



# Modern Composite Dentistry Hands On Course

David Clark DDS   Lauren Wilson DMD

*featuring*

 **BIOCLEAR**



# BIOCLEAR LEARNING CENTER

Tacoma USA · Solihull UK  
Varberg Sweden · Cairo Egypt  
Syracuse Italy · Taubate Brazil  
Livermore CA (Bioclear pediatrics)  
Seoul Korea · Madrid/Barcelona  
Sydney Australia · Baghdad Iraq

For a copy of today's presentation,  
Learning Center info or the essential  
Learning Center Library

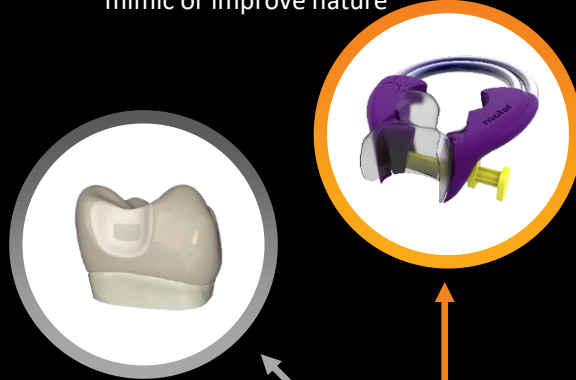




# Modern Method for Composite Restorations

## Bioclear Anatomic Matrices

- Anterior & Posterior Matrices designed to mimic or improve nature



## Preparation Design

- I.C.E. Infinity edge, Compression based, Enamel driven
- Maximizes enamel involvement by going "around the tooth"

## Biofilm Removal

- Bioclear Blaster removes biofilm before bonding
- Allows bonding to uncut enamel
- Allows infinity edge margins

## Injection Mold Composite

- Injection mold warmed Solventum Restorative materials
- Industry leading polish, esthetic, strength & wear

## Rock Star Polish

- 3M™ Sof-Lex™ XT coarse discs for reduction
- "Rock Star" polish with Bioclear Magic Mix & RS Polisher

# 1<sup>st</sup> Pillar of Modern Composite

Disclosing of Biofilm, then  
Blasting to remove Biofilm plus  
remove Protein Pellicle

Does 37% phosphoric acid  
(gel etchant)  
remove biofilm?

Composite  
Heating: Trend  
or the future of  
placing the  
material?

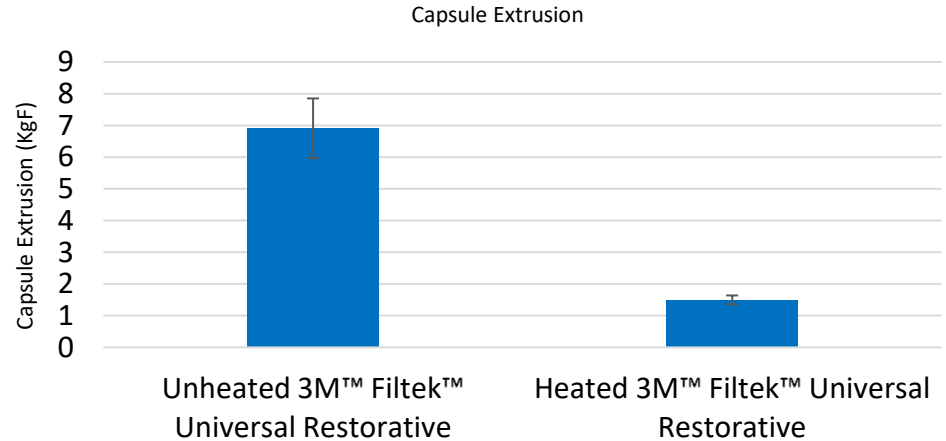
Composite Heater pre-set  
to 155° F



# Composite warming

## Why warm?

- Handling preference
- Lowers capsule extrusion force by 75-80%



3M internal data

14% of dentists survey stated they use some type of device to warm their composite prior to placement.

3M Market Research, January, 2018 N=304 Dentists (US, Russia, UK, Brazil, Germany)

Let's go back to 2007...

“Dr. Clark, aren't we supposed to layer everything?”

# Studies do not support layering to mitigate polymerization stress

---

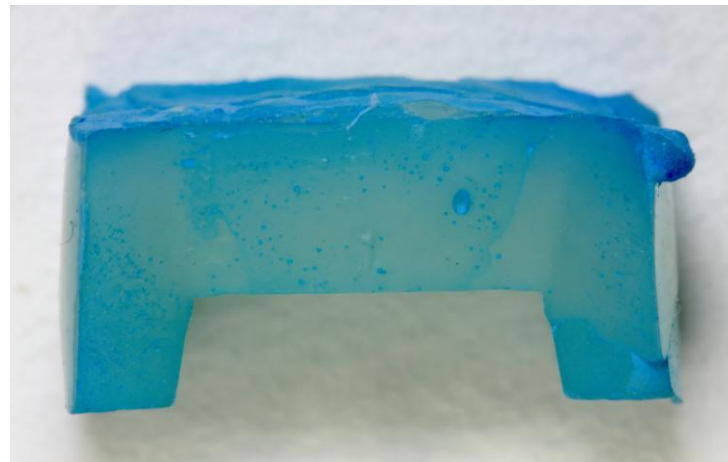
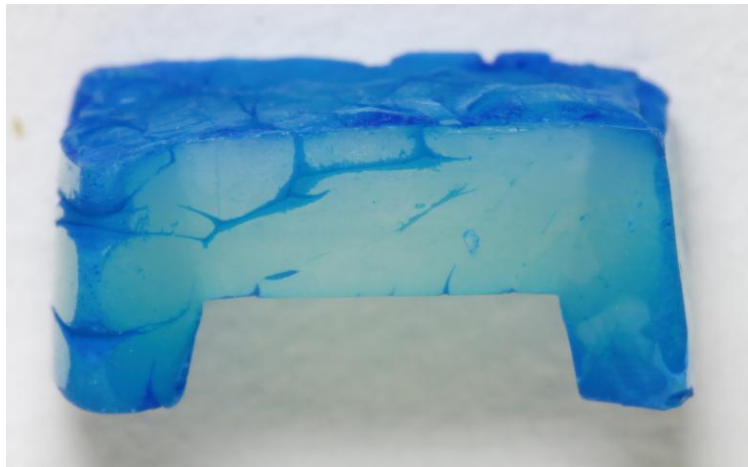
---

- ◆ Does Incremental Filling Technique Reduce Polymerization Shrinkage Stresses?  
Versluis A, et.al., J Dent Res March 1996; 75(3): 871-878
- ◆ An In Vitro Study of the Effect of Restorative Technique on Marginal Leakage in Posterior Composites  
Neiva IF, et.al.; Oper Dent 1998, 23:282-289
- ◆ Microleakage and adaptation of Class II packable resin-based composites using incremental or bulk filling techniques  
Gallo JR, et.al., Am J Dent 2000; 13: 205-208
- ◆ The Effects of Adhesive Thickness on Polymerization Contraction Stress of Composite  
Choi KK, et.al., J Dent Res 2000; 79(3): 812-817
- ◆ Microleakage of Posterior Packable Resin Composites with and without flowable liners  
Leevailoj C, et.al., Oper Dent 2001; 26: 302-307
- ◆ Marginal adaptation of Class II resin composite restorations using incremental and bulk placement techniques: and ESEM study  
Idriss S, et.al., J Oral Rehab 2003; 30: 1000-1007
- ◆ A reappraisal of the incremental packing technique for light cured composite resins  
Rees JS, et.al., J Oral Rehab 2004; 31: 81-94
- ◆ Cuspal deflection and depth of cure in resin-based composite restorations filled by using bulk, incremental and transtooth-illumination techniques  
Carlos E. Campodonic, DDS 2011, October 2011 JADA

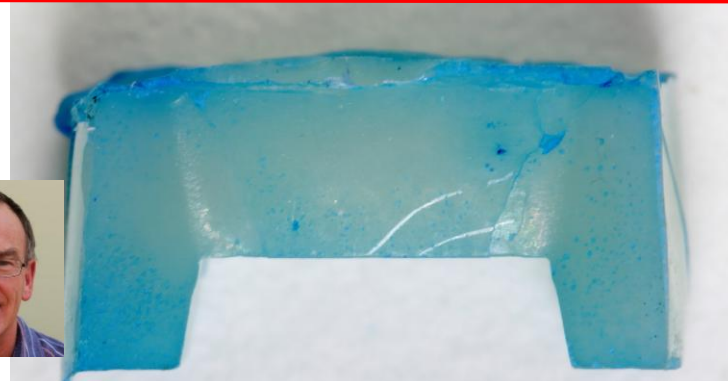
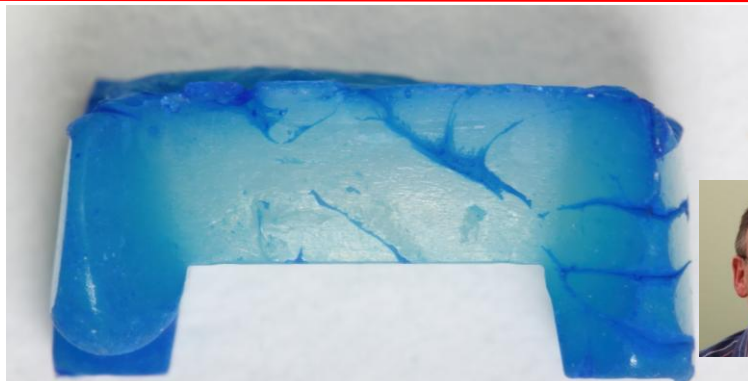
Hand-Packed and Layered

Monolithic and Injection-Molded

Dr. #1



Dr. #2



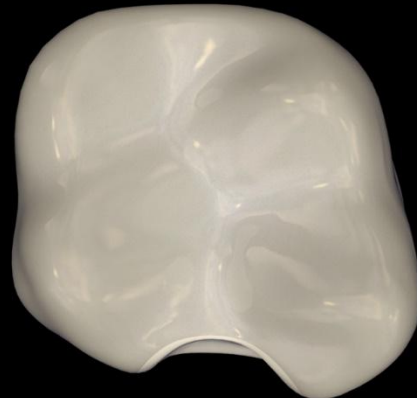
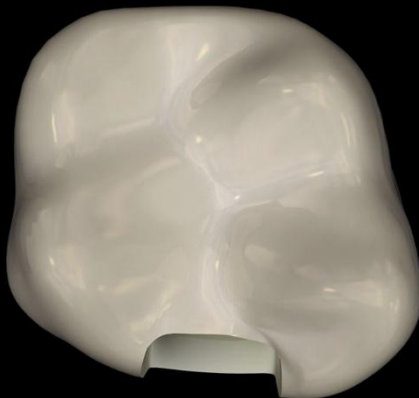
Courtesy Dr. Richard Price

# Epidemic of Failing Composites

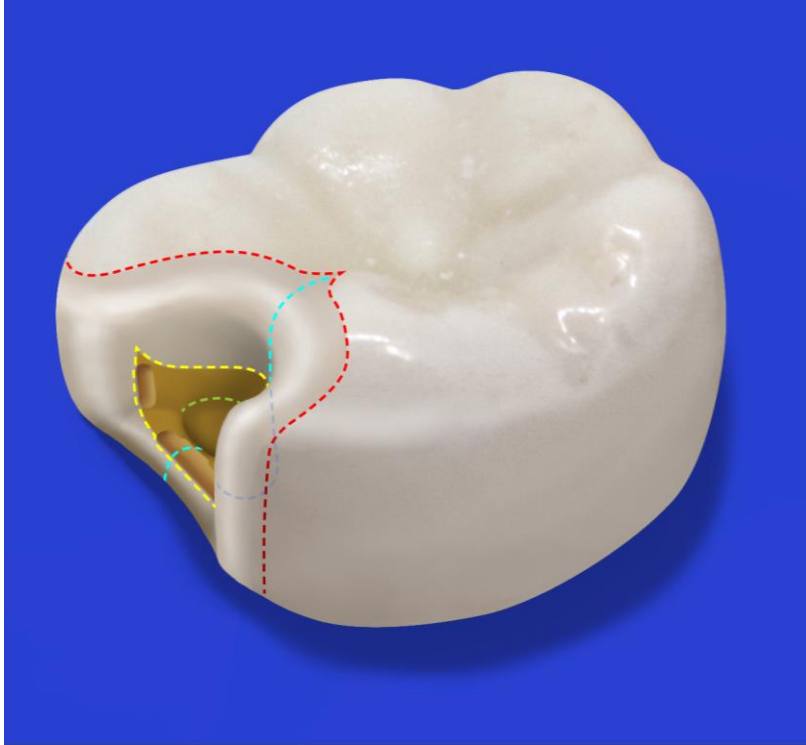


# Modern Class II Cavity Preparation Design

# The Prep?



## Final views of completed Bioclear Class II Preparation.





before

# The Bioclear method





Infinity edge  
of the T.R.I.

# The Bioclear Injection Molding Approach



Failing composite;  
traditional preparation



Re-Restored using the  
Bioclear Evolve System and Method



# The Bioclear Evolve All In One Kit



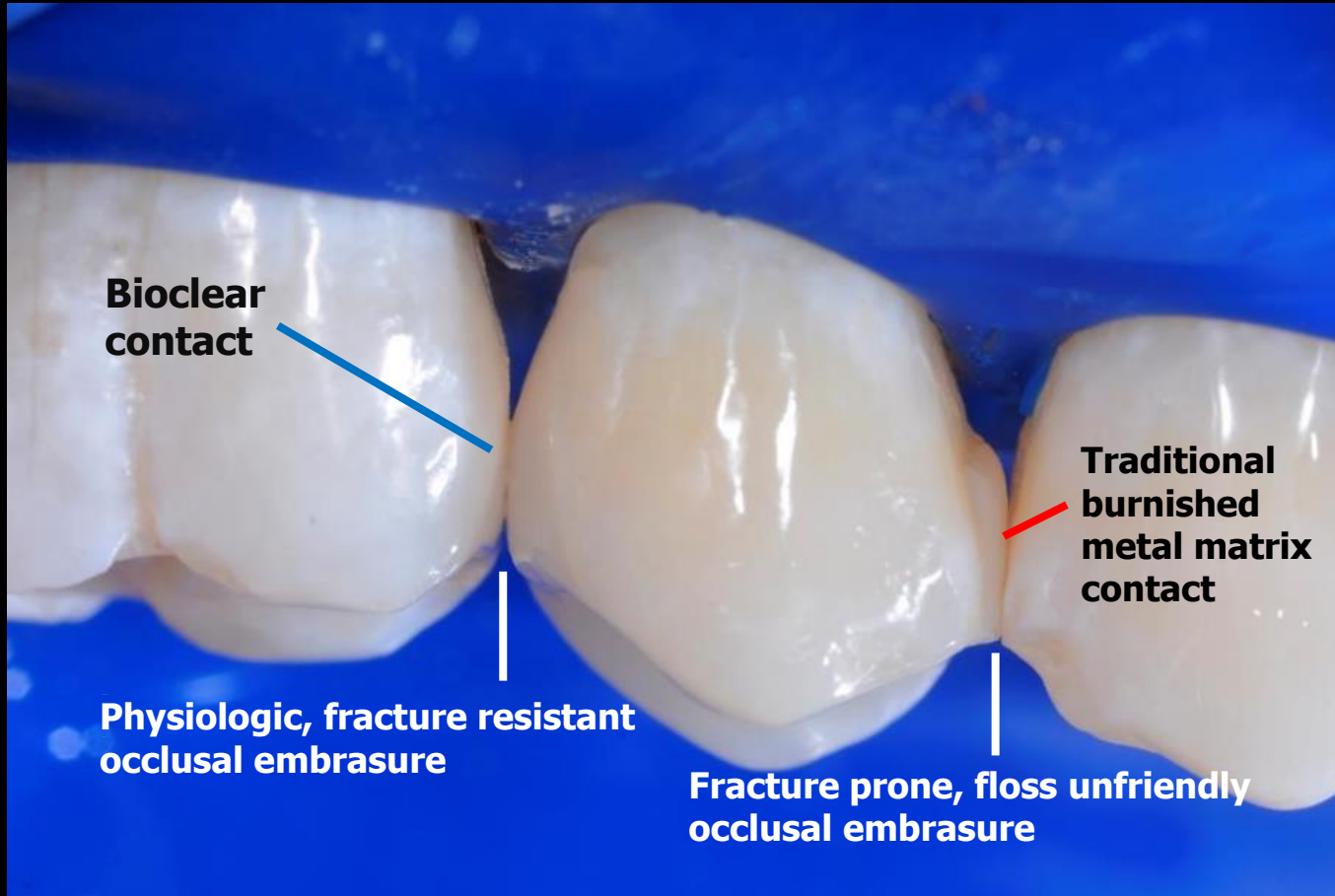
# Let's compare old vs. new

Traditional box prep restoration with staining margins and burnished mediocre shape.



Bioclear restoration with Evolve Matrix, Twin Ring Universal, and Diamond Wedge combined with an infinity edge.

