FLORIDA FOCUS

March, 2023

the publication exclusively for the general practitioner

FLORIDA ACADEMY of GENERAL DENTISTRY

Dr. Gigi Meinecke on Leading With the Chin: Facial Rejuvenation of the Lower Third

Dr. Tom Brown on External Cervical Resorption

Dentist Availability in the Western and Southwestern United States,
by Bernardo Caldas, John Kraynik, and Ahmadreza Khademi

The 2023 Florida AGD General Assembly and Award Recipients

What's New With Florida's Components?

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Dr. Tyler Rathburn lectures on "Clear Aligners 101," a Florida AGD participation course given in conjunction with the General Assembly.

How to Reach Us

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President's Message

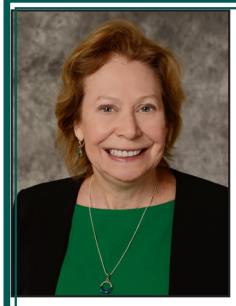
It has been such a pleasure serving as your president over the last year. 2022 was such an exciting year for our organization as we welcomed back in-person CE and board meetings. We have weathered a storm none of us saw coming and adapted as an organization to continue to bring quality CE to our members through new technology, some of which has helped change our board and organization for the better.

This year's General Assembly in Tampa was amazing. We had a great CE on clear aligners and decided to hold this course at no cost to our members as an appreciation for all your support, especially through COVID. Thank you to all our great sponsors who took time out of their work week to join us at our luncheon and general assembly.

As an organization whose focus is to help facilitate lifelong learning, these events are the culmination of all the hard work our board, chairs, and executive director put forth throughout the year. Without their dedication to our profession and organization, it would not be possible. So, thank you all, especially our membership, and remember to please find a way to be involved with your local component.

It is my great honor to return this year as your president, and I hope to see you all very soon at another one of our great CE events. I hope you all have a happy and healthy 2023!

Matthew Scarpitti, DDS



Editor's Note

What an honor it is serving as your Editor! This is my third year in this position, and I hope you've been reading and benefitting from our authors' knowledge of clinical procedures and practice management. As always, this issue demonstrates the wide extent of topics seen in dentistry today. In "Leading with the Chin," Dr. Gigi Meinecke discusses the use of facial injectables to rejuvenate the lower third of the face. Endodontist Dr. Tom Brown describes the diagnosis and treatment of external cervical resorption, and Nova Southeastern dental students Bernardo Caldas, John Kraynik, and Ahmadreza Khademi address dental education in the western U.S. *Thank you* to Drs. Meinecke and Brown and to the students for taking the time to share their expertise with our members.

The issue also covers some of the recent and future Florida AGD activities. On January 21, the annual General Assembly included the installation of the 2023-24 Board of Officers and the recognition of the 2022 Award Recipients, those members who have devoted exceptional time to continuing education or to volunteer service for the community or the Florida AGD. For example, Dr. Jeremiah Taylor, the recipient of the award for Most Continuing Education (Participation), earned **1,000** CE hours last year! Congratulations to Dr. Taylor and all the awardees! To learn how you can become more involved in the Florida AGD, please read the update on pages 6-7, and join your fellow general dentists at your local meetings.

As with most printed media today, the costs of printing and mailing the quarterly *Florida Focus* increased dramatically in 2022. At the board meeting which followed the General Assembly, the board members decided to make the journal more sustainable financially and environmently by printing two 16-page issues per year and making all four quarterly issues available on the Florida AGD website, as usual. Executive Director Patricia Jenkins will send our members a link to each new issue.

The day before the Florida AGD General Assembly, I participated in the Florida Dental Association's LEAD (Leaders Emerging Among Dentistry) event. The main presentation was a wonderful "fun, highly interactive program" on the DiSC personality system by certified leadership coach Velma Knowles. Another event was a round table discussion about defining leadership, led by the LEAD committee members. Since I'm on the committee, I did some preparation in advance of the meeting, reviewing some notes and literature I'd read years ago. I also watched a Stanford University video, "3 Keys to Becoming a Great Leader," and was struck by this quote: "Great leaders are connected, keep their organizations fresh, and show courage." In other words, as dentists, we should communicate effectively and constantly with our office team, our patients, our peers, and our community. We should be innovative and not be afraid to stand by our decisions if we feel they are right, in spite of the objections and doubt of others. Becoming active in the Florida AGD and earning your Fellowship and Mastership will develop both your leadership and your clinical skills, giving you support to stay connected, innovative, and courageous. Have a wonderful spring!

Millie K. Tannen, DDS, MAGD; Editor, *Florida Focus*

The 2023 General Assembly in Tampa: Congratulations to the Florida AGD Officers and Award Recipients!

The 2023 FLAGD Board of Officers, from left: Drs. Mel Kessler, Toni-Anne Gordon, President Matthew Scarpitti, John Gammichia, Ray Morse, Naresh Kalra, Herminia Rodriguez, Mykhue Nguyen, Aldo Miranda, Executive Director Patricia Jenkins, Millie Tannen, and Douglas Massingill.

Clockwise from right:

Frank J. Collins Lifetime Achievement Award: *Harvey P. Gordon, DDS, MAGD*

Most Continuing Education Hours (Lecture): *Troy A. Gessner, DDS, FAGD*, with Drs. John Gammichia and FLAGD President Matthew Scarpitti

Humanitarian Award: *Glenn W. Forhan, DMD, MAGD;* Distinguished Service Award: *Millie K. Tannen, DDS, MAGD*

Most Continuing Education Hours (Participation): *Jeremiah R. Taylor, DDS*, with Drs. Toni-Anne Gordon and Gail Mcdonald-Chang

Dr. Harvey Gordon is a faculty member at the Nova Southeastern University College of Dental Medicine, Department of Restorative Sciences and Public Health Dentistry. He is a 51-year member of the Academy of General Dentistry and a founder of the Florida AGD (first called Gold Coast) in 1991. He has served the Florida AGD as President, Vice President, and almost-permanent Treasurer, producing financial reports worthy of the most skilled and diligent CPA. At the 2023 General Assembly, Dr. Gordon passed the Treasurer's office to Dr. Herminia Rodriguez and accepted the Florida AGD's Frank J. Collins Lifetime Achievement Award with this speech. **Thank you for all your years of dedication, Dr. Gordon!**

From left: Dr. Harvey and Mrs. Terry Gordon with Dr. Mark and Mrs. Judi Gordon.

Dr. Harvey Gordon's Accepts the 2023 Frank J. Collins Lifetime Achievement Award

Dear Fellow Florida AGD Members & Guests:

It has been a long struggle. BUT seriously, folks, this award is a surprise, a great honor. I am truly humbled and feel extremely privileged to receive this award from the Members of the Florida Academy.

As most of you know, I have served as Florida AGD Treasurer for almost 25 years. I took a brief hiatus from that position around **2000** to serve as your VP, President-Elect, and then President of this great organization. And, no sooner than my term of office as President was over, and while I was still Immediate Past President, I was also back as your Treasurer.

I have personally worked with 6 Executive Directors, 23 Presidents, and even though my office mate calls me a "Forensic Accountant," I have met and worked with more Board Members than even I can count. During this time, I have seen Members, Officers, Presidents, and especially Executive Directors come and go. But, if you grant me the privilege, I would like to take this opportunity to pay tribute to two ED's, in particular. First, Ms. Rosie Small, who was with us for over 13 years. Rosie was also a dear friend and unfortunately left us and this world much too soon. *May God Bless and keep you, Rosie.* And, of course, our current ED, Ms. Patricia Jenkins, who we can all thank for this wonderful luncheon and for her hard work and all the important things she does that supported me and supports our Academy on a daily basis.

I would also like to thank everyone for all their hard work and dedication and your confidence in me for all these years.

Lastly, and most importantly, I would like to thank my lovely wife for her partnership and understanding for the past 32 years. She been my inspiration & dedication for all these years. She has also proofed and edited an untold number of Florida AGD Reports for me and has even found accounting errors when I was unable to. Thank you, Terry.

Once again, thank you all for this singular honor in presenting me with the **Frank Collins Memorial Life-Time Achievement Award.**

God Bless the Florida Academy of General Dentistry and the United States of America.

Thank you to our speakers, Mr. John Kekel and Dr. Tyler Rathburn!

