FLORIDA FOCUS

September, 2024

the publication exclusively for the general practitioner

Understanding the Value and Mystique of Digital Marketing, by Scott Mahnken

Digital Dentistry and 3D Technology, by Dr. Camille Dixon

From Cause to Comfort: Innovative Approaches to Combat Dry Mouth, by Jo-Anne Jones, RDH

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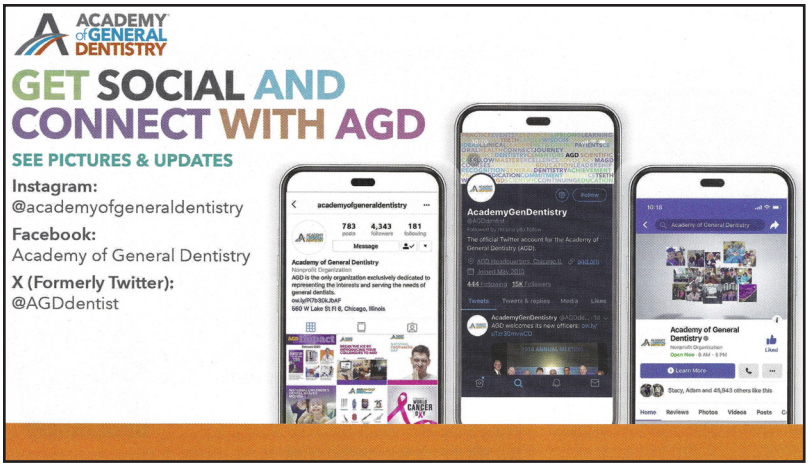
Oral Collaboration of Physical Therapy and Dentistry: Interdisciplinary Care for the Temporomandibular Patient, by Dr. Erienne Blanchard, PT, DPT

FLORIDA ACADEMY of GENERAL DENTISTRY



FLORIDA FOCUS

SEPTEMBER 2024

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President's Message

The Fellowship (FAGD) and Mastership (MAGD) Awards and Lifelong Learning & Service Recognition (LLSR) are AGD's highest honors and represent a lifelong commitment to exceptional patient care. Congratulations to our Fellows, Masters and LLSRs who attended the **AGD2024 Convocation Ceremony** at the AGD Scientific Session in Minneapolis, MN. It was an honor to receive my Fellowship award, celebrate with our Florida members and all AGD members receiving their awards. We regret that some of our members were unable to attend classes at the Scientific Session and/or receive their prestigious awards due to the worldwide CrowdStrike outage causing flight cancellations and delays. The AGD is working with our members to receive refunds for classes and to obtain approval for them to still receive their awards due to this incident.

Did you know that AGD Members are now eligible to apply for recognition awards during **AGD2025 Convocation Ceremony**? If you would you like to be recognized as the next **Fellow or Master or LLSR in Montréal, Quebec**, then please submit applications to the AGD by December 31, 2024. If you need assistance with fulfilling the required CE or are not sure about the requirements, please contact us at flagdinfo@gmail.com or call us at 352-663-3763.

We are thrilled to invite you to our upcoming course, **Injection Molding and the Bioclear Technique for Composite Workshop**. This hands-on course promises to be both informative and enjoyable, offering you the chance to **learn** from an expert instructor, **engage** in interactive activities, and connect with like-minded individuals. The course is scheduled for October 11, 2024, in Orlando. Don't miss out on this fantastic opportunity to expand your knowledge and skills. We look forward to seeing you there!

Kindest regards,

Toni-Anne T. Gordon, DMD, FAGD

Editor's Note

Would you like to expand your leadership skills by becoming more involved in the AGD on a national level? Then consider applying for one of the AGD's fifteen Councils and Committees! From "Budget and Finance" to "Membership" to "Self-Instruction," volunteering for the AGD provides an enjoyable and worthwhile opportunity to contribute your expertise, learn about and guide our organization, and engage with fellow members. As a member of the Self-Instruction Committee, I've enjoyed learning the finer points of writing a good CE question, which are more specific than I'd realized! During the Zoom committee meetings, I appreciate the opportunity to discuss upcoming *General Dentistry* articles and CE questions with dentists from other regions. If you're interested in participating in the many functions of the AGD, please apply on the "Leadership Opportunities" page at agd.org.

Congratulations to the new AGD Fellows, Masters, and Lifelong Learning and Service Recognition recipient, and welcome to the Florida AGD's new Legislative Chair, Dr. Hector Cabrera! Florida's laws regarding dentistry have changed dramatically, so please read Dr. Cabrera's report on pages 5-6.

As always, thank you to the speakers from the recent AGD Scientific Meeting and the Florida Dental Convention who generously contributed articles to our journal: Drs. Van Haywood and Kevin Frazier on creating tight proximal contacts; Dr. Erienne Blanchard on the collaboration of physical therapy and dentistry; Jo-Anne Jones, RDH, on advances in treating xerostomia; and Scott Mahnken on digital marketing. Thank you, as well, to Dr. Camille Dixon for her clear guidance on the uses of 3D printing in prosthodontics. We hope you enjoy and benefit from the variety of dental topics in this issue.

Wishing you a happy and healthy autumn with minimal political trauma!

Millie K. Tannen, DDS, MAGD

CONGRATULATIONS TO THE FLORIDA ACADEMY OF GENERAL DENTISTRY'S NEW FELLOWS, MASTERS, AND LLSR!

AGD Region 20 Director Dr. Aldo Miranda celebrates with awardees despite computer outages and cancelled flights, which prevented some awardees from attending the convocation. We applaud all the awardees for their pursuit of excellence and dedication to the dental profession!

2024 Lifelong Learning and Service Recognition

Gregory M. Feldman, DMD, MAGD

2024 Masters

Bryant M. Anderson, DMD, MAGD

Kathleen E. Anderson, DMD, MAGD

Liliana M. Marshall, DMD, MAGD

Lauren O'Hagan, DMD, MAGD

2024 Fellows

Daniel Reid, DMD, FAGD, ABGD
Christine Adams, DMD, FAGD
Anuja Aryal, DMD, FAGD
Adam C. Barbag, DMD, FAGD
Matthew J. Dillon, DDS, FAGD
Brandi Dinh, DMD, FAGD
Dominick Richard Dolecki, BDS, FAGD
Kathleen M. Du Lac, DMD, FAGD
Jennifer R. Engelhardt, DMD, FAGD
Dasha Frias Landa, DMD, FAGD
Toni-Anne Gordon, DMD, FAGD
Helen Hoveida, DMD, FAGD
Bayonne Joseph, DDS, FAGD
George Khazoum, DDS, FAGD
Tony Nader, DMD, FAGD
Emily Theresa Newton Friend, DMD, FAGD
Charles Alan Poblenz, DMD, FAGD
Robert E. Quesada, DMD, FAGD
Jose E. Rivadeneira, DMD, FAGD
Kristofer Sears, DMD, FAGD
Kimberly V. Tran Nguyen, DMD, FAGD
Olga Tron, DDS, FAGD
David Aaron Woodruff, DDS, FAGD

Legislative Updates for 2024

Dr. Hector Cabrera, FLAGD Legislative Chair

I'd like to take a moment to introduce myself to the members of the Florida Academy of General Dentistry. My name is Dr. Hector Cabrera, and I am a practicing dentist and private practice owner in Clermont, Florida, located in Lake County, just outside of Orlando.

I am a proud graduate of two dental institutions. I received my degree in dentistry from Universidad Iberoamericana in the Dominican Republic in 2010, and my DMD from the University of Illinois at Chicago in 2017. I recently received my Fellowship in the International Congress of Oral Implantologists, and I hope to one day soon walk the stage cloaked in pride with the distinction of earning my Fellowship in the Academy of General Dentistry.

Political science, law and history have always been passions of mine. It is my sincere hope that I can be of service to our profession in this role, and an asset to our Board and all members of the Florida AGD.

I'd like to especially express my gratitude to Dr. Toni-Anne Gordon, a friend and colleague from the early days of our career, and to Ms. Patricia Jenkins for being so generous with her time and welcoming as I find my footing in this new position.

Florida HB 855

Florida HB 855, which took effect on July 1, 2024, implements several key changes and requirements for dental services, particularly focusing on telehealth and in-person examinations. Here are the main provisions:

1. ***Dentist Information Requirement***: Dentists must provide each patient with their name, contact telephone number, after-hours emergency contact information, and license information.

2. ***In-Person Examination***: Before diagnosing and correcting tooth malposition or using an orthodontic appliance, a dentist must either perform an in-person examination or review records from an in-person examination conducted within the last 12 months. This includes evaluating the patient's most recent diagnostic radiographs or other equivalent imaging.

3. ***Telehealth Advertisements***: Any advertisement for dental services provided via telehealth must include a disclaimer recommending an in-person examination with a licensed dentist to prevent injury or harm. This applies to services such as taking dental impressions, creating or repairing dental appliances, and correcting teeth or jaw malformations.

4. ***Designated Dentist of Record***: Business entities advertising dental services must designate a dentist of record with the Board of Dentistry. This dentist must hold a full, active, and unencumbered license or be an out-of-state telehealth dentist registered with Florida's Department of Health. The designated dentist's information must also be provided to patients.

5. ***Grounds for Disciplinary Action***: The bill establishes grounds for disciplinary action if a dentist fails to perform the required in-person examination or provide the necessary contact information to patients.

These regulations aim to ensure patient safety and transparency in dental care, especially with the increasing use of telehealth services.

Florida SB 892

Florida Senate Bill 892 (SB 892), effective January 1, 2025, addresses dental insurance claims.

The bill introduces several key provisions to improve the transparency and fairness of dental insurance payments and claims processes:

1. ***Prohibition on Payment Method Restrictions***: Contracts between health insurers and dentists cannot mandate credit card payment as the sole method for payments. Insurers must inform dentists of any fees associated with electronic funds transfer (EFT)payments, such as virtual credit cards, and obtain consent before using such methods.

2. ***Fees for Payment Transmission***: Health insurers cannot charge fees for transmitting payments to dentists via Automated Clearing House (ACH) transfers unless the dentist consents to the fee.

3. ***Prior Authorization Protections***: Insurers are prohibited from denying claims for procedures that were previously authorized, with certain exceptions. These exceptions include situations where new procedures were performed, a patient's condition changed, or the claim was based on fraudulent information.