# Buccal View Post-Op



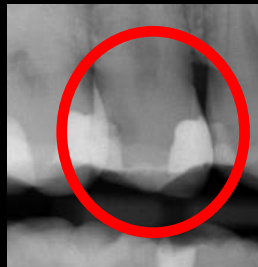
**Bioclear  
contact**

**Traditional  
burnished  
metal matrix  
contact**

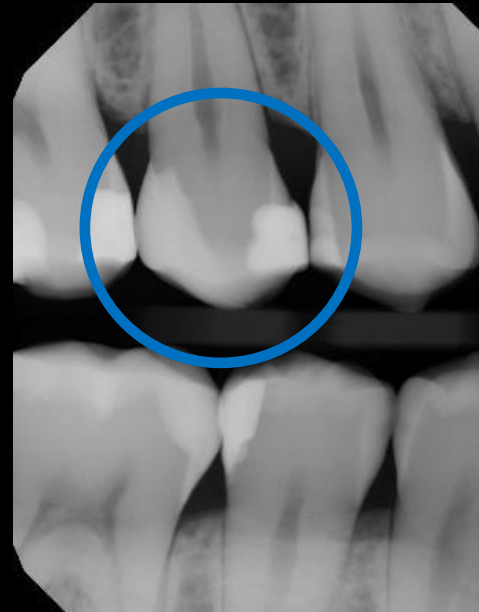
**Physiologic, fracture resistant  
occlusal embrasure**

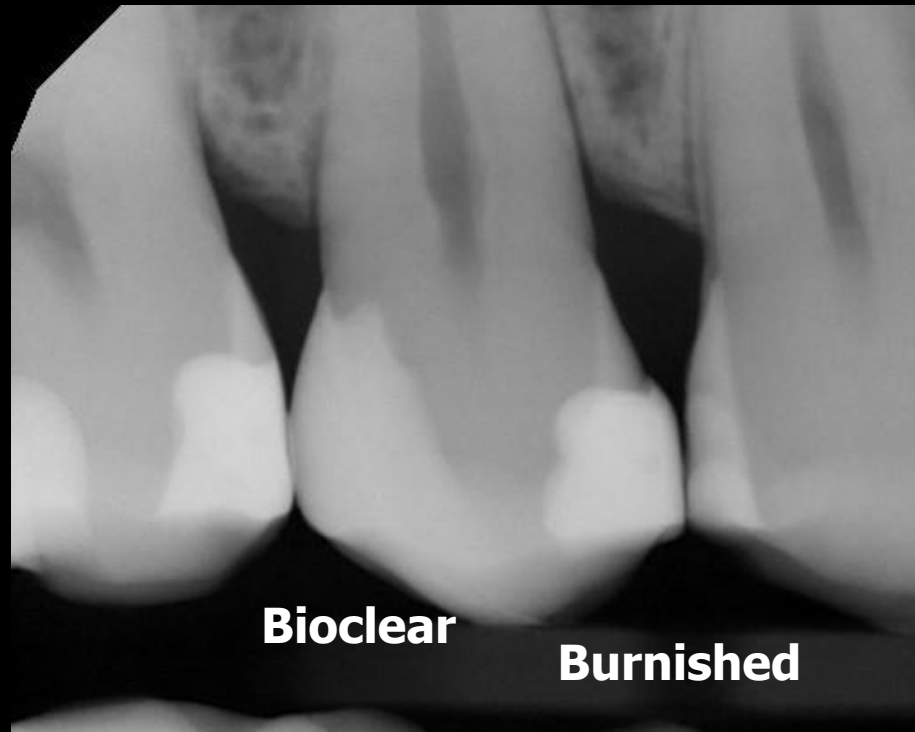
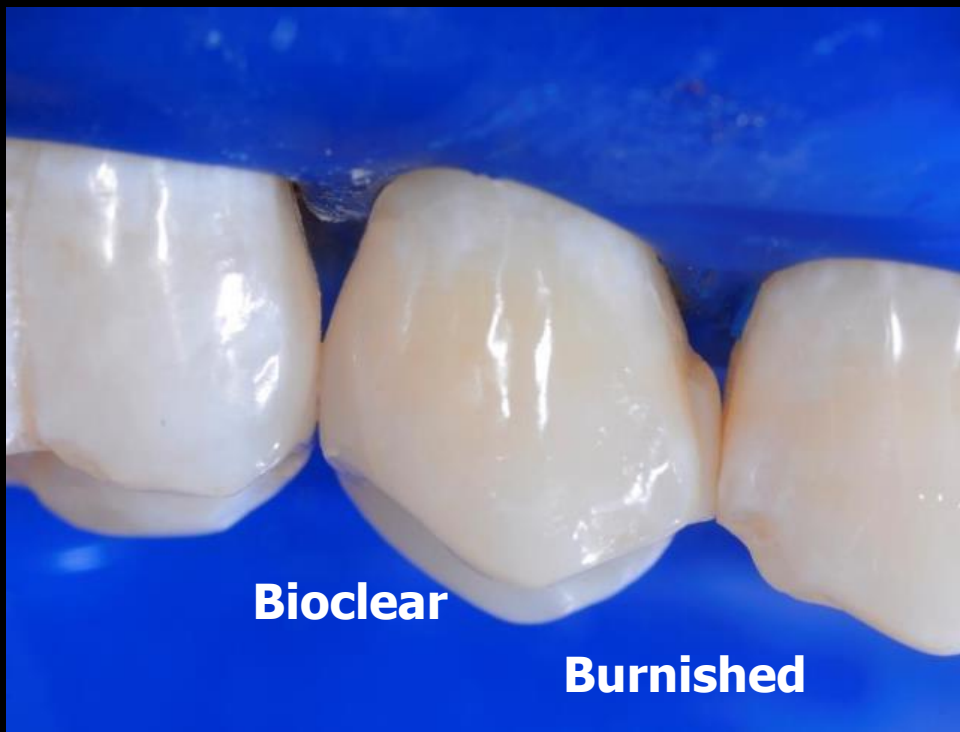
**Fracture prone, floss unfriendly  
occlusal embrasure**

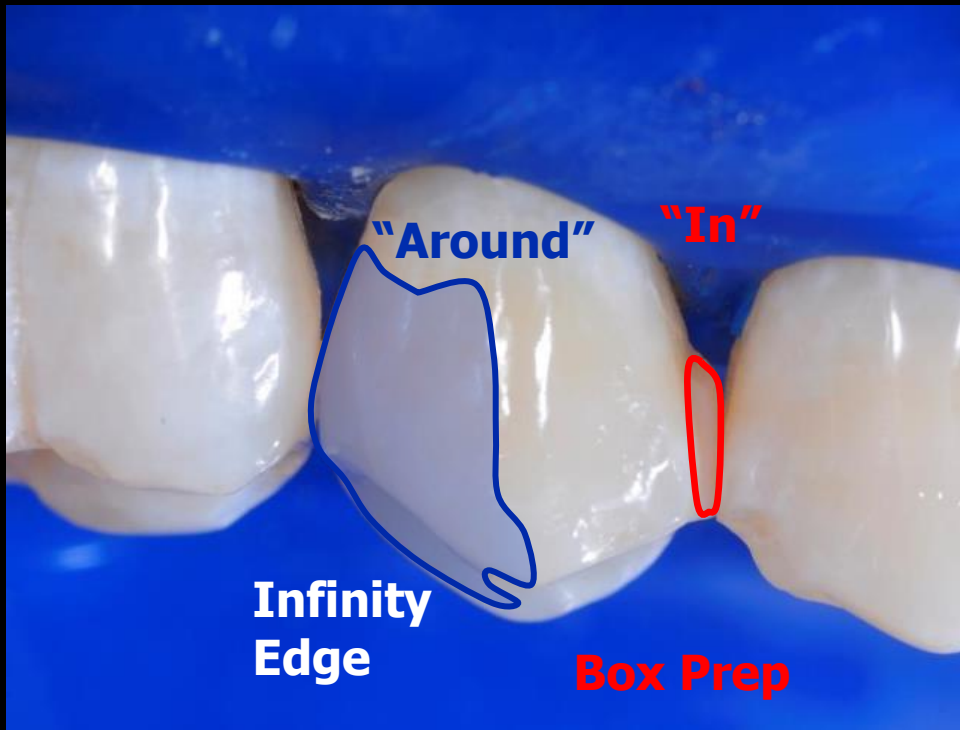
## Pre-Operative Radiographs



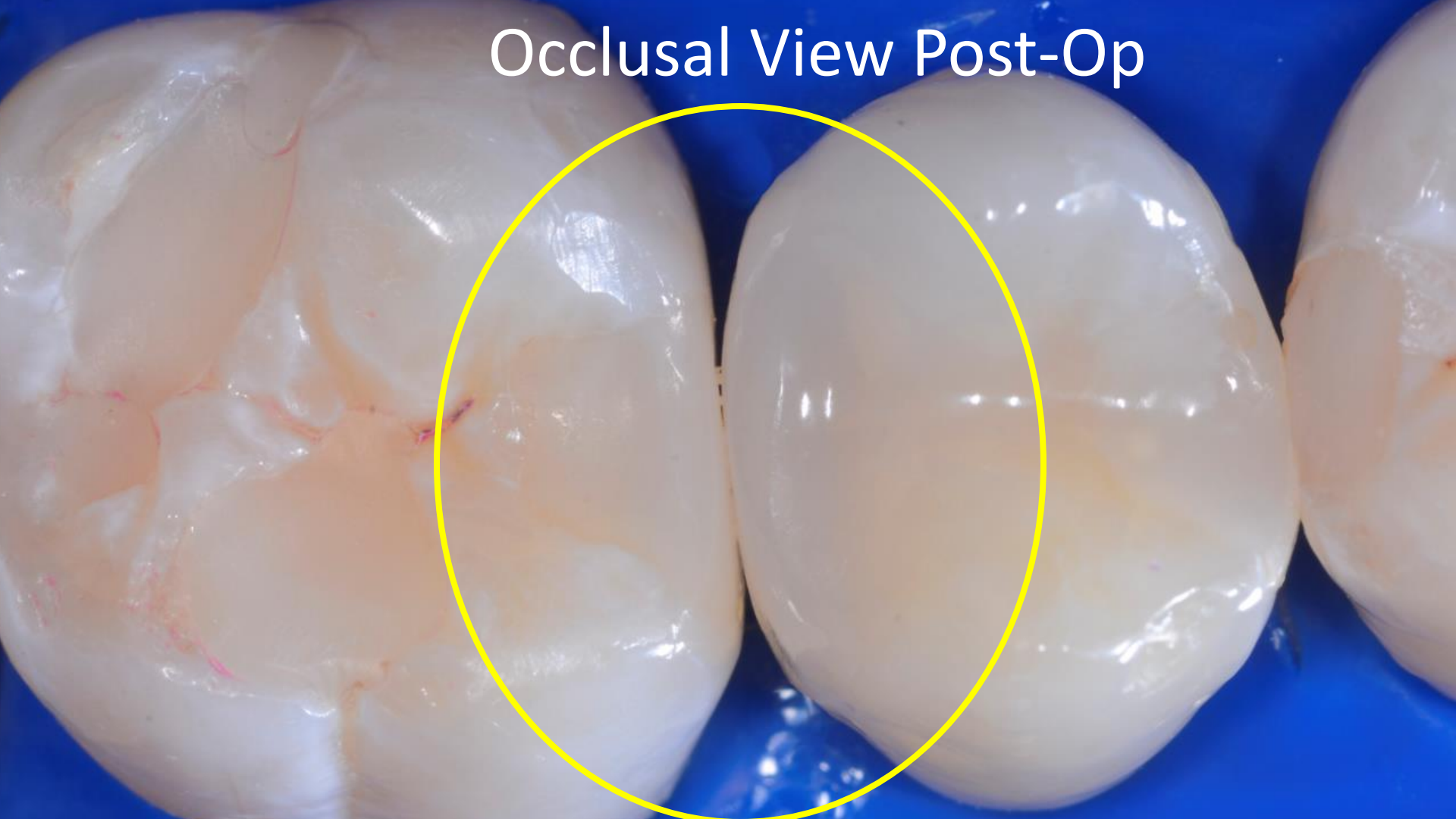
## 1 Year Post-Operative







Occlusal View Post-Op





















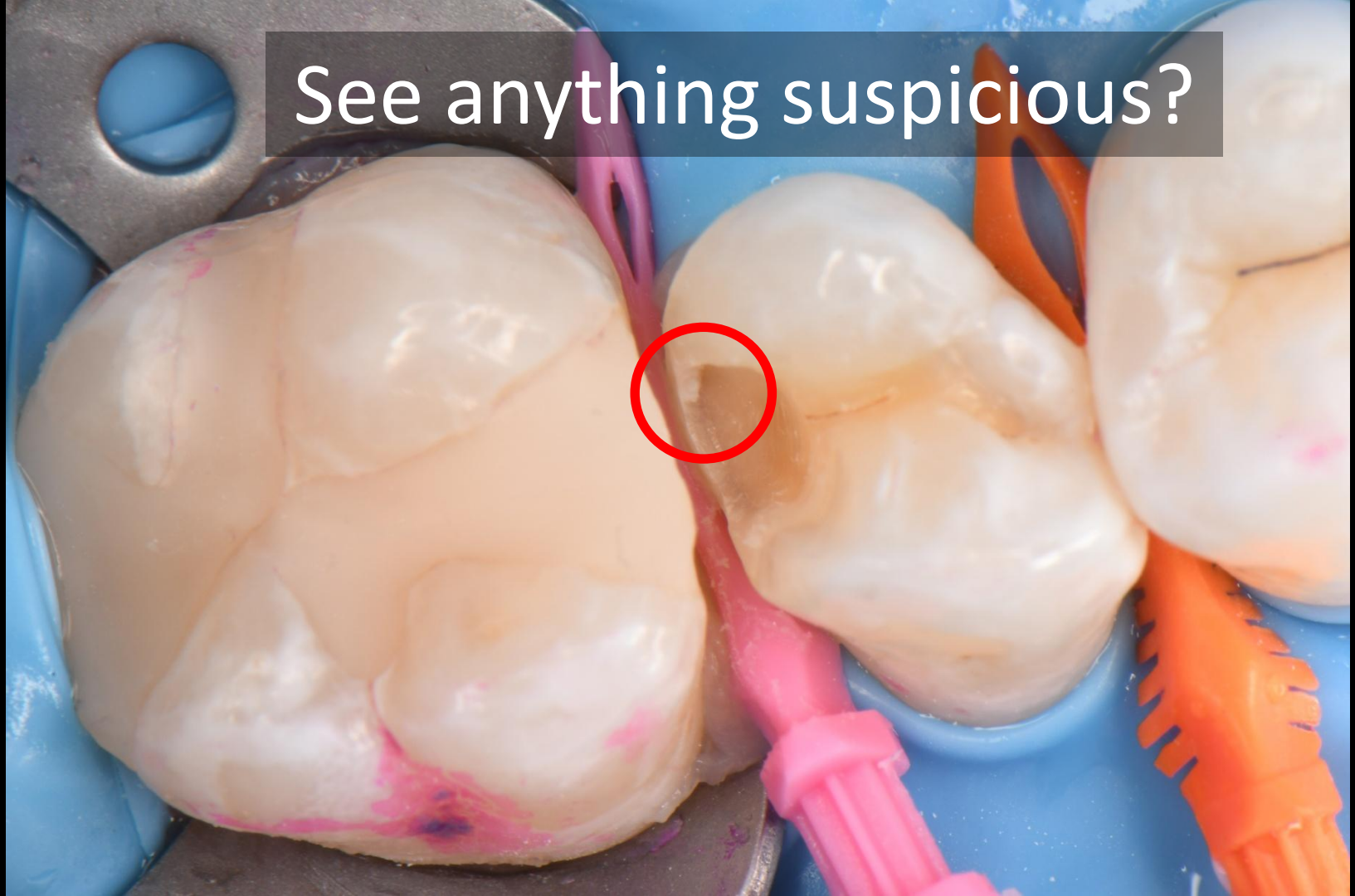








See anything suspicious?







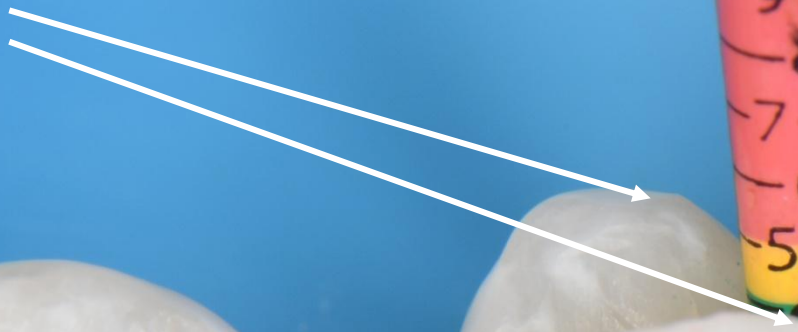








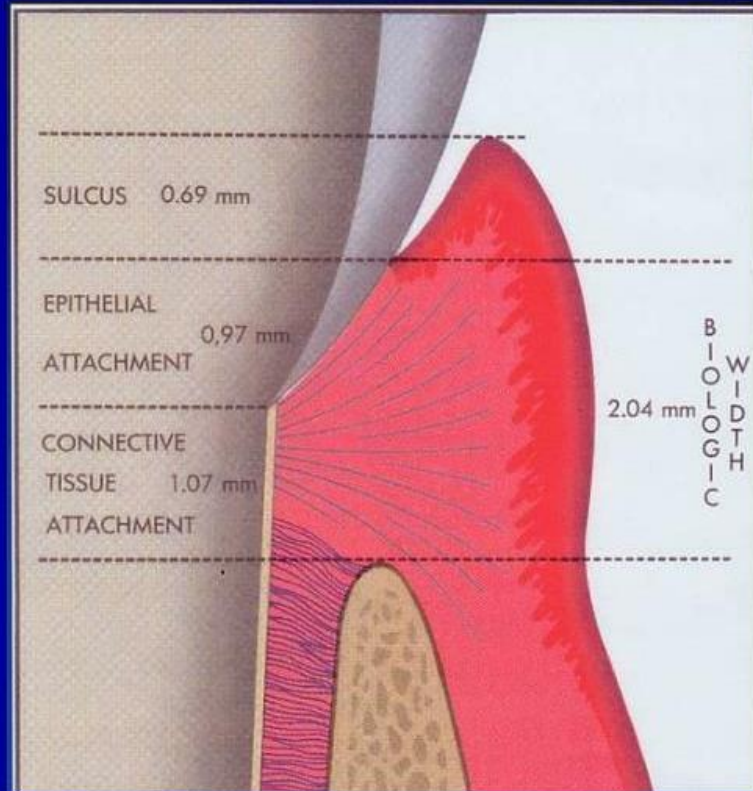
What's my  
reference?

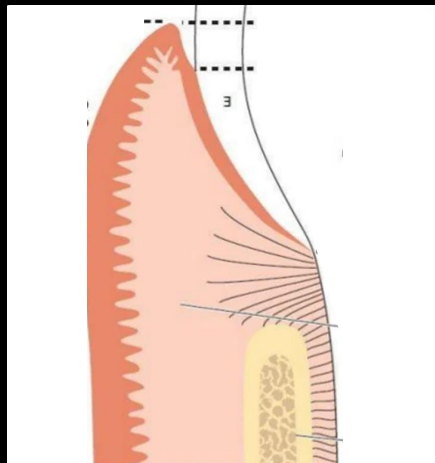


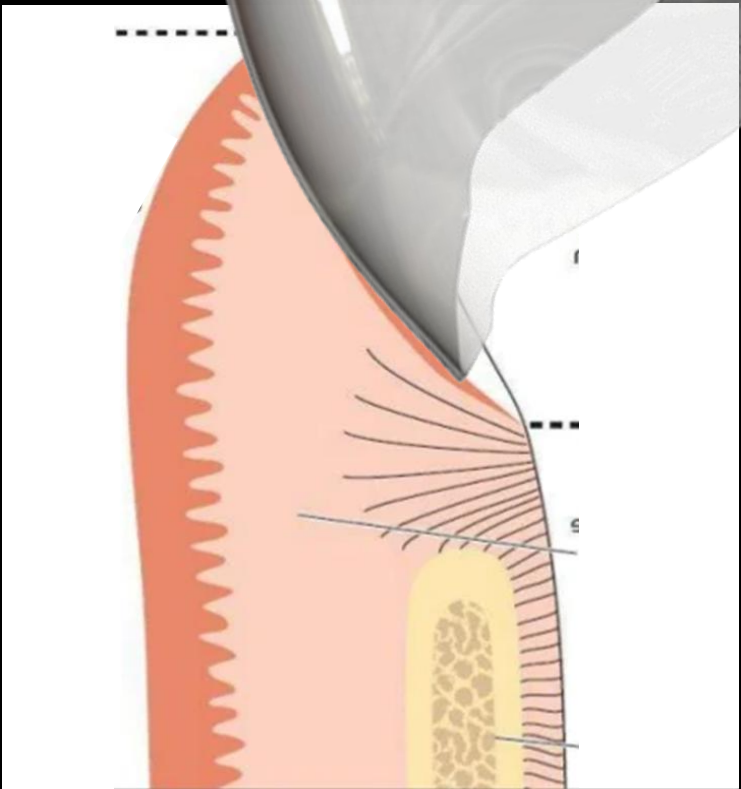
What's my  
reference?