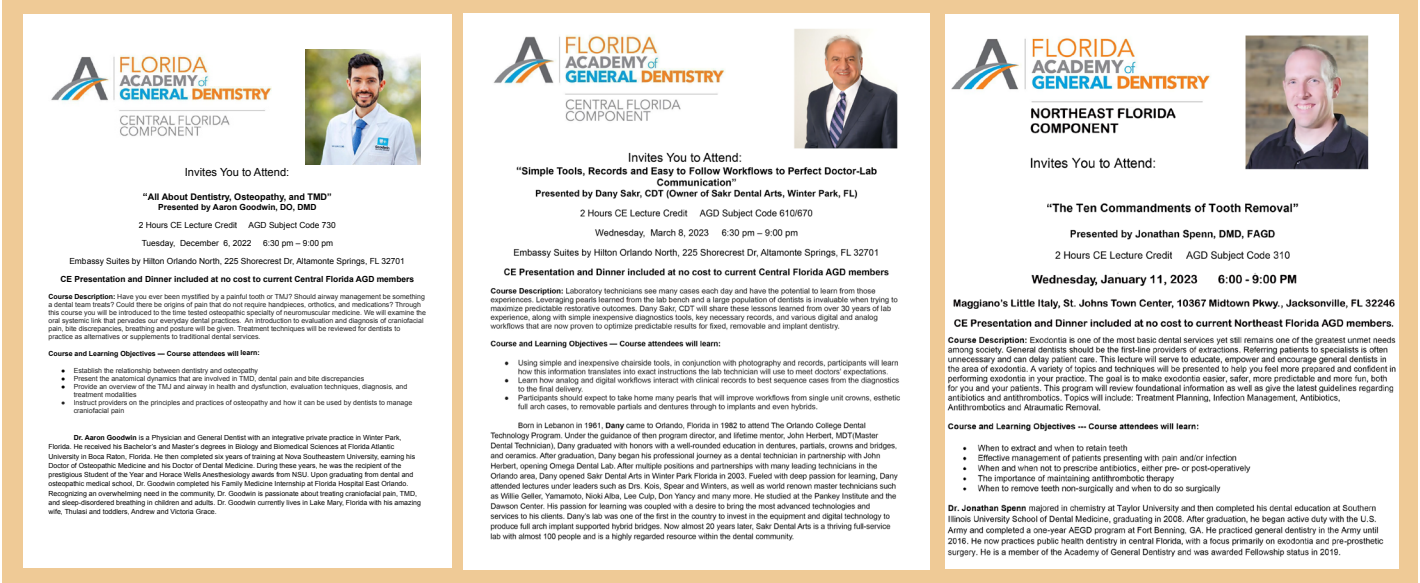
The Florida AGD was fortunate to have two excellent speakers on January 21 in Tampa. Mr. Kekel spoke to the General Assembly on "Proper Use of Legal Entities for Lawsuit Protection and Tax Reduction," and his firm, Legally Mine, generously sponsored the entire meeting.

Dr. Rathburn taught a 7-hour course, "Clear Aligners 101: The Basics - Hands-on Workshop," which the Florida AGD was able to offer free to the first thirty members who registered, thanks to the generous sponsorship of the General Assembly by Legally Mine. Mr. Kekel and Dr. Rathburn, a warm thanks to you both!

What's New With Florida's Components?

Florida is fortunate to be one of the few states with local AGD chapters, known as "components." Currently, our state has seven components:

- **Central Florida Academy of General Dentistry – Alachua, Brevard, Indian River, Lake, Marion, Orange, Osceola, Polk, Seminole, Volusia and Sumter Counties.**
- **Gold Coast Academy of General Dentistry – Broward, Glades, Hendry, Highlands, Martin, Okeechobee, Palm Beach, and St. Lucie Counties.**
- **Northeast Academy of General Dentistry – Baker, Bradford, Clay, Columbia, Duval, Flagler, Hamilton, Lafayette, Madison, Nassau, Putnam, St. Johns, Suwannee, and Union Counties.**
- **Southeast Academy of General Dentistry – Miami-Dade and Monroe Counties.**
- **Tampa Bay Academy of General Dentistry – Citrus, Dixie, Gilchrist, Hernando, Hillsborough, Levy, Pasco, Pinellas Counties.**
- **Northwest Academy of General Dentistry – Bay, Calhoun, Escambia, Franklin, Gadsden, Gulf, Holmes, Jackson, Jefferson, Leon, Liberty, Okaloosa, Santa Rosa, Taylor, Wakulla, Walton, and Washington Counties.**
- **Suncoast Academy of General Dentistry, currently inactive – Charlotte, Collier, De Soto, Hardee, Lee, Manatee, and Sarasota Counties.**



FLORIDA ACADEMY of GENERAL DENTISTRY
CENTRAL FLORIDA COMPONENT

Invites You to Attend:

"All About Dentistry, Osteopathy, and TMD"
Presented by Aaron Goodwin, DO, DMD

2 Hours CE Lecture Credit AGD Subject Code 730

Tuesday, December 6, 2022 6:30 pm – 9:00 pm

Embassy Suites by Hilton Orlando North, 225 Shorecrest Dr, Altamonte Springs, FL 32701

CE Presentation and Dinner included at no cost to current Central Florida AGD members

Course Description: Have you ever been mystified by a painful tooth or TMJ? Should airway management be something a dental team treats? Could there be origins of pain that do not require handpieces, orthotics, and medications? Through this course you will be introduced to the time tested osteopathic specialty of neuromuscular medicine. We will examine the oral systemic link that pervades our everyday dental practices. An introduction to evaluation and diagnosis of craniofacial pain, bite discrepancies, breathing and posture will be given. Treatment techniques will be reviewed for dentists to practice as alternatives or supplements to traditional dental services.

Course and Learning Objectives — Course attendees will learn:

- Establish the relationship between dentistry and osteopathy
- Present the anatomical dynamics that are involved in TMD, dental pain and bite discrepancies
- Provide an overview of the TMJ and airway in health and dysfunction, evaluation techniques, diagnosis, and treatment modalities
- Instruct providers on the principles and practices of osteopathy and how it can be used by dentists to manage craniofacial pain

Dr. Aaron Goodwin is a Physician and General Dentist with an integrative private practice in Winter Park, Florida. He received his Bachelor's and Master's degrees in Biology and Biomedical Sciences at Florida Atlantic University in Boca Raton, Florida. He then completed six years of training at Nova Southeastern University, earning his Doctor of Osteopathic Medicine and his Doctor of Dental Medicine. During these years, he was the recipient of the prestigious Student of the Year and Horace Wells Anesthesiology awards from NSU. Upon graduating from dental and osteopathic medical school, Dr. Goodwin completed his Family Medicine Internship at Florida Hospital East Orlando. Recognizing an overwhelming need in the community, Dr. Goodwin is passionate about treating craniofacial pain, TMD, and sleep-disordered breathing in children and adults. Dr. Goodwin currently lives in Lake Mary, Florida with his amazing wife, Thulasi and toddlers, Andrew and Victoria Grace.

FLORIDA ACADEMY of GENERAL DENTISTRY
CENTRAL FLORIDA COMPONENT

Invites You to Attend:

"Simple Tools, Records and Easy to Follow Workflows to Perfect Doctor-Lab Communication"
Presented by Dany Sakr, CDT (Owner of Sakr Dental Arts, Winter Park, FL)

2 Hours CE Lecture Credit AGD Subject Code 610/670

Wednesday, March 8, 2023 6:30 pm – 9:00 pm

Embassy Suites by Hilton Orlando North, 225 Shorecrest Dr, Altamonte Springs, FL 32701

CE Presentation and Dinner included at no cost to current Central Florida AGD members

Course Description: Laboratory technicians see many cases each day and have the potential to learn from those experiences. Leveraging pearls learned from the lab bench and a large population of dentists is invaluable when trying to maximize predictable restorative outcomes. Dany Sakr, CDT will share these lessons learned from over 30 years of lab experience, along with simple inexpensive diagnostics tools, key necessary records, and various digital and analog workflows that are now proven to optimize predictable results for fixed, removable and implant dentistry.

Course and Learning Objectives — Course attendees will learn:

- Using simple and inexpensive chairside tools, in conjunction with photography and records, participants will learn how this information translates into exact instructions the lab technician will use to meet doctors' expectations.
- Learn how analog and digital workflows interact with clinical records to best sequence cases from the diagnostics to the final delivery.
- Participants should expect to take home many pearls that will improve workflows from single unit crowns, esthetic full arch cases, to removable partials and dentures through to implants and even hybrids.

Born in Lebanon in 1961, **Dany** came to Orlando, Florida in 1982 to attend The Orlando College Dental Technology Program. Under the guidance of then program director, and lifetime mentor, John Herbert, MDT(Master Dental Technician), Dany graduated with honors with a well-rounded education in dentures, partials, crowns and bridges, and ceramics. After graduation, Dany began his professional journey as a dental technician in partnership with John Herbert, opening Omega Dental Lab. After multiple positions and partnerships with many leading technicians in the Orlando area, Dany opened Sakr Dental Arts in Winter Park Florida in 2003. Fueled with deep passion for learning, Dany attended lectures under leaders such as Drs. Kois, Spear and Winters, as well as world renown master technicians such as Willie Geller, Yamamoto, Nicki Alba, Lee Culp, Don Yancy and many more. He studied at the Pankey Institute and the Dawson Center. His passion for learning was coupled with a desire to bring the most advanced technologies and services to his clients. Dany's lab was one of the first in the country to invest in the equipment and digital technology to produce full arch implant supported hybrid bridges. Now almost 20 years later, Sakr Dental Arts is a thriving full-service lab with almost 100 people and is a highly regarded resource within the dental community.