4. ***Applicability***: These provisions apply to all contracts delivered, issued, or renewed on or after January 1, 2025. The bill grants the Office of Insurance Regulation the authority to enforce these rules and allows for the adoption of additional rules to implement the bill's provisions.

Florida SB938

Florida Senate Bill 938 (SB 938), effective July 1, 2024, significantly changes the regulations around dental licensure and examinations. Key aspects of the bill include:

1. ***Examination Administration***: The Board of Dentistry and the Department of Health are no longer responsible for administering dental licensure examinations. This removes their role in setting and collecting examination fees.

2. ***Licensure Requirements***:

- Dental students can now apply for licensure without waiting until their final year of dental school if they have completed the necessary coursework.
- The National Board of Dental Examiners examination is replaced by the Joint Commission on National Dental Examinations or its successor.
- Out-of-state licensed dentists no longer need to provide

proof to the Board of Dentistry about their status with the National Practitioner Data Bank; they only need to disclose this information during the application process.
- The requirement for out-of-state dentists to practice full-time in Florida for one year post-licensure is removed.

3. ***Reexamination and Validity***:

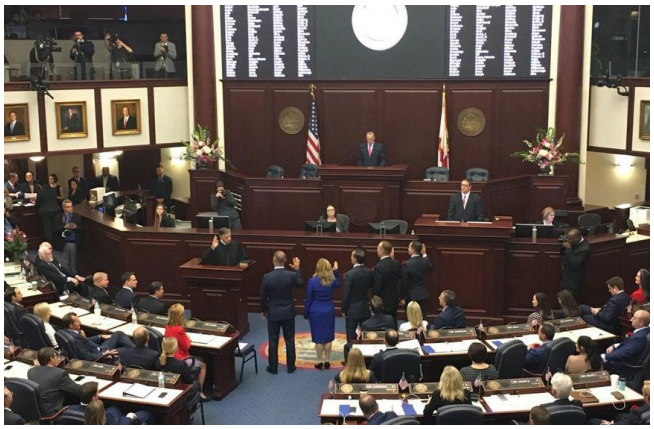
- Applicants who fail the licensure examination for dentists or dental hygienists are allowed to retake the exam without restrictions on the number of attempts.
- The time limitation on the validity of licensure examination results is removed.

These changes aim to streamline the licensure process and reduce administrative burdens for aspiring and practicing dentists in Florida.

Florida SB1600

Universal Licensure and Reciprocity

The Florida Universal Licensure Bill (CS/SB 1600) aims to streamline the process of professional licensure by endorsement and reciprocity, particularly for health care professionals, including dentists. The bill facilitates the mobility of licensed professionals from other states to Florida by recognizing their existing licenses, provided they meet specific criteria.



Key Provisions:

1. ***Licensure by Endorsement:***

- Applicants with an active, unencumbered license from another state or territory with a similar scope of practice can obtain a Florida license.
- Requirements include submission of a complete application, passing a national licensure examination, practicing the profession for at least three out of the last four years, and not being subject to disciplinary proceedings or actions in the past five years.
- Applicants must meet financial responsibility requirements and submit fingerprints for a background check.

2. ***Interstate Mobility:***

- The bill requires respective health care regulatory boards or the Department of Health to issue licenses or certificates to applicants who meet the specified conditions.
- It emphasizes the use of the National Practitioner Data Bank to verify applicants' credentials and disciplinary history.

3. ***Jurisprudential Examination:***

- Boards may require applicants to complete a jurisprudential examination specific to Florida laws and regulations

Analysis

Florida Senate Bill 1600 (SB 1600), the Universal Licensure Bill, has sparked significant discussion within the healthcare community. This legislative proposal aims tostreamline the licensure process for healthcare professionals, including dentists, byrecognizing out-of-state licenses under certain conditions. Advocates for SB 1600 present compelling arguments highlighting its potential to address critical issues such as workforce shortages, access to care, economic growth, and overall public health improvement.

Alleviating Workforce Shortages and Access To Care

One of the most persuasive arguments in favor of SB 1600 is its potential to mitigate the persistent shortage of healthcare professionals in Florida, particularly dentists. By facilitating the licensure process for qualified out-of-state professionals, the bill can significantly increase the number of practicing dentists in the state. In theory, this is particularly beneficial for rural and underserved areas where access to dental care is limited. The influx of skilled dentists can help fill the gap, ensuring that more Floridians receive timely and adequate dental care.

The reality, I believe, will be different. SB 1600 will indubitably increase the number of practicing dentists in the state, drawn in by the year round sunshine and lack of state income tax. However, if the rest of the country serves as a bellwether, there is little reason to believe that dentists will flock to rural and underserved communities. The much more likely scenario, in my opinion, is that they will settle in metro-suburban areas just outside major cities; areas like Clermont, Wesley Chapel, Cape Coral, Naples, and Winter Haven.

The access to care issue is complex, and simply increasing the number of licensed providers allowed into the state will not necessarily alleviate it. California, for example, currently has over 30,000 practicing dentists. Yet, according to the California Department of Health Care Access and Information's March 2024 report, the state currently has 233 designated "High Needs Geographic Health Professional Shortage Areas" for dental health. Indeed, Alpine County does not even have a single practicing dentist.

Professional Mobility

The strongest argument in favor of Florida SB 1600 is that there simply does not exist a coherent argument against it. A dentist in Tennessee, with an unencumbered license who graduated from a fully accredited dental school and passed the licensing exam, should be able to practice not just in the state they graduated in, but also in Florida and any other state in the country for that matter.

Universal licensure for dental professionals is essential for fostering a dynamic and competitive healthcare market, aligning with the core American values of freedom, mobility, and free enterprise. Restricting dentists' ability to practice across state lines is a form of protectionism that undermines the principles of commerce and free trade, impeding the professional growth and economic opportunities of individuals in the field. Such restrictions are anathema to the ideals of the United States, which champion the free movement of goods, services, and labor.

By enabling dental professionals to move and practice without bureaucratic barriers, we not only support their right to work unencumbered but also enhance the overall quality and efficiency of healthcare services. This approach aligns with the broader economic goals of the country, ensuring that the marketplace remains competitive and vibrant, ultimately benefiting both professionals and patients alike. Universal licensure is not just a matter of convenience; it is a reaffirmation of the American commitment to liberty and economic dynamism.

Understanding the Value and Mystique of DIGITAL MARKETING

by Scott Mahnken

Dr. Tim Simpson wanted to surprise his wife with a very special anniversary gift. She'd always dreamed of going to Hawaii. One day, Tim decided he was going to give her a five star experience by booking a great hotel and finding a few restaurants they could try, and he also wanted to search for a few activities they could do.

QUESTION: Did Tim call a travel agent? No, Tim went exactly where most of us turn to when we want to gather important information or ask a question. Tim searched Google and found a terrific hotel, he found restaurants that offered a selection of native cuisines, and he found a snorkeling school that had over 500 five star Google reviews.

Now I could have started the article by telling you why digital marketing and Google should be your best friend. But as I speak with dentists daily, they tell me, "I don't understand SEO and Google," or worse, they tell me they tried it for a short time and failed.

If you read on, you'll learn about some tangible takeaways as we crystalize the value of digital marketing to you and your practice.

This should help…

Digital marketing increases your visibility and reach. Your digital presence lives 24/7, 365, and penetrates every household and mobile phone.

I constantly hear dentists say "I'm getting new patients, but I'm not getting the right type of new patients." Well, let's fix that using targeted digital marketing. Let's target by demographic, income, age, etc. Let's digitally market procedures that are most desirable such as implants. These steps will attract your ideal new patient.

Digital done right is extremely cost-effective, especially compared to traditional marketing methods like print ads or billboards. Also, digital comes with exact performance data scoreboards, unlike print, billboards, and traditional forms of marketing. There are no gray areas!

Great images, including posting pictures of your office, staff, and happy patients, help you brand a message that your practice is welcoming, your staff is personable, and you use elite technologies. You simply can't send this message through print or any other medium.

Educating the potential new patient and even existing patients should be integrated into your overall marketing plan. There is a certain percentage of the uncaptured patient base that relies upon education before making decisions.

QUESTION: Do you know the statistics for your website traffic, the number of patients that found you organically through Google, patients that found you because of your Google ads, patients that found you organically on Facebook, or through Facebook ads? How about the real new patient conversation rates at the front desk, doesn't that have some tangible value?

We believe that there's tremendous value in the power of knowing the data. It's also easy to understand how practices that are leveraging the digital world increase their value at the point of sale and acquisition.

Next, think about the flexibility offered by digital marketing! You want to change an image on the website, add a testimonial or image? It takes minutes. Would you like to launch an Invisalign campaign on Facebook? It takes minutes. New staff? Opening on Saturdays? All just a few minutes.

Now doctors, I'll ask you to take a moment to think about your patients' personalities. They live in a world of absolute convenience. Need a ride? Uber Hungry? DoorDash. Have a zany question? Google will answer it in a second. The point is, if you have the proper digital presence and tools, you make it more convenient for the patient to schedule an appointment, answer questions, and get to know you.

In summary, mastering the world of digital marketing versus simply ignoring the gaps and inefficiencies in your current plan is a bit like baseball. I'll use the baseball batter for this example. The batter for practice #1 (the practice that's not optimizing digital) gets one hit in four at bats. The batter for practice #2 (digital masters) gets one hit in three at bats.

On the surface they seem very close. But the first batter is only batting .250 and will only earn $1M. Yet the second batter is hitting .333 and not only is he making $25M, in addition, "everyone" wants him.

During the past 13+ years, Firegang has been providing new patient and production growth in boutique fashion. Leveraging our years of experience, working intimately with our practice partners, and tenaciously staying on top of the latest changes and trends in digital, Firegang is here to help you when the time is right. Batter up.

Scott Mahnken has served on the editorial board for the *Dental Entrepreneur* and has authored several articles for the *Dental Tribune* and *Dental Products Report*. A pioneer of online continuing education, Scott launched a national CE network with leading dental schools, state dental associations, key opinion leaders, and dental publications. While working at Lanmark360, Scott developed a program to help hygienists transition from clinical to careers in dental product sales and marketing. His agency, Edge Marketing, provided sales and marketing strategies for more than two dozen dental companies including AMD LASERS, DentalVibe, KOMET USA, Next Level Practice, and Cadent.