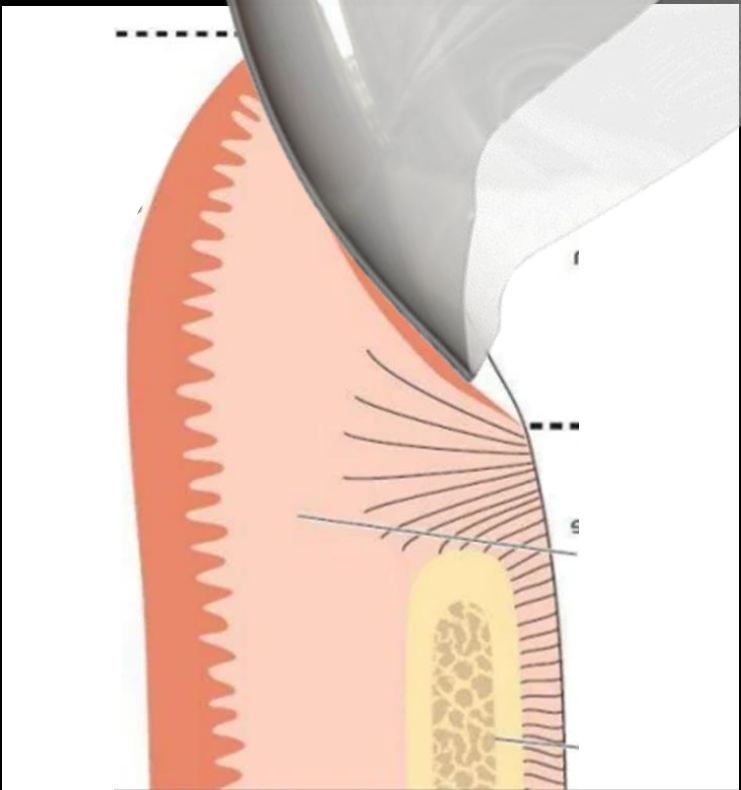














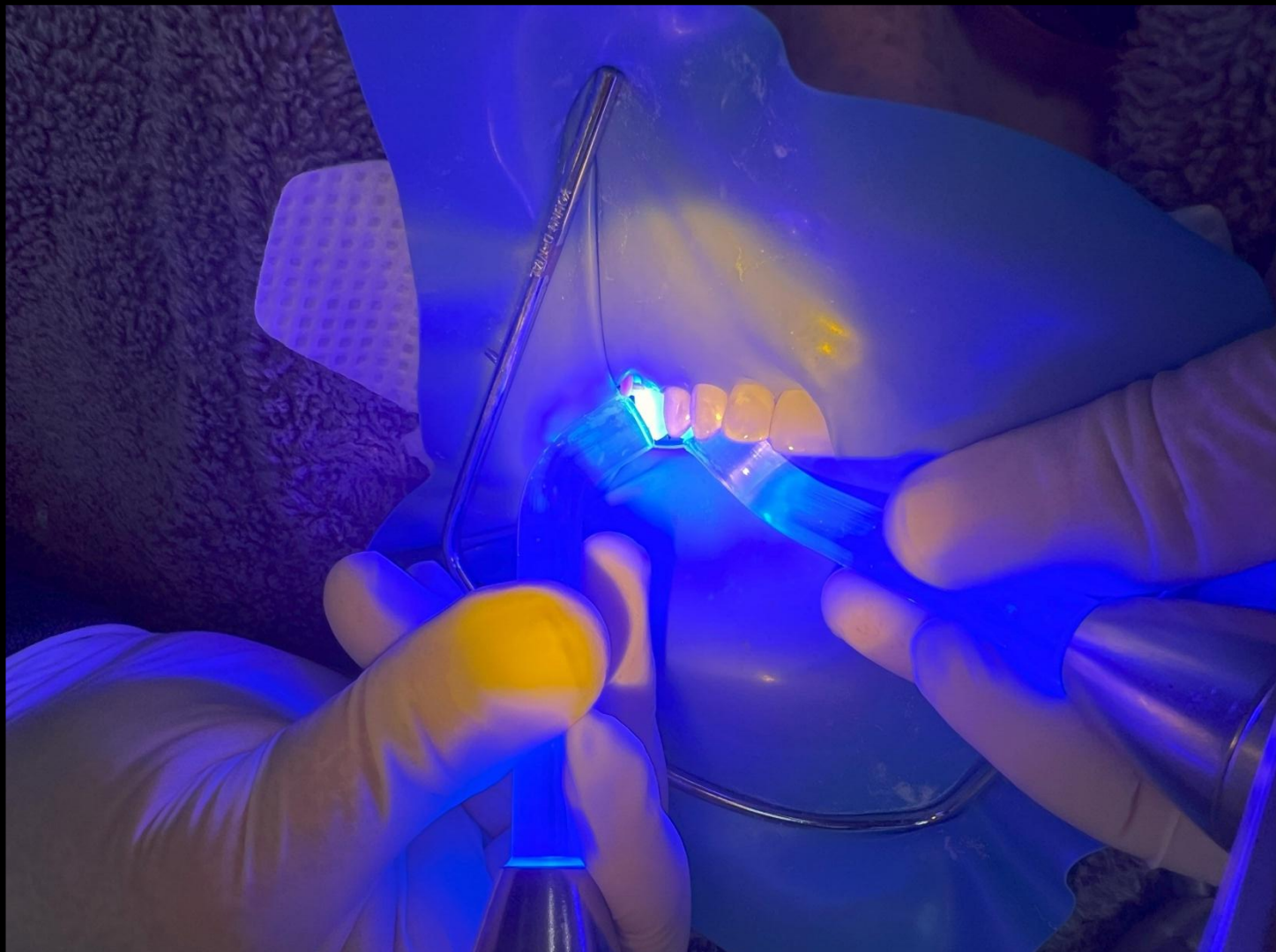














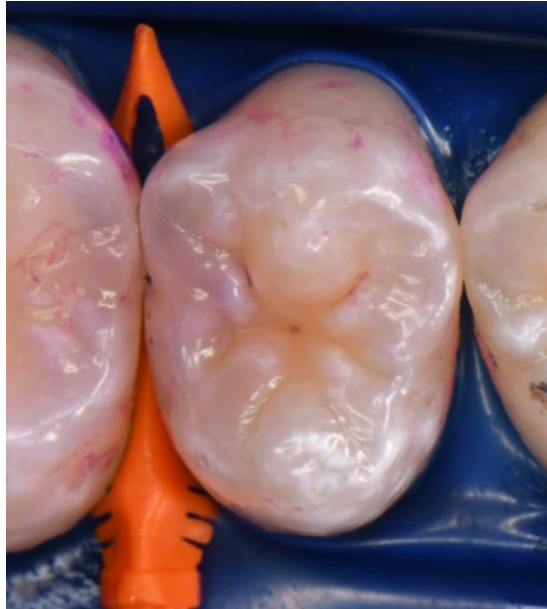








# Similar Case: Pre-op, post op, and 3 year follow up





# Step by Step Guide for Injection Molded Class II

Are all  
Separators  
Equal?

**NO!**



Stretched to 20mm ONCE!!!





And now most of the power is permanently lost

Once the yield of the metal/shape is reached, the metal undergoes plastic deformation

Stretched to 20mm Twenty Times

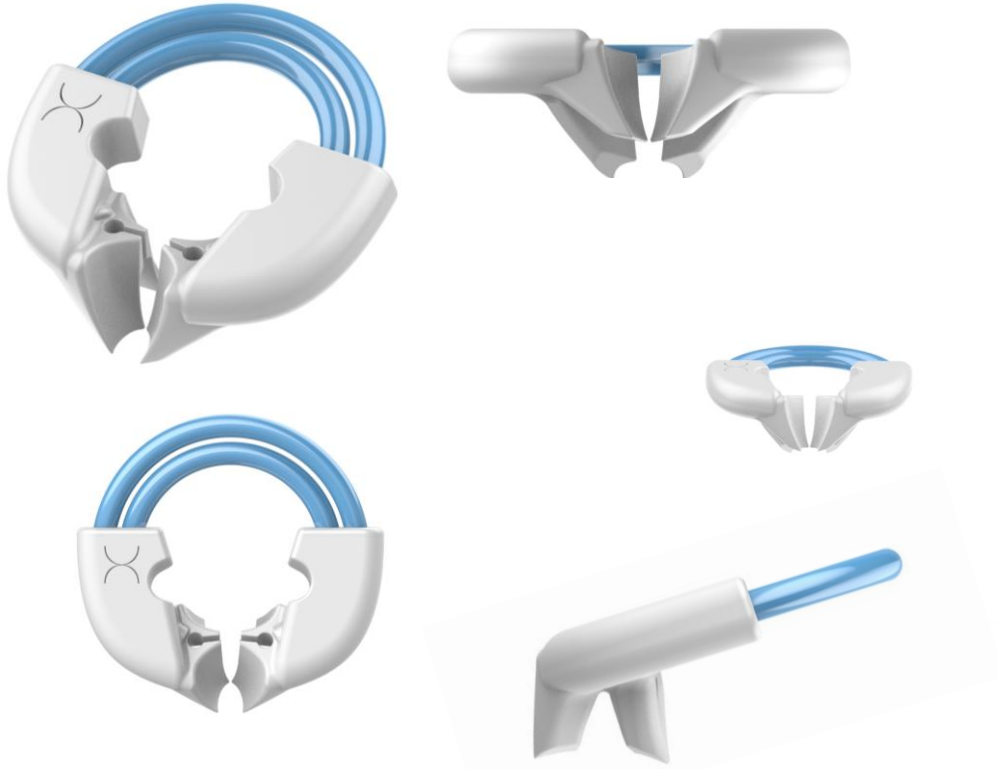


Stretched to 20mm Twenty Times



# TwinRing Universal

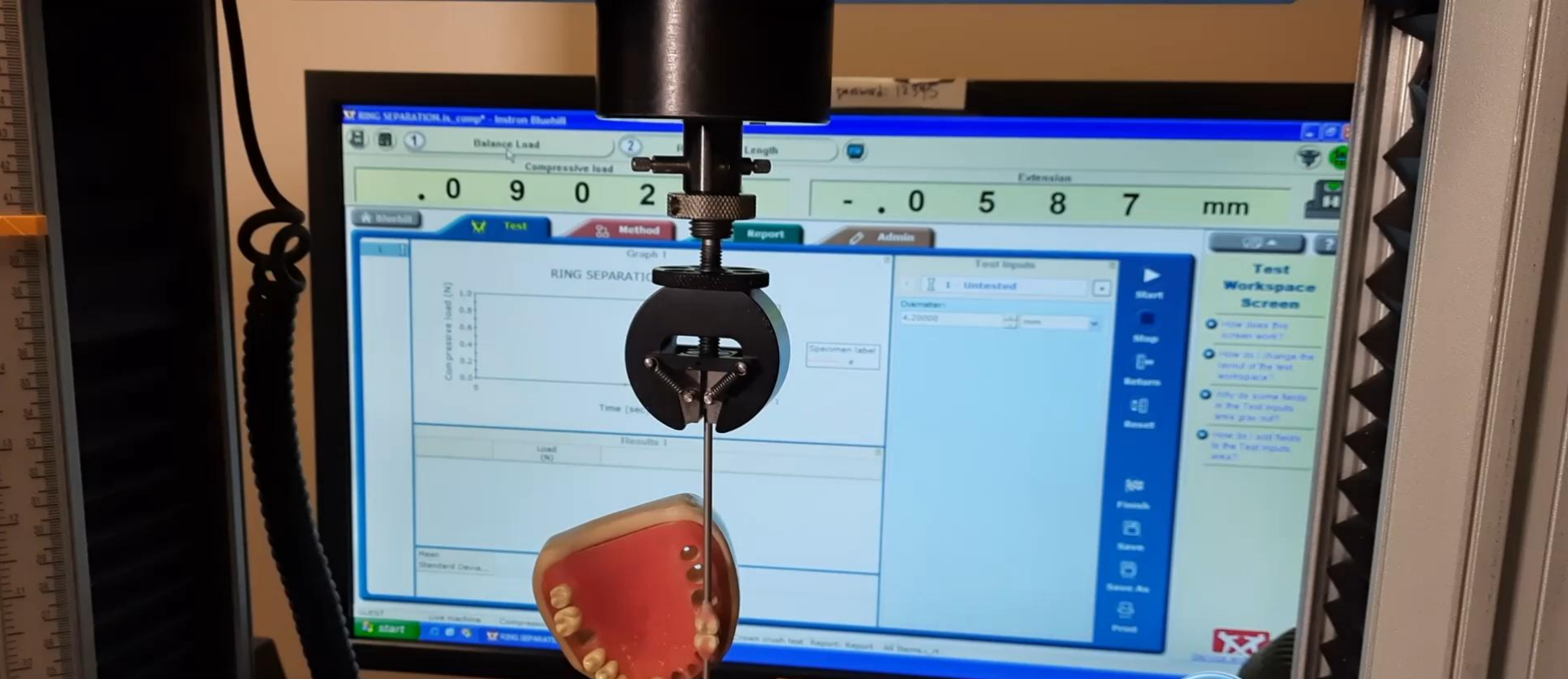
∞ BIOCLEAR





## How do we win the *Snug Contact Game?*

- Power
- Strategy
- Technique



**Nate Lawson DMD PhD**

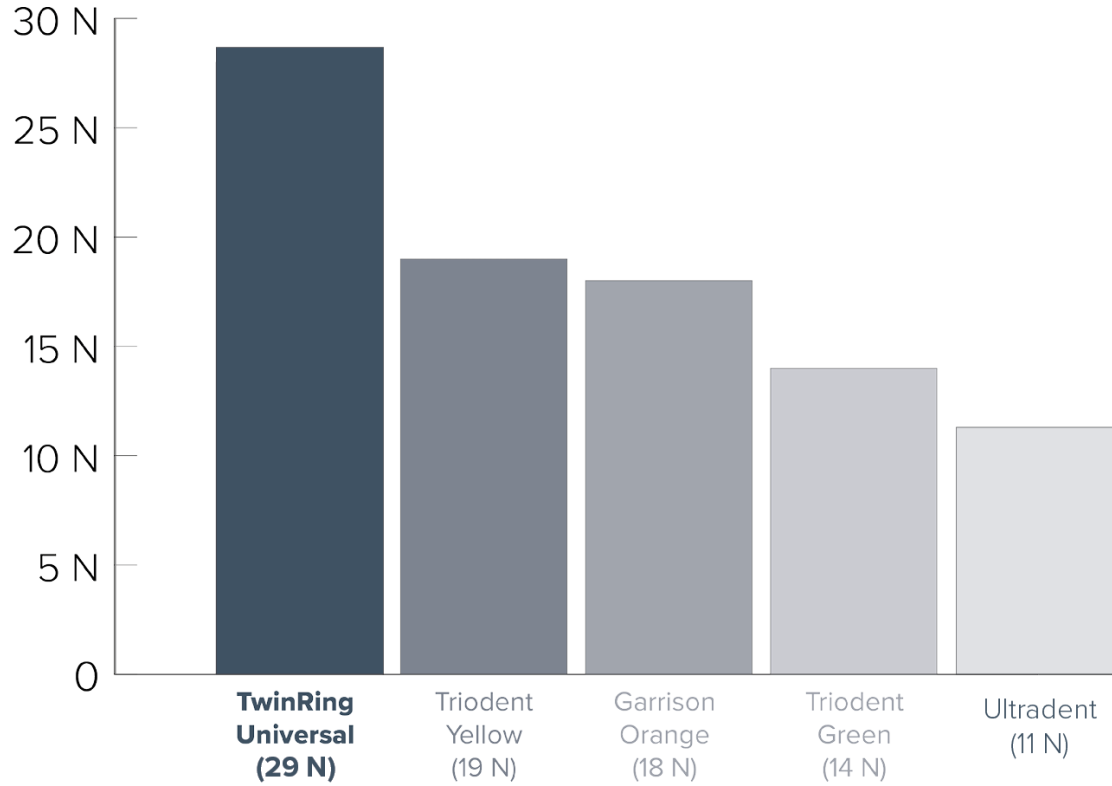
Director of the Division of Biomaterials and Pranit Bora. BDS, MDS.

Resident, Division of Biomaterials UAB School of Dentistry



TwinRing Universal  
28 N

# TwinRing Universal Instron Comparison



Note: Rings tested are not new and some rings stretch out quickly and lose up to half of their power after multiple uses. 1N = 1kg (m/s/s)

∞ BIOCLEAR

# Bioclear Matrices - Posterior





# EVOLVE --- MATRIX

## Premolar



## Molar



EVOLVE  
MATRIX

## Premolar Evolve: Width & Profile

- Evolve premolar matrices come in one width and profile – Black – to fit a variety of premolar tooth shapes

### BLACK EVOLVE

Designed with an aggressively rounded emergence profile. Shaped specifically for premolar teeth, these matrices can be used anywhere you would typically use a Biofit matrix or BT matrices on premolars.

Tip: Rotate the matrix into place.



Premolar Normal  
Width

# Black Premolar Evolve

∞ BIOCLEAR



5 Sizes

5mm

6mm

7mm

8mm

10mm

- Curved profile
- Normal width for a premolar



## 5 Sizes

5mm

6mm

7mm

8mm

9mm

- Curved profile
- Normal width

# Molar Evolve: Width & Profile

- Evolve matrices come in three widths and profiles – Blue, Orange, and Pink – to fit a variety of posterior tooth shapes

## BLUE EVOLVE

Designed with an aggressively rounded emergence profile and an average width. Blue Evolve is suitable for the majority of posterior cases.

Tip: Rotate the matrix into place.