FLORIDA ACADEMY of GENERAL DENTISTRY
NORTHEAST FLORIDA COMPONENT

Invites You to Attend:

"The Ten Commandments of Tooth Removal"

Presented by Jonathan Spenn, DMD, FAGD

2 Hours CE Lecture Credit AGD Subject Code 310

Wednesday, January 11, 2023 6:00 - 9:00 PM

Maggiano's Little Italy, St. Johns Town Center, 10367 Midtown Pkwy., Jacksonville, FL 32246

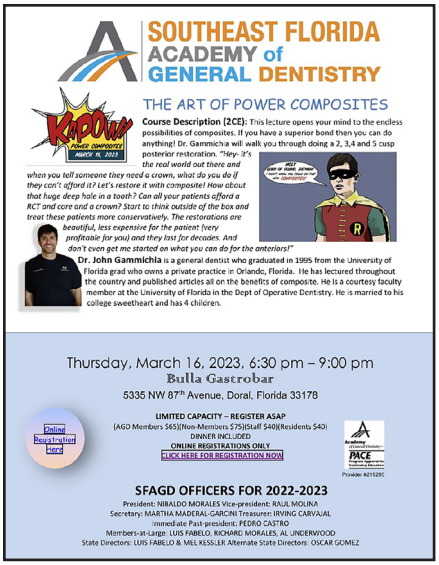
CE Presentation and Dinner included at no cost to current Northeast Florida AGD members.

Course Description: Exodontia is one of the most basic dental services yet still remains one of the greatest unmet needs among society. General dentists should be the first-line providers of extractions. Referring patients to specialists is often unnecessary and can delay patient care. This lecture will serve to educate, empower and encourage general dentists in the area of exodontia. A variety of topics and techniques will be presented to help you feel more prepared and confident in performing exodontia in your practice. The goal is to make exodontia easier, safer, more predictable and more fun, both for you and your patients. This program will review foundational information as well as give the latest guidelines regarding antibiotics and antithrombotics. Topics will include: Treatment Planning, Infection Management, Antibiotics, Antithrombotics and Atraumatic Removal.

Course and Learning Objectives --- Course attendees will learn:

- When to extract and when to retain teeth
- Effective management of patients presenting with pain and/or infection
- When and when not to prescribe antibiotics, either pre- or post-operatively
- The importance of maintaining antithrombotic therapy
- When to remove teeth non-surgically and when to do so surgically

Dr. Jonathan Spenn majored in chemistry at Taylor University and then completed his dental education at Southern Illinois University School of Dental Medicine, graduating in 2008. After graduation, he began active duty with the U.S. Army and completed a one-year AEGD program at Fort Benning, GA. He practiced general dentistry in the Army until 2016. He now practices public health dentistry in central Florida, with a focus primarily on exodontia and pre-prosthetic surgery. He is a member of the Academy of General Dentistry and was awarded Fellowship status in 2019.



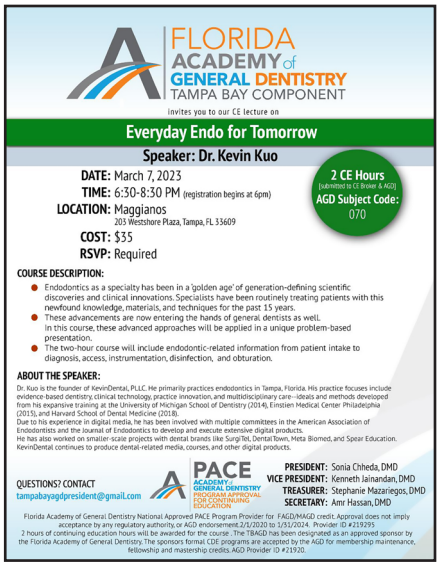
Here's a look at some of the Florida components' recent and future activities. If you are not currently participating in your component, please join your fellow general dentists at the next local meeting and invite your dentist friends to join you and the AGD!

Central Florida

Central Florida has 409* members and meets frequently for dinner and continuing education. Their president is Dr. Nishita Patel. The CFLAGD's most recent programs were "Orthodontic Treatment of the Worn Anterior Dentition," presented by Dr. John X. Cordoba on September 21, 2022, and "All About Dentistry, Osteopathy and TMJ," by Dr. Aaron Goodwin on December 6, 2022. Both programs were held in Altamonte Springs. Their next dinner meeting will be held in March, with the topic of "Simple Tools, Records and Easy to Follow Workflows to Perfect Doctor-Lab Communication," to be presented by Dany Sakr, CDT, the owner of Sakr Dental Arts in Winter Park.

Tampa Bay

The Tampa Bay component has 315 members* and is very active with frequent meetings. Their president is Dr. Sonia Chheda. The TBAGD held a dinner meeting on December 6 on "Dental Erosion: Etiology, Diagnosis, Risk Factors and Management," by Dr. Alex Delgado. The next meeting, "Everyday Endo for Tomorrow," by Dr. Kevin Kuo, will be held on March 7. Additional future programs include a full day participation course on Platelet Rich Fibrin, presented by Dr. Lester Gil on April 1, and a lecture on oral pathology by Dr. Indraneel Bhattacharyya on April 4.



Northeast

On January 11, 2023, in its first meeting in three years, the Northeast Component held a well-attended dinner meeting in Jacksonville. Dr. Jonathan Spenn gave an excellent lecture on "The Ten Commandments of Tooth Removal," and AGD President-Elect Dr. Merlin Ohmer addressed the attendees about the AGD. In a brief follow-up to the AGD's Advocacy Conference in October, component Past President Dr. Millie Tannen encouraged members to become involved in dental advocacy efforts. The 144-member* component is currently in the process of forming a board of officers and applying for PACE approval.

Southeast

In the September, 2022, issue of the Florida Focus, Dr. John Gammichia's article asked our readers, "What Happened to the Big Filling?" On March 16, 2023, he will expand on his answer to that question for the Southeast Component in his lecture "The Art of Power Composites." The component has 180* members and is headed by President Nibaldo Morales.

Once again, if you have not been attending your local AGD meetings, take advantage of this membership benefit and join your fellow AGD members at the next local event for continuing education, dinner, and camaraderie!

***All membership numbers are from the AGD's "Current List of Members" as of December 31, 2022.**

Previous page, top left: Members of the Northeast Component enjoy dinner; **right,** Drs. Jonathan Spenn and Merlin Ohmer at the Northeast Component meeting. **This page, below:** Northeast AGD members are absorbed in Dr. Spenn's lecture.

Leading With the Chin:

Facial Rejuvenation of the Lower Third

by Dr. Gigi Meinecke

INTRODUCTION

This article provides an overview of injectable rejuvenation of the facial lower third, specifically the chin. After defining the chin, we'll discuss its uniqueness in humans, sexual dimorphism, manifestations of aging, and finally how to stage injectable treatment to optimize esthetic outcomes.

Facial injectable treatment, like any other endeavor, begins with the end in mind. Unlike purely therapeutic treatments such as root canals or extractions, esthetic procedures have to satisfy both the practitioner and the patient. To achieve this, cosmetic consultations must include the following:

- ◊ **What are the treatment goals?**
- ◊ **What does success look like in the treatment area?**
- ◊ **Can treatment goals be achieved with injectables?**
- ◊ **Will the patient be satisfied with the projected outcome?**

As obvious as these considerations may seem, treatment results that miss the mark are often the consequence of not thinking it through before the first needle is uncapped. Meaning, success is often doomed from the start.

In all areas of the face, practitioners need a clear vision of what "optimum" looks like. It sounds straightforward until you realize that "optimum" is predicated on and modified by age and gender. For example, creating full, juicy lips on a 55-year-old man, in general, looks unnatural. This is also why "single technique" practitioners struggle when a patient outside a specific demographic presents for treatment. Using the same technique on every patient can be a recipe for disaster. Understanding how age and gender impact the operational approach and goal of any given treatment is an essential skill. Likewise, the ability to convey that information to patients in a clinically compassionate way is also fundamental.

DEFINING THE CHIN

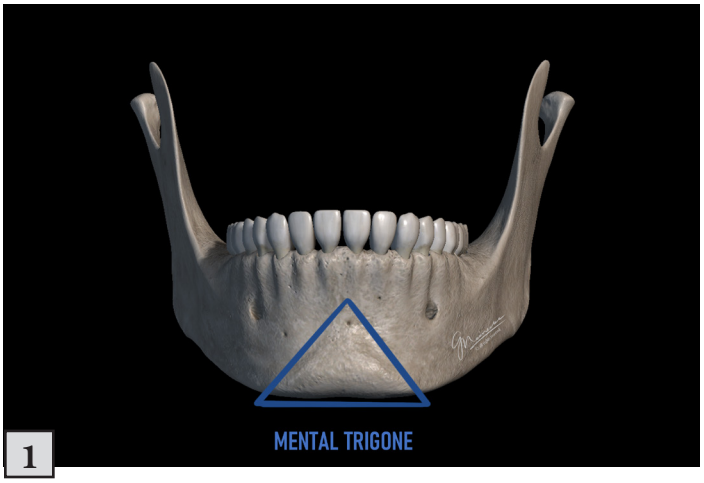
Anatomically, the chin, or "Mentum," is defined as the frontal portion of the mandible, which is the anatomical line of fusion between the two embryologically distinct halves of the mandible (symphysis menti). This fusion line creates a slightly raised median ridge that divides inferiorly to enclose a triangular area called the mental protuberance. This fusion point is not a true symphysis in that there is no cartilage between the two halves of the mandible. At the midline, the base of this protuberance is depressed, and flanked by raised areas known as the mental tubercles. Collectively, the protuberance and the two tubercles are called the mental trigone. [fig. 1] Ideally, the chin projects anteriorly to a point that meets a vertical line drawn from the nasion, which is perpendicular to the Frankfort horizontal line. This point of maximum projection is called the pogonion.