Scott resides on the Jersey Shore with his wife Dr. Joy Mahnken and their two daughters; Courtney, an elementary school teacher, and Lindsey, an engineer with Apple. In his rare moments of spare time, you'll find Scott rooting for Notre Dame football or continuing his quest to find that next 5-star restaurant.

firegang

Digital Dentures AND 3D TECHNOLOGY

by Dr. Camille Dixon

Fig. 1: The denture on the left is a print copy denture, on the right is the original denture.

When you hear the words "digital dentures" or "3D printed dentures," what comes to mind? Perhaps you think:

- "I must intraorally scan for dentures."
- "I need a lot of technology that I don't have."
- "They don't last."
- "The technology and materials aren't there yet."

These are common misconceptions among clinicians when they might think about digital dentures. My goal in this article is to bring clarity to these potential misunderstandings. We will discuss the advantages to digital design and manufacturing of dentures, explore the properties of current 3D print resins and milled materials, discuss the benefits of having an in-office printer, and an overview of clinical workflows that enable you to complete dentures in fewer appointments compared to the traditional five visits we here taught in dental school.

Foundations

Whether creating dentures conventionally or digitally, the fundamental principles of denture fabrication remain consistent. Proper border molding and capturing all relevant anatomical landmarks are crucial. Accurate vertical dimension and occlusal records are essential. Teeth must be positioned correctly to ensure proper aesthetics, phonetics and function. Neglecting these core principles will result in compromised or ill-fitting dentures, irrespective of the manufacturing method.

In essence, we are taking our conventional records and digitizing them via a desktop scanner or an intra-oral scanner. If you do not have a scanner, records can be physically sent to lab for digitization. Once they are in the CAD software, the denture is designed and a try-in and or final denture can be 3D printed or milled

Why Digital Dentures?

As clinicians, any new technology or procedural change we adopt must be better, faster, and more cost-effective than our current methods. Otherwise, we will not have a good return on our investment. With digital denture workflows, we can leverage technology to accomplish that goal.

Reproducibility: When a denture is made via CAD/CAM, a manufacturing file can be easily stored. If a patient loses their denture or would like an identical spare, no extra visits are required. That denture can quickly be 3D printed or milled. Imagine a patient in a hospital who loses their denture; you can have an exact replacement reproduced within a day, without the patient even coming into the office!

In contrast, when making conventional dentures, all the records and models used during fabrication are usually destroyed or become unusable if another denture was requested. If a patient loses their denture, the only available information might be the tooth shade and, possibly, the tooth mold. This means that the patient must go through the entire denture-making process again, which involves multiple appointments and weeks in between visits. The outcome may not be identical to the previous denture the patient was comfortable with.

Fewer appointments: With digital dentures, we are leveraging digital technology and the patient's existing denture or dentition to reduce the number of office visits. If a patient has an existing denture, whether they like it or not, we can leverage this denture for our clinical workflow. We can keep the good and eliminate the bad and we automatically have a custom tray/bite rim for the patient!

Unlimited customization: With computer-aided design, the lab is no longer restricted to a carded tooth library and their inventory. Teeth and arch form can be digitally customized with CAD software. There is no need to order a specific mold in a specific shade only to realize it wasn't correct. Most tooth manufacturers have a digital library for their lines of carded teeth.

Consistent manufacturing: Using a calibrated machine, whether a printer or a mill, to manufacture dentures ensures consistency and accuracy. This minimizes the amount of potential compound errors seen with conventional processing. Models no longer need to be poured, acrylic does not need to be mixed, and polymerization shrinkage is not a factor. The result is a highly accurate manufacturing of the denture design.

Fig. 2, left: Example of a PMMA milled denture, still in the puck
Fig. 3, right: Example of a 3D printed denture with nesting supports

Print or Mill

Each of these manufacturing methods will produce a very accurate and functional denture. The quality, strength, and durability of the materials improve yearly. Currently, milled PMMA dentures **(Fig. 2)** are the most accurate compared to printed dentures **(Fig. 3)** and conventional injection processing. A study by Emam et al.[1] supports this claim, demonstrating the fitting accuracy of CAD-CAM milled, 3D-printed, and injection-molded manufacturing

Fig. 4: Flowchart for Copy Denture Workflow

techniques. Additionally, a 2023 article published in the *Journal of Prosthodont* by Helal MA, et al.[2] shows that milling denture bases is significantly more accurate than 3D printing and conventional injection processing.

3D printing materials are constantly improving. The shortfalls of 3D printed denture resins are long-term durability, water absorption, and wear of the denture teeth. Every quarter, new resins and technology are being developed to overcome these challenges. A 2024 article published in *Science Progress*, "Enhancing 3D-Printed Denture Base Resins: A Review of Material Innovations," discusses new advancement in resins and nanotechnology.[3]

Overview of Clinical Workflows

I categorize the clinical workflows for digital dentures into the following categories:

- Copy denture
- Redesign or reference denture
- Immediate denture
- No teeth, no denture

Copy Denture

A copy denture **(Fig. 1)** is a reproduction of an existing denture. It can be 3D printed or milled and manufactured as either one or two pieces. The two pieces consist of a pink denture base and white tooth material, while the one piece, or monoblock, is usually fabricated in tooth-color material. A copy denture can be either 3D printed with denture resin or milled from PMMA. Uses and indications for a copy denture include:

- A patient is happy with their existing denture and would like a spare.
- A patient presents with a broken denture, needs it repaired, and requires an emergency denture.
- A duplicate denture is needed for diagnostic or surgical purposes.

Remember, a copy denture is just that - a copy. If the patient's existing denture is worn and/or ill-fitting, the replica will be worn or ill-fitting. Minor imperfections, such as a small chip, can be fixed in the CAD software. Additionally, if the patient would benefit from a better fit, a wash impression can be taken inside of the existing denture, scanned, and the new denture will have an improved fit. Lastly, any tooth shade can be selected.

To create a copy denture **(Fig. 4)**, the denture is scanned 360 degrees with an intraoral scanner or a desktop lab scanner using CAD software. The STL file is sent to a lab for design and or fabrication. If you have a 3D printer, you can print and finish the copy denture in-office. Also, if you would like to just print a monoblock, just export the STL to your printer software.

Redesign or Reference Denture

In a redesign denture **(Fig. 5,6)**, we are creating an entirely new denture. We can modify many things such as:

- Increase or decrease vertical dimension
- Change tooth mold and position of teeth
- Improve intaglio fit and borders
- Correct occlusal cants or Curve of Spee

Or, if a patient is happy with their existing denture but the teeth are extremely worn, we can keep or reference what we want to keep and change the bad.

With the reference denture workflow **(Fig. 7)**, we are using the patient's existing denture as a reference. We are also leveraging their existing denture as a custom tray and bite rim to minimize appointments needed to complete. I will review the general workflow but in essence of brevity for the article, I cannot go into detailed workflows for mixed-arch cases.

Fig. 5, top: Clinical example of a 3-visit reference denture.
Fig. 6, bottom: Clinical example of a 2-visit reference denture

Another wonderful feature of digital denture design is that we have an actual prototype of the proposed new denture. This prototype can also be used for a trial run that the patient can take home and use. No more teeth set in wax, bulky record bases, or fear of the teeth breaking away from the wax during try-in!

Immediate Dentures

The workflow for immediate dentures **(Fig. 8)** can be very similar to the conventional workflow. Detailed and adequate impressions can be with alginate impression material. The models from the poured impressions can be digitized with either an IO scanner or a lab scanner with the correct articulation.

Conversely, instead of impressions, the mouth can be scanned with an IO scanner. This is great if many of the teeth are mobile and there is a concern about inadvertently removing a tooth while taking impressions. However, sometimes it can be challenging to capture all the pertinent anatomy and landmarks, especially on the lower arch. If scanning intra-orally for immediate dentures, It is best to place a soft liner in immediate dentures to border mold for proper extension at delivery.

No Teeth, No Denture

If a patient presents with an edentulous arch (or arches) and has no dentures to reference, it may take an additional appointment to complete the dentures. In a completely edentulous mouth, I use the workflow of **Fig. 9**.

Conclusion

Incorporating digital dentures into your practice offers many advantages. Key benefits include having a manufacturing file for easy reproduction if needed, fewer appointments to complete cases, unlimited customization of a digital tooth library,

Camille Dixon, DMD

"One aspect I particularly enjoy about digital design and prototype try-ins is the ease with which I can create multiple try-ins featuring different tooth molds and arrangements."

Dr. Camille Dixon, a native Floridian, earned her DMD from the University of Florida in 1996. As a general dentist with a focus in restorative dentistry and digital technology, Dr. Dixon has been utilizing digital workflows for denture design and fabrication since 2019. In her role as CCO of Dentures Today, she brings extensive clinical experience in full arch tooth replacement. She incorporates 3D printing workflows for conventional dentures, implant-retained overdentures, surgical guides, and full-arch implant bridges into her daily practice.

In addition to her clinical work, Dr. Dixon serves on the Board of the Atlantic Coast Dental Research Clinic and teaches a digital denture class. She also consults with dental organizations on the implementation of digital workflows, equipment, and support.

and consistent manufacturing compared to conventional denture-making processes.

This article is intended to provide an introduction to digital dentures and basic workflows. Once clinicians have a solid understanding of the fundamentals of digital design and manufacturing, they can explore and implement variations in workflows.

One aspect I particularly enjoy about digital design and prototype try-ins is the ease with which I can create multiple try-ins featuring different tooth molds and arrangements. We now paint all of our monolithic prototypes for try-ins, giving them an extremely realistic and attractive appearance. In the CAD software, after completing the initial setup, it's simple for me to duplicate the design and replace the existing tooth mold with another option. If the patient is selective, I often create three different designs. It's a fun and engaging experience for both the patient and the staff to be part of the process. The first try-in may look good, but when we have two more to test, there's usually that "WOW! That's the ONE!" moment.