Normal width

## ORANGE EVOLVE

Features a flatter emergence profile than the Blue Evolve. Orange Evolve is perfect for patients with average-sized molars where the tooth is too flat for the Blue Evolve

Tip: Use the Orange Evolve if the Blue Evolve inverts



Wide Molar



3 Sizes

6mm

7mm

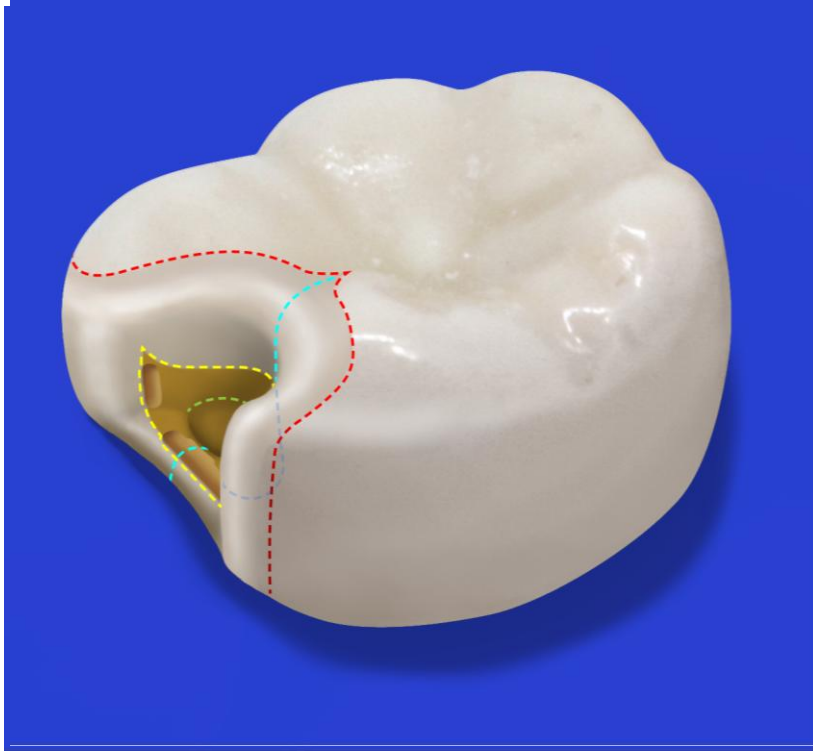
9mm

- Curved/straight profile
- Wider width

# The slip-off test



# Final views of completed Bioclear Class II Preparation.



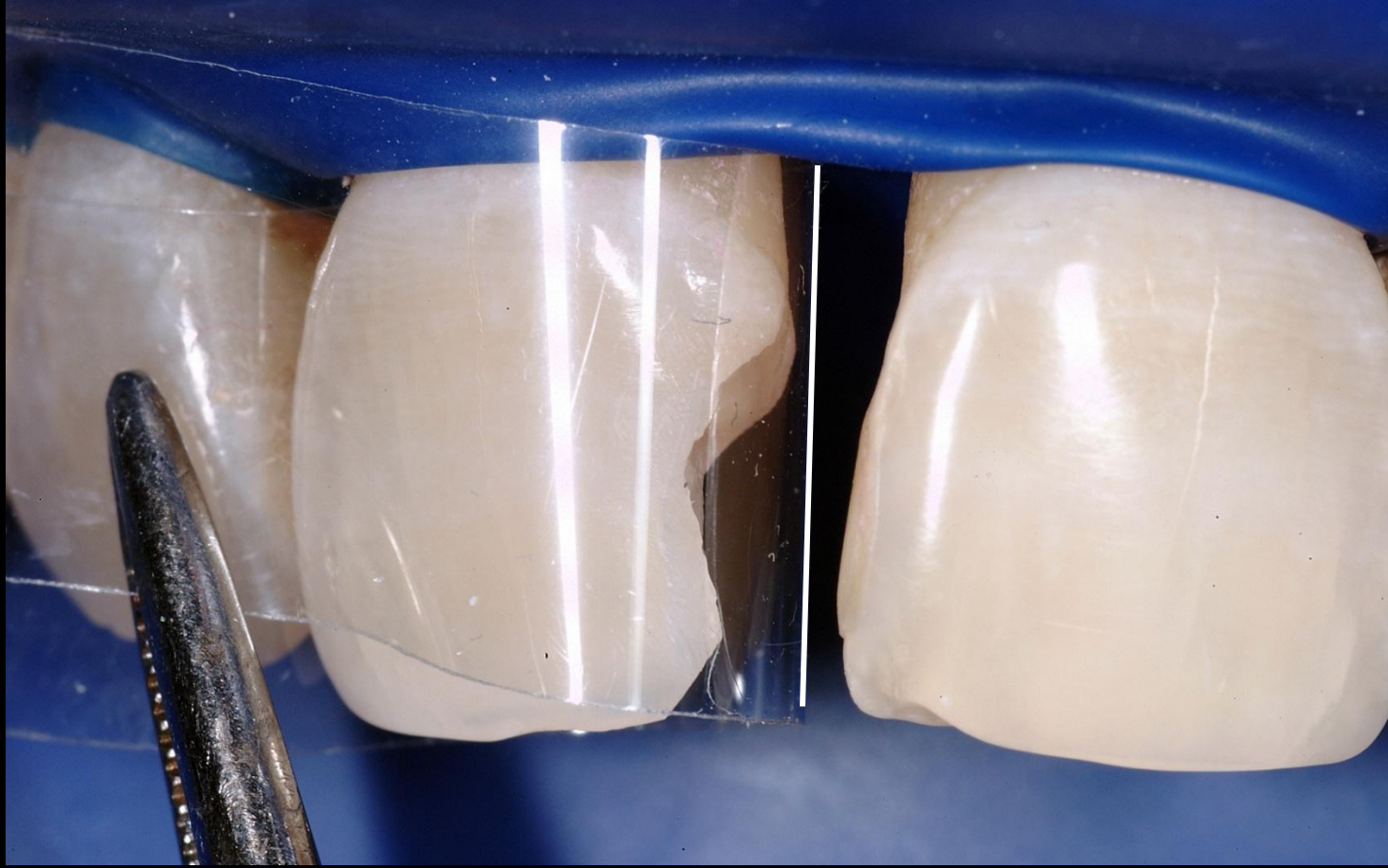
Natural Contacts



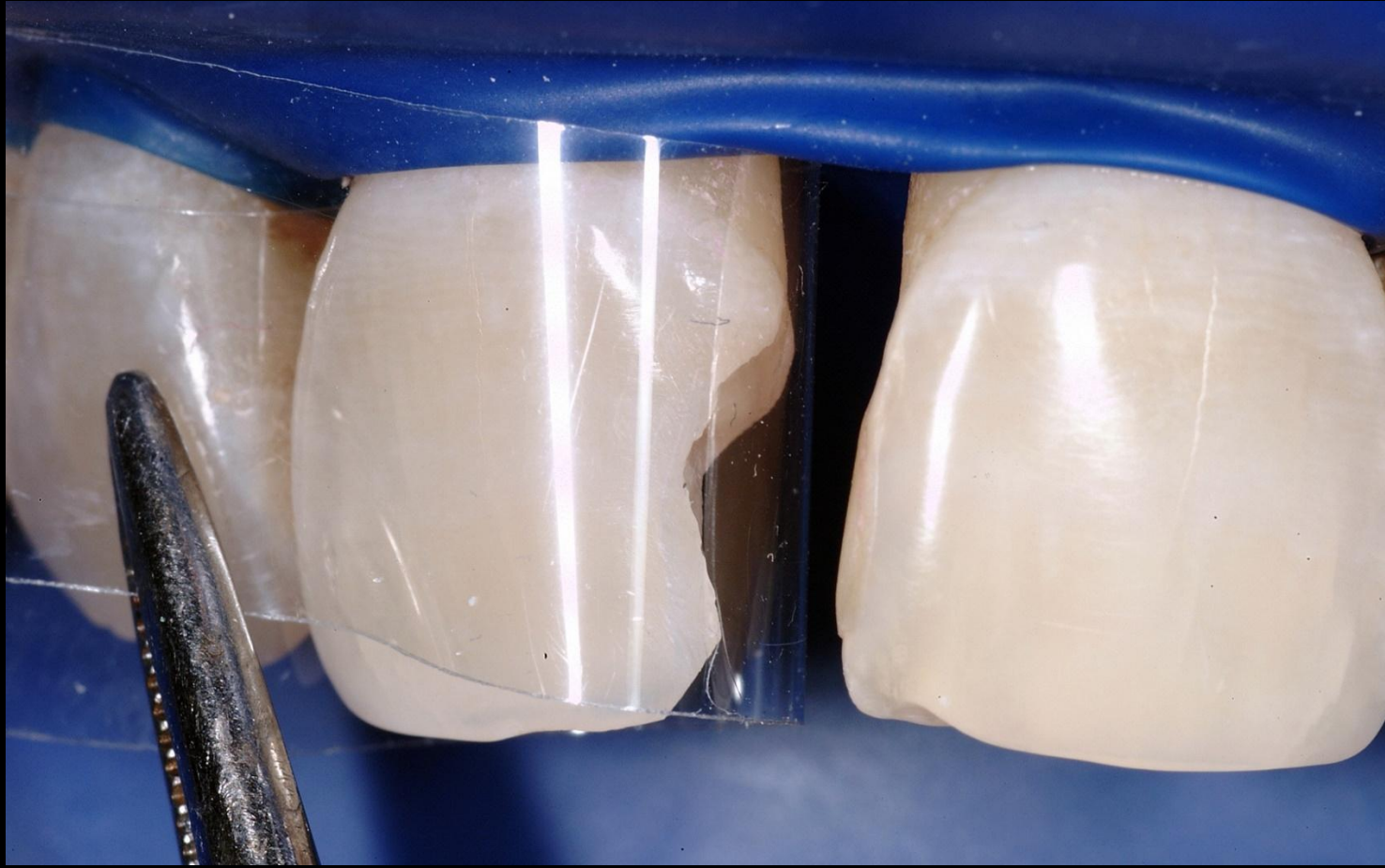
Traditional Composite Contacts



# Traditional composite technique



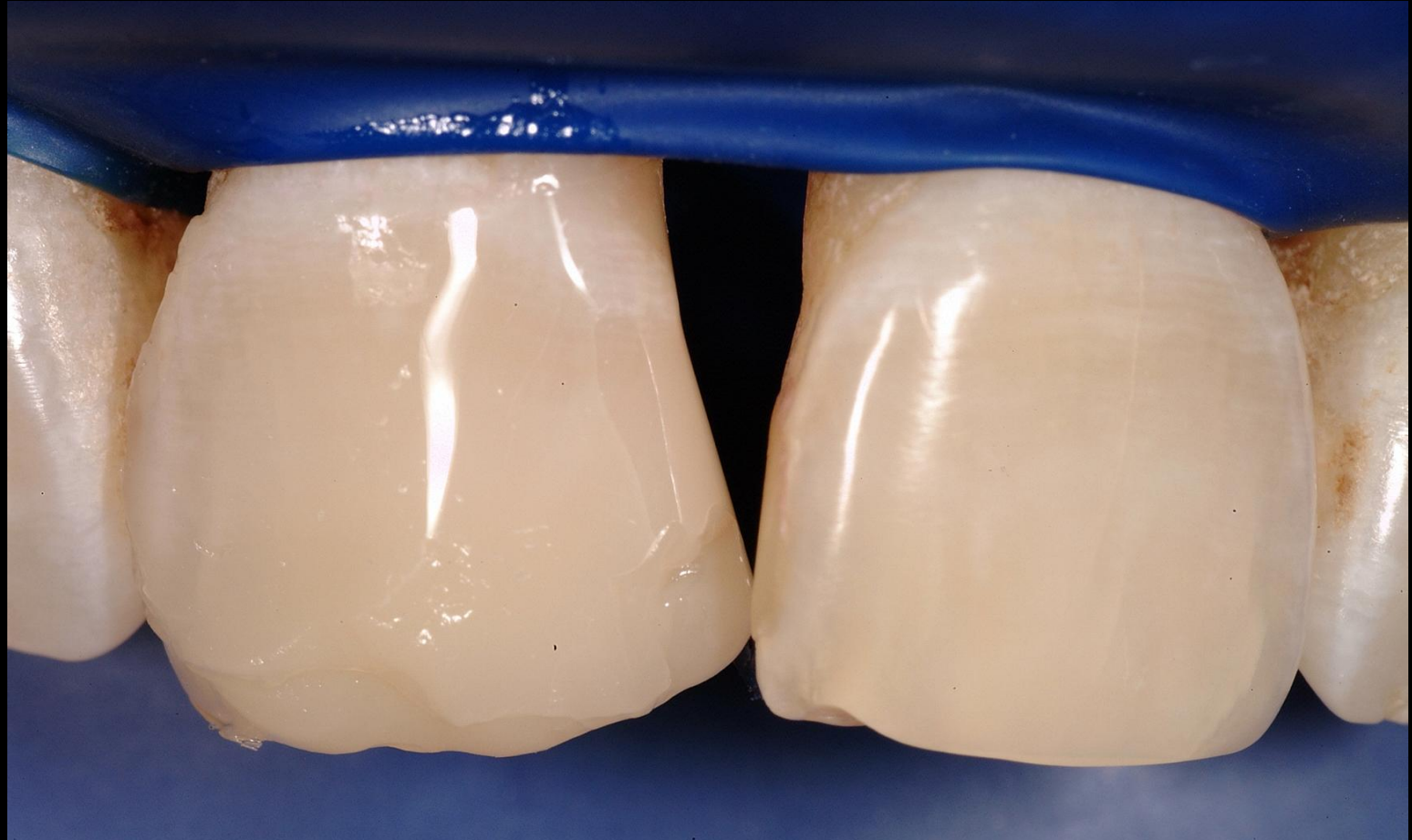
# Traditional composite technique



# Traditional composite technique



# Traditional composite technique



# Traditional composite technique



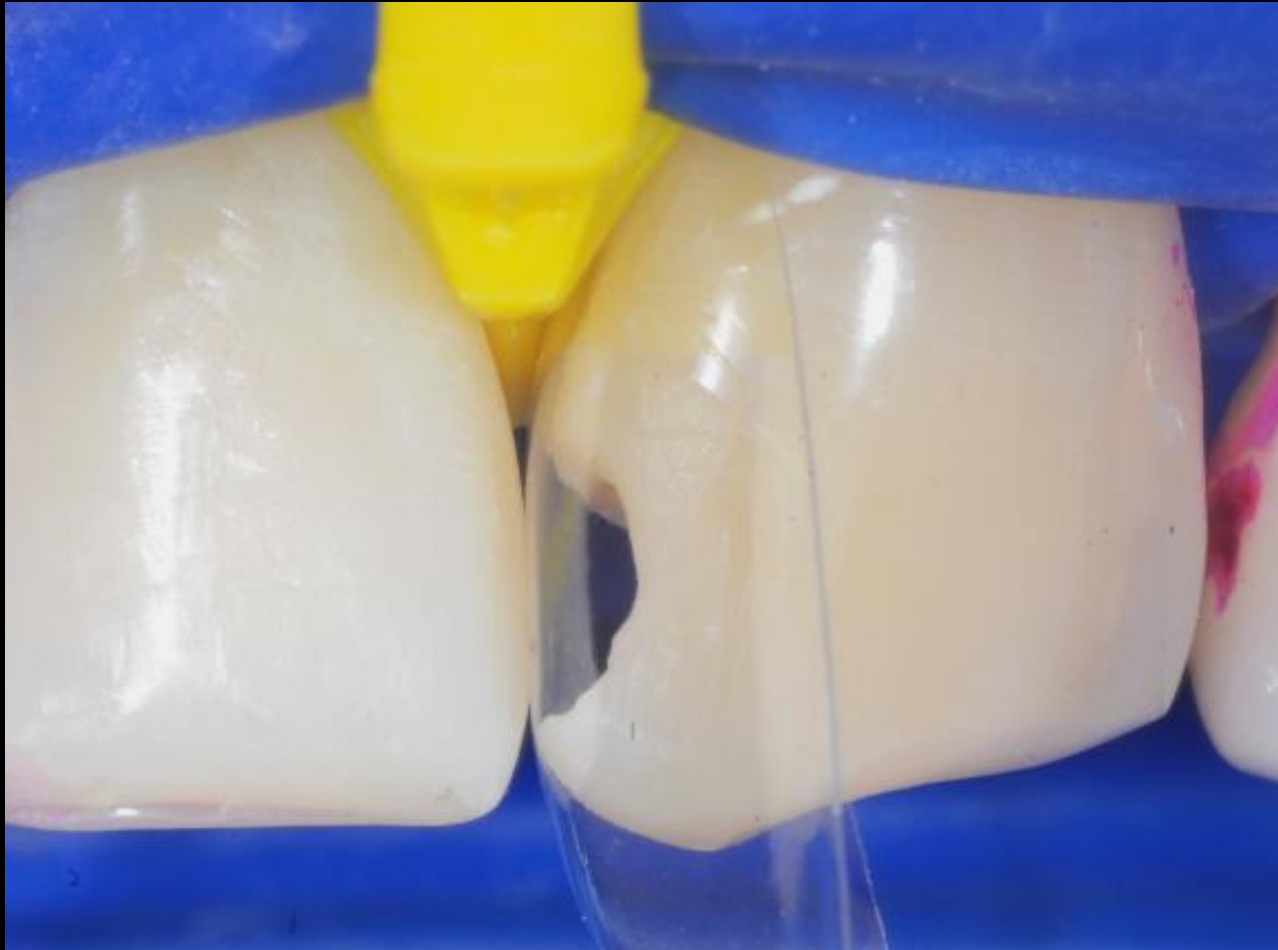
flat matrix + flat wedge = flat tooth

It's 2026. Why are we  
still using flat Mylar and  
flat wedges?