For our discussion, we'll define the chin in slightly broader terms. A more inclusive description is suitable since esthetic treatments typically encompass a region rather than a single point of projection. Here, we'll use the term "chin" to denote the location bound superiorly by the lower lip, laterally by a vertical line dropped inferiorly from the oral commissures (approximating the marionette lines) and defined caudally by the inferior border of the mandible. [fig. 2]

UNIQUENESS OF THE HUMAN CHIN

The forward projecting element at the midline of the mandible is a distinctive feature in homo sapiens. Very specifically, the triangular-shaped projection, the mental trigone, is uniquely human. All mammals, even our closest DNA relatives, the Chimpanzee and the Bonobo, lack an anteriorly projected mentum. Their "chins" slope posteriorly in a retrusive fashion. [fig. 3]

Much attention has been given to the human chin and the possible reason why humans "developed" that midline mandibular projection



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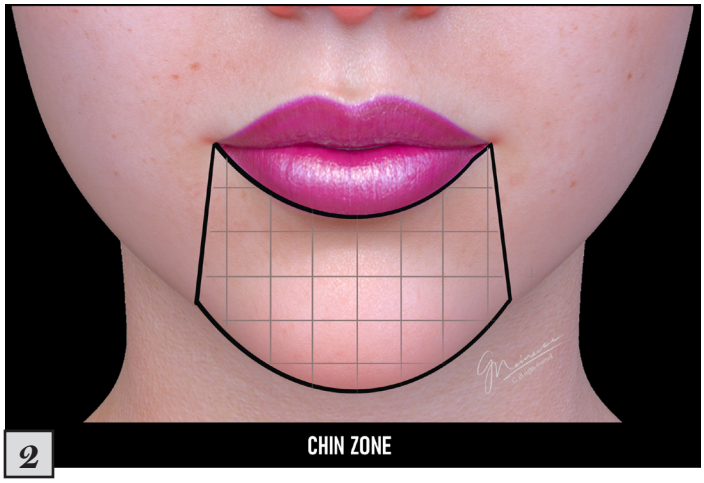

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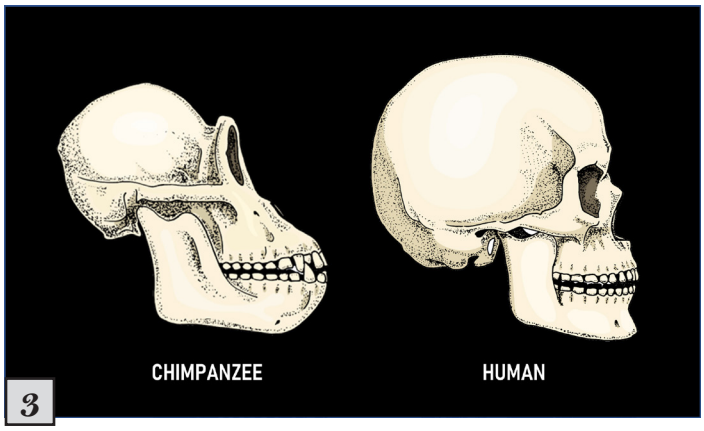

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4 OPTIMUM CHIN PROJECTION – ZERO-DEGREE MERIDIAN LINE

Through the years, evolutionary anthropologists have offered many theories as to why the hominin chin came to be - whether by mutation, genetic drift, gene flow, or natural selection. Some of these theories have been disproven and others have yet to be validated. For example, adaptation hypotheses for both speech and mastication have been negated since it's extremely likely that chinless extinct hominins used complex vocalizations. Likewise, functional analyses demonstrate that the human mandible is actually overbuilt for the masticatory demands of our modern diet. Moreover, since both men and women have chins, the "sexual ornament" theory is unsupported. The current popular theory is that it's vestigial and has no functional advantage or purpose.

Regardless of its evolutionary etiology, the chin significantly contributes to our esthetic interpretation of the overall facial shape. A well-formed chin creates balance and harmony. To a certain degree, it even plays a role in social signaling. A chin's projection can influence our perception of an individual's dominance without any evidence to support such an assumption. Its "strength" or "weakness" is often used in first impressions to intuit a person's character or leadership qualities. Notwithstanding the incentive, whether social or structural, consideration of the chin, its size, and shape, are important factors in any facial esthetic evaluation.

SEXUAL DIMORPHISM

From an esthetic point of view, regardless of culture or ethnicity, we prefer a chin that projects anteriorly far enough to meet a vertical line coincident with the nasion in both men and women. [fig. 4] However, geometrically, the chin shape does present sexually dimorphic differences. The male chin is one of the most characteristic features of the masculine face. It tends to protrude more, with the lateral tubercles more developed than those of the female, giving the chin a more square and wider appearance. The female chin appears rounder in shape and its width approximates the medial intercanthal distance. The anatomical reference for width in men is slightly wider, ending at the oral commissures.

OPTIMUM CHIN ESTHETICS

Without question, the chin is the drum major of the facial lower third. It contributes greatly to overall facial shape as well as providing balance to other facial features. Studies show it's a key factor in facial attractiveness as well as the perception of youthfulness. , , Large disparities in chin height in both men and women are perceived as the least attractive facial feature. Due to the negative impact on a patient's self-image, chin height disproportions are frequently corrected surgically.

Even today, the majority of injectable practitioners don't routinely include the chin in esthetic treatment planning. Moreover, it's rare that a patient possesses the necessary level of sophistication to recognize that their chin has either undergone changes or that injectables are capable of enhancing or rejuvenating this area. Practitioners and patients alike usually zero in on crowd favorites and are frequently blind to pivotal structural assets. Treating popular areas, such as the lips without considering the chin is akin to replacing only the front door of a dilapidated house.

SENESCENT CHIN PRESENTATION

Like other facial features, the chin sustains volumetric and topographical changes over time. Age-related hard tissue changes manifest primarily as dimensional and positional modifications. A decrease in the height of the symphysis in both sexes leads to a more square appearance of the chin shape. Mandibular rotation (posterior in women and anterior in men) leads to a retrusive or protrusive chin appearance respectively. In both men and women, the buccal aspect of the bony incisive fossa undergoes age-related resorption. Interestingly, the skeletal thickness of the incisive fossa remains largely unchanged due to concurrent apposition on the lingual aspect in that area. Nonetheless, predictable resorption patterns diminish the bony scaffolding which, in youth, provides support to the overlying soft tissue flanking the mentalis muscle. Age-related resorption results in a weakening of soft tissue projection in that area.

Soft tissue changes in the face begin early in adulthood and are strongly correlated with sun exposure and smoking. Facial aging is more noticeable in females than males due in part to differences in skin thickness and collagen content. These changes are precipitated primarily by the hormonal impact of menopause. Regardless of sex,

FACES

Dr. Gigi Meinecke has been active in the field of facial injectables since 2004. In 2013 she established **FACES Education,** providing cosmetic and therapeutic injectable training to medical and dental professionals with a core focus on comprehensive facial anatomy. Her programs regularly integrate cadaver study with live patient injections.

In addition to teaching nationally, Dr. Meinecke is instructor and the Course Director and facial anatomy prosector for the Facial Injectables Pre-doctoral program at the Boston University School of Dental Medicine. She also provides litigation support as an expert witness in the injectable domain.

Her publications include "*Applications for Facial Injectables in Dentistry*," *"Lower Face Influence on Total Facial Esthetics*," and "*When and How to Say No to Facial Injectable Patients*." She is author of the book, "*Start and Grow Your Cosmetic Injectable Practice*."

Dr. Meinecke is a past President of the Maryland Academy of General Dentistry. On the national level, she is past Chair of the ADA Council on Communications and serves as spokesperson for the AGD. She is a Fellow in the Academy of General Dentistry, the International College of Dentists, and the American College of Dentists. Dr. Meinecke maintains a private practice limited to facial injectables in Potomac, Maryland.

5 ARROWS INDICATE 2 EXAMPLES "POTATOE-EYE" DIMPLING

6 GOLF-BALL APPEARANCE

7 PREJOWL SULCUS DELINEATED BY TRIANGLE

8 PERIMENTAL ZONES

age-related soft tissue depletion allows surface irregularities in the facial lower third to become more obvious. Multiple, conspicuous mentalis muscle-skin insertion points become visible. These randomly arranged adhesions between muscle and skin produce an irregular, "potato-eye" appearance. [fig. 5]

The area flanking the mental trigone is called the perimental zone. This region is medial to and includes the marionette lines. It's limited superiorly by the lower lip vermilion and ends inferiorly at the mandibular border. Here too, soft tissue sustains volumetric loss. It combines with the loss of bony support in the incisive fossa to allow the solitary mentalis muscle to present as an elevated golf ball-like tumescence. [fig. 6]

With time, the smooth, full, uninterrupted contours of youth seem to disaggregate. The once-subtle transitions between anatomical facial segments are replaced by shadowy creases and an irregular, pock-marked surface emerges. Lines form at muscle origins while skin pores enlarge and become more conspicuous. These changes represent the hallmark of the senescent chin.

