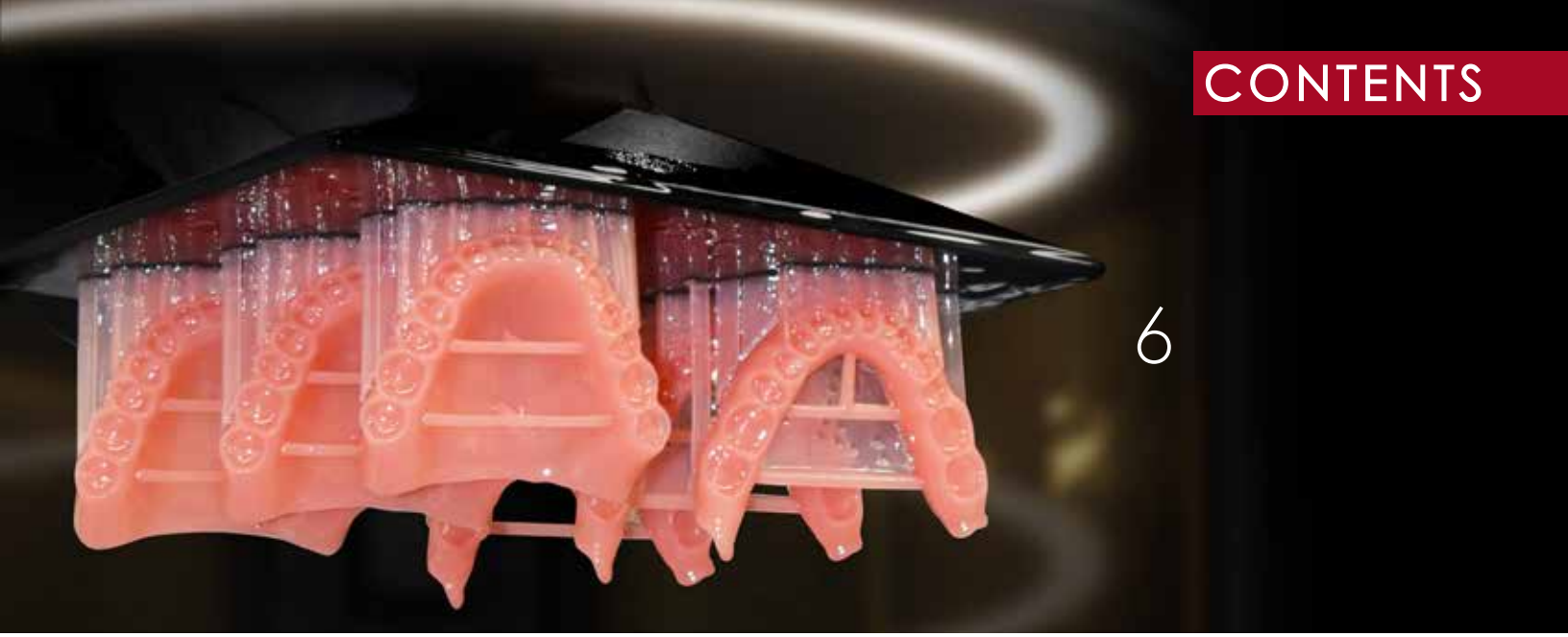

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In the Middle of Difficulty Lies Opportunity

By Dory Sartoris

FDLA President

It's hard to believe we are coming up on the fourth quarter of another year. Sadly, it has been another year of hardship for many. There is one specific quote from Albert Einstein which defined 2021 for me. "In the middle of difficulty lies opportunity." The FDLA seeks to help you recognize and capitalize on those opportunities and mitigate some of the difficulties.

I highly encourage you to take some time out of working IN your business to instead work ON your business.

One opportunity we were blessed with this summer was a generous grant. FDLA was the recipient of the Foundation for Dental Laboratory Technology (Foundation) 2021 SCDL Component Business Education Grant. The Foundation offers this annual grant in order to support state and regional dental laboratory associations to help fund business management continuing education offerings. Receiving this grant is a prestigious honor. The grant selection process awards recipients based on the number of years as an NADL member, contributions made to the Foundation, affiliations with allied dental organizations, and more. The FDLA is grateful we were able to use the funds to help offset the expenses associated with workshops and keynotes at the Symposium & Expo. Visit dentallabfoundation.org to see all of the scholarships and grants the Foundation offers to dental laboratories and technicians.

As we approach the end of the year, we often reflect on the progress we have made thus far and goals we want to set for the coming year. How can we be better and stronger next year? How can our lab reach new heights? How can I personally be a better spouse, parent, or friend? I challenge you to set new goals for yourself and your lab for 2022. If this is something you already do, great! If this is a new idea, I highly encourage you to take some time out of working IN your business to instead work ON your business. It can be hard to do, I know. It will, however, set you up for success in 2022!

Every year, your FDLA board of directors strives to make our association stronger. We review how we can make the Symposium & Expo better, improve the education we offer and explore any additional benefits we can provide to our members. If this is something you would like to be part of, we would love to have you join the board! If you are interested in applying, please reach out to FDLA Executive Director Jillian Heddaeus by calling (850) 224-0711.

Thank you for supporting the FDLA. If there is anything the association can do to better support you, please let us know! I hope you enjoy the upcoming holidays with your family and loved ones.

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

FDLA Vision
Advancing the individual and collective success of Florida's dental technology professionals in a changing environment.

Values Statement
FDLA's board of directors and professional staff are guided by these principles: Integrity, Leadership, Recognition, Safety, Acceptance and Innovation.

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By Jimmy Stegall

TRADITIONAL Versus DIGITAL Denture Production

By The Numbers

I was very blessed to have spent nearly 40 years at one laboratory. I learned from a phenomenal owner and helped him build the business to over $12m annual revenues with 130 technicians, with a full range of prosthetic services including 100+ dentures per day.

Being a data nerd, I measured everything, including materials, time, and labor, to help us establish standards and goals to facilitate growth and profits. A few years ago, I moved into the corporate realm at the outset of digital denture products and workflows. My hope is that by sharing those experiences in this article, you may find some tools to help you.

No, we are certainly not running out of opportunities to make dentures.

Opportunities from the Demographics

As I worked with dental students at two universities, a common question often arose. "With all of the advances in dental care and a health-oriented population, won't we see a reduction in the number of denture needs?"

To this I answer, absolutely not!

There are approximately 350 million people in the U.S., with nearly 40 percent in the age brackets where denture needs arise. This group currently has an estimated 36 million edentulous, and in this large bubble of our population, there are projected to be nearly 200 million edentulous within 15 years.

Dental students and labs also ask, "Even with the large population, aren't all of the dental schools graduating more dentists, which means more competition and less production per office?"

In 1977, dental schools were graduating 2.4 dentists per 100k of the population. That rate in 2019 was 1.8 dentists per 100k.

No, we are certainly not running out of opportunities to make dentures, and there simply will be no problem filling appointment books!

Other interesting facts to note about our demographics:

The other 60 percent of the U.S. population, Generation X (aged 45-54), Y (aged 35-44), and Z (under 35) is where our customers and employees are coming from. These groups are certainly digitally oriented and will be expecting products, services, and job opportunities that benefit from the technologies. We need to adapt to this resource as providers and employers.