Teeth are not flat

**Teeth are not flat!**

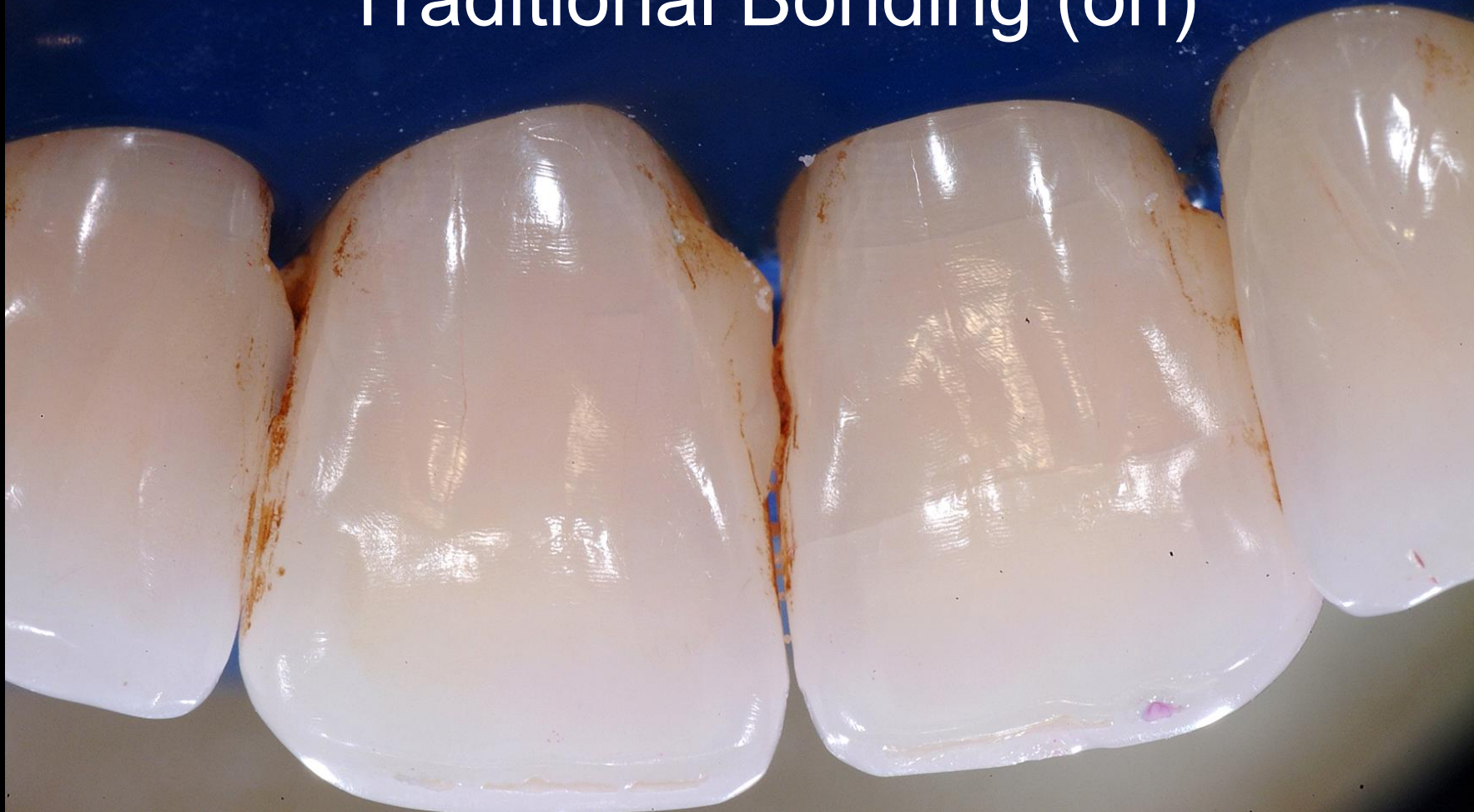




Anatomic  
Bioclear Anterior  
Matrix plus  
Bioclear  
Diamond Wedge  
(yellow-large)

“On” versus “Around”

# Traditional Bonding (on)



# Modern Method (around)



# The Matrix and the Method Matter



# Modern Method for Composite Restorations

## Clear Anatomic Matrices, Powerful Separation

- Anterior & Posterior Matrices
- Designed to mimic nature

## Injection Molded Composite

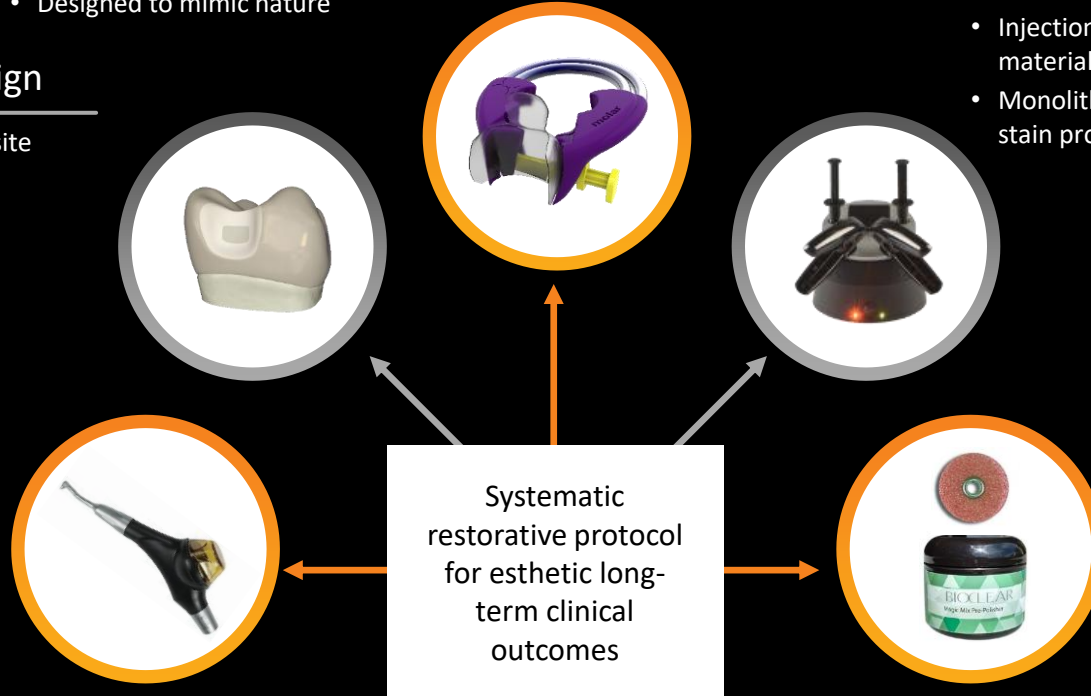
- Injection mold warmed Restorative materials
- Monolithic strength and Infinity Edge stain proof margins

## Preparation Design

- Designed for composite
- Minimizes stress concentration
- Maximizes enamel involvement

## Biofilm Removal

- Remove biofilm before bonding
- Allows bonding to uncut enamel
- Allows infinity edge margins



## Final Polish

- “Rock Star” polish with Bioclear Magic Mix & RS Polisher



**TOOTH & SURFACE SPECIFIC  
MATRIX SYSTEM**  
BY  BIOCLEAR



**140 Anterior Matrices**  
#6 through #11 in Mesial & Distal  
Small & Medium Lower Incisor

**75 Wedges**  
25 Small Wedges  
50 Medium Wedges

**The next generation  
of anterior matrices:**  
We're taking the  
guesswork out of to  
matrix selection

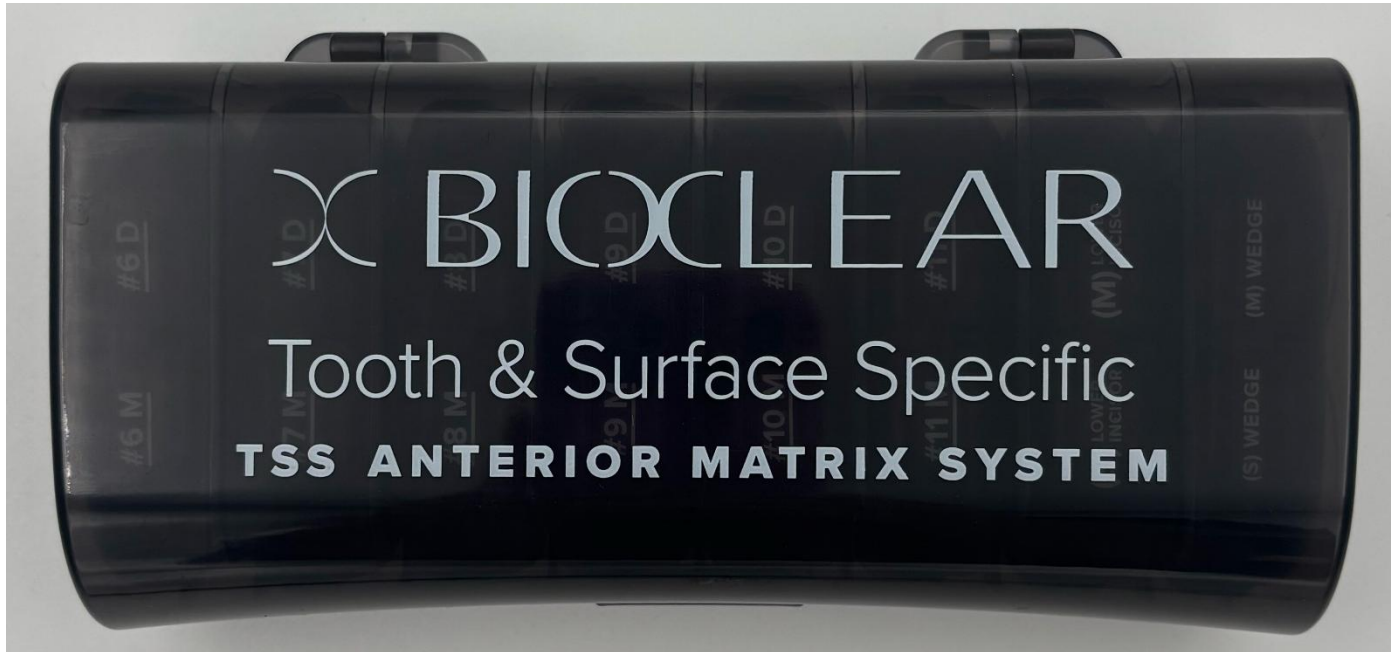


**Contact your Bioclear Sales Rep to Pre-Order**

[WWW.BIOCLEARMATRIX.COM](http://WWW.BIOCLEARMATRIX.COM)

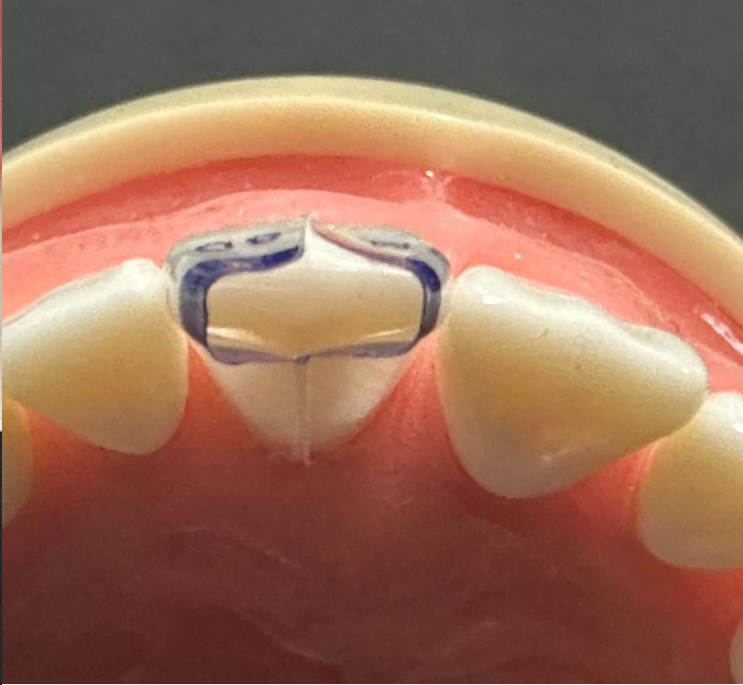
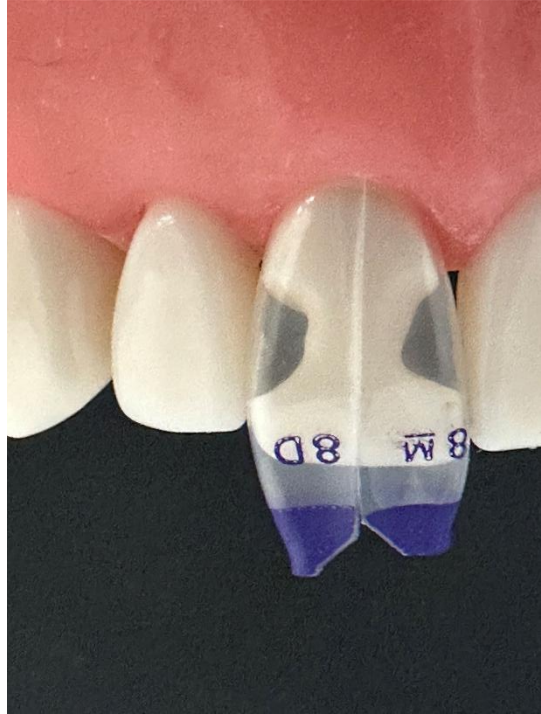
1.855.712.5327

The TSS system is for small and large anterior restorations, broken teeth and anterior esthetic veneering when you DO NOT have a black triangle or diastema













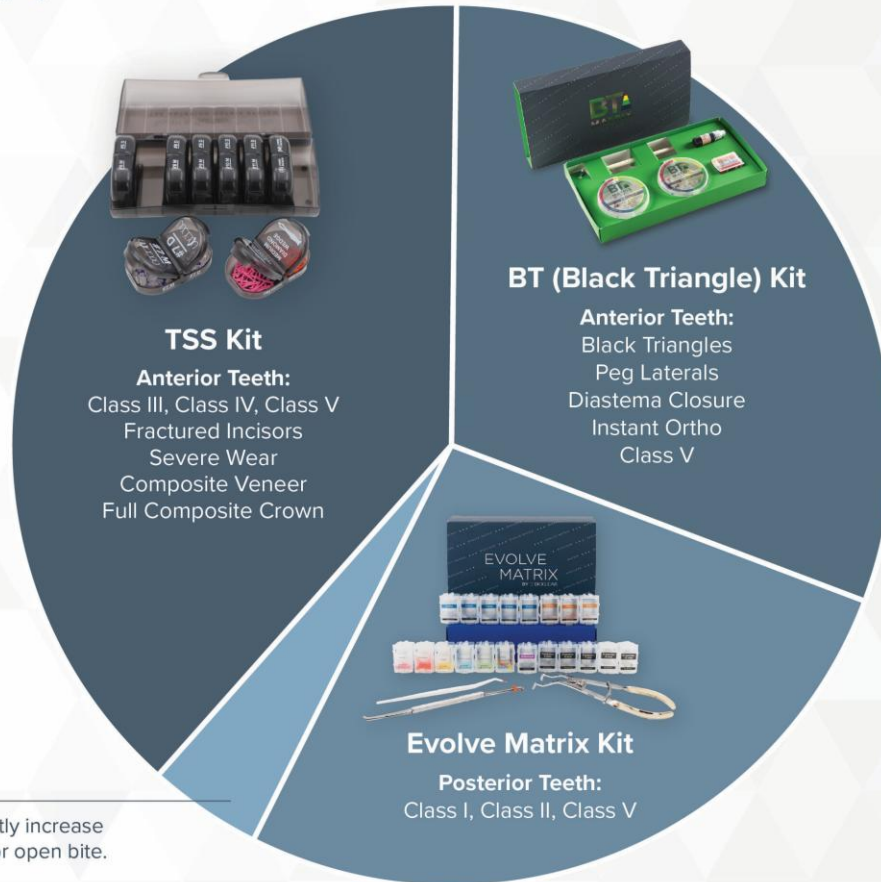
## Recommended Bioclear Matrices by Indication

For more information contact us  
*Bioclear Matrix Systems*  
1-855-712-5327



**360 Veneer**

Class V and to significantly increase overjet or correct anterior open bite.







Dan placed a Direct Contact Strut which made his life way easier and the case much better.



Dan placed a Direct Contact Strut which made his life way easier and the case much better.

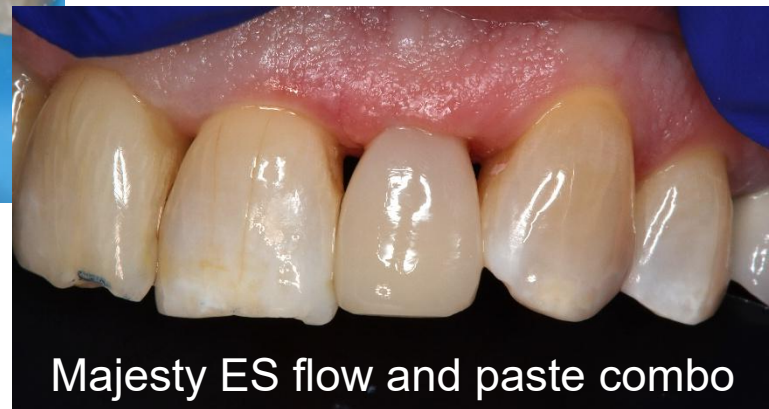








Courtesy of Dr.  
Dan  
Henricksen



Majesty ES flow and paste combo

Is monolithic injection molded composite a viable alternative to full ceramic crowns in some cases?

You be the judge of that



The patient is a 35-year-old male. His original chief complaint was a discolored filling on the distal of tooth #8. The patient was given two treatment plans, one to simply replace a few defective restorations and remove caries with traditional fillings or in patient terms we said, “We can patch the holes, or I can rejuvenate your smile. The patchwork plan will be healthy but will not make a significant esthetic change. In addition, the severe wear and acid erosion present on the palatal surfaces could eventually lead to catastrophic problems later i.e. root canals, infection, and tooth loss.” The patient opted for Bioclear rejuvenation versus simple fillings because he wanted a beautiful smile. He chose Bioclear in lieu of crowns because he understood that Bioclear is a more conservative and healthier approach to achieving his goals than traditional crowns.

Phase one of the treatment plan was to restore the anterior six teeth, simultaneously opening the vertical dimension to reduce the need for aggressive tooth reduction for material thickness. In addition, because the patient needed to have the teeth lengthened by 2 mm, opening the vertical dimension by 2 mm allowed the overbite to be more ideal. Because the patient could only commit to the cost of the six Bioclear restorations (\$11,600) we placed transitional occlusal flowable composites (thick sealants) on the four maxillary premolar teeth, and we will allow the molars to settle into occlusion utilizing the well-researched Dahl Technique.