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Fig. 7: 3-Visit Reference Denture Workflow

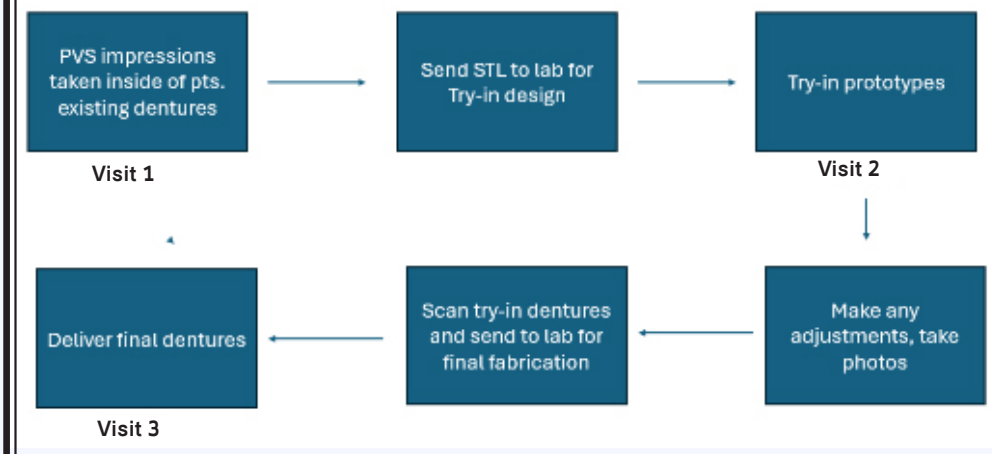


Fig. 8: Flowchart for Immediate Denture Workflow

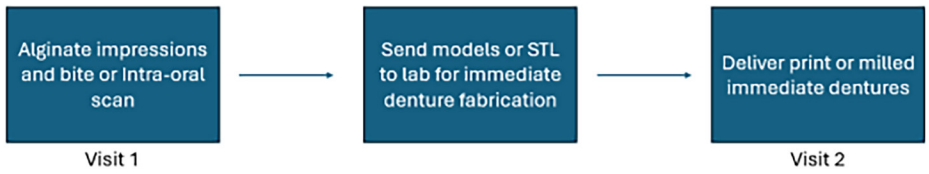
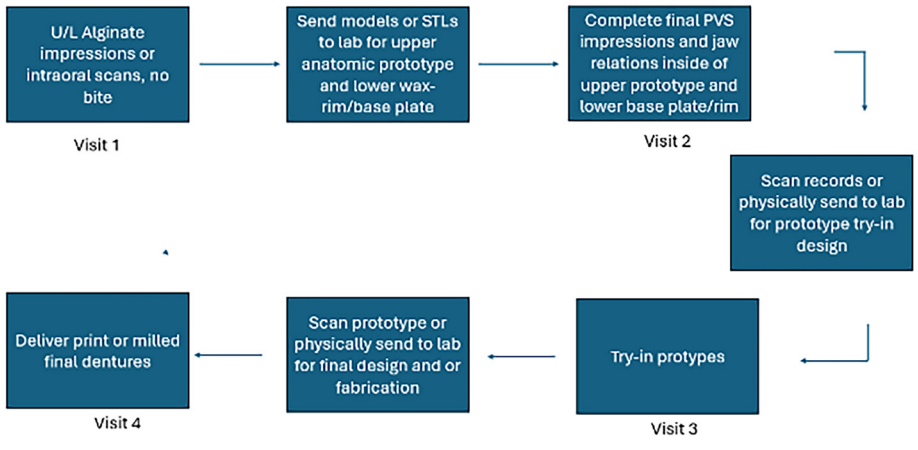
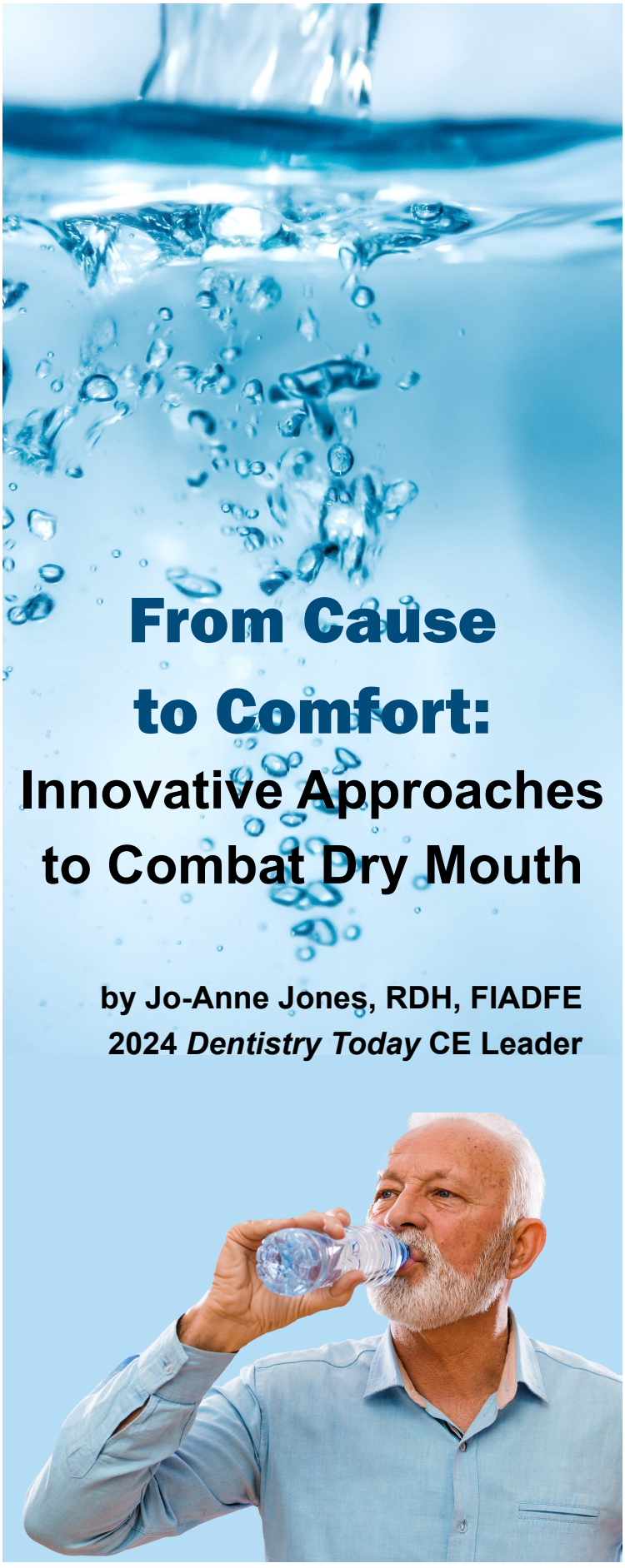


Fig. 9: Flowchart for No Teeth, No Denture Workflow





From Cause to Comfort:

Innovative Approaches to Combat Dry Mouth

by Jo-Anne Jones, RDH, FIADFE
2024 *Dentistry Today* CE Leader

To those of us who have plenty of saliva, it is something we never give a second thought to. For those who unfortunately experience a level of depletion, the loss can be devastating. As Joni Mitchell's 1970's song 'Big Yellow Taxi' states, "Don't it always seem to go that you don't know what you've got 'til it's gone?" The same may be said for those who struggle relentlessly with dry mouth. To refer to a condition that can be utterly debilitating as 'dry mouth', appears highly insensitive. Xerostomia, as referred to by healthcare professionals, has a localized, systemic, and social impact on the affected person. As dental professionals, it is time we provide greater validation to those who are seated in our treatment rooms suffering in silence from this condition.

Xerostomia, or dryness of the oral cavity, affects 1 out of every 5 adults[1] and has become one of the most common oral health pathologies. This figure is supported by a 2018 systematic review estimating the prevalence of xerostomia in approximately 22% of the global population.[2] Aging plays a factor, with an estimated 30% of adults older than 65 years and in 40% of those older than 80 years suffering from xerostomia[3] For those diagnosed with autoimmune disorders such as Sjogren's disease or undergoing head and neck cancer radiation therapy, the incidence is 100%.

Why is saliva so critical to our health?

We often inadvertently compartmentalize saliva to only be of significant value to the maintenance and protection of the oral cavity, yet its benefits go far beyond. The composition of saliva is a mixture of secretions from the major salivary glands, which are the parotid, submandibular, and sublingual, as well as the minor salivary glands located throughout the oral mucosa. Saliva is 99% water and less than 1% solids, including a number of electrolytes such as sodium, potassium, calcium, bicarbonate, and phosphate. Several organic components are present in saliva, including immunoglobulins, proteins, enzymes, and mucins. Salivary proteins and mucins contribute to lubrication, protecting the mucosa from injury caused by chemical, microbial and physical invaders. Without adequate salivary flow, oral health is at tremendous risk. Caries, periodontal disease, and oral infections are all exacerbated by its absence. Furthermore, if xerostomia is not effectively managed, it can go far beyond significantly damaging a patient's oral health and have a major impact on general health.

In addition to keeping tissues moist and providing protection, saliva is a critical aid to digestion. Bicarbonate, along with phosphate, provides a critical buffer neutralizing acid, aiding digestion further. Amylase starts the process with the digestion of starch even before the food is swallowed. It has a pH of 7.4, providing a neutralizing buffer. On the other hand, lipase has a pH of 4, enabling the breakdown of fats. Lipase is not activated until it enters the acidic environment of the stomach. Lactoperoxidase/lactoferrin reacts with hydrogen peroxide to generate antibacterial compounds, which comprise part of the body's immune system. Salivary EGF, or epidermal growth factor, plays a vital role in the maintenance of oroesophageal and gastric tissue, including the healing of ulcers.

Etiologic Pathways Leading to Xerostomia

Advances in medicine and therapeutic modalities have resulted in a steadily increasing human life expectancy. The mere impact of our aging population is going to have a profound effect on the degree of clinical xerostomia. For the first time in U.S. history, adults aged 65+ are projected to outnumber children by the year 2034.[4] Along with aging come co-morbidities and polypharmacy, all contributing towards hyposalivation. With longevity, we can expect salivary hypofunction. Polypharmacy, or the taking of one or more prescription drugs, is

a strong co-factor with the aging population. Among adults aged 40 to 79, almost 70% used one or more prescription drugs in the past 30 days, and 1 in 5 used five or more.[5] The risk for xerostomia increases with the number of medications taken, as the dry mouth condition may also be a side effect of the underlying medical condition. There are over 1100 drugs which contribute to this oral condition. The main xerostomic drugs are antihistamines, antidepressants, anticholinergics, anorexiants, antihypertensives, antipsychotics, anti-Parkinson agents, diuretics, bronchodilators, and sedatives.