Between 2008 and 2018, the number of dental laboratories decreased from over 12k to approximately 6k, and some current data expects

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that number to drop due to COVID-19. All of us in the industry are very well aware of this. Everywhere I go, the absolute most common question is, "Where can I find technicians to hire?" The skills needed are specific, and can result in hiring difficulties and extended training time. We can debate about globalization, corporate groups, the race to the bottom mentality, or how the digital shift has or has not taken our creativity away. With a 46 percent drop in the number of labs, however, all of the work that needs to be done means huge opportunity for those that find ways to adapt.

How will remaining labs be able to keep up with the demand for all of the dentures that will be required? Based on what we learned with C&B production, the answer lies with digital. We simply are unable to find or create enough removable technicians to keep up with this growth, so we need new ideas on materials, equipment, and workflows.

Traditional Workflow – Knowing What It Costs

The steps to fabricate dentures have not changed much in decades. While there have been improvements in processing technology and materials, there are still five basic steps. In teams of five technicians, our target was set at :93 minutes of hands-on time (**Fig. 1**). This led to a daily production target of 24 arches. Note that some technicians needed more than eight hours and some less than eight to accomplish their targeted number. This is where teamwork came in to create the balanced goal of everyone working an eight-hour shift. For example, the waxer helped the tooth setter and the model technician supported the processing and finishing technician.

When technicians are asked how long they think it will take them to perform a task, they all say the same thing, "It depends." Nevertheless, I wanted our system to establish baselines to determine what would be a realistic and productive target for each process. Our data measurement allowed technicians to do what they do best, but with daily quantified and timed work. My goal was not to create unrealistic expectations, or drive us to a "numbers before quality" mindset. It was simply to have a clear understanding of where we were and what we were capable of. Researching production data from manufacturers and more importantly, other labs, confirmed our time results were within realistic expectations. Keeping the technicians involved in this process also contributed to the acceptance of production capabilities.

We fully understood that every day was different, and no one has 24 ideal arches every day, but this was an ongoing collection of data and fluctuated very little. Our team was typically more efficient, but we wanted a more real-world target so we left in a two-hour per day cushion. By calculating minutes with pay rates and adding in materials, admin, and overhead, it became easy to determine the total cost of $108.95 per denture (**Chart A & Fig. 2**).

Chart A

Traditional Denture Workflow Tasks	Min. Per Arch	Total Man-hours To Produce 24 Arches	Hourly Rate *(from LMT Survey)*
Model work	:10	4	$17.50
Select & setup teeth	:20	8	$21.00
Wax	:15	6	$18.00
Invest/Process/De-vest	:25	10	$17.50
Finish & Polish	:23	10	$19.00
Total	**:93**	**38 ***	**$31 Labor cost/ denture**
**2 hr cushion per team (5 techs @8hrs = 40) allows for unknowns*			

How will remaining labs be able to keep up with the demand for all of the dentures that will be required?

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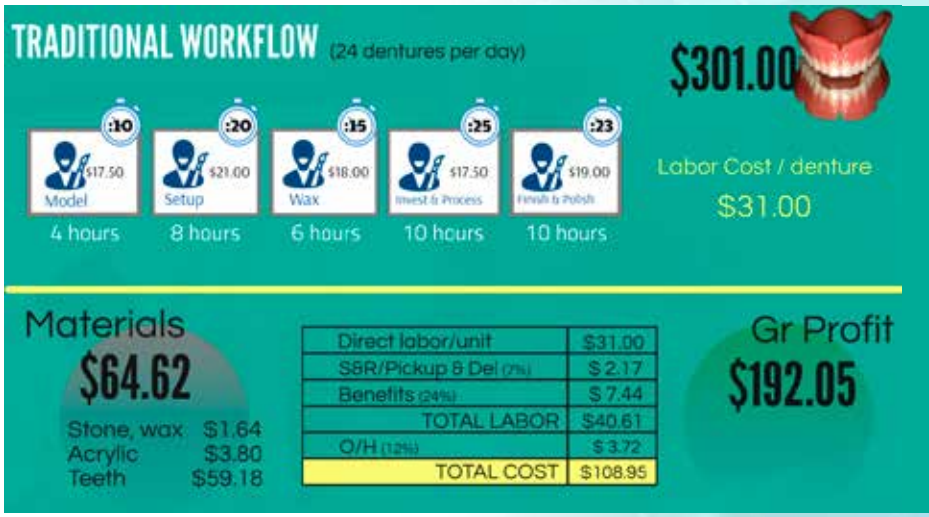

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Even a team of two technicians can increase productivity, revenue, and profits when transitioning to digital denture workflows.

How Does Digital Workflow Compare?

The efficiency of the digital workflow saves nearly 20 minutes of labor per arch, which allows us to fabricate more dentures per day. In my example, invoicing 30 dentures per day digitally, versus 24 traditionally, generates an additional $1,800 in revenue and $1,350 in profits, even after the printer payment (**Chart B & Figs. 3-4**).

Saving $7 in costs to fabricate per denture digitally versus traditionally may not seem impactful, but when you consider the total daily revenue and profits on 30 instead of 24, the numbers begin to resonate.

The bigger win is in scalability. How much easier is it going to be to expand capabilities to produce more dentures as the business grows? While the benefit of doing something in less time is obvious, what we should really notice is the ability to

Chart B

Digital Denture Workflow Tasks	Min. / Arch	Total Man-hours To Produce 30 Arches	Hourly Rate *(from LMT Survey)*
Model work	:10	5	$17.50
Case entry & Scan	:10	5	$15.50
Design	:20	10	$23.00
Print/Post Processing & Assembly	:24	12	$18.00
Finish & Polish	:10	5	$19.00
Total	**:74**	**37 ***	**$25 Labor cost/ denture**
**3 hr cushion per team (5 techs @8hrs = 40)*			

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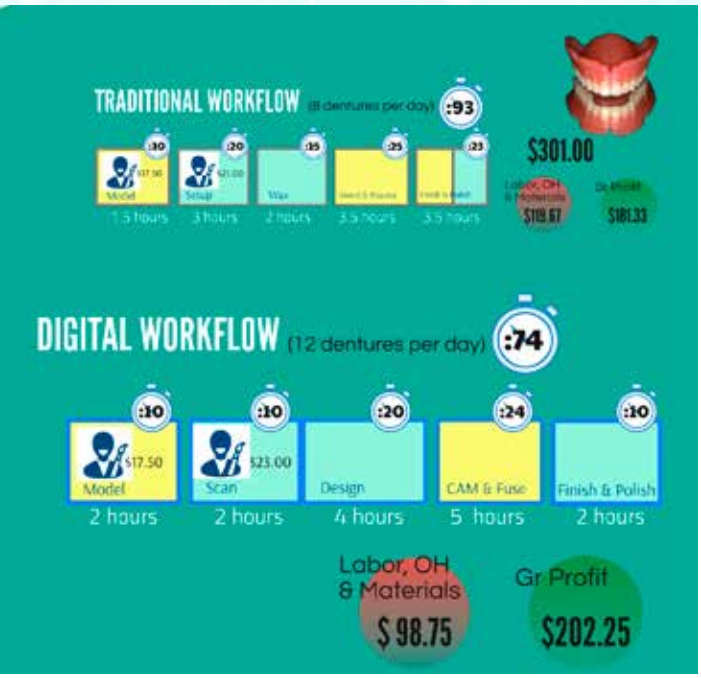

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perform denture fabrication with a skill set that is much easier to train, and therefore scalable. The digital path is the clear winner here.