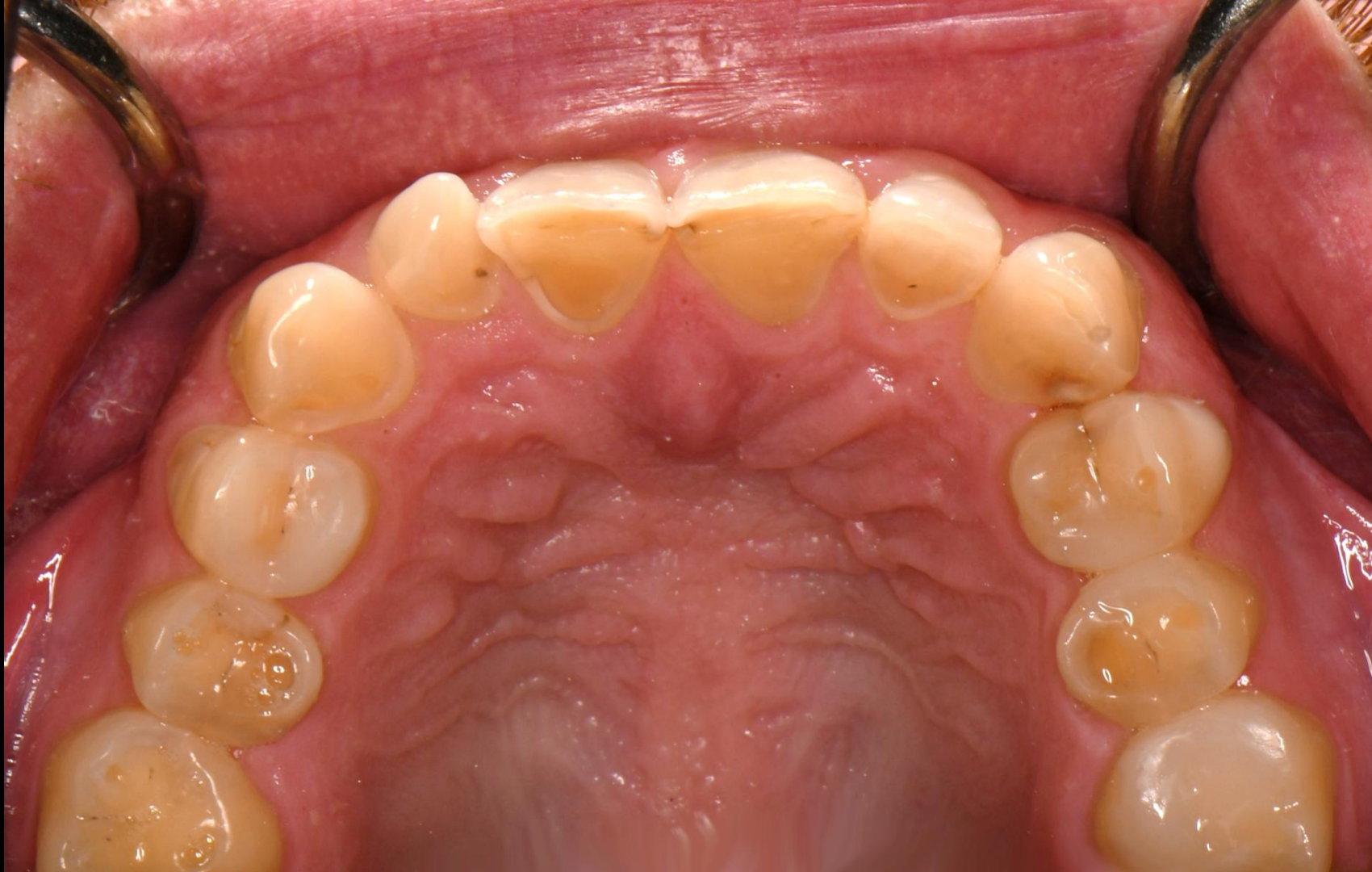
Phase two will be to restore the remaining teeth with Bioclear when the patient has his finances ready.

#### Treatment Summary Short Version:

Treatment was finished in a single 4-hour session. (Less experienced clinicians should plan to give one hour per tooth). Bioclear TSS Matrices were utilized on all the teeth except tooth #10. #10 required the Bioclear BT matrix system to create “instant ortho” and because a diastema was present there. Bioclear Diamond wedges were used as needed in areas where the contact was lost during caries removal or removal of old composites. Bioclear RSP X-course discs (Black) were used to shape the incisal edges and smooth the small seams present where the matrices meet on the facial and palatal. Final polish was achieved with Bioclear Magic Mix and then Rock Star Polish cups and cones.

One-week postoperative visit revealed healthy teeth and gingiva. The patient was ecstatic about his new smile, had zero post-operative pain or sensitivity, and expressed that his new bite with the increase in VDO felt more comfortable than before.





What percentage of the tooth is removed for a conservative crown prep?



Source: Google Images

# What percentage of the tooth is removed for a conservative crown prep?



Source: Google Images



Wouldn't it be nice to preserve nearly all the healthy tooth structure and at the same time completely rejuvenate this guy's smile?

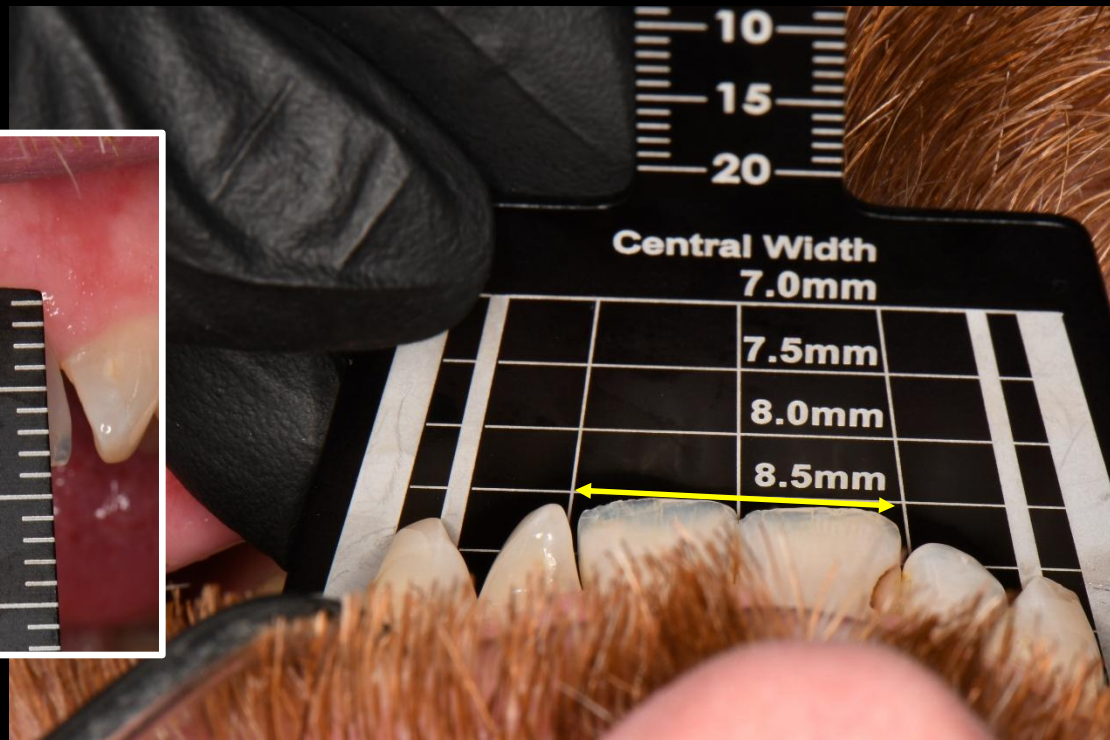


**Simplified Smile Design!**

How long are his  
centrals currently? 8.5 mm



How wide are his centrals? 8.5 mm



5  
10  
15  
20

Central Width  
7.0mm

7.5mm

8.0mm

8.5mm

9.0mm

9.5mm

10mm

 **Panadent**  
**Esthetic Proportion**  
**Gauge**

Central Width | Central Height

8.0mm | 10.0mm

8.5mm | 10.6mm

9.0mm | 11.2mm

9.5mm | 11.8mm

10.0mm | 12.5mm













**TSS**

TOOTH & SURFACE SPECIFIC  
MATRIX SYSTEM  
BY BIOCLEAR



140 Anterior Matrices

20 Standard Anterior Matrix

Small & Medium Upper Incisors

76 Bridges

20 Small Bridges

20 Medium Bridges

**The next generation  
of anterior matrices:**

We're taking the  
guesswork out of  
to matrix selection



Contact your BioClear Sales Rep to Pre-Order

[www.bioclearmatrix.com](http://www.bioclearmatrix.com)

1-800-702-3327



**TSS**

TOOTH & SURFACE SPECIFIC  
MATRIX SYSTEM  
BY DEXELLAR



100 Anterior Matrices  
PE, BPA Free, 100% Sterile & Ready  
to Use. No Prep. No Clean. No Waste.

25 Matrices  
PE, BPA Free, 100% Sterile  
& Ready to Use.

**The next generation  
of anterior matrices:**  
We're taking the  
guesswork out of  
matrix selection



Contact your Dexellar Sales Rep or Fax Order  
www.dexellar.com  
1.888.752.5227





**TSS**

TOOTH & SURFACE SPECIFIC  
MATRIX SYSTEM  
BY BOLLER



80 Single-Block  
Matrix and Wax  
1000 & 10000  
1000 & 10000  
1000 & 10000

25 Single-Block  
Matrix and Wax  
1000 & 10000  
1000 & 10000

**The next generation  
of anterior matrices:**  
We're taking the  
guesswork out of  
matrix selection



Contact your Bollor Sales Rep or Visit Us  
[www.bollor.com](http://www.bollor.com)  
1 800 765 5247



**TSS**  
TOOTH & SURFACE SPECIFIC  
MATRIX SYSTEM  
BY BOLLER

**The next generation  
of anterior matrices:**  
We're taking the  
guesswork out of to  
matrix selection

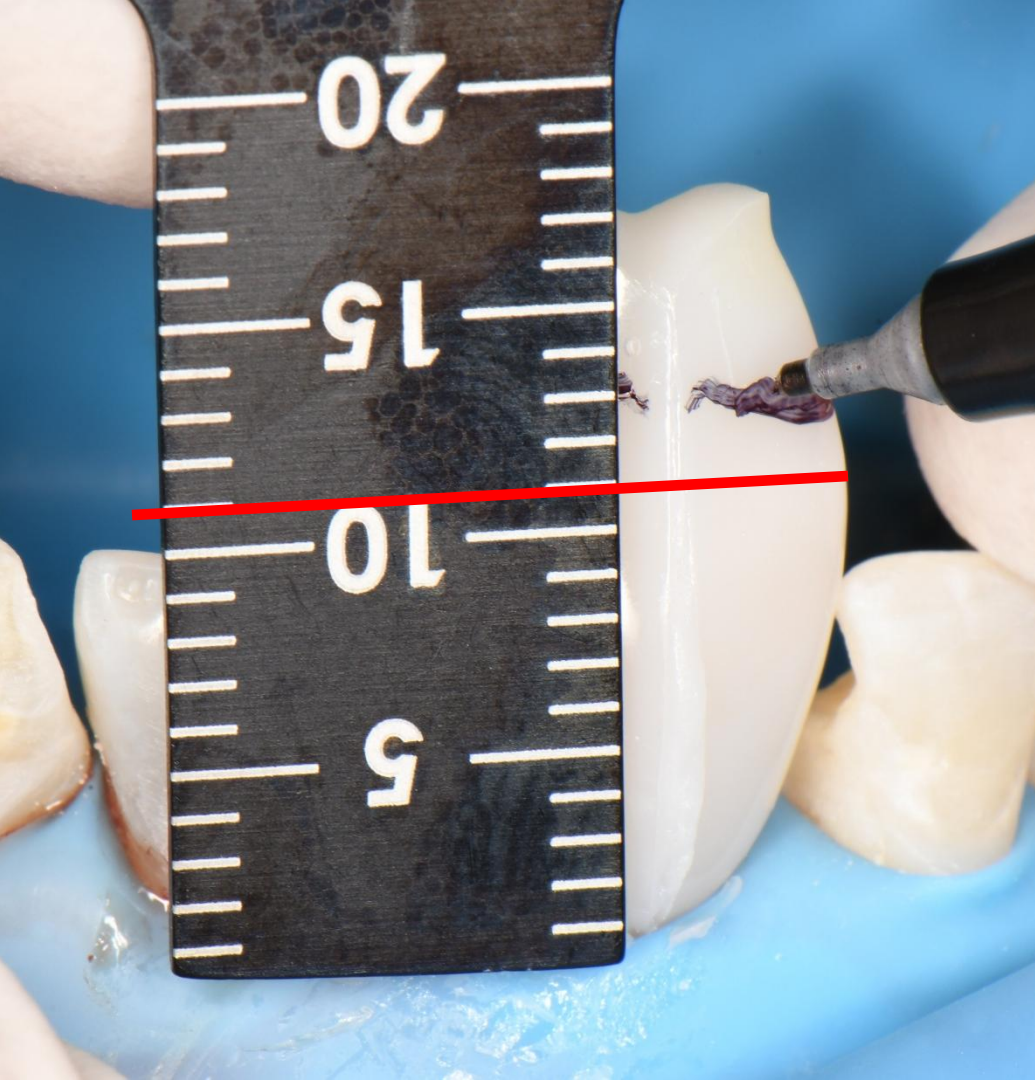


Order your Matrix Sides Kit in Pre-Order  
[www.boller.com](http://www.boller.com)  
800.735.5237

100 Anterior Matrices  
in 10 different sizes & colors  
to match your patient's teeth

10 Designs  
to match your  
patient's teeth



































Pre-operative



Immediate Post-Operative

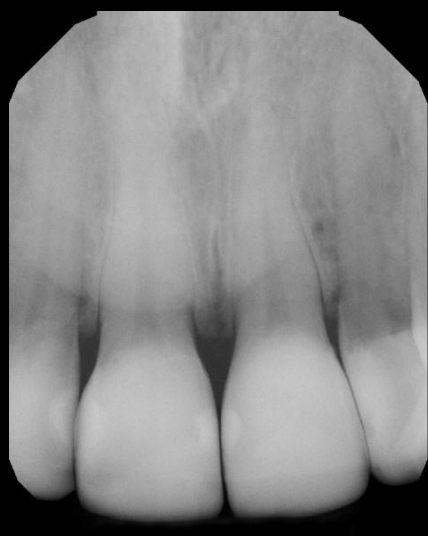


One Week Post-Operative









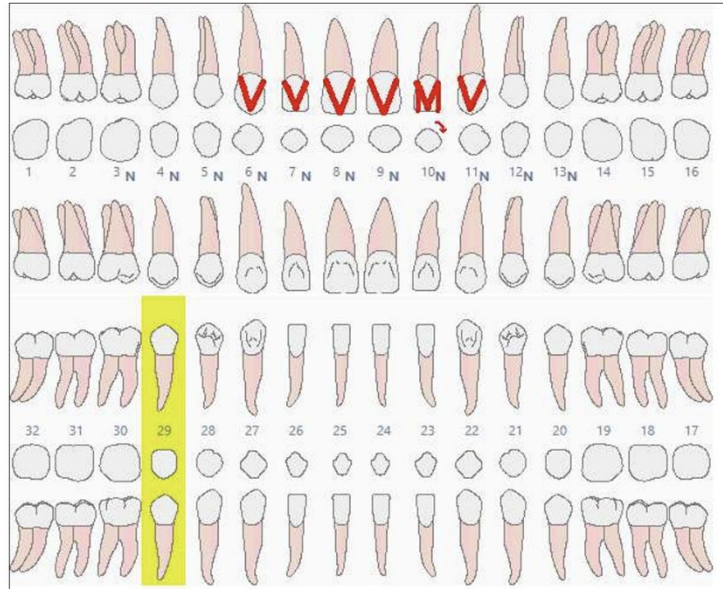
Day of treatment:  
About 4 hours



1-week  
post-op

Patient Chart

Patient Name [Redacted]  
 Patient ID [Redacted]



# Total Bioclear Case Fee?

# \$11,631

| Date      | Description                                 | Provider               | Tth | Surf | Status   | Fee        |
|-----------|---------------------------------------------|------------------------|-----|------|----------|------------|
| 1/15/2026 | 2993A - BIOCLEAR 360 REJUVENATION COMPLEX   | David J. Clark, D.D.S. | 6   |      | Proposed | \$1,840.00 |
| 1/15/2026 | 2993A - BIOCLEAR 360 REJUVENATION COMPLEX   | David J. Clark, D.D.S. | 7   |      | Proposed | \$1,840.00 |
| 1/15/2026 | 2993A - BIOCLEAR 360 REJUVENATION COMPLEX   | David J. Clark, D.D.S. | 8   |      | Proposed | \$1,840.00 |
| 1/15/2026 | 2993A - BIOCLEAR 360 REJUVENATION COMPLEX   | David J. Clark, D.D.S. | 9   |      | Proposed | \$1,840.00 |
| 1/15/2026 | 2993A - BIOCLEAR 360 REJUVENATION COMPLEX   | David J. Clark, D.D.S. | 10  |      | Proposed | \$1,840.00 |
| 1/15/2026 | 2993A - BIOCLEAR 360 REJUVENATION COMPLEX   | David J. Clark, D.D.S. | 11  |      | Proposed | \$1,840.00 |
| 1/15/2026 | 199.2 - BIOCLEAR ORTHO CORRECTION PER TOOTH | David J. Clark, D.D.S. | 10  |      | Proposed | \$306.00   |
| 1/15/2026 | 299.5 - BIOCLEAR DIASTEMA CLOSURE           | David J. Clark, D.D.S. | 10  | MD   | Proposed | \$285.00   |



∞ BIOCLEAR

## **Bioclear Black Triangle Restoration**

*with Kuraray Majesty ES-2 Flowable*

---

## Recommended Bioclear Matrices by Indication

For more information contact us  
*Bioclear Matrix Systems*  
1-855-712-5327



**360 Veneer**

Class V and to significantly increase overjet or correct anterior open bite.



### TSS Kit

**Anterior Teeth:**  
Class III, Class IV, Class V  
Fractured Incisors  
Severe Wear  
Composite Veneer  
Full Composite Crown



### BT (Black Triangle) Kit

**Anterior Teeth:**  
Black Triangles  
Peg Laterals  
Diastema Closure  
Instant Ortho  
Class V



### Evolve Matrix Kit

**Posterior Teeth:**  
Class I, Class II, Class V

Meet Erica: 35-year-old female  
finishing her 2<sup>nd</sup> round of orthodontics



Erica just finished her ortho and she's not happy



What are Erica's chief complaints?



What were the options given when she complained to her orthodontist?



What was the TX Plan when she got back to her  
General Dentist?



What were the TX Plans when she consulted with the periodontist?