INJECTABLE OPTIONS FOR THE CHIN

The approach to chin modifications with injectables is wholly predicated on the presenting deficiencies. These deficiencies can be divided into two general categories:

1. Projection and shape, or
2. Projection and shape with age-related defects.

PROJECTION AND SHAPE

A youthful under-projected chin should be evaluated to determine the magnitude of the projection deficiency as well as any associated geometric defects. Under projection can result from either a bony or soft tissue insufficiency or it can be a combination of both. Geometric assessment should determine any disparities in width and overall shape. For example: Is the chin too pointy? Overly square? Too narrow? Too short? etc.

Viewed from the injectable modality standpoint, projection problems that are bony in origin require dermal filler to restore. Prior to placement of dermal filler in the central chin area, it's advantageous to treat the mentalis muscle with toxin. By decreasing muscle contractility prior to treatment, the residency time of the filler increases. Pretreatment with toxin also decreases potential flattening of the dermal filler projection within that first 48 postoperative hour window when hyaluronic acid based fillers are still "moveable."

Projection deficits that are muscular in origin and have satisfactory bony support can often be treated solely with neuromodulation. Mentalis hyperactivity is managed with aggressive toxin treatment. This muscle is very strong and can tolerate fairly high, well-placed doses of toxin without untoward effects. Treating this muscle also decreases muscular traction on the lower lip, allowing a more neutral placement and fuller labial contour.

PROJECTION AND SHAPE WITH AGE-RELATED DEFECTS

Much like the youthful chin, the senescent chin can present with size, shape, and projection challenges. However, dimensional changes in the maturing chin are compounded by age-related distortions. A hyperactive mentalis muscle is practically endemic with increasing age, therefore, treatment of the full constellation of presenting deficits is often best initiated with neuromodulation. Treatment with toxin decreases the baseline "tug" the muscle applies to its skin insertions. This diminishes the characteristic "potato eye" deformity. It produces a smoother, fuller appearance. Moreover, as the mentalis muscle also lifts the caudal aspect of the chin rostrally, treatment with neuromodulation decreases the appearance of the mental crease depth and width. By the same principle, toxin placed at the muscle origin site can increase the length of the chin in its rostral-caudal dimension. This sets the stage for the dermal filler segment of rejuvenation.

When the full effect of neuromodulation is realized, strategic placement of dermal filler can replace extant volume loss. Re-establishing maximum chin projection (pogonion) is an excellent starting point for any augmentation. Increasing chin prominence effectively provides a "tent pole" that not only elevates the tissue immediately superficial to the filler, it suspends neighboring tissue as well. This aids in establishing a smoother mandibular line by distracting the adjacent ptotic tissue in the prejowl area. Once the pogonion is augmented to either: 1. coincide with the "zero-degree meridian line" (a vertical line dropped from the soft tissue nasion perpendicular to the Frankfort Horizontal Plane), or 2. provide enough projection to achieve a satisfactory esthetic endpoint, the prejowl area is treated next.

The prejowl sulcus typically presents as a triangular-shaped depression at the caudal end of the marionette line. [fig.7] Small aliquots of dermal filler placed strategically in this area are effective in masking the mandibular undulations associated with the aging chin. The youthful appearance of an unbroken line sweeping from pogonion to gonial angle can be recovered with surprisingly modest volumes in this area.

With the chin augmented and the mandibular sweep re-established, perimental hollows are the logical next step. These hollows form trapezoidal medial extensions of the marionette lines ending at the midline and superior to the mental crease. [fig. 8] Untreated, these present as shadowy recesses consistent with an aging visage. Replacing volume loss in the perimental zone evokes a more approximate depiction of a youthful lower facial third.

SUMMARY

Before any injectable treatment, a thorough discussion of existing problem(s) and patient desired outcomes should take place. Obtaining an accurate assessment of the patient's concept of expected results is time well spent. This conversation should clarify 4 things:

1. **specifically, what the patient hopes to achieve**
2. **whether injectables are the appropriate modality to achieve the desired result**
3. **whether the patient has reasonable expectations**
4. **whether you want to be the one who treats this patient**

Knowledge of the typical age-related deformities native to each area of the face helps streamline the approach to treatment planning. Moreover, when rejuvenating the chin, logical staging of injectable treatment can result in a longer duration of effect, more economical use of product, and potentially better esthetic outcomes. Beginning with the end in mind when treating the chin, as well as all other facial injectable areas, establishes a blueprint for success.

External Cervical Resorption

by Dr. Tom Brown

Dr. Tom Brown received his DMD from the University of Florida and his endodontic certificate along with an MS from the University of North Carolina at Chapel Hill. He is very active in the American Dental Association, Florida Dental Association and Southern Endodontic Study Group. He also holds memberships in the Pierre Fauchard Academy and International College of Dentists in addition to serving as courtesy faculty at the UF Graduate Endodontic Clinic. He has a private endodontic practice in Orange Park, FL.

There is no doubt that the clinical practice of dentistry comes with many diagnostic and treatment challenges. One common entity that provides such a challenge is external cervical resorption (ECR). While the prevalence reported in the literature ranges from 0.02%-0.08%[1,2], it still appears to be a relatively common finding in clinical practice. The purpose of this article will be to familiarize the reader with the etiology and pathogenesis, clinical assessment, and treatment of these cases.

While much is known about the disease process in ECR, the etiology is poorly understood. Most studies have most commonly shown associations between ECR and trauma, orthodontic treatment, scaling and root planning, and adjacent tooth extraction[2,3]. Malocclusion and parafunction may possibly exacerbate ECR once it has been initiated[3]. 35-60 year olds are the most likely to demonstrate ECR and there is no predilection for male or female[2,3]. Perhaps best illustrating the uncertainty surrounding etiology is that a European study showed that ECR was associated with playing wind instruments in 2.7% of cases studied[3].

While there is some disagreement as to the role of bacteria in the initiation of ECR, it is generally agreed that inflammation drives the resorption process[4]. Of course, inflammation alone cannot explain ECR or it would be far more prevalent. The second component that is likely necessary is a susceptible tooth. Enamel and cementum are largely resistant to resorption, so a defect where dentin is exposed is thought to be required. This defect may be due to a developmental gap between cementum and enamel at the CEJ in some teeth or may be a result of various dental procedures or trauma as mentioned previously. As ECR progresses, it is important to note that it will not be able to cause resorption of the innermost layer of dentin that surrounds the pulp.

It is important to be able to differentiate ECR from internal resorption as their radiographic appearance may be quite similar. On the whole, it has been the author's experience that ECR is vastly more common than internal resorption. An important clue on a periapical radiograph that ECR is the culprit will be that the faint outline of the canal will still be visible due to the aforementioned inability to resorb the innermost layer of dentin. In some cases, ECR may resemble cervical caries radiographically and mislead the clinician. One important distinguishing factor is that it will typically be nearly impossible to detect the resorption defect with an explorer as the origin is subgingival and frequently very small. Further, while attempting to treat the tooth, the "cavity" will be filled with a highly vascular soft tissue that will bleed readily. Some teeth may also exhibit a pink hue coronal to the CEJ due to the proliferation of this vascular soft tissue responsible for the resorption.

Much of the knowledge we have about ECR comes from the work of Australian endodontist Geoffrey Heithersay. The classification system he developed is still widely used, though some attempts have been made to develop more modern systems that incorporate CBCT into staging of the lesions[5,6].

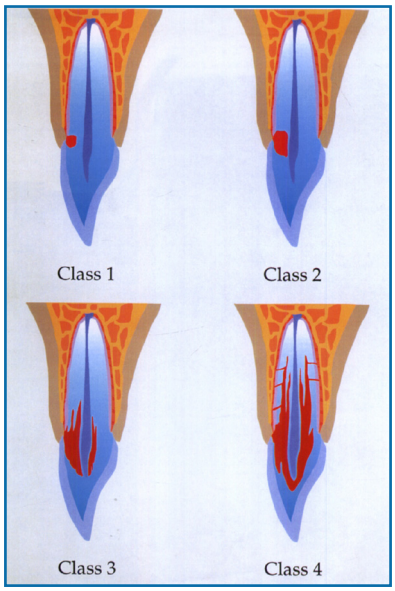

Figure 1. Heithersay Classification of external cervical resorption based on extent of the resorption.

The advantage of the Heithersay classification is that there is evidence available for outcomes of treatment based on the classification of the ECR.

In this day and age, use of CBCT in diagnosis and treatment planning for ECR should be considered essential. Given that the prognosis for treatment is largely dependent on access to treat the lesion and restore the tooth appropriately, knowing the location and full extent of the resorption defect is not possible with periapical radiographs alone. Additionally, the likelihood of pulp exposure during treatment can be assessed.