What about small labs/teams? Using the same minutes per task data, we see that even a team of two technicians can increase productivity, revenue, and profits when transitioning to digital denture workflows (**Fig. 5**).

Converting from a traditional to a digitally fabricated workflow is not something that can be done with a mouse click. There will be a period where you transition people and resources. Consider the example of Reality Dental Lab who had two technicians producing eight dentures per day with conventional methods. They added a Carbon© printer and Dentsply Lucitone Digital Print© resin, and within three months, they were producing 10 dentures per day, but had converted four of them to the digital workflow which added $600 in revenue per day. What was their biggest win? Using the more efficient digital workflow, even with only four of the 10 dentures, cut their time at the bench by 20 percent! They are anxious to continue toward a complete move to digital and now see a way to scale up their ability to produce without worrying about finding technicians with traditional skill sets (**Fig. 6**).

Implementation Strategies

While digital is one of the possible options, I'm not advocating that we move all of our traditional tooth setting experts into digital setup technicians. I believe a better use of their skills would be on the challenging cases, like advanced implant restorations, or cases that are difficult to accomplish with digital workflows. A better workflow implementation would be to move a less experienced technician, but one with some CAD skills, into digital denture designs. Their first few days should be spent with oversight from an experienced denture technician. I have seen repeated success with someone who is comfortable with the design software tools adapting to productive denture designs within a couple of weeks, along with the guidance of another technician who explains things like retromolar pads, borders, and balanced occlusion.

Other successful implementation strategies would be to convert and/or parallel production. This is when we call the dentist to explain our new processing method and ask permission to switch a case over to digital fabrication. Or, we simply make the case both ways and send to the dentist for evaluation and feedback. It's not a difficult conversation. The benefits of a digitally processed denture are quick-

While digital is one of the possible options, I'm not advocating that we move all of our traditional tooth setting experts into digital setup technicians.

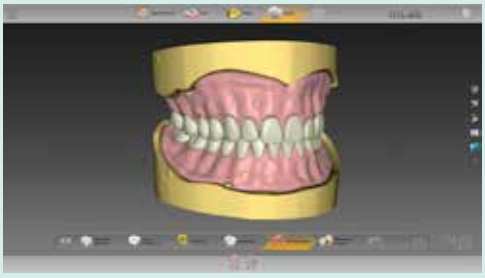
COMMON QUESTIONS

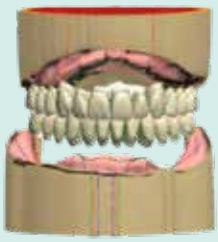
Can I use any printer?
It depends on the resin. The industry is rapidly adding materials and printer validations to make it easier and suitable to more lab needs.

I have heard that the printed denture resins are weaker than my traditional acrylic. Is this true?
While they gave us a great entry point to printed dentures, the first generation of resins were weaker and less esthetic than traditional acrylics. The latest generation of print resins for denture bases is considerably stronger. For example, the Dentsply Lucitone Digital Print© denture is 2x stronger than conventional.

Can you repair or reline digital dentures?
Some digital resins, like Dentsply Lucitone Digital Print©, do work with traditional repair and reline materials and techniques.

What other capabilities does digital denture workflow provide?
Immediates, single arch, copy dentures, multiple tooth options (carded, milled, printed), implant overdentures and conversions.





ly becoming well known, including improved denture base to tissue fit (fewer adjustment appointments), improved try-in process (fewer try-in appointments), and digitally archived records (replace lost denture with a phone call).

Summary

In order to take advantage of market opportunities, dental laboratories must have the ability to produce more dentures than ever to keep up with the growing demand. Finding or training the skills needed to accomplish the volume needed has become the biggest challenge we face. Digital workflows for dentures affords us the chance to become more efficient with the people we have, but more importantly, bring in newer trainees and get them up to speed faster than ever.

About the Author

Jimmy Stegall is a seasoned dental lab operations and management executive with over 40 years of teaching and clinical experience in the U.S. and Canada. He is a published author and has assisted in research projects with dentists, universities, and manufacturers. After a successful 30+-year career helping build and lead a large dental lab in South Carolina, Stegall served as a division president of a large dental lab network, and is now a National Procedural Solutions Specialist for Dentsply Sirona. As a key opinion leader, teacher, and trainer, he has a demonstrated history of bringing results-oriented strategies and techniques to dental practices and labs throughout the U.S.

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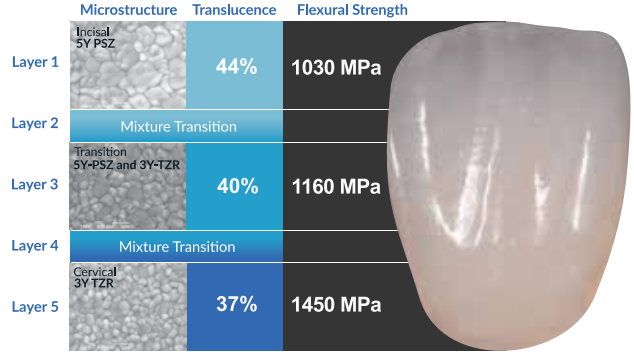

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By Gary Morgan, CDT

Virtual Assessment, A NEW PARADIGM FOR FDA

COVID has affected pretty much every facet of our lives. It has definitely impacted dental laboratories. It has also impacted the government agencies that have oversight over dental laboratories.

Routine FDA onsite audits take agency resources in personnel, time, and money.

State dental boards, OSHA, and FDA were all pretty much shut down during the height of the pandemic. The responsibilities were still there, but the agencies shut down their physical offices and did not want to expose their compliance personnel to the disease. The agencies prioritized inspections and investigations based upon the risk that noncompliance would pose to employee and general public safety.

FDA, unlike OSHA, is charged with routine inspections of the facilities over which the agency has oversight. Food, drugs, cosmetics, and medical device manufacturers must comply with stringent manufacturing requirements to ensure that the products that they produce are fit for placing in or on the human body.

FDA continued performing inspections on those medical device manufacturers that developed and produced life supporting and life-sustaining devices. Since the products that dental laboratories make are lower risk devices, inspections were not performed. As the pandemic has continued to persist, the agency had to determine how it could continue to meet its oversight requirements.

Routine FDA onsite audits take agency resources in personnel, time, and money. The audit is generally placed into the audit queue when an area office plans its year. The agency contacts the auditee to schedule and generally does not allow much deviation from that schedule. The audit itself lasts however long it takes the inspector to be satisfied that the audit has been fulfilled. This can last as much as a week and can be very disruptive to a dental laboratory's operations due to required participation of management team members and many times employee interactions as well.

Once the onsite audit is completed, the lab has to respond if there are nonconformances. This extends the agency's commitment of time and personnel.

As the agency started working to achieve some sense of normalcy to its operations, a new approach to its oversight responsibility has been added to its compliance portfolio in the form of a virtual assessment. Just like most other office-based businesses, virtual conferencing became the way that work could still be accomplished in a manner that kept individuals distanced so that the spread of COVID in the office environment could be minimized. I am sure that most people have engaged in some form of virtual meeting like Zoom, Teams, GoToMeeting, etc., especially during the COVID pandemic.