➤ Bioclear can fix almost everything if you follow the method



- Take photos from a lateral view. The patient doesn't see this (but everyone else in the room does)





➤ Gauge the triangle space **before** the rubber dam









- “Aquarium” matrices and “Shield” matrices











Pre-Operative



1-Year Post-Operative



Pre-Operative



1-Year Post-Operative



Pre-Operative



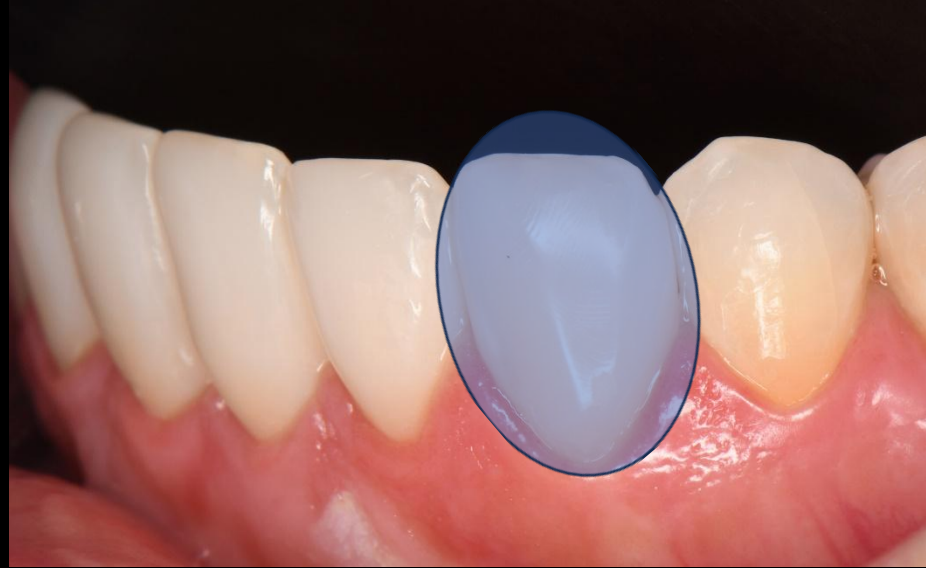
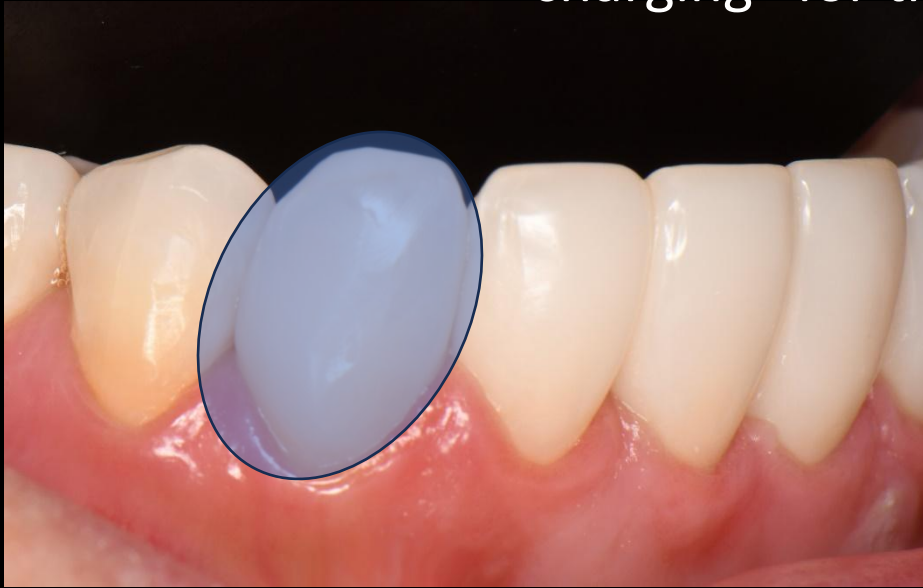
1-Year Post-Operative



If you are doing more than one BT, consider overmolding the entire tooth, even when we are not “charging” for that triangle area



If you are doing more than one BT, consider overmolding the entire tooth, even when we are not “charging” for that triangle area

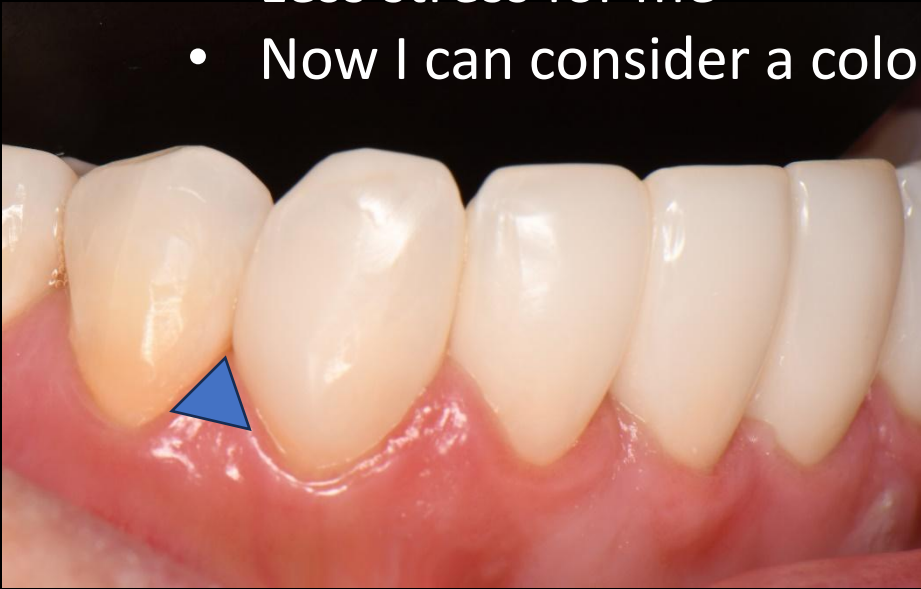


If you are doing more than one BT, consider overmolding the entire tooth, even when we are not “charging” for that triangle area



## Why cover the WST (Whole Stinking Tooth)

- Easier than marginating
- Less stress for me
- Now I can consider a color upgrade



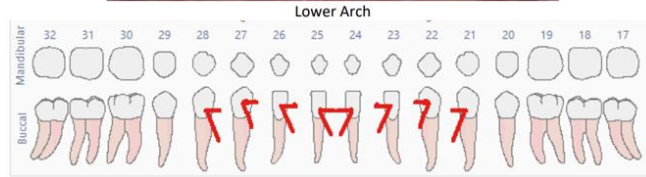


CLINIC

3402 South 38<sup>th</sup> Street, Tacoma, WA 98409  
O: 253-474-7635 E: Patient@BioclearClinic.com

Date: 03-08-2021

Patient Name: Erica  
Consultation Date: 03-08-2021  
Treating Doctor: David Clark



Appointment time required to complete treatment One Day: 7am to 4pm with 10 day follow appointment.

- **Lunch and Breaks:** We provide a protein liquid drink for lunch. Be sure to eat breakfast prior to appointment. You will receive breaks to rest your jaw and use restroom.
- **Night Guard:** To protect your Bioclear restorations. Requirement for 5 yr. warranty of restoration. REFERRED: Night guard to be fabricated by your local dental provider.
- **Whitening Tray Options:** 1 Kit: (Kit include: custom upper and lower trays and bleach) Following Bioclear restoration placement for take home maintenance. Cost: \$250


| Tooth #                                                                                       | Description                       | Fee   |
|-----------------------------------------------------------------------------------------------|-----------------------------------|-------|
| <b>Comprehensive Evaluation:</b> complete oral evaluation, color, size determination, photos. |                                   |       |
| •                                                                                             | Bioclear Comprehensive Evaluation | \$289 |

**Bioclear Black Triangle:** To close negative space between teeth and rejuvenate tooth to youthful appearance.  
Tooth # 21/22, 22/23, 23/24, 24/25, 25/26, 26/27 Bioclear Black Triangle Closure Multiple \$1,200 per Bioclear Black Triangle Closure.

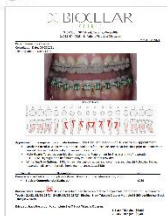
Erica, you have the option to complete 5 or 7 Black Triangle Closures.

5 Black Triangles \$6,000  
7 Black Triangles \$8,400

- **Lunch and Breaks:** We provide a protein liquid drink for lunch. Be sure to eat breakfast prior to appointment. You will receive breaks to rest your jaw and use restroom.
- **Night Guard:** To protect your Bioclear restorations. Requirement for 5 yr. warranty of restoration. REFERRED: Night guard to be fabricated by your local dental provider.
- **Whitening Tray Options:** 1 Kit: (Kit include: custom upper and lower trays and bleach) Following Bioclear restoration placement for take home maintenance. Cost: **\$250**

| Tooth #                                                                                                                                       | Description                                                                       | Fee                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Comprehensive Evaluation:</b> complete oral evaluation, color, size determination, photos.                                                 |                                                                                   |                                                                                    |
| • <b>Bioclear Comprehensive Evaluation</b>                                                                                                    |                                                                                   | <b>\$289</b>                                                                       |
| <b>Bioclear Black Triangle:</b>                                                                                                               |  | To close negative space between teeth and rejuvenate tooth to youthful appearance. |
| <b>Tooth # 21/22, 22/23, 23/24, 24/25, 25/26, 26/27 Bioclear Black Triangle Closure Multiple \$1,200 per Bioclear Black Triangle Closure.</b> |                                                                                   |                                                                                    |

**Erica, you have the option to complete 5 or 7 Black Triangle Closures.**



**5 Black Triangles \$6,000**  
**7 Black Triangles \$8,400**

## Key Takeaways from Erica's case:

- Use a shield matrix or shield matrices when possible
- What's a shield matrix?
- What are aquarium matrices?
- Doing the whole tooth is easier than half a tooth
- The "flowable clamp" for anterior rubber dams
- Use very small hole punch on your rubber dam



## Pre-Operative



## 1-Year Post-Operative



## Key Takeaways from Erica's case:

- Remove the matrix/matrices after injection molding before you move on to achieve a tighter contact
- You don't want or need a shield matrix on a tooth once you have injection molded (same principal as above, to get tighter contacts)
- We will utilize this principal when we talk about quadrant strategy for Class II restorations later



# Treating a Single Black Triangle























2-year follow up



2-year follow up

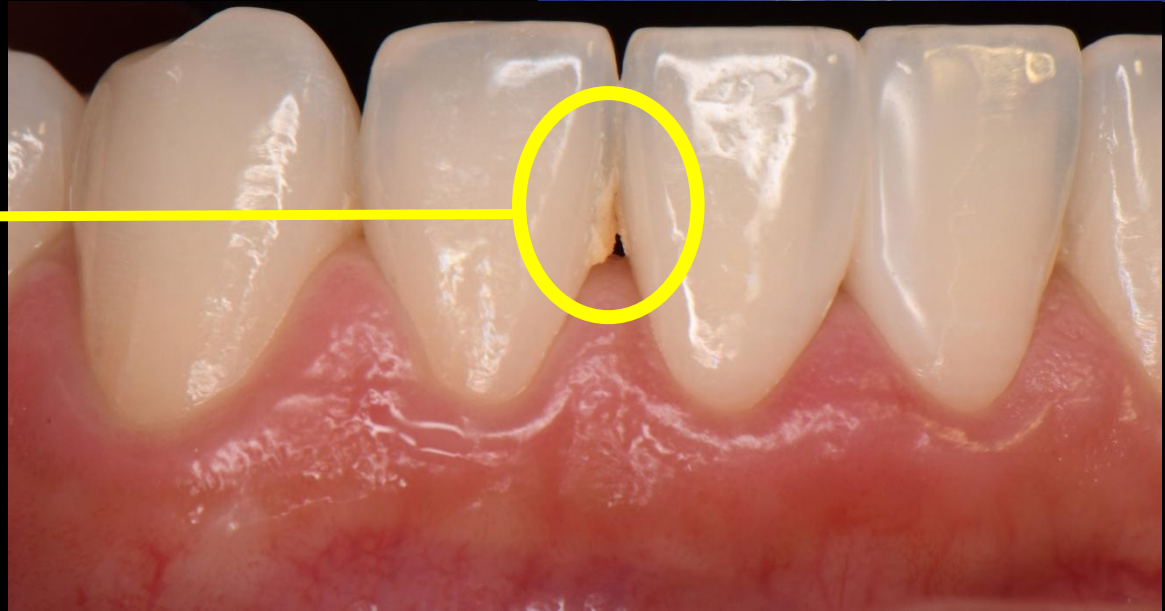


2-year follow up

➤ The new Bioclear BT matrices have a specific shape i.e. shoulder blades that deflect bacterial accumulation



unrestored



- The new Bioclear BT matrices have a specific shape i.e. shoulder blades that deflect bacterial accumulation



Injection over -  
molded



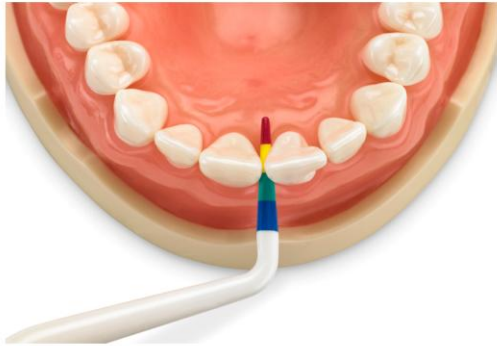
Treat yourself to a weekend with ∞ BIOCLEAR

# BLACK TRIANGLE

## CERTIFICATION COURSE

18 CE CREDITS

This three-part live hands-on certification course will teach you how to treat black triangles, gingival recession, root abrasions, and perform confident restorations. In becoming a certified Bioclear black triangle doctor, you'll increase your overall skill and knowledge of Bioclear and learn to market your new skills to patients.



**Upcoming Dates:**

**Washington DC**  
May 8<sup>th</sup> 2026



**Orange Beach**  
April 24<sup>th</sup> 2026



*Limited spots available!*

Scan to learn more  
& sign up for your  
local BT Course!



[www.bioclearmatrix.com/live-courses/](http://www.bioclearmatrix.com/live-courses/)



**BEFORE**



**AFTER**



**BEFORE**



**AFTER**

# ∞ BIOCLEAR

## Stop by convention

# booth #3902

## to...

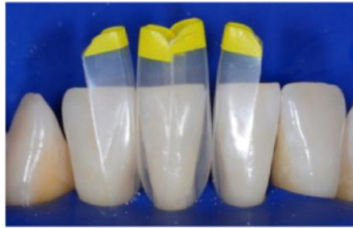
- ✓ Hear more about Bioclear courses
- ✓ Meet our team of Bioclear nuts
- ✓ Order products
- ✓ Register for courses
- ✓ Learn why Bioclear is a BIG DEAL!



# Getting paid to be conservative

## BIOCLEAR VS. CROWNS AND VENEERS

Bioclear is an alternative to traditional methods for enhancing a smile. Rather than preparing for a crown or veneer, the Bioclear Method—expanding the possibilities of dentistry—conserves the natural tooth structure, tooth enamel and tooth durability.



**BIOCLEAR PREPARATION**  
Bioclear allows dentists to **conserve** healthy tooth structure



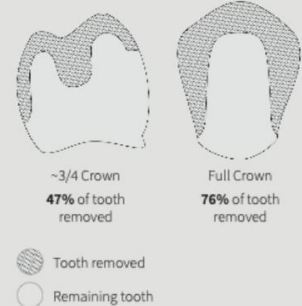
**CROWN PREPARATION**  
Crowns require dentists to **remove an average of 76%** of the tooth structure prior to the procedure



**VENEER PREPARATION**  
Veneers require dentists to **remove an average of 47%** of the tooth structure prior to the procedure

## AN HONEST LOOK AT CROWN PREPARATIONS

As illustrated below, crowns, veneers, and onlays require the removal of a significant amount of healthy tooth structure. Bioclear dentists can leave most or all of the tooth structure. Bioclear is a very attractive option to patients.





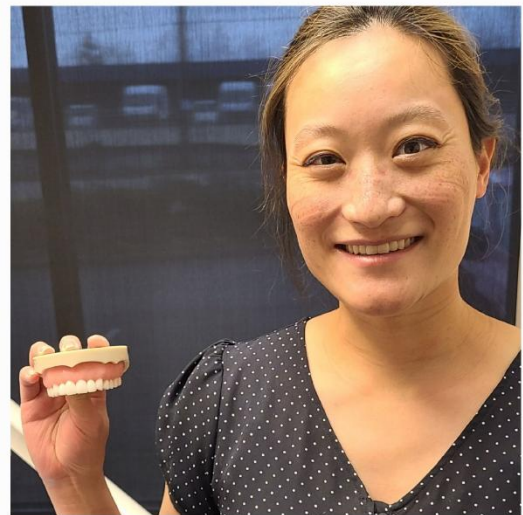
 **BIOCLEAR**  
LEARNING CENTER

**Tacoma USA · Solihull UK**  
**Varberg Sweden · Cairo Egypt**  
**Syracuse Italy**









# Last week's attendees at the certification course





# 2026 Certification Courses



- Core Anterior + Core Posterior • Complex Cases & Problem Solving
- Smile Design & Comprehensive Anterior Rejuvenation • Bioclear Alumni Summit

### January

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

### February

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |

### March

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 |    |    |    |    |

### April

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 |    |    |

### May

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  |    |
| 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 |    |    |    |    |    |    |

### June

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    | 1  | 2  | 3  | 4  | 5  | 6  |
| 7  | 8  | 9  | 10 | 11 | 12 | 13 |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 28 | 29 | 30 |    |    |    |    |

### July

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 |    |

### August

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    |    |    | 1  |
| 2  | 3  | 4  | 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 |    |    |    |    |    |

### September

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    | 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 |    |    |    |

### October

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

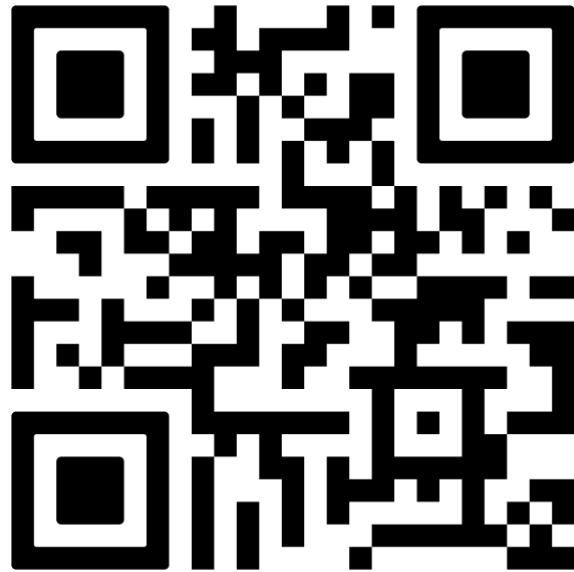
### November

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  |
| 8  | 9  | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 |    |    |    |    |    |

### December

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    | 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 |    |    |

For a copy of today's presentation,  
Learning Center info or the essential  
Learning Center Library



Course  
Code:  
6843



# The Bioclear Direct Contact Strut

*Creating Contacts for Diastemas, Peg Laterals, and Bioclear 360° Veneers*

- Abbreviated Version -

---

# Dr Jose Moura 5/2025 Taubate Brazil







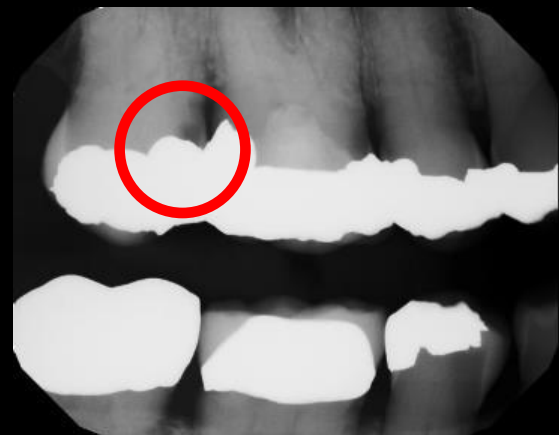












## Deep Margin Acquisition (DMA)



Inside the prep to our reference = 6mm

- What Evolve matrix color should you choose and what height?
- What's my reference?