One of the most profound etiologic pathways leading to xerostomia is the result of treatment protocols for the epidemic of HPV-related oropharyngeal cancers. Although more highly survivable than non-HPV oral cancers, the rigorous treatment is equally as debilitating, with severe xerostomia being a definitive outcome. Even with radiation therapy protocols designed to minimize collateral damage to the major and minor salivary glands, the oral dryness is devastating, impacting the 'survivor' physically, socially, and emotionally. Radiation to treat head and neck cancers, such as oral and specifically oropharyngeal cancer, is more than what the human body can tolerate. Typically, the human body can endure up to 25 Gy (unit of measurement of radiation dosage). The standard treatment protocol for treating head and neck cancer has been 70 Gy.[6] It is only recently that researchers are beginning to closely examine lowering of the radiation dosage to treat the specific tumor for identified candidates.[7, 8]

The most common disease manifesting xerostomia is Sjögren's syndrome; an autoimmune disorder typically affecting women 30 to 50 years of age. Presently there is no cure, hence the focus is on management of symptoms.[9] The disease is characterized by lymphocytic infiltration of salivary and lacrimal glands causing inflammation and damaging glands resulting in xerostomia and xeropthalmia.

A strong contender is diabetes. An updated U.S. report card estimates that approximately 38 million people have diabetes. That's equivalent to 1 in every 10 people, and 20% are unaware they have it. About 98 million American adults, or more than 1 in 3, have prediabetes. More than 8 out of 10 adults with prediabetes are unaware that they have it. In other words, nearly half of all American adults have diabetes or prediabetes.[10] Dry mouth is often the first clinical sign of undiagnosed prediabetes or diabetes.

According to the 2024 National Council on Aging, over 33 million U.S. adults use a CPAP machine,[11] of which one of the common side effects of therapy is dry mouth. Globally, obstructive sleep apnea is a strong health concern, afflicting as many as 936 million adults. This estimate is supported by a 2019 study funded by ResMed; a company that manufactures machines for sleep apnea treatment.[12] Risk of development of obstructive sleep apnea increases with age.[13]

Optimizing Care for Patients with Dry Mouth

The rise in all of the preceding etiologic pathways only further magnifies this oral condition and warrants the need for clinical recognition, chairside assessment, and innovative strategies to treat. There are several conservative practices that address mild dry mouth symptoms, such as the use of a humidifier at night, use of coconut oil spread on oral tissues, avoiding irritants such as alcohol, tobacco and caffeine, using a lanolin-based lip balm, limiting use of antihistamines, sips of water, and sucking on ice chips. Using a water spray bottle to spray inside the mouth is a continuous effort providing a temporary amount of relief. A few drops of aloe or glycerin can help to extend the moisturizing effects. Glycerin, a humectant, must be diluted in water and never placed directly in the mouth or on the surface of the tongue.[14]

However, with increased severity, these measures hardly touch the surface of this condition. Some have reverted to mouth taping to prevent mouth breathing and encourage nasal breathing. The science is scant, supported only by anecdotal benefits surrounding this viral trend. Mouth taping is accomplished by using a one-inch strip of 3M micropore tape placed vertically, often accompanied by Breathe Right nasal strips to open nasal passages. It is always recommended that an individual check with their primary care provider to verify whether this treatment is suitable and would provide any tangible benefits.

Oral rinses serve a strong purpose in neutralizing, supporting, and strengthening the oral microbiome. A simple rinse with water, salt, and baking soda or sodium bicarbonate (blend 1 cup of warm water with ¼ teaspoon baking soda and 1/8 teaspoon salt), is recommended to neutralize the acidic pH environment that results from salivary depletion.[15] Various antimicrobial rinses are available, as well as stannous fluoride, chlorhexidene rinses such as PerioMed, and CloSys with stabilized chlorine dioxide. CloSys effectively addresses VSCs, or volatile sulfur compounds, that contribute to halitosis, as well as being an antimicrobial without the harsh burning sensation that accompanies some oral rinses.

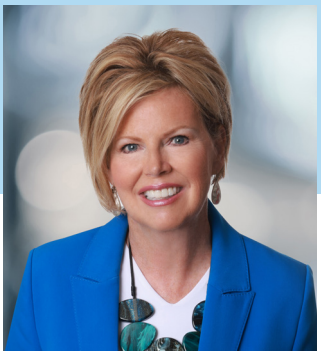
Toothpastes with remineralization capabilities are recommended due to the depletion of calcium and phosphate, also referred to as hydroxyapatite, that occurs with head and neck radiation therapy. The synthetic version of hydroxyapatite is called nanohydroxyapatite. This novel discovery was developed by NASA in response to a need to restore minerals lost both in teeth and bones of astronauts during their space travel. It was then incorporated into toothpastes in Japan in 1978 and subsequently approved for caries prevention in 1993.[16] Nanohydroxyapatite has a number of redeeming features; it is capable of sealing dentinal tubules resulting in reduced sensitivity along with inhibiting colonization of Streptococcus mutans.[17] *S. mutans* is the predominant cariogenic bacteria that wrecks havoc in a xerostomic environment. VOCO Remin Pro and X-Pur Remin, CariFree by Oral Science, both with nanohydroxyapatite, offer a fluoride-free alternative.

Demineralization is further exacerbated by the presence of an acidic oral environment. pH stabilizers such as Basic Bites with arginine bicarbonate shift the pH of an acidic oral environment back towards neutrality. Tom's of Maine Rapid Relief Toothpaste contains arginine and calcium carbonate as well enabling a more neutral oral environment. Fluoride varnishes are recommended to strengthen the dentition and lower the critical pH.

Along with balancing pH comes a requirement to address the predominant strain of cariogenic bacteria, *Streptococcus mutans*. Xylitol is a salivary stimulant, a five-carbon natural sugar alcohol or polyol, unable to be metabolized by *S. mutans*. Xylitol also has the ability to reduce the colonization of *S. mutans* while acting as a prebiotic or food source for beneficial bacteria, inhibiting growth of pathogenic oral bacteria such as *P. gingivalis*. With a low glycemic index, xylitol is a healthier nutritive sweetener

Jo-Anne Jones, RDH, FIADFE

A respected thought leader and international, award-winning speaker, **Jo-Anne Jones** has done over 1,000 presentations worldwide. Jo-Anne is a past honoree as one of DPR's Top 25 Women in Dentistry and joins the 2024 *Dentistry Today* CE Leaders for the 14th consecutive year. A 2021 Fellowship Award with the International Academy for Dental Facial Esthetics was presented to Jo-Anne for her contributions to the field of dentistry. Jo Anne was instrumental in launching the international 'Check Your Mouth' campaign promoting oral self examination between professional visits. A frank and open lecture style, a focus on direct knowledge translation to practice complemented by the provision of educational and clinical resources has earned Jo-Anne many loyal followers both nationally and internationally. As a passionate advocate for dentistry, Jo-Anne is focused on creating a positive impact on those who are struggling with compromised oral health.



for diabetics. The recommended dose is 6 – 7 grams of xylitol daily, separated into three to five exposures. It is imperative to have a medicinal grade product of xylitol, as over-the-counter chewing gum, for example, frequently contains a combination of sorbitol, mannitol, and xylitol, eliminating the assurance of a therapeutic dose.

Once again, a xerostomic oral environment is a compromised one characterized by low pH. Aggressive toothbrushing can cause severe wear and abrasion in an acidic environment. Power toothbrushes with 'smart sensor' technology, such as Philips Sonicare with real-time feedback, ensure that the user is not brushing too hard and is covering all surfaces with their brushing technique. If required to use a soft manual toothbrush, Curaprox carries a good line of supersoft post surgical toothbrushes.

SalivaMAX® is a supersaturated prescription-based calcium phosphate powder that, when dissolved in water, creates a solution with a high concentration of electrolytes. According to a benefit research study on patients with high grade xerostomia, the average duration of the rinse lasted about 71 minutes per dose. SalivaMAX® may be used 2 – 10 times per day.

Various other sprays, oral rinses, and gels may be found in pharmacies. Allday® Dry Mouth Gel by Elevate Oral Care contains 44% xylitol, a pH of 7, and a patented mucoadhesive property. All over-the-counter remedies are water based, requiring a repetitive approach to sustain efficacy and benefits for the patient.

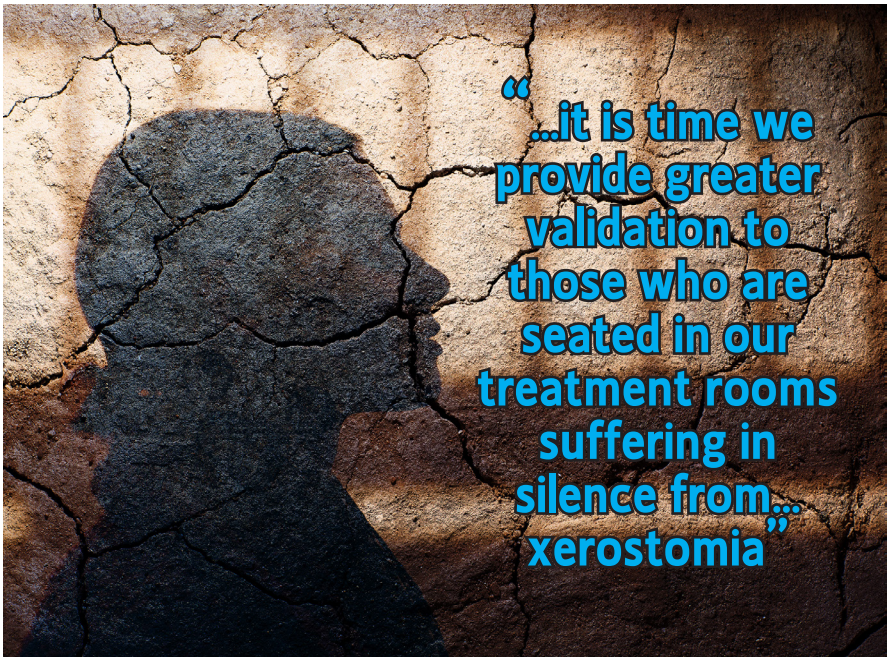
Innovative Therapeutic Approach

There is one product on the market that has a strong differentiator, though, and that is Aquoral®. Aquoral® is a lipid-based solution resembling human saliva, designed to moisten and lubricate the oral cavity, including the oral mucosa of the mouth, tongue and throat, by formation of a lipid film which limits loss of water and restores the viscoelasticity of the oral mucosa.