Figure 1 shows the classification of ECR lesions based on the Heithersay classification[7]. As might be expected, in the study smaller Class 1 and 2 lesions carry higher success rates and ability to fully arrest ECR lesions. In fact, 100% of the cases studied showed success as well as no additional resorption over and average of 4.5 years for Class 1 lesions and 8 years for Class 2 lesions. However, even the more extensive Class 3 lesions showed 77.8% success rates over an average follow up period of 5.5 years. The survival rate for Class 3 lesions during the study period was 92.1%. Class 4 lesions show extremely poor success and survival rates and extraction would be the recommended treatment.

When treatment of ECR is needed, many times endodontic treatment will also be required, but it should not be assumed that it will be necessary. **Figure 2** shows a case where endodontic treatment was not needed. When treating the defect created by the resorption, surgical access will typically be required. Once all curettage of soft tissue from the defect has been accomplished, it is important to treat the defect first with a 90% trichloroacetic acid (TCA) solution as described by Heithersay[7]. This ensures that any residual tissue tags within the defect are chemically cauterized without the need for excessive removal of tooth structure. It should be noted that 90% TCA is quite caustic to adjacent tissues, so care must be taken. Using a microbrush that is very slightly moistened with the 90% TCA helps to apply carefully only to the defect.

Once the lesion has been treated, endodontic treatment may be completed if needed. To restore

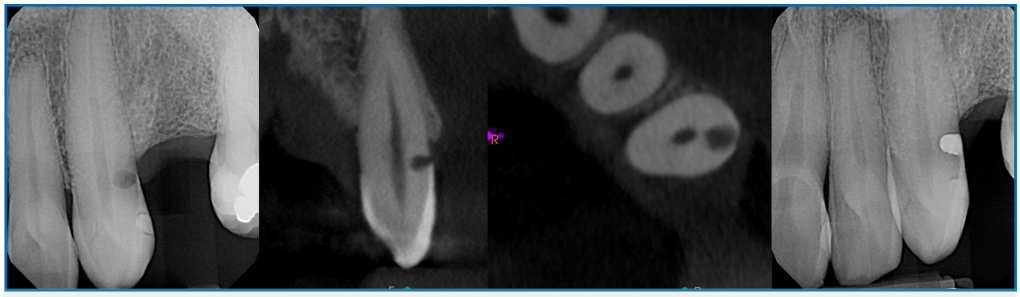

Figure 2. A periapical radiograph of tooth #11 indicates that the external cervical resorption is close to reaching the pulp space. Sagittal and axial CBCT slices provide confidence that the pulp is unlikely to be affected by the treatment of the lesion. A final periapical radiograph shows that conservative treatment of the lesion is successful without the need for endodontic treatment.

the defect, a glass ionomer such as Geristore is a good choice as moisture control may be difficult. If esthetics are a concern, a composite restoration may be used over a base of glass ionomer. It is important to note that 90% TCA acts as an etchant and no further application of etchant will be needed.

In some cases, an external surgical approach may be more destructive or difficult than approaching the defect through modification of a traditional endodontic access. **Figure 3** illustrates a case where this approach was utilized[8]. Once access is extended and all resorptive tissue is removed, obturation of the canals can be completed as normal. The defect created by the resorption should be treated with 90% TCA and, preferably, a bioactive material such as mineral trioxide aggregate (MTA) should be used to restore the defect.

Unfortunately, there are many times that the size and location of a defect from ECR can mean that treatment of the lesion is not advisable. In these situations, monitoring is often a successful strategy and will result in retention of the tooth for a long period of time. ECR lesions are very typically asymptomatic and may progress very slowly, allowing the patient to retain a functional tooth for many years.

Though ECR is not exceptionally common, it is important to recognize patients that will present to your office. When developing a treatment plan, utilization of CBCT is critical to anticipate how successful treatment may be and whether or not it should be anticipated that endodontic treatment will be needed as well. It is important to remember that even Class 3 Heithersay lesions have an excellent prognosis and can be treated successfully. When treating ECR, the use of 90% TCA is essential when it comes to preventing continuation of the resorption after treatment. In the case of more extensive lesions that are not easily treatable, it is also important for the practitioner to remember that monitoring of the tooth may result in retention of a functional tooth for many years to come.

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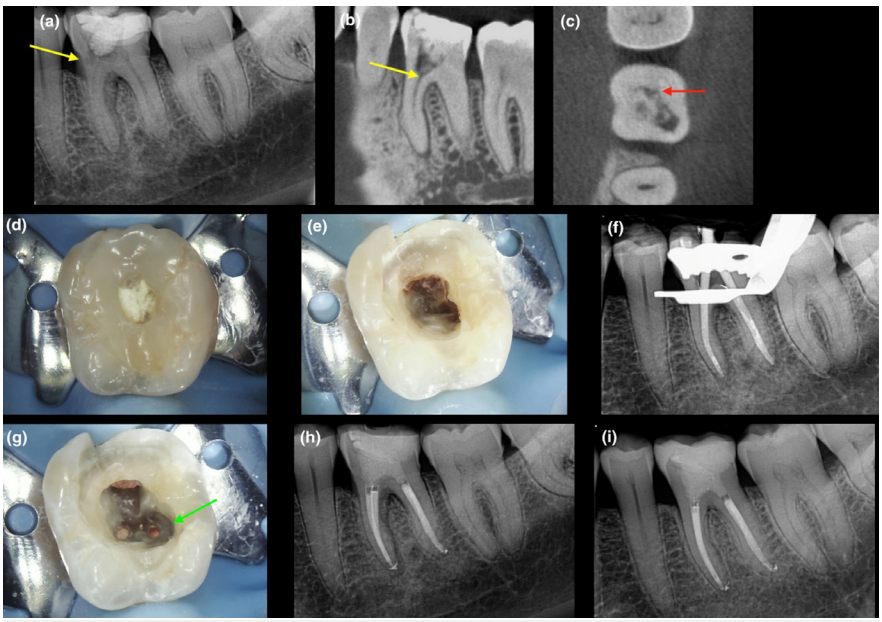

Figure 3. (a-c) Conventional and CBCT imaging help assess the extent of the resorption. (d) Prior to and (e) after initial access preparation. (f) Master cone radiograph. (g) Extension of the access after obturation to remove all of the resorption defect and tissue. (h) Final radiograph and (i) 3 year follow up radiograph.

> "It has been the author's experience that ECR is vastly more common than internal resorption... When treatment of ECR is needed, many times endodontic treatment will also be required, but it should not be assumed that it will be necessary."
>
> **- Dr. Tom Brown**

Dentist Availability in the Western and Midwestern United States

by Bernardo Caldas, John Kraynik, and Ahmadreza Khademi

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Abstract

To examine the number of practicing dentists in West and Midwest states during the four-year range following the opening of a new dental school. Systemic review to compare the number of dental schools available in a state and the number of working dentists in that state. American Dental Association (ADA) Supply of Dentists in the US: 2001-2020 was used for state data and National Library of Medicine's (PubMed) was used for literature. Most states showed an increase in the number of in-state practicing dentists after a new dental school was opened. The opening of a state's first dental school showed a more significant increase in the number of practicing dentists, as compared to when state's opened their second or third school.

Key words: dentistry, disparity, delivery of healthcare, dental education, healthcare provider shortage area (HPSA)

Introduction

It is generally accepted that healthcare disparities exist across the United States. Disparities can be examined through different categories: socioeconomic status (SES), demographics, or geographic distribution.1,2 Geographic disparities contribute to a lack of access to healthcare which extends to dentists, primary physicians, specialists, and mental health providers.3 This review will compare the number of dental schools available in a state and the number of working dentists in that state. For the purposes of this project, researchers examined several states in the Western and Midwestern United States. The goal was to examine a wide variety of states in similar geographic regions of the country. Several western and midwestern states opened new dental schools to address the deficiencies in access to dental care in these regions after the year 2000: Arizona and Utah opened the 1st and 2nd dental programs in their respective states, California opened its 6th and 7th programs, Missouri opened its 2nd, Illinois its 3rd, and Nevada and Iowa opened their 1st dental schools ever in the state. The states examined with a dental school opened prior to the year 2000 in the West and Midwest are Oregon, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Michigan, Ohio, and Colorado. The states of Wyoming, Idaho, New Mexico, and Montana currently do not have an in-state dental program available for their residents. While there are 67 current general dentistry programs in the United States, not every state has a dental school within their borders. It was decided to use the West and Midwest as the comparison group because of the reasonable distribution of states with new dental schools, states with multiple programs, states with older dental programs, and states without any dental school. Authors predicted that states opening their first dental school would see the most significant increase in the number of practicing dentists during the four year range from the year school was opened to the year that the inaugural class graduated, when compared to other nearby states.