Very early this year, one of our clients was one of the first to receive a notification from FDA requesting that the lab participate in a "voluntary" compliance assessment. The client is registered with FDA to manufacture Class II devices and has been through the onsite audit process several times over the past few years. The request stated that the assessment was not mandatory and the lab did not have to participate. The request stated that the assessment was a way that FDA was facing the challenge of working with medical device manufacturers to measure conformance to FDA quality system requirements without putting inspectors at risk of exposure to COVID. As a Certified Quality Auditor myself, I have been using virtual conferencing as a way of working with SafeLink's clients before and especially during the pandemic, as well as performing remote internal audits and DAMAS recertification audits. I was, however, a little surprised to see FDA try this approach to their audit process. The notice went on to state that there would be no negative outcome if the lab decided not to participate and that they would just remain in the normal audit queue for an onsite. The indication was that the assessment would not replace an onsite audit, but would push off an onsite audit based upon the outcome.

Upon receiving the notification, I was contacted by the lab to consult on whether the lab should participate in the assessment or not. One of the determining factors that led the lab to ultimately agree to participate was that the notification stated that the assessment would not result in the issuance of documented nonconformances

and a formal 483. A 483 is the report issued by FDA after an onsite audit, and details any findings of nonconformance to FDA regulations, including registration issues, failure to meet FDA quality system specifications and especially any issue that undermines the safety and efficacy of the medical device being produced by the facility, which is ultimately FDA's role in protecting the public. Once a 483 has been issued, then the lab must correct any nonconformances and provide proof in the form of corrective and/or preventive actions. Follow-up audits may be performed to ensure that the actions have been taken and the nonconformity no longer exists. The 483 is public information and is posted in FDA's inspection database so that anyone can view the information. Potential customers of the lab can utilize this information to determine if they want to work with the lab. This is usually part of the due diligence process to grant contracts from government agencies such as the Veteran's Administration and the military and other institutions such as dental schools, prisons, and even dental service organizations (DSO). Equity firms that are now pumping money into the dental lab industry will also include this information in their regulatory compliance assessment for a potential investment.

Our client ultimately decided that there seemed to be no particular downside to participating in the assessment, so they agreed and the process started with an FDA compliance officer/

The entire assessment took less than five hours over three sessions that were spread out over two weeks.

inspector/auditor contacting them to discuss and arrange the logistics of the assessment. The client asked if they were allowed to have a consultant participate in the assessment and the FDA employee stated that they could have anyone they desired participate. A date and time was agreed upon by all participants and the process began. Just the fact that a discussion was held to determine date and time was significant, since usually FDA dictates the date and time of an onsite audit and allows very little variance to that schedule.

The entire assessment took less than five hours over three sessions that were spread out over two weeks. At the first meeting, the inspector asked for quality system documentation, such as policies, standard operating procedures, and records, the same as would have been requested in an audit. The documents were shared with the inspector through secure file sharing systems. The inspector followed up with questions and a request for further documentation on the second session. The third session was a review of areas that the inspector felt needed addressing. The inspector had informed the lab that they should address the findings just as they would have done for an audit, but they did not have to respond to FDA as to the corrective actions. Since this was one of the first assessments, this lab's experience may not be typical of future assessments.

An audit is a very structured process. The American Society for Quality defines auditing as "the on-site verification activity, such as inspection or examination, of a process or quality system, to ensure compliance to requirements." Auditors need to confirm that the quality system has been implemented and embraced by everyone within the organization from the top management to the manufacturing line worker. This is very difficult to accomplish remotely. An assessment lacks that onsite component, but serves the same purpose to determine the conformance to the same requirements, and is less constrained than a formal audit. The assessment allowed for more open discussion.

There are definitely positives to the assessment process. Primarily it prepares a lab for an audit, either from FDA or any other formal audit, and ensures that any issues are discovered before a formal finding and the consequences of that finding.

Our client was well prepared for the assessment since, as mentioned earlier, they had already gone through formal FDA audits before. The determination to participate in an FDA assessment should never be taken lightly. If a lab is not prepared, the assessment could lead to a follow-up audit to ensure compliance. Should a lab have any agreements in place as a contract manufacturer, these contracts may be reviewed by the inspector. These contracts may include language stating that prior to any audit or assessment by an outside body, including FDA, that the initiator of the contract be notified before the lab agrees to the external audit or assessment.

I believe FDA, while using the assessment as an alternative to an onsite audit during the COVID pandemic, may also be looking at the assessment as an asset to help them meet their ever-growing responsibility for oversight over a medical device segment that is not only growing in the sheer number of businesses that design and produce them, but also due to the rapid development of new technologies and medical device manufacturing modalities. The assessment may be here to stay.

About the Author

Gary Morgan, CDT, CQA/ASQ, is the Vice President and Senior Consultant with SafeLink Consulting. Gary guides businesses in implementing employee health and safety programs and quality systems. Gary is an Authorized Trainer under OSHA's Outreach Program, a Certified Quality Auditor and a Certified Dental Technician. His experience as a dental laboratory owner has provided a unique understanding that enables him to help companies integrate compliance in a way that not only mitigates risk but also benefits the business. He performs safety and quality audits throughout the U.S. and internationally.

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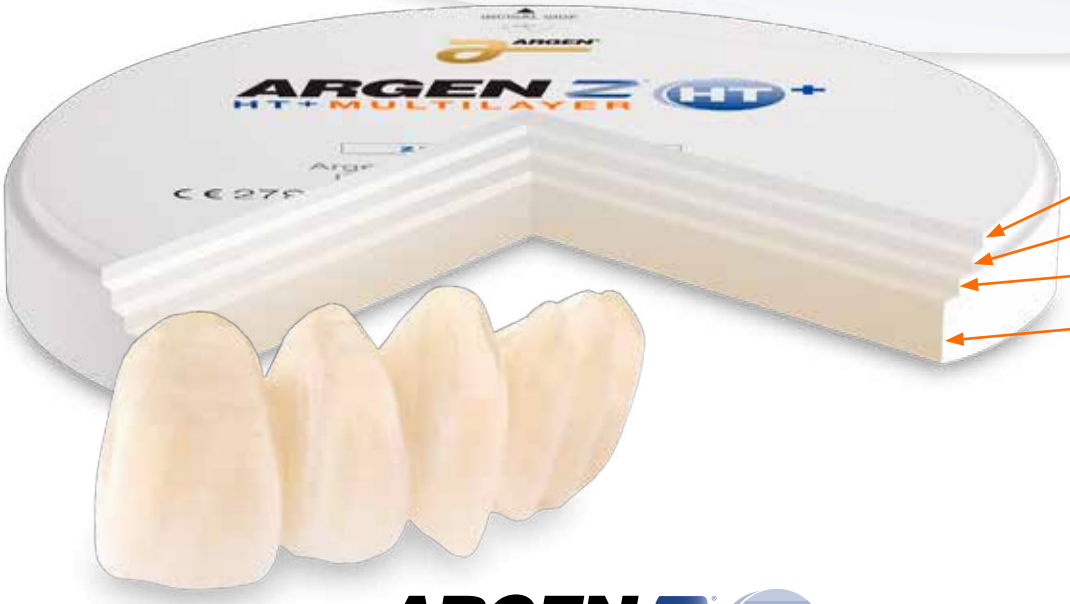