A systematic Cochrane Review compared xerostomia interventions such as sprays, lozenges, mouthrinses, gels, oils, chewing gum and toothpastes. There was no strong evidence that any topical treatment was effective for relieving the sensation of dry mouth. The review concluded that there was greater efficacy with lipid-based OGT or oxidized glycerol technology than with a water-based electrolyte spray.[18] Oxidized glycerol technology (OGT) is the foundation for Aquoral®. Why is OGT superior? OGT creates a protective layer that helps trap moisture in the oral mucosa and has been shown to promote a more balanced oral microbiome. Studies conducted by 3M researchers measuring moisture loss over time demonstrated significantly less water loss with lipid-based OGT technology compared to mainstream OTC products.

The convenient and discreet prescription-based product is sprayed into the mouth twice and is spread around to the inflamed and/or dry areas of the mouth with the tongue up to 3 – 4 times per day.[19] Aquoral® is a strong contributor to a synergistic approach to management of dry mouth.

In conclusion, exercise evidence-based decision making. Consider scientific evidence, clinical experience and judgment and, equally important, the patient's values or preferences. Be a voice for those who are silently struggling.



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Author Disclosure:

The author received no compensation for writing this article. Jo-Anne may be reached at jjones@jo annejones.com.

The Pre-polymerized Ball Technique
for obtaining posterior composite proximal contacts

by Drs. Van B. Haywood & Kevin Frazier

One of the biggest frustrations in restorative dentistry when placing posterior composite restorations is achieving an adequate proximal contact. The dentist can perform everything correctly from the anesthesia to the isolation to the preparation to the placement of the composite and light-curing, but if there is an open proximal contact, that's all the patient knows about, and it is what they remember about the dentist. It's imperative that the dentist have a system that will ensure an appropriate proximal contact to avoid interproximal food packing problems and the associated periodontal issues over time. Many techniques exist for achieving a solid interproximal contact with direct placement composite restorations.[1] The purpose of this article is to present a historical restorative strategy called the "pre-polymerized ball" technique, in conjunction with some of the newer segmental matrices and finishing techniques. There are different hand instruments and light-curing tips that have been used in the past to create a proximal contact, but each of those require having an instrument available for each patient and necessitate having the instrument fit the potentially different sizes of the proximal box. This article describes an older technique called the "pre-polymerized ball" technique, where the dentist creates the composite ball from the existing composite material at the size needed to ensure an adequate proximal contact and polymerizes it prior to insertion into the preparation.[2] With this technique the dentist can customize the ball size to fit the prepared proximal box.

The first decision is whether to use a segmental matrix band, which only covers one proximal surface, or whether a circumference matrix band is needed. In either case if the matrix is not well-adapted and clearing contacting the adjacent tooth prior to placement of the restoration, then an adequate proximal will not be achieved. There are a variety of segmental matrix bands on the market as well as circumferential pre-burnished bands which provide good contour when the space is available between the teeth for a pre-burnished band.[3]

This article demonstrates the use a segmental matrix band for a DO composite restoration on a mandibular molar. The first step is to achieve adequate isolation with a well-adapted rubber dam (Figure 1), followed by placing a tight wooden wedge in between the teeth before initiating the preparation ("pre-wedging"). This wedge will protect the gingiva and displace the rubber dam downward by depressing tissue, as well as begin moving the teeth apart much like an orthodontic separator. If the wedge gets in the way when preparing the gingival extension of the box, then it should be cut during the preparation as if it were tooth structure.

When the preparation is completed (Figure 2) with all caries is removed, then the tooth is prepared for bonding. Place the appropriate matrix to seal the margins and achieve proximal contact (Figure 3). Note that segmental matrix bands use a soft wedge for gingival marginal adaptation, not separation. The separation needed to account for the thickness of the band is provided by the ring. Inspect the matrix from the proximal and occlusal to ensure that it clearly contacts the tooth (Figure 4). If not, reposition the band and ring to achieve proximal contact. Now create two small composite balls that are slightly smaller in diameter than the axial depth of the proximal box. Do this by placing a small amount of unset composite material on the bracket table and roll it into a ball with a composite handling instrument or uncontaminated gloved hands. It is best to create two composite balls in case one is too big or is dropped while transporting from the bracket table to the tooth preparation. Completely light cure the two balls of composite material. Return to the preparation and complete the bonding steps (e.g. etch, prime, and bond) as appropriate

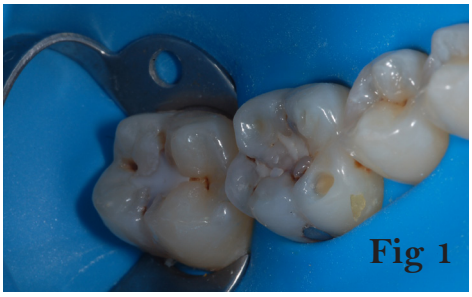
Fig 1

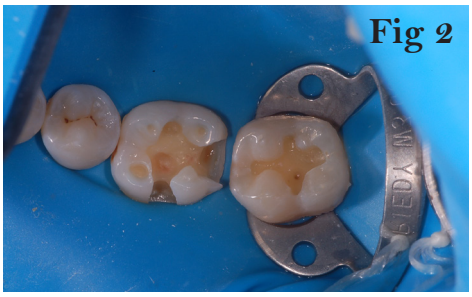
Fig 2


Fig 3


Fig 4

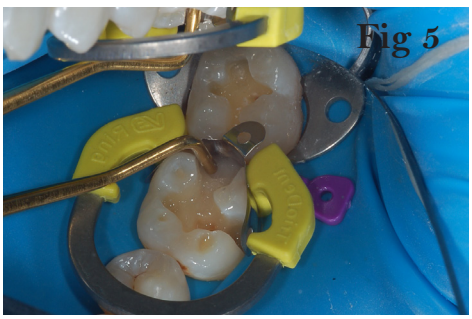
Fig 5


Fig 6

Figures, from top right:
Figure 1: Pre-operative teeth with ICDAS 3-4 caries isolated with a rubber dam.
Figure 2: Preparations completed (#31 O, #30 DOB)
Figure 3: Segmental matrix band and contouring wedge placed
Figure 4: Verifying the matrix band has good contact with adjacent tooth
Figure 5: First increment of composite material placed on gingival floor and light-cured
Figure 6: Second increment of composite material placed against matrix band leaving a small pocket, but not cured.

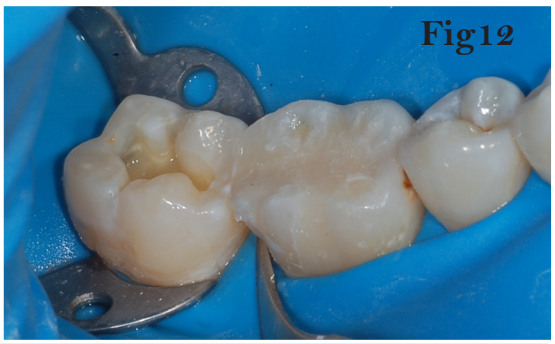

Figure 7: Pre-polymerized ball of composite material placed into the pocket and unset material is adapted around it.
Figure 8: Parallel-sided instrument (e.g. a condenser) is used to press the ball through the composite material against the matrix band and held tightly during curing.
Figure 9: Remainder of preparation incrementally filled, with final layer burnished to form with a ball-shaped burnisher wetted with bonding agent before final curing.
Figure 10: Latch-type round bur used at slow speed to level marginal ridges and trim composite back to margins without damaging enamel.
Figure 11: #12-scalpel blade is "safe sided" using a metal-cutting bur to only leave the last 3-5 mm of blade for cutting on the inner curve.
Figure 12: #12-scalpel blade used to trim gingival margins and proximal margins.

for the system being used. Place a small amount of composite material in the depth of the box and pat the material along the gingival floor and into the proximal corners (Figure 5) Cure this first increment with the appropriate curing light positioned perpendicular to the floor of the box to obtain a full cure. The second increment of composite material is placed and patted up against the matrix band to form the contact, but not cured (Figure 6). Place the pre-polymerized ball of composite material that you have created into the unset composite material (Figure 7). Before placing the instrument on the composite, ensure that there are not any gaps between the set ball of composite and the unset composite in the box. Gently pack the unset composite around the ball. Using a parallel-sided condenser or plastic instrument, press the ball at a diagonal angle gingivally and toward the proximal contact with firm pressure and maintain it (Figure 8). The direction of this force vector will move the matrix band tightly against adjacent tooth and provide a broad, more gingival proximal contact. Continue holding the instrument-ball in place with firm pressure while the assistant light-cures the composite. Once this increment of composite is set, then continue to restore your restoration as normal. After the resin is filled to the surface of the occlusal cavo-surface margins, burnish this final increment pre-curing to create initial occlusal anatomical (Figure 9) and to provide a good marginal adaptation. Perform the final light-curing step and then remove the matrix band.

One conservative strategy for the initial finishing of the occlusal margins of the composite restoration is to use the same latch-type round bur which was used for caries removal (Figure 10). The latch-type bur used at slower speeds will not cut enamel readily but will cut composite easily. This slow-speed bur approach avoids the use of a high-speed handpiece and the resultant inadvertent loss of tooth structure while removing any marginal flash along the occlusal surface of the restoration. This technique can also be applied to removing excess cured sealant material while adjusting the occlusion without losing any enamel. With an electric handpiece which have increased torque, the speed should be under 5000 RPMs to avoid cutting the enamel.