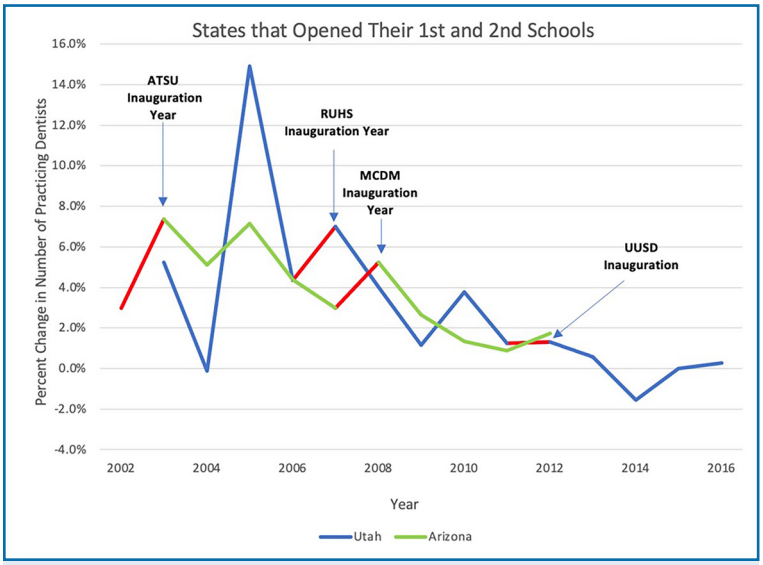


Figure 1. Illustrates the percent change of working dentists in the states of Wyoming, Idaho, New Mexico and Montano. These states currently do not have a dental school.

Methods

A comprehensive analysis of the American Dental Association (ADA) Supply of Dentists in the US: 2001-2020 was performed. For states that opened a new dental school after the year 2001, specific date ranges were examined. The goal was to collect data four years prior to the opening of the school and compare it to four years after (year of graduation) the inaugural class enrolled. For states without a dental program and states with a dental program founded prior to the year 2001, the date range of 2001-2019 was used. The goal was to compare the trends seen in the three groups: states with a new dental school, states with an old dental school, and states lacking any dental school.

Researchers categorized the states based on presence and characteristics of the dental program. The categories are as follows: state opened its first dental school in the twenty-first century, state opened an additional dental program in the twenty-first century, state had a dental program founded prior to the twenty-first century, and state had no dental program within its borders.

A comprehensive search of the English literature using the National Library of Medicine's (PubMed) database was performed. Keywords used during the search included population-based dentistry, oral health disparities, access disparities, dental care access, oral health care access, dental education, dental faculty shortage, dental education.

Results

Arizona established two dental programs after the year 2000; A.T. Still University (ATSU), Arizona School of Dentistry and Oral Health in 2003 and Midwestern College of Dental Medicine – Arizona (MCDM) in 2008. In 2002, Arizona saw a 2.98% increase in the number of dentists practicing in their state when compared to the year prior. In 2003 (the year ATSU opened its doors), the state increased the number of dentists by 7.36% compared to the year prior, and from 2003-2007 there was an average 5.39% increase per year. During 2008-2012, Arizona saw a smaller increase of 2.36% annually (see Figure 1).

The state of California saw the inception of two new dental programs since the year 2000. Western University of Health Sciences (WUHS) College of Dental Medicine was founded in 2009. That year, the number of practicing dentists in California increased

by 2.05% when compared to the year prior. The four years prior to the opening of WUHS, California averaged a 1.54% increase in the number of practicing dentists per year. From 2009-2013, the state observed an annual increase of 1.03%. California Northstate University (CNU) College of Dental Medicine opened in 2015. From 2011-2014, the percentage of practicing dentists increased on average by 1.19%. From the year the inaugural class arrived on campus, 2015, to the time they graduated, 2019, California averaged an annual increase of 0.56% (see Figure 2).

Missouri School of Dentistry & Oral Health (MSDOH) at ATSU, Missouri's second dental program, opened its doors to its initial class of 42 students in 2013. The previous four years saw an average increase of 1.69% in the number of practicing dentists in the state of Missouri. In 2013, a decrease of -0.37% was observed and from 2013-2017, the state had an average increase of 1.69% (see Figure 2).

Utah founded both its first and second dental educational programs in the twenty-first century. Roseman University of Health Sciences College of Dental Medicine (RUHS) accepted its first class of students in 2007. That year, the state saw an increase of 6.99% in the number of practicing dentists. The four years prior also saw a strong average annual increase of 6.09%, owed to a 14.91% increase from the years 2004-2005. From 2007-2011, the state of Utah saw an average increase of 3.43% in their practicing dentist population. The following year in 2012, the University of Utah School of Dentistry (UUSD) began accepting students. The year of 2012 saw an increase in the state's number of practicing dentists of 1.30% and from 2012-2016, the state averaged a low annual increase of 0.12% (see Figure 1).

University of Nevada, Las Vegas School of Dental Medicine (UNLV) opened in the fall of 2002. Due to availability of data, researchers were unable to analyze the four years prior to the opening of the school. In 2002, an increase of 2.79% occurred in the state. From 2002-2006, an average annual increase of 7.16% in the number of practicing dentists was observed. UNLV was the first, and remains the only, dental program in the state of Nevada (see Figure 2).

Utah saw a strong average annual increase of 3.43% from 2007-2011 after opening its first dental program. Neighboring states of Idaho and Wyoming, both of which lack a dental program, observed an average annual increase of 1.58% and 2.09%, respectively, during the same timeframe (see Figure 1). Similarly, neighboring Colorado, which has a more historic dental program, observed an average annual increase of 2.36%.

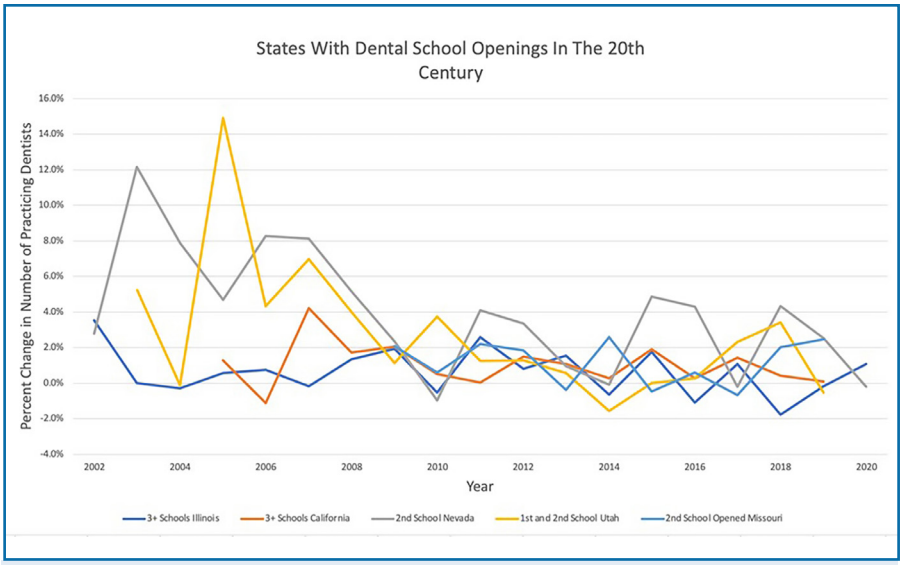


Figure 2. Arizona and Utah are a few of several states that opened their first and second dental schools after the 20th century and noted an increase in the number of working dentists after inauguration.

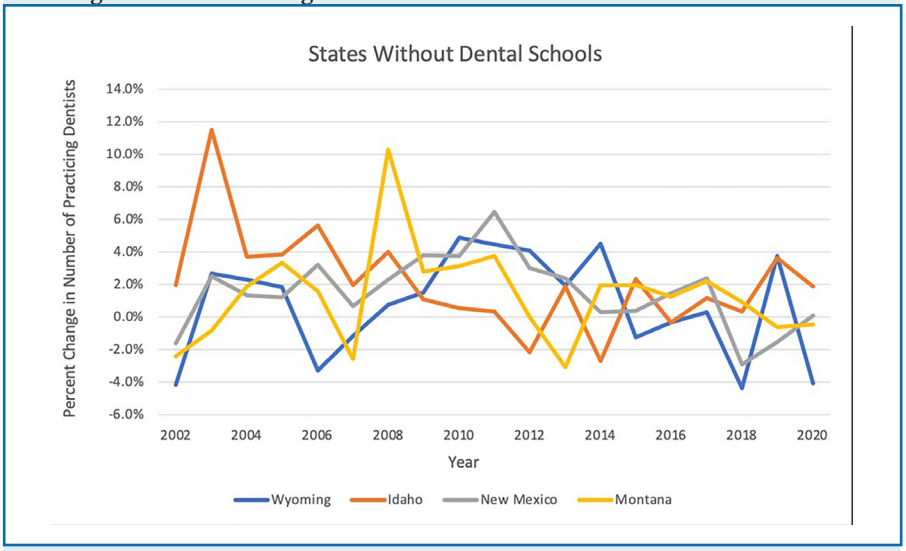


Figure 3. Illustrates the percent change of working dentists in states that have opened new dental schools in the 20th century. Results for the states of Illinois, Utah, California, Missouri and Nevada are illustrated.

After opening UNLV school in 2002, Nevada observed a strong average annual increase of 7.16% in its number of practicing dentists (see Figure 2). Comparatively, neighboring states Idaho and Oregon observed lower numbers during the same 2002-2006 window. Idaho, which lacks a dental program, averaged an annual increase of 5.52% (see Figure 3). Its other northern neighbor, Oregon, which has a more historic dental program than Nevada's, averaged an annual increase of 1.97%.