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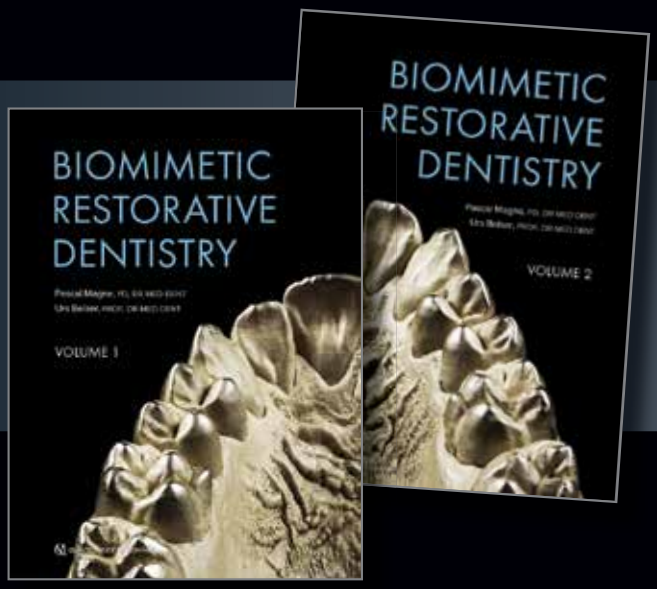

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10/21

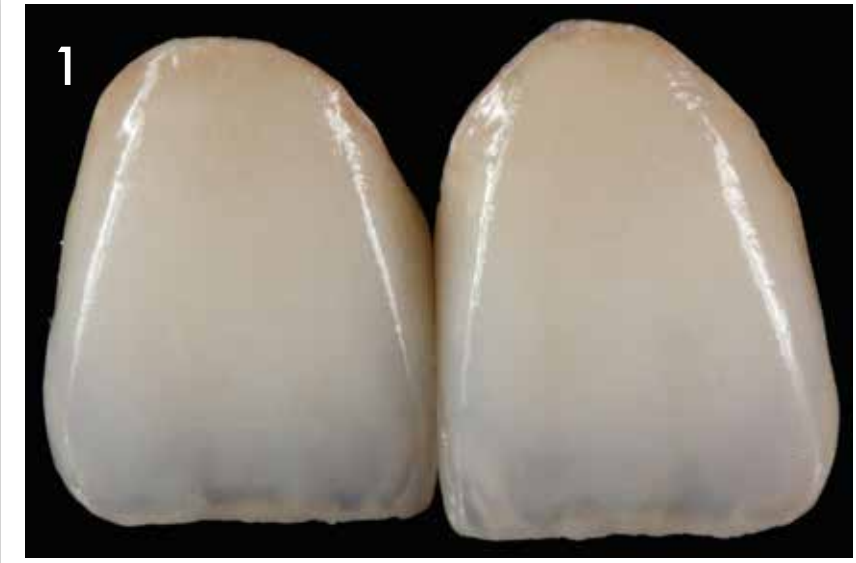
By Aiham Farah, CDT

MASTERING Challenging Situations

Introduction

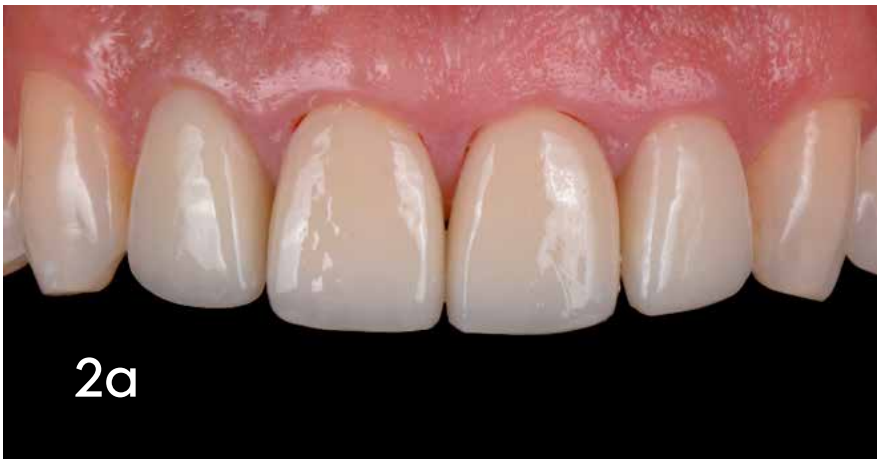
Over the past two decades, we have witnessed a new era in the development of all-ceramic materials. The demand from patients to improve esthetic results has caused the industry to grow exponentially. The new restorative materials have found a good balance between the three key factors that determine the success of a restoration: biocompatibility, esthetics and mechanical strength.

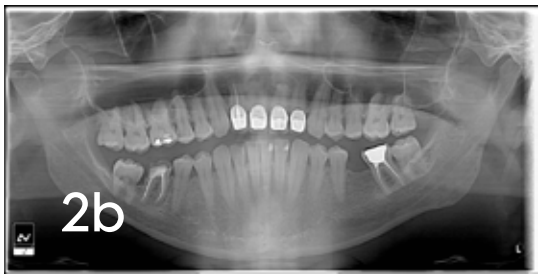
For example, conventional zirconia is both biocompatible and strong. Nevertheless, the initial material did not meet the esthetic expectations of patients. Glass-ceramics are also biocompatible and esthetic, but they were not strong enough to cover the wide range of common indications. Therefore, the introduction of lithium disilicate glass-ceramic revolutionized the dental industry. Concurrently, metal-ceramic materials have also been further developed. Their excellent track record proves the exceptional potential they possess: Millions of PFM restorations (shown excellent in vitro and in vivo survival rates) have been inserted over many decades. The development of the PFM technique started in 1962 and has never come to an end and has been consistently refined.

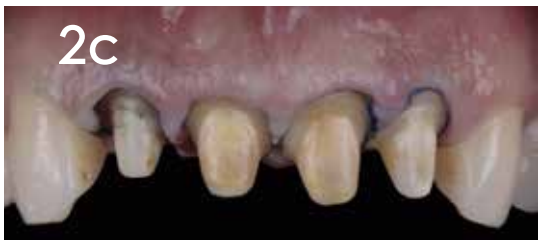


In 2015, Ivoclar Vivadent launched materials containing a crystal structure called oxyapatite. Oxyapatite crystals reflect incident light to a very high degree, which produces an effect of depth. As these oxyapatite crystals are contained in all the shaded components (from the opaquer to the incisal material), the translucency of the restorations can be directly controlled as needed. We have conducted several tests and were able to find out how to handle the layering powder by testing it on a model. The photo to the left shows the result of one of these tests (**Fig. 1**).

In this article, we will present two clinical case reports.







Case Report 1

Preoperative situation

The patient presented to our clinic with four PFM crowns. The client's main objection was the unattractive appearance of these crowns.

The clinical and radiological examinations exposed the margin of those crowns overhanging over the edge of the teeth, causing recession in the gum. Furthermore, the restorations looked very opaque, and they had to be replaced.

Photos were taken and study models made. A wax-up showing the new design proposal was created. The crowns were removed, and the tooth structure was cleaned. The margins were prepared subgingivally (**Figs. 2a-c**).

Technical background

In cases involving severe discoloration and slight grey appearance of the remaining tooth structure such as ND9, PFM restorations continue to promise the best results. Metal-ceramic restorations are capable of fully masking stained and discolored dental hard tissue.