One of the best instruments for removing any flash on the proximal and the gingival margin is a #12- scalpel blade. This curved blade has the cutting edge on the inside edge, while the outside has a smooth non-cutting edge. The scalpel blade is so sharp that you can carve cured composite much like amalgam. To use the blade, the cutting edge should be trimmed such that only the last 3 to 5 mm of the blade is used interproximally (Figure 11). A palm-thumb grasp provides excellent control. This approach can be used not only in the gingival and proximal embrasures (Figure 12), but also in the occlusal embrasure to provide the appropriate marginal ridge shape without damaging the tooth or opening the embrasure too large. When carving on an enamel, the blade feels like it is contacting glass, so it slides easily. When carving the composite, the blade bites or digs into the surface with resistance. Much like carving unset amalgam, only shave small amounts of composite material at a time. This technique allows smooth margins without opening the embrasure or damaging in the enamel with a high-speed handpiece and bur. Now evaluate the clinical adequacy of the proximal contact, contours and margins (Figure 13).

Complete the finishing techniques to finalize the restoration, then remove the rubber dam and evaluate the occlusion (Figure 14). It is wise to assess the pre-operative occlusal contacts prior to the initiation of the restoration since some patients are unable to close back into maximum intercuspation after being open for a while.

If the patient feels like the restoration feels high to them, and it is obvious that they are not occluding on a surface that that was restored, it may be that there is residual bonding agent on the unprepared enamel. This is another situation where the latch type round bur in the slow speed can be used for adjusting those presumedly high occlusal markings (Figure 15). Because the enamel will not be removed, then the occlusal contact will not be lost, but adjustment will remove the extra 25 microns

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In 1989, he co-authored the first publication in the world on Nightguard vital bleaching (at-home tray bleaching) and in 1997 co-authored the first article on extended treatment (six-months) of tetracycline-stained teeth using this technique. He has completed further research and over 145 publications on the tray bleaching technique and the topic of bleaching and esthetics, including first papers on treating bleaching sensitivity with potassium nitrate, direct thermoplastic tray fabrication, bleaching primary teeth, and caries control with bleaching materials. While he is most known for his research and articles on tray bleaching, he teaches in the Fixed Prosthodontics courses, the Occlusion courses, and the Esthetics course, as well as in sophomore and junior Operative and Fixed student clinics.

After over 29 years at the Dental College of Georgia, he retired from full-time teaching in December 2022. The DCG Class of 1997 initiated a scholarship in his name for clinical excellence and compassionate care. In 2023, he was named among the top 2% most-cited scientists in the world. In 2024, he was awarded "Educator of the Year 2024" by the Christian Medical Dental Association.

Kevin B. Frazier, DMD, EdS; is Vice Dean and Professor of Restorative Sciences with the Dental College of Georgia (DCG) at Augusta University (AU). He received his dental and General Practice Residency training from the University of Florida and an EdS degree (Educational Leadership) from AU. He teaches pre-clinical and clinical restorative dentistry, participates in the DCG faculty practice, and conducts research in dental materials and trends in dental education and practice. He has participated in over $2.6M in research and training grants and has had more than 130 publications and over 260 professional presentations. His role as DCG Vice Dean includes faculty affairs includes new faculty onboarding, supporting the DCG promotion and tenure committee and the DCG Faculty Senate. He is the AU Chapter President of the Honor Society Phi Kappa Phi and conducts initiations for eligible students from all AU colleges and programs. National leadership service includes the Consortium of Operative Dentistry Educators, Academy of Operative Dentistry, ADA Council on Scientific Affairs, and the American Dental Education Association. He has co-led nine international medical/dental mission trips. He is currently serving as the Co-Interim Chair for the Department of Oral & Maxillofacial Surgery and as the Interim Director for Dental Continuing Education.

of composite bonding agent that may be on the tooth (Figure 16) causing the restoration to feel high to the patient.

The use of a pre-polymerized ball technique with a segmental matrix to obtain a tight well-contoured proximal contact, the ball burnisher for composite marginal adaptation, the #12-scalpel blade for gingival and proximal excess, and the latch-type round bur for margination can result in an excellent outcome for a directly placed Class II composite restoration.

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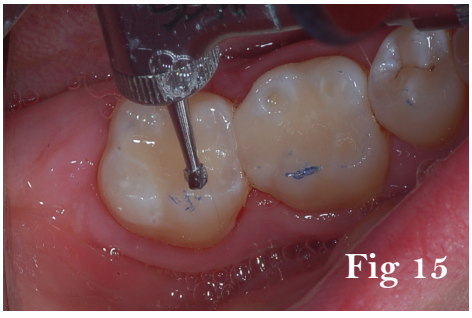
Figure 13: Verifying that a tight proximal contact is obtained
Figure 14: Occlusion evaluated but patient reports that it feels "high"
Figure 15: Adjustment of occlusion with latch-type round bur removing bonding agent
Figure 16: Final restoration has appropriate occlusion and proximal contact.



"The dentist can perform everything correctly...but if there is an open proximal contact, that's all the patient knows about, and it is what they remember about the dentist."

Collaboration of Physical Therapy and Dentistry:

Interdisciplinary Care for the Temporomandibular Patient

by Dr. Erienne Blanchard, PT, DPT, OCS, CMPT, CFC, Cert. DN, CCTT

Dentists are the primary care practitioners of the face, teeth, and jaw. They are who the public will immediately access for conditions that affect these areas. The dentists are qualified and trained for odontogenic pain and have added orofacial pain as a specialty to further assist this increasing population. The orofacial pain specialty has been advocating for physical therapy in conjunction with dentistry and has added it to their recommendations through the American Academy of Orofacial Pain. The temporomandibular joint is a synovial orthopedic joint that has many factors affecting the movement and causes of pain. Temporomandibular disorders (TMD) can be caused by multifactorial inputs such as occlusion, muscle tension, postural alignment, cervical spine and nerve components, and parafunctional activities of the patient.[1] These maladaptations to the muscles, joints, capsule, ligaments, synovium, and posture can change the tissues' mechanical properties, displace discs, alter energy and force in the joint, change blood supply, and create functional overload of the joint.[1]

Physical therapists are primary care practitioners of the musculoskeletal system and are skilled in assisting with muscles, joints, load, and alignment. A Doctor of Physical Therapy is skilled in screening and diagnosing cervicogenic causes of facial pain including the alignment of the cervical spine and head causing tension throughout the oral musculature. A Certified Cervical and Temporomandibular Therapists (CCTT) is trained to create an individualized patient care plan based on the best-known practice standards to reduce arthralgia, myalgia, and mobility deficits of the TMJ. A CCTT is a member of a specialized group of physical therapists that are trained to work closely with dentistry in caring for the TMD patient. This differs from other physical therapists, as a CCTT's education is focused on the mechanics of the joint, how dentistry approaches TMD, and how to care for post-operative orofacial patients. They are skilled in assisting and diagnosing causes of oral pain related to masticatory muscles, cervical musculature, and alignment of the joint and spine, as well as neurological causes of pain, while taking into consideration the dental treatment plan for TMD. Their skills are designed to complement the TMD treatment plan created by the dentist and empower the patient to utilize the tools provided to gain control over symptoms and function via this multidisciplinary approach.

The collaboration of physical therapy and dentistry is a movement forward into interdisciplinary care for the TMD patient. It is imperative that these groups work together to improve outcomes. Other healthcare practitioners can and will be important to include as well, as many with prolonged chronic pain with TMD will require further evaluation. Judicious referrals to other disciplines ensure a comprehensive approach to manage chronic pain. Dentists are the entry point for collaborative care, as they provide the first line of interventions for facial pain patients and are directly sought out for this purpose. Physical Therapy should be the next referral to assist the dentist with the treatment of TMD.[2]

According to the Diagnostic Criteria for TMD (DC/TMD) Axis 1, a TMD patient's pain can be divided into myalgia, myalgia with referral, joint dysfunctions, and headache with TMD. Screening a patient for TMD begins with the TMD Screener Questionnaire.[3] This questionnaire has been shown to be effective in diagnosing a TMD patient chairside with a score greater than or equal to 3 points.[3] The questionnaire has a sensitivity of 99% and specificity of 97%. This means that a score of 3 or more is 99% correct that a TMD is present. If the score is less than 3 points, you can be 97% certain that they do not have a TMD. This questionnaire has also been effective in assisting with diagnosing the headache attributed to TMD category of the DC/TMD.[4] Those patients that have headaches and report them should be screened for TMD as a component whether it is a causation or correlation to their headache. The TMD screener was found to be 83% sensitive and 82% specific for TMD in the presence of headaches.[4] This tool should be utilized by the dental professional to assist with treatment and referral as it relates to TMD.

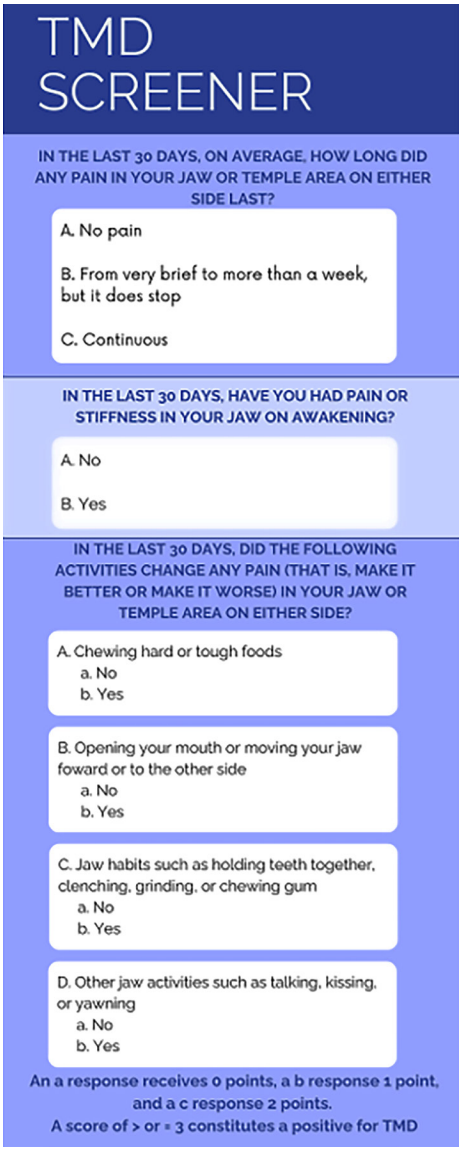
A TMD issue can confidently be ruled in or out once the questionnaire is completed. As an interdisciplinary team, our next focus will be to determine the likelihood that the origin of their pain is myalgia, myalgia with referral, or joint dysfunction. The DC/TMD has specific guidelines as to what constitutes myalgia and myalgia with referral.[2] Myalgia is "pain of muscle origin that is affected by jaw movement, function, or parafunction, and replication of this pain occurs with provocation testing of the masticatory muscles."[2] Local myalgia is defined as pain within the muscle boundaries. Myalgia with referral is defined as pain extending beyond the muscle of origin.[2] Myalgic pain is described as pain in the jaw, temple, ear, or in front of the ear as well as being modified with jaw movement, function, or parafunction.[2] The muscles likely to cause myalgia based on validity and specificity are the masseter and temporalis. However, the pterygoids and digastrics may contribute to pain and should be investigated based on the patient's description of painful movements.