After opening its third dental program, Midwestern University College of Dental Medicine—Illinois, the state experienced an annual increase of 1.28% during 2009-2013 (see Figure 2). Nearby, Iowa averaged a 0.68% increase and neighboring Wisconsin, averaged 1.72% increase from 2009-2013, both of which house historic dental programs opened prior to the year 2000.

Discussion

Researchers observed that states opening a sequential dental program experienced a less significant increase in the number of practicing dentists than states opening their first school. In Arizona, ATSU was the first dental school opened, and MCDM followed shortly after. It is possible that the state saw a lower average increase after MCDM because the state supply was already saturated. Similarly, in California, less predictable trends were observed after the opening of CNU and WUHS; Since California already had five other dental schools in existence. It is reasonable to assume that a state opening its sixth and seventh dental school would observe a less significant annual increase of the state's dentists than a state opening its first dental school. In Missouri, the same percentage increase was observed during the four years prior and the four years after the school's inception. MSDOH was the second dental school opened in the state of Missouri; University of Missouri-Kansas City School of Dentistry (UM-KCSD) had already existed for over a century. In Utah, the low annual increase from 2012-2016 is possibly due to the fact that UUSD was opened one year after the inaugural class at RUHS graduated.

There are several factors to consider when a new dental school is opened in a state, and how that possibly influences the number of practicing dentists within the state. Once a dental school is created and accredited, professors and dental faculty are recruited and brought in to teach and work in the clinics. This creates a market where out-of-state dentists may be recruited and brought into the state. The inception of a new dental school gives rise to advertising and marketing opportunities targeting out-of-state dentists. Newspapers and news channels may feature stories about the school, which generates publicity and potential

excitement about the field of dentistry which may encourage graduating dentists to remain and practice within their graduating state. This would strengthen the dental workforce within the state.

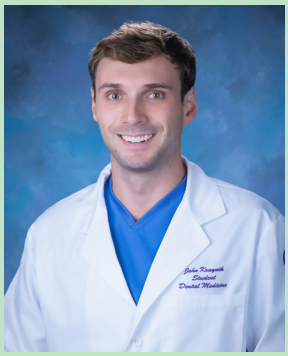
Even with the continued inception of new schools and the increased number of dentists, there are still many provider shortage areas in all the states that were examined in this paper.4 Reviews of geographic disparities are worrisome because they highlight that physicians are concentrated in urban and prosperous suburban areas, while rural and poorer suburban areas often have a shortage of primary and specialty providers.5 The issues associated with workforce recruitment and stability of dental providers mimic those outlined in other health fields.6 Geographic regions have shown variation in the quality of care received, access to recommended preventative care, care for acute medical conditions, and necessary treatment for chronic conditions.3 It is important to bolster the dental workforce as our population continues to grow; however, if the dental population is disproportionately increasing in urban areas, then provider shortages will continue to exist in rural and poorer suburban areas. Patients living in rural settings, across all demographics, visit the dentist at lower rates when compared to their urban counterparts.7 One study from the state of Georgia found that, on average, the state had twice the professional supply necessary to meet the dental needs of their population; however, half of the counties did not have a sufficient dental workforce to serve the population.8 This is an example of how state averages can be misleading.

When examining the geographic distribution of dental providers, there are many factors contributing to the maldistribution between rural and urban areas. Job availability, financial opportunities and burden of educational debt, lifestyle differences, and spouse's employment opportunities were reasons provided by dentists as to why they preferred urban to rural work environment.9 Rural communities may face greater travel times to dental services due to greater geographic isolation and population dispersion; a limited population size may also make a healthcare facility unsustainable; potential higher proportion of elderly, families below the poverty line, and indigenous peoples can disadvantage healthcare provision.6

Conclusion

As outlined above, the issue of dental provider recruitment and retention to low-provider areas is complex and multifactorial. The opening of a state's first dental school may contribute to the larger growth rates in the number of practicing dentists. However, for states with older dental programs, states with multiple dental schools, or states lacking any dental school, changes in growth were tougher to predict. Small increases and decreases year-to-year was a common trend that researchers observed when looking at many U.S. states. After analyzing the data and other studies that have looked at similar topics, simply increasing the number of dental schools is not enough to significantly impact the number of practicing dentists. Additionally, an increase in the number of dentists will not necessarily improve the shortage of providers in rural and low-income suburban areas. Researchers would next like to examine the geographic location of these dental schools in their communities; were they established in provider shortage areas and did the creation of the program improve the disparity of access? Increasing access to dental education is important for many reasons, however, it is not sufficient to significantly increase the number of practicing dentists within that state.

Bernardo Caldas is a fourth-year dental student at Nova College of Dental Medicine. He was born in Sao Jose dos Campos, Brazil and earned a B.S in Biology from the University of Central Florida. Bernardo will be starting Orthodontics residency in July at the New York University.



John Kraynik is a third-year dental student at Nova College of Dental Medicine. He was born in Charlotte, North Carolina and earned a B.S in Health Promotion and Behavior Science from the University of Georgia. John is applying for orthodontic residency programs this May with hopes of enrolling in the summer of 2024.

Reza Khademi is a third-year dental student at Nova Southeastern University College of Dental Medicine. He was born in Tehran, Iran and earned a B.S in Biology from the University of Central Florida. Reza is applying for Oral and Maxillofacial Surgery this may with hopes of enrolling in the summer of 2024 upon graduation.

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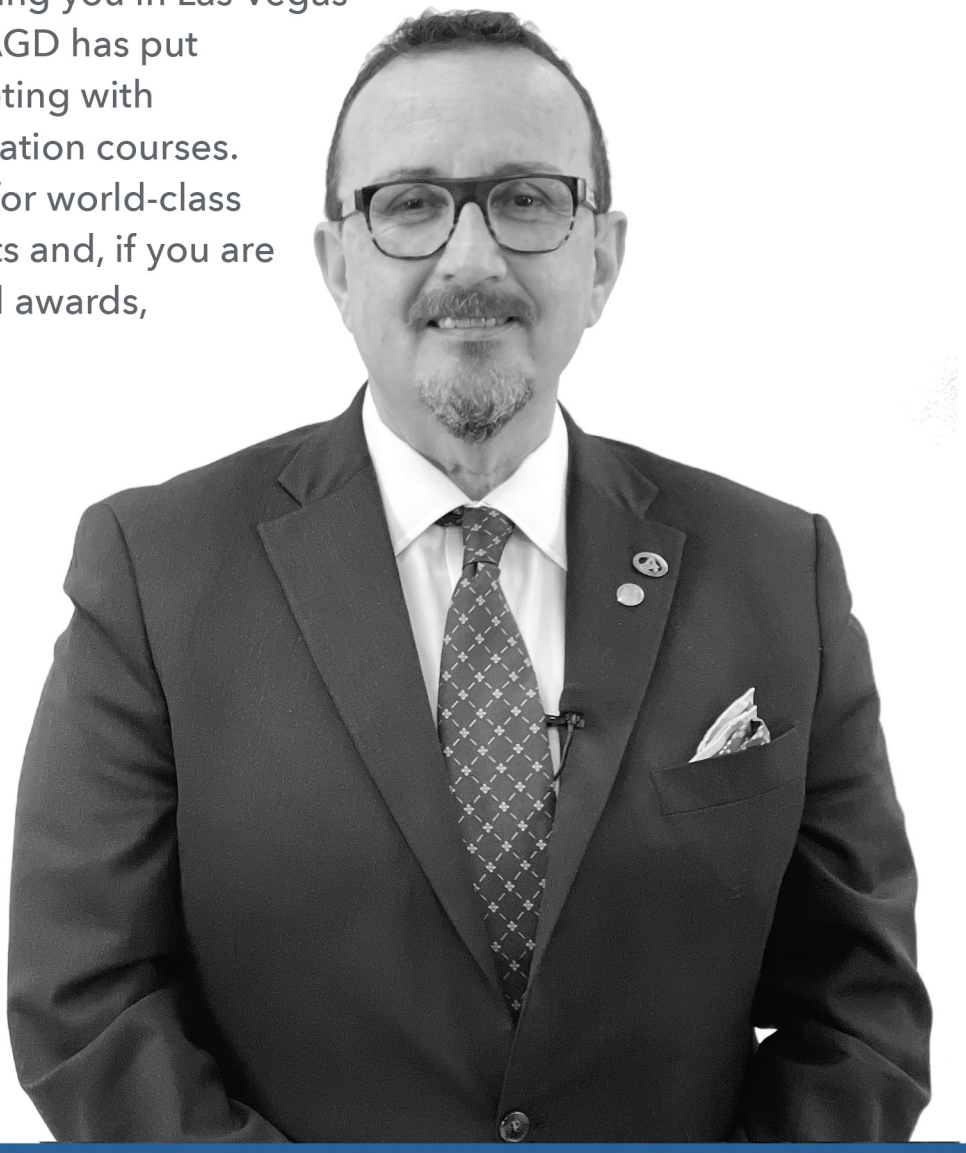

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