Laboratory workflow

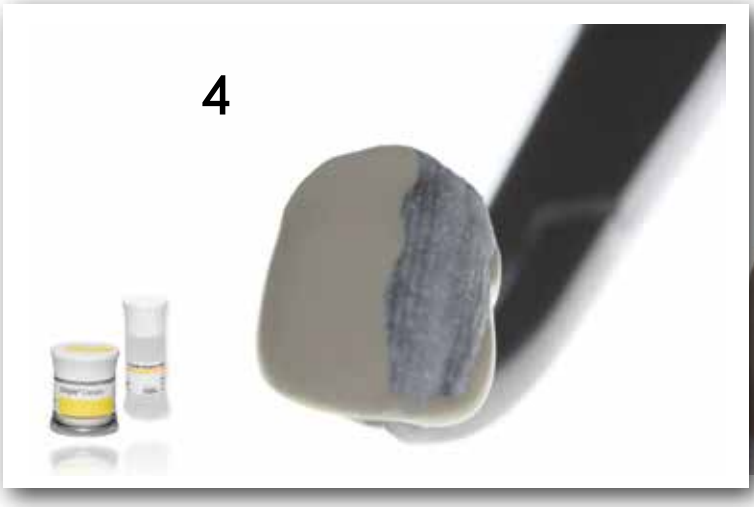
To ensure a smooth laboratory workflow in the creation of a PFM crown, the used alloy has to be treated according to the instructions of the manufacturer. This applies to all alloy frameworks, irrespective of whether they have been milled, laser sintered or cast.

In the present case, the surface of the metal frame was finished with ceramic-bonded grinding instruments. Subsequently, they were sandblasted using the instructed grit size and blasting pressure, keeping the nozzle flat to the blasted surface. All these steps play a significant role in enhancing the mechanical bond between the alloy and the ceramic (**Fig. 3**).

Oxidation firing of the alloy according to the parameters recommended by the manufacturer, including steam cleaning after every firing cycle, improved the chemical bond between the alloy and the ceramic.

We selected the opaquer in accordance with the tooth shade. For the first opaquer layer (wash) we chose to use IPS Style Ceram Intensive Powder Opaquer white, which we applied in a thin layer. Since white is the perfect color for masking the greyish color of the alloy, the application of a foundation or wash layer on the framework represented an important step. After having steam cleaned the framework, we applied a second opaquer layer. We recommend moistening the surface of the framework

Oxyapatite crystals reflect incident light to a very high degree, which produces an effect of depth.



with Opaquer Liquid immediately before the second opaquer application, since this will help to spread the opaquer more neatly and evenly. (**Fig. 4**).

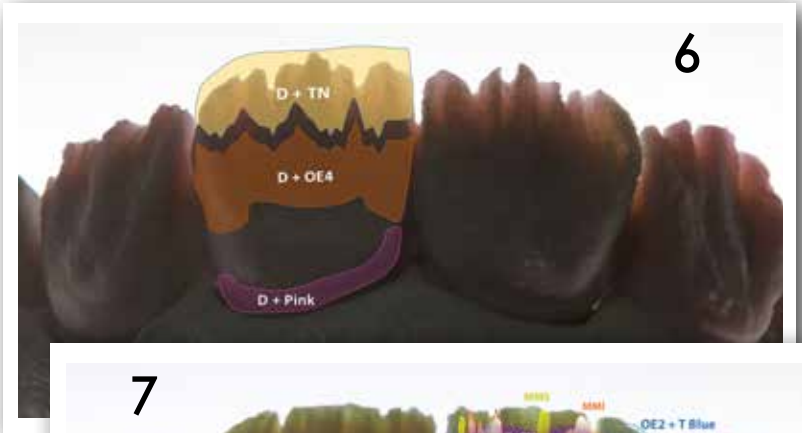
After firing, the IPS Style Ceram Powder Opaquer layer showed a matte surface and provided effective coverage of the framework (**Fig. 5**).

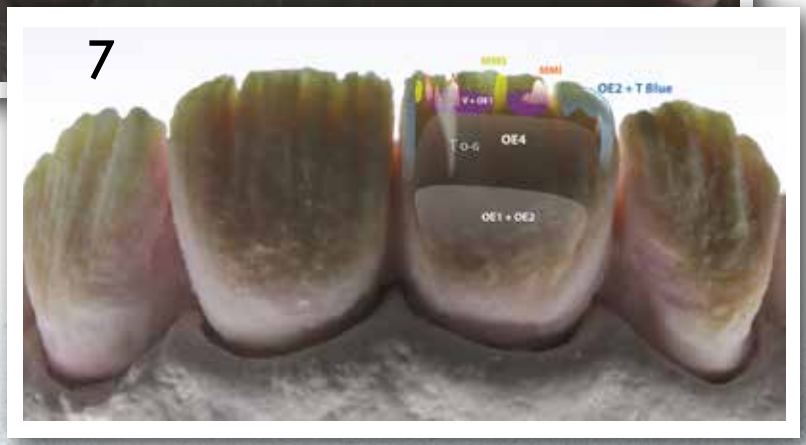
Before the dentin layer could be applied, the restoration had to be thoroughly steam cleaned.

The oxyapatite crystals tend to produce extra brightness.

Build-up of the dynamic dentin layer

The application of Deep Dentin is necessary in areas where space is limited. In the present case, a vital-looking dentin area was created by carefully mixing the Dentin material as follows:





with a little IPS Ivocolor Essence Rose for building the cervical third; with IPS Style Ceram OE4 for building the middle third; and with IPS Style Ceram Transpa neutral for building the incisal third. A reduction was formed toward the incisal edge to achieve a lifelike progression of the shade and create a mamelon structure from the dentin portion to the incisal edge (**Fig. 6**).

Individualized internal characterization

The Dentin cut-back area was subsequently built up using a selection of IPS Style Ceram Impulse materials. Next, the final step is to create the surface anatomy by layering incisal material. This layer must be very thin to avoid covering up the delicate internal characteristics underneath it. The oxyapatite crystals tend to produce extra brightness. Therefore, we should keep the thickness of the incisal layer we build very minimal.

Individualized external characterization

The restorations were characterized with stains and glazes. The glazing material was applied with a pointed staining brush to create a natural-looking micro-texture. The characteristic lines maintained their shape during glaze firing.

A solid non-segmented study model was used to check the proximal contacts and touch-ups were made with powder. These materials were fired together with the glaze in one firing cycle (**Fig. 8**).

The photo of the smiling patient shows the outcome. All the esthetic parameters have been fulfilled: The individually layered restorations have

a natural-looking color, and they are esthetically integrated in the surrounding dentition (**Fig. 9**).

Case Report 2

Preoperative situation

The patient presented to our clinic because of his dissatisfaction with the appearance of the two central incisors. Both teeth had been endodontically treated and then restored with composite resin restorations. The patient's main complaint centered around the dark appearance of the teeth and their length.

Photos were taken and study models were made. A wax-up was created based on the patient's desire of the new shape of the teeth.

The old, defective composite resin restorations were completely removed.