Palpation of the muscles of mastication provide important clinical insight. Masseteric palpation should be done throughout the entirety of the muscle, both superficial and deep, as areas of trigger points can refer to the joint, teeth (mandibular molars), and along the ear. Palpation of the temporalis should be performed along the whole muscle just lateral to the eye, above the zygomatic arch, around the top of the ear, and behind the ear. Different zones of the temporalis can cause referral to different areas including the maxillary molars. There are several other muscles that can also refer pain to the TMJ and surrounding areas, such as the sternocleidomastoid, pterygoids, and digastrics, and should be palpated as a part of the evaluation. Trigger points within these muscles can be the cause of non-odontogenic tooth pain that cannot be diagnosed based on imaging.[5] These are ideal physical therapy patients as myalgia can be addressed with specific exercise, postural correction, and trigger point release with multiple modalities such as soft tissue release and dry needling.

The DC/TMD defines arthralgia as "pain of joint origin that is affected by jaw movement, function, or parafunction, and replication of this pain occurs with provocation testing of the TMJ."[2] To confirm the joint is the source of pain, the patient will identify pain in the jaw, temple, in the ear, or in front of the ear as well as pain that is modified with jaw movement, function, or parafunction.[2] The exam will confirm the joint as the source with replication of pain during palpation of the lateral pole as well as maximum movements of the joint replicating the pain.[2] Arthralgia of the TMJ can be from sprain and strain after a dental

procedure and should resolve within a week or two after the initial sprain. However, for some patients, the pain persists and may now report progression of dysfunction and pain. Therapy can assist with improving the stability of the disc, the capsular stability, and muscular tone to assist with re-establishing joint tolerance to load in good alignment. An intra-articular pain can be evaluated using the "Dental Stick Test."[6] A dental stick is placed between the molars on one side and the patient is asked to bite down, careful to avoid protrusion. They are to hold the bite for several seconds and point to the area of pain. The test is considered positive if they point to the ipsilateral or contralateral joint while reporting no pain in the surrounding areas. This test has a sensitivity of 62% and a specificity of 100%. This test was found to correlate highly with MRI/CT findings as well and can be a very useful tool for chairside examination for intra-articular dysfunction.[6]

Dr. Erienne Blanchard was born and raised in Gainesville, Florida and takes pride in being a home-grown Gator. Dr. Blanchard graduated with her bachelor's from the University of Florida In 2008 and her Physical Therapy Doctorate In 2011. Erienne has always been fascinated and focused on the cervical spine and jaw. She received her Craniofacial Certification in 2017 from the University of St. Augustine, which focused on physical therapy for TMD patients. This certification advanced her knowledge of physical therapy care for spinal alignment, cranio-cervical centric relating to the mandibular centric, disc dislocation, and post-operative needs including joint arthroplasty. She recently became a Board-Certified Specialist in Orthopedics in 2021 through the American Physical Therapy Association for advanced knowledge. She is a Certified Cervical Temporomandibular Therapist in 2023 through the Physical Therapy Board in the American Academy of Orofacial Pain. She is a specialty private practice owner focused on craniofacial and orofacial issues. She teaches as an adjunct lecturer for the University of Florida in medical screening for referral. In her free time, she has run 7 half-marathons, enjoys boating, and being involved with the kids. She enjoys her husband, two children, and their pup as well as the time they spend together outdoors.



Patients may report disc dislocation with or without reduction. These patients are candidates for physical therapy, as the condyle moving posteriorly to the disc is a factor for anterior disc displacement. The posterior condylar movement may be attributed to a forward head posture. This is best assessed with the patient sitting upright in a chair or on the side of the dental chair so that from the side you may view whether their cheekbones are forward to the sternum. If the zygomatic arches are forward by 2 inches, the muscular tension through the neck is three times greater than at rest, indicating there is significant strain through the upper cervical spine and thereby through the oral musculature.[7] The upper cervical spine has muscular attachments through the oral cavity such as the superior pharyngeal constrictor, which will cause retrusion of the mandible and thereby posterior placement of the condyle in the fossa. The posterior position of the condyle may now rest within the bilaminar zone causing changes to the blood supply to the condyle. The longer this position is maintained the more probable there will be a decrease in blood supply creating a bony change of the condyle. Therefore, posture is significantly important to the disc-condyle relationship and the workload placed upon the muscles and joint loading.[7] A physical therapist is trained to assess and assist with the multifactorial causes of postural deficits. A thorough exam is required to establish whether there are mobility deficits, weakness, spinal structural changes, and other contributing factors to the forward head posture.[7]

Headaches caused by TMD are a unique category of headache and are caused by the crossover of the trigeminal nerve and the upper cervical nerves at the base of the skull. Within the upper cervical spinal cord, the trigeminal nerve and the C1-C3 nerve roots are processed within the cervicotrigeminal nucleus (CTN). Prolonged forward head posture creates an undue workload for the suboccipital muscles which can be relayed at the CTN and interpreted by the brain as originating from the trigeminal nerve resulting in a headache.[7] This irritation can excite the trigeminal nerve and will cause myalgia and jaw pain. This can also work in the other direction in that a patient with TMD may have facial pain and irritation of the temporomandibular musculature causing irritation of the trigeminal nerve which may then excite the suboccipital nerve roots, causing a headache. This category can get even more complicated, since the trigeminal nerve can trigger migraines via the trigeminal innervation of the arterial supply of the dura of the brain. Overall, the TMD Screener can assist with determining if your patient's headache has a possible TMD origin. Physical therapy can assist with the screening, treatment, and care of these patients.

Splint therapy is used in combination with all the patient diagnosis above, such as myalgia, joint dysfunction, and headache. If you have tried splint therapy before and your patient reports that they keep removing it in their sleep without knowing why or they report that the pain seems to get worse with the splint, these patients are great physical therapy candidates as there seems to be more underlying limited adherence. Patients for whom a splint fails to reduce pain in the acute stages are also good physical therapy candidates.

In summary, all TMD patients would benefit from the collaboration of dentistry and physical therapy as their symptoms are usually multifactorial. Physical therapy can contribute to the dental plan by reducing parafunction, improving posture, educating on pain science, and reducing pain with modalities and treatment to give the patient the best possible outcome and recovery from the second most leading cause of pain in the United States.

More information on the Certified Cervical and Temporomandibular Therapists (CCTT) can be found at www.ptbcct.org. We would be happy to assist with finding a therapist in your area that can assist you with your patients and their needs. If you would like assistance finding a qualified therapist in your area, please email info@ptbcct.org.

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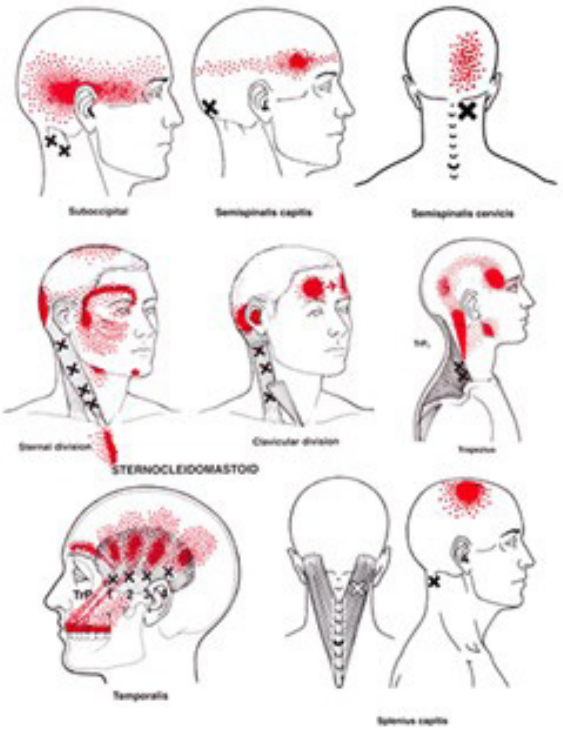

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Delivery: Participation
Tuition: AGD: $449
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- Discover the benefits of injection molding into special Black Triangle matrices
- Close a black triangle and create a mirror-like finish with invisible margins
- Understand how to avoid common mistakes that lead to less-than-satisfactory results when performing anterior composites
- Receive an updated, hands-on evaluation of modern matrices, wedges, and separators
- Learn and perform the three steps to achieve rock-solid posterior composite contacts

SCAN ME

SPEAKER: Dr. David Carroll is a fervent believer in specialized care. "Patients, especially those who need advanced care, benefit more from a dentist with a specialized concentration." Dr. Carroll is an expert in dental implants and patients receive the benefit of his extensive expertise and passion for the specialty.

His relaxed, warm chair-side manner combined with his specialized skill has earned him the respect of colleagues and loyalty of patients. Dr. Carroll is also a leader in innovation, and an early adopter of ground breaking technology like the T-Scan III used by less than 5% of offices in South Florida. His attention to new developments that can improve the comfort and outcomes of patients has made him one of the most sought after dentists in the region. "It is important to be attentive to the changes in the industry because advances can improve care, lessen discomfort and increase the predictability of procedures. I adopt new techniques and materials not because they are new and shiny but because they will improve the care of patients.

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