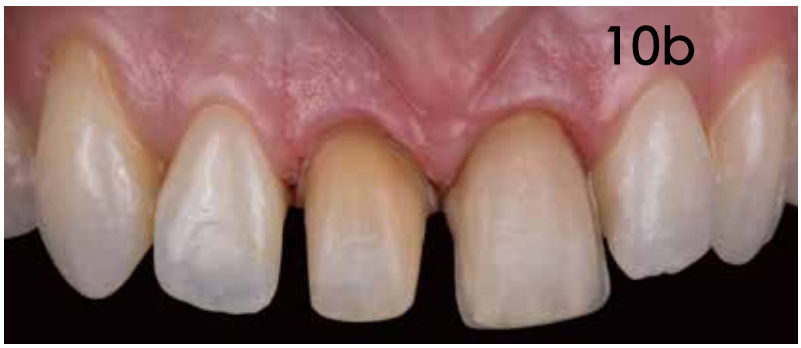
Tooth 8 had been treated with a large composite filling. To mask the discolored tooth structure, we prepared this tooth for a crown with an axial reduction of 1 mm.

Tooth 9 was prepared for a ceramic veneer and reduced by 0.6 mm on the facial aspect (**Figs. 10a-b**).

Technical background

Both prepared teeth showed severe discoloration. The color of the tooth that was prepared for a veneer was between ND8 and ND9, while the color of the tooth prepared for the crown was between ND3 and ND4 (**Fig. 11**).

The treatment of this case was very challenging due to the severely discolored tooth structure, which had to be masked, and the fact that a ceramic crown and ceramic veneer of different thicknesses (veneer: 0.6 mm, crown: 1.0 mm) needed to be accommodated.



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First steps in the laboratory: selection of the shade and materials

When assessing this case, our plan A was to try out different IPS e.max Press ingots for creating the veneer to evaluate their effectiveness in masking the ND8/ND9 shade of the prepared tooth in the limited labial space (0.6 mm) available. The minimum required thickness, however, is 0.3 mm for a successful pressing. Therefore, this solution is inadequate. This would have left 0.3 mm for building up the ceramic. With this in mind, we disregarded this option and decided to implement our Plan B, which was to conceal the ND8/ND9-coloured tooth structure with a thin layer of 0.1 mm IPS Style Ceram Opaquer. This layer was applied to selected areas of the refractory die as a foundation layer. As a result, we ended up fabricating the anterior veneer using the IPS Style Ceram in the technique of refractory die and produced the anterior crown right next to it by using the IPS e.max Press & Ceram in the pressing and layering technique (**Fig. 12**).

Laboratory Workflow

The work on the two restorations was conducted in parallel with regards to the layering powders.

- On the Veneer side: After the refractory die had been heat-treated and soaked in water for ten minutes, a thin covering layer of IPS Style Opaquer was applied on the refractory die material. The wash firing cycle was conducted according to the firing parameters of IPS Style Ceram Opaquer.
- On the Crown side: we sprinkled a thin layer of IPS e.max Ceram Margin BL1 powder on the anterior crown which is made of IPS e.max Press MO0 and subsequently conducted a margin bake, observing the corresponding parameters (**Figs. 13-14**).

The two restorations were now ready for the first application of the dentin and incisal layer (**Fig. 15**).

It was important to keep in mind that the incisal material of IPS Style Ceram is slightly brighter than that of IPS e.max Ceram, therefore we diluted it here with (Transpa neutral) to give us the same brightness level like the incisal material from the IPS e.max Ceram (**Fig. 16**).

A natural-looking shape and surface texture were created with the help of silver powder, which enhanced the visualization of the surface structure (**Figs. 17a-b**).

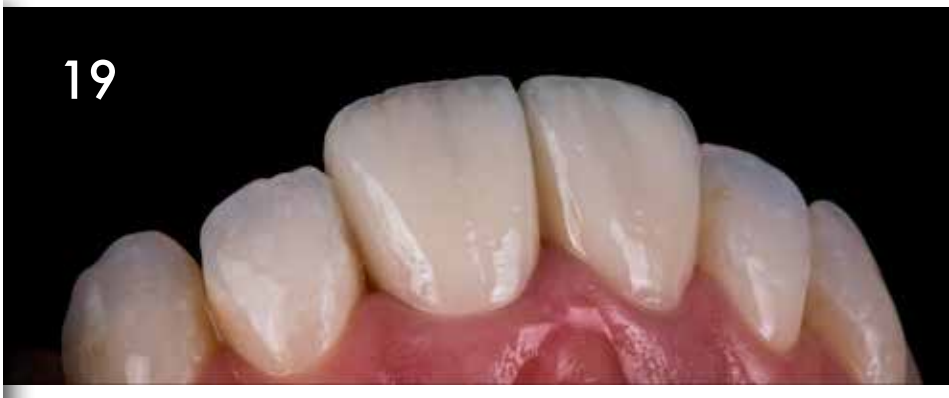
The veneer was removed from the die (the inner part of the anterior veneer was cleaned with glass beads at low pressure) and placed on the plaster model next to the completed crown. **Figure 18** shows the two restorations before they were cemented.

Figure 19 shows the outcome several weeks after the insertion of the restorations.

A big thank you goes to Dr. Anas Aloum, Prosthodontist, American Board Certified; Private Practice and Medical Director, HIKMA Medical Center, Abu Dhabi, UAE.

About the Author

Aiham Farah is a certified dental technician. He focused his work on esthetic dentistry. Since 2009, he has been a materials consultant for Ivoclar Vivadent in the Near East and Orient. He is a certified ICDE Ivoclar Vivadent (Switzerland) Master Trainer. In 2013, he received the "Best Esthetic Case Award" from MENA Magazine. In 2015, he was nominated for the Digital Dentistry Excellence Award – Best Contribution. From 2010 to 2011 he was a teacher lecturer at the Department of Dental Technology at the University of Kalamoon. Today, he is frequently invited to speak at international events. He lectures on various topics including; ceramic materials, esthetic CAD/CAM solutions, analog working techniques and lot more. His work has appeared in numerous national and international publications including Reflect, Dental Labor, QDT, Dental News, Dental Triubne, etc. In 2019, Aiham joined the AurumGroup, in a constructive role, as a national trainer and consultant of comprehensive esthetic.



By Kevin Krumm, CDT, TE

SCREW-RETAINED PFM Implant Crown

As a technician in a small lab, we have to find solutions to situations that arise on what seems like a daily basis. One of these situations I found myself in the other day was fabricating a PFM screw-retained implant crown. We old-school technicians would cast a porcelain metal to a UCLA pattern with a gold alloy interface and go from there. In the age of digital dentistry, however, we design titanium abutments and cement PFM crowns to them. We can even punch a hole allowing access to the screw. These are the typical options, and in a small lab, the need for a porcelain system to veneer these titanium abutments has not been a priority.

Krumm

Herein lies my situation; the prescription is requesting a single piece implant crown with no metal showing. This warrants a phone call to the dentist as we can't necessarily meet this as requested. During the conversation, I discover that the dentist does indeed want a single unit restoration and zirconia is not an option, but a ti-base is. At this point, I'm not asking any more questions because I have found my solution. I can design a ti-base supported "reduced" restoration using our exocad software.

Once designed, we send this .stl file to Argen where they will print and cast the pattern in our metal of choice (Platinum Plus). Second, as we've partnered with TruAbutment for our custom abutment needs, we'll use their ti-base as it will match the geometry of the casted pattern. In **Figure 1**, you can see what we received from both sources. Once I'm satisfied that both parts fit, I will then veneer the metal frame with IPS d.SIGN porcelain, as seen in **Figure 2**. We'll then use GC's G-CEM LinkForce adhesive (**Fig. 3**) to cement the parts together as seen in **Figures 4-6.** While there are as many solutions to this particular scenario as there are technicians, my hope is that if you find yourself in a similar one you'll have an additional option.

About the Author

Kevin Krumm, CDT, TE, joined the United States Air Force in 1993, where he was initially trained as a dental assistant. After his first duty assignment in 1997, he was afforded the opportunity to train as a dental lab technician, where he continued his career until his retirement in 2013. Once retired, he settled in the Orlando area, where he continues his career at Touchstone Dental Lab.

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Preat Corporation Welcomes Elvis Dahl as New District Sales Manager

Preat Corporation announces the hiring of Elvis Dahl as the company's new District Sales Manager for the Midwest, covering Indiana, Illinois and Michigan. As District Sales Manager, Dahl will be working directly with dental laboratory technicians, clinicians, and lab management. Many within the dental industry already know Dahl from his role as Creator & Co-host of Voices from The Bench. Other notable career highlights include Dahl's NADL board membership, 13 years as Director of Operations at Somer Dental Laboratory, and a five-year membership with the Spear Study Club. Dahl's passion for the dental industry thoroughly aligns with Preat's enduring core values: a commitment to supporting the industry, ongoing education, and putting the customers first.

Dental Labs & Practices: Leveraging the Employee Retention Credit

By: Jennifer Groff, Associate Director at alliantgroup

2020 was challenging for many businesses, including the dental industry. According to one study, the $139 billion dental industry lost roughly 6 percent of its revenue, with oral hygiene appointments alone falling by 47 percent. As a result, many dental laboratories and practices are taking advantage of the Employee Retention Credit to revive their businesses. The credit was recently updated so that more businesses can qualify. The ERC puts money back into businesses that had to adapt during the pandemic. It can eliminate a business' payroll tax and generate a cash return based on the number of employees on staff.

There are two ways in which American businesses can qualify for the credit. The first is if the company meets a certain decline in revenue, which varies, depending on the tax year, as designed by the IRS. Businesses can still claim the ERC, however, even if their decline in revenue does not meet the designated threshold. If the company experienced an "interruption" in operations tied to a city, state, county, regional or federal ordinance or mandate they can still qualify for this incentive.

Unfortunately, there is a lot of misinformation out there and some dental labs and practices are wrongly disqualifying themselves.

Let's clear up a couple misconceptions. A dental lab or practice can qualify for ERC:

- If social distancing impacted their capacity
- If they had to reduce hours due to sanitation purposes
- Even if they took PPP
- Even if they were considered essential
- Even if they did not suffer a decline in revenue

A perfect example is a small dental lab with 17 employees that qualified due to the suspension of elective procedures and had to reduce capacity due to social distancing mandates. That lab received a $60,000 credit. Meanwhile, a larger lab with almost identical issues received an $844,000 credit. There are also a lot of other reasons why a lab may qualify beyond the short list above, but the results can be lucrative.

As the year comes to an end, dental laboratory professionals should work the ERC into their year-end planning as it can help them recover and grow next year. To learn more, contact Jennifer Groff at Jennifer.groff@alliantgroup.com or call (713) 855-9312.

OSHA ETS

In June of 2021, OSHA adopted a COVID–19 Emergency Temporary Standard (ETS) which also exempts certain settings. One exemption in particular, specifically, 29 CFR 1910(a)(2)(vi), exempts healthcare support services not performed in a healthcare setting such as an off-site medical building. NADL was aware of a recent article from ADA explaining that most of dentistry is basically exempt from ETS. If the dentist is exempt, it seemed unlikely that a dental laboratory technician assisting the dentist would cause the dental laboratory to then fall under the ETS rule on that basis alone. Recently, NADL asked OSHA to address the question of whether and in what settings dental laboratories would be subject to the OSHA ETS standards. The bottom line is that OSHA confirmed that dental laboratories not located within a dentist office are exempt from coverage under the ETS. OSHA also confirmed employees of a dental laboratory that do work within an exempt dentist office would also be exempt from the ETS. Thus, if the dentist's office takes the necessary steps to be exempt from ETS (screening, etc.), employees of a dental laboratory working within the exempt dentist office would also be exempt from ETS. And since there is no ETS screening requirement for standalone dental laboratories, standalone dental laboratories don't need to screen for the dentist's office to be exempt. While OSHA's ETS rule is not applicable to most dental laboratories, dental laboratories continue to follow OSHA standards and CDC guidelines for the protection of their clients and employees.

https://www.ada.org/en/press-room/news-releases/2021-archives/june/dentistry-and-new-covid-19-workplace-regulations

CLASSIFIEDS

Contact: Maureen Turner, Advertising Director
850-224-0711 advertising@fdla.net

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Simplicity of Systems

Mark N. Schwer, *Chief Operating Officer at Smart Dentistry Solutions, shares more about their challenging launch and what is important to them moving forward.*

Despite all of our advancements in communications and internet technology, dentistry is fundamentally a hands-on business.

What measures did Smart Dentistry Solutions take in order to overcome the challenges from COVID-19? Did your business strategies change?

Smart Dentistry Solutions was incorporated in 2019 with the intent to launch in May of 2020. With state-mandated closures stretching from days, to weeks, to months, and trade shows cancelling unexpectedly, our traditional launch playbook was no longer feasible. While many labs remained operational, most were social distancing with their doors closed to visitors. Our solution was to take a decidedly old-school marketing approach. Simply put, we shifted back to traditional marketing techniques such as magazine ads, postcard mailers, and frequently, just picking up the phones and introducing ourselves. We also took advantage of our inventory overstock situation from cancelled trade show surplus and offered very generous promotions such as buy one get one free and sampling opportunities, which we continue to this day as a way to allow our product quality to speak for itself.

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

With a quickly growing field of competitive manufacturers, I see a strong need to simplify marketing messages when branding new products over the coming years. For too long, dental technicians have been inundated by misleading marketing terms which have confused the correct application of materials. Look at zirconia discs, for example. How can anyone accurately differentiate between 10 or more levels of translucency? Moreover, these terms are compounded by multiple different brands, levels of strength, and varied indications, which has led to an inventory management nightmare for everyone. Our customers are longing for simplicity of systems.

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

It's safe to assume that digital dentistry will continue to expand indefinitely. In this new reality, laboratories would be wise to prepare for increased dependency on digital workflow. You may not consider yourself "a digital lab" per se, but you can't afford to refuse digital services when they arrive. The sooner you prepare to receive such work, the better.

Additionally, at Smart Dentistry Solutions, we always recommend to customers to consolidate their inventory. The fact is, that 16 shades and multiple levels of translucency of partially used zirconia discs aren't profitable on your shelf. A lean and well-organized inventory is inherently easier to manage, more cost effective, and less prone to supply issues.

Why is being an FDLA Business Partner valuable to you?

Despite all of our advancements in communications and internet technology, dentistry is fundamentally a hands-on business. With so many states across the U.S. which have closed or are closing due to COVID-19 shutdowns, Florida is one of very few states that provide manufacturers the opportunity to share our products face-to-face at trade shows, and via FDLA's extended member network. While virtual CE has flooded the market, dental technicians, and the professionals they support, require the traditional social and educational interactions facilitated by the FDLA. We are eternally grateful for the partnership opportunities the FDLA organization offers.

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