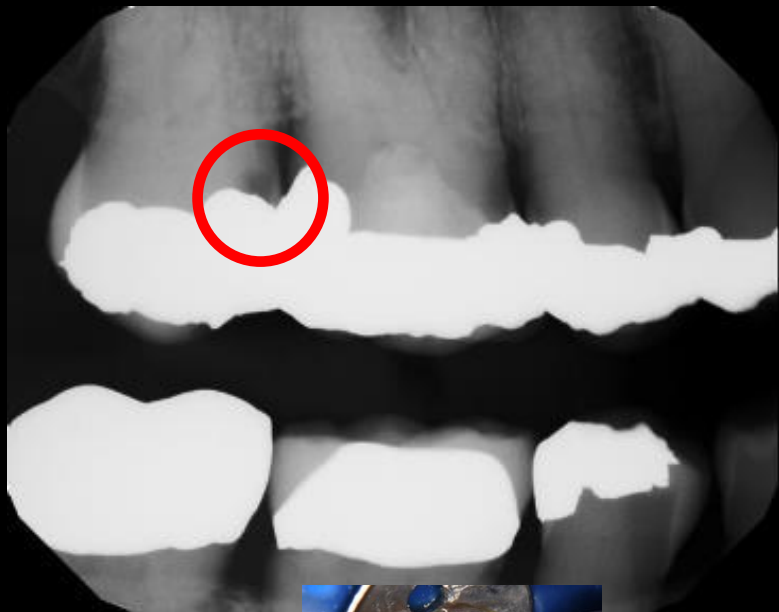




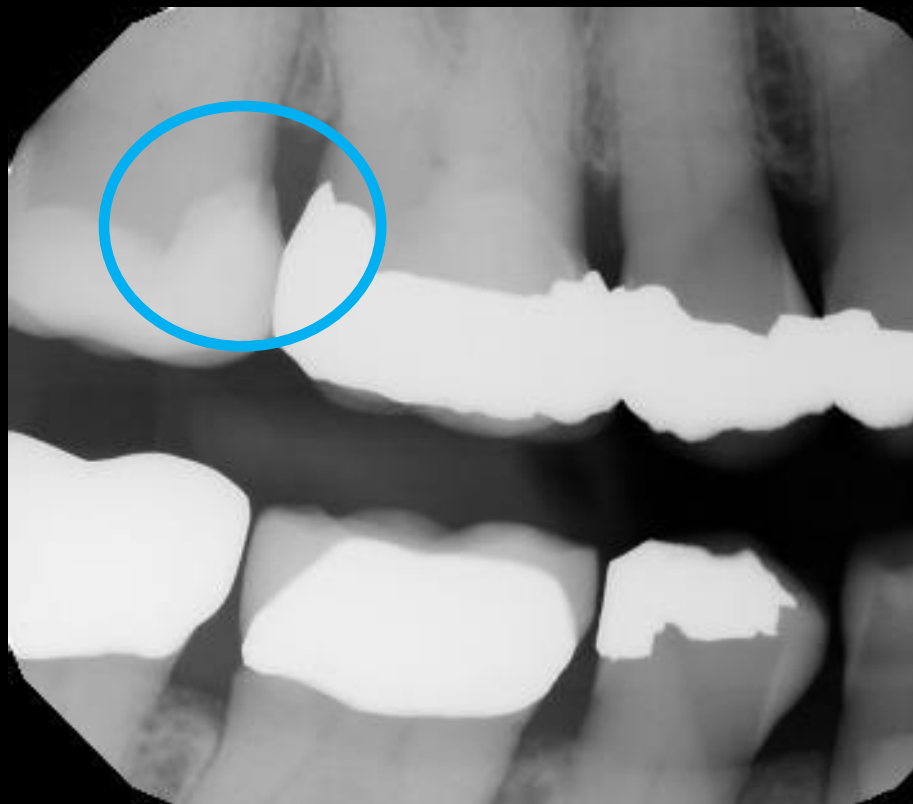




Pre-op



Post-op

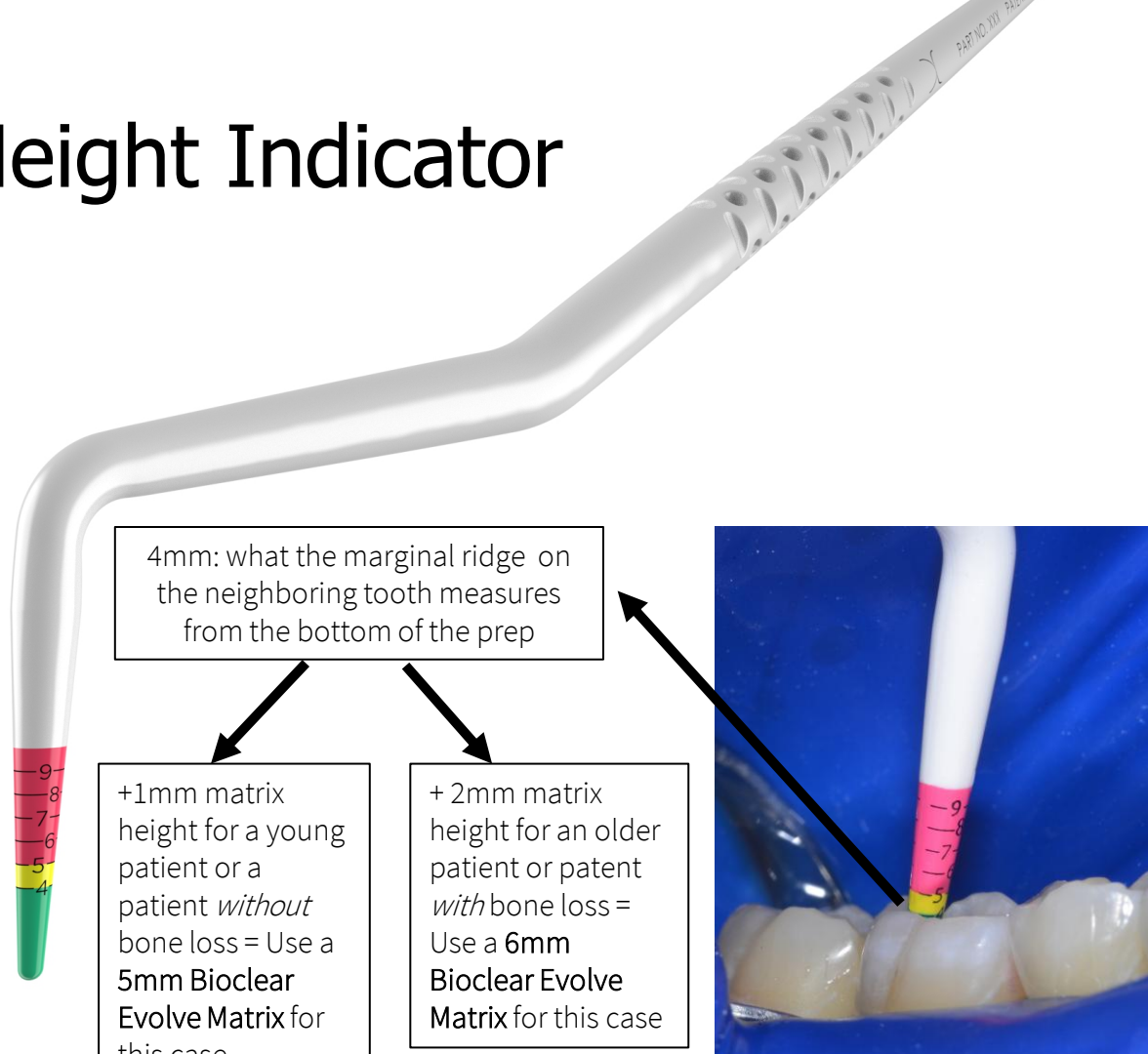


# Evolve Matrix Height Indicator

## Matrix Height Indicator:

Numbers are printed on the indicator so the correct Evolve matrix for a restoration is chosen the first time. This helps reduce waste when incorrect matrices are chosen.

Once you have measured the depth of the cavity in relation to the marginal ridge of the neighboring tooth, you will generally need to add 1-2mm from that reading.



4mm: what the marginal ridge on the neighboring tooth measures from the bottom of the prep

+1mm matrix height for a young patient or a patient *without* bone loss = Use a 5mm Bioclear Evolve Matrix for this case

+ 2mm matrix height for an older patient or patient *with* bone loss = Use a 6mm Bioclear Evolve Matrix for this case

# Evolve Matrix Height Indicator

## Go/No-Go:

The colored tip indicates if a cavity prep can be cured in one layer or if more must be used.

**Red:** NO-GO the composite will be deeper than 5mm

**Yellow:** GO WITH CONDITIONS

**Green:** GO



*Tip: The best reference point is the marginal ridge of the neighboring tooth. If you are doing a back-to-back restoration and no marginal ridge is available, then use the gauge to estimate the height the composite should be when you are finished injection molding but before curing.*





 **DIAMOND**  
WEDGE

So which composites turn yellow over time, and which composites maintain their color better?

If you use A-1, B-1, W, or XW it matters... a lot

If you are using A-2 or darker, you don't see the change



Filtek™ EW Body 2020



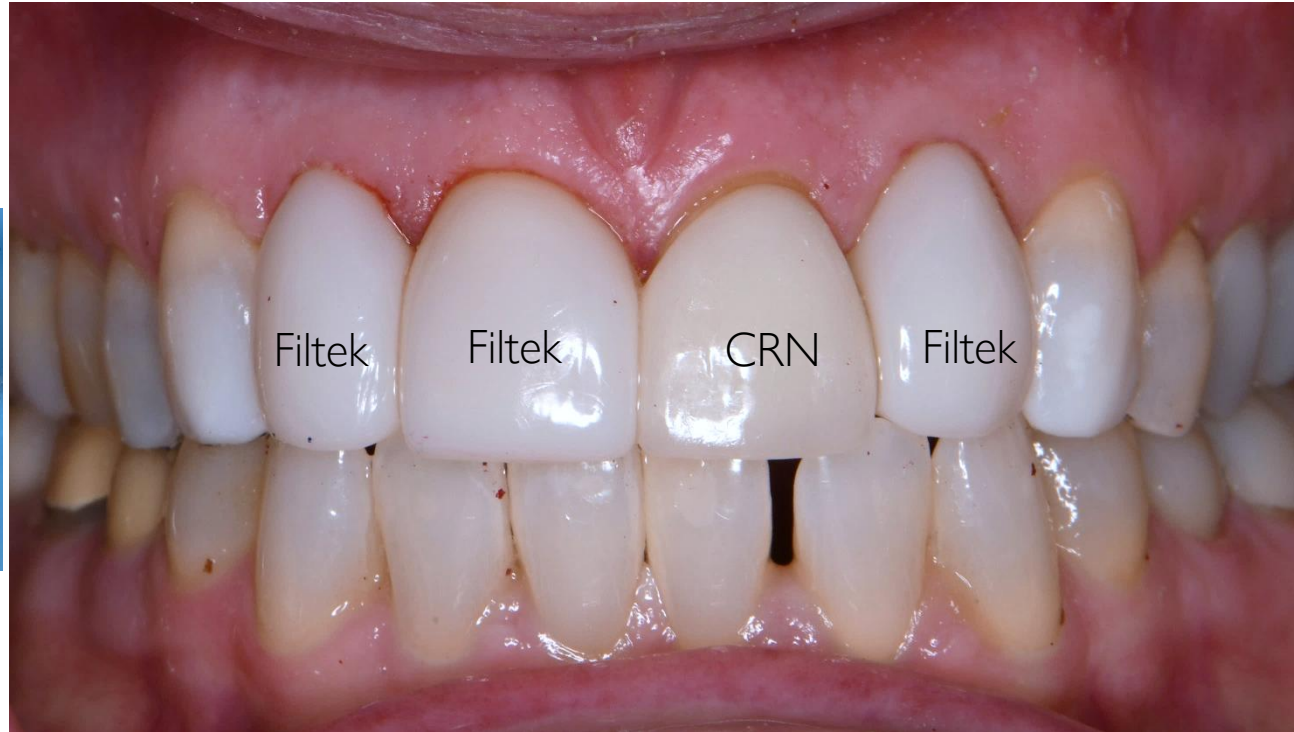
Filtek™ EW Body 2024



# Immediate post-op with Filtek B-1



Pre-polish



2-year post-op, there is noticeable yellowing



Filtek 9-year post-op, there is catastrophic yellowing



Filtek™ B1  
Body 2016

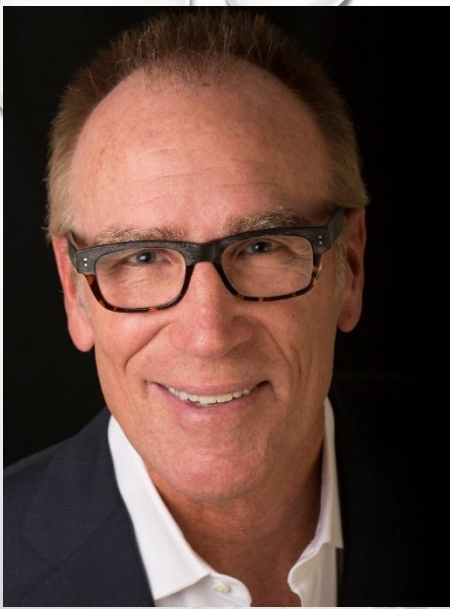


Filtek™ B-1  
Body 2018



Filtek™ B-1  
Body 2025





Dr. Richard  
Young

Bioclear Cases 4 Year  
Post-ops  
Untouched-NO refresh  
on either case  
Majesty ES Classic and Flow



[@dr.young.esthetics](https://www.instagram.com/dr.young.esthetics)



@dr.young.esthetics



@dr.young.esthetics



@dr.young.esthetics

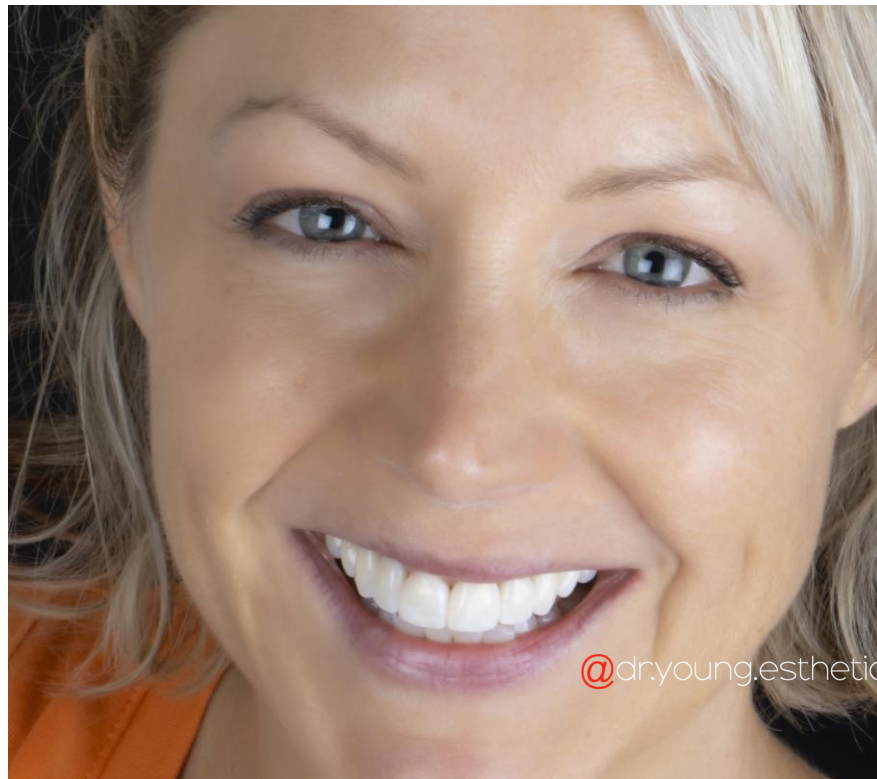


@dr.young.esthetics





@dr



@dr.young.esthetic



4 Years Post-Op

@dr.young.esthetics

Kuraray Majesty ES Classic (Paste) and Flow

# **CLEARFIL™**

## Injection Molded Composites



DENTAL BONDING AGENTS  
**CLEARFIL™ Universal Bond Quick 2**



DENTAL LIGHT-CURED RESTORATIVE COMPOSITE  
**CLEARFIL MAJESTY™ ES Flow**



DENTAL LIGHT-CURED RESTORATIVE COMPOSITE  
**CLEARFIL MAJESTY™ ES-2**  
**Classic**  
(Body Shades)

## Color stability and surface roughness of novel single-shade universal composite resins exposed to staining solutions: an in vitro study

Malin Janson<sup>1</sup>, Anja Liebermann<sup>2</sup>, Christoph Matthias Schoppmeier<sup>3</sup>

Received: 26 March 2025 / Accepted: 29 June 2025 / Published online: 15 July 2025  
 © The Author(s) 2025

**Abstract**  
 This study investigated the color stability and surface roughness of three novel single-shade universal composites after exposure to common staining solutions. A total of 120 specimens (n = 40 per composite) were fabricated from Transcend Universal Composite (TRA), Essie One (ECO), and Clearfil Majesty ES-2 Universal (CLA). Specimens were stored at 37 °C in four different staining solutions (artificial saliva, coffee, red wine, matcha tea). Color changes ( $\Delta E_{45}$ ) were assessed at five time points using the e-LAB system, and surface roughness (Sa, Sr) was analyzed via 3D laser scanning microscopy. Statistical analysis was performed using a linear mixed model and post-hoc test (Tukey) ( $p < 0.05$ ). Composite type, staining solution, and exposure duration significantly affected discoloration ( $p < 0.001$ ). Red wine induced the most pronounced color change ( $\text{ECO } \Delta E_{45} = 38.9 \pm 1.56$ ), while coffee and matcha tea caused similar discoloration ( $p = 0.164$ ). TRA showed the greatest surface roughness increase; no correlation with color change was observed. The color stability of single-shade composites is influenced by resin matrix composition and staining agent exposure. Tri-modal or multi-hybrid composites showed greater color stability than the micro by hybrid composite. Surface roughness did not impact discoloration susceptibility.

**Keywords** Single-shade universal composites · Color stability · e-LAB system · Staining solutions · Surface roughness

### 1 Introduction

The long-term color stability of restorative materials is a critical factor in esthetic reconstructive dentistry, as it significantly impacts both the durability and visual longevity of restorations (Parvina et al. 2015). Among the various restorative materials, resin-based composites must withstand continuous exposure to chromogenic substances found in foods, beverages, and saliva, which can compromise their optical and mechanical integrity over time (Cicchetti et al. 2024; Catelan et al. 2011; Kuchman et al. 2020). Multi-shade composites traditionally achieve esthetic outcomes through stratified layering and customized pigmentation techniques (Chen et al. 2024; Enobé et al. 2022). While effective, these procedures are time-consuming, technique-sensitive, and require a wide inventory of materials. Single-shade universal composites have been developed to overcome these limitations, offering simplified color selection while maintaining essential aesthetic and functional properties such as strength, durability, and adaptability (Lei et al. 2024). The primary advantage of these materials lies in their dynamic color adjustment. The chameleon effect enables a harmonious integration with the tooth structure by scattering and

## Effects of different curing methods on the color stability of composite resins

Massimo Pisano<sup>1</sup>, Alfredo Iandolo<sup>1</sup>, Dina Abdelatif<sup>1</sup>, Andrea Chiacchio<sup>1</sup>, Marco Galdi<sup>1</sup>, Stefano Martina<sup>1</sup>

Department of Medicine, Surgery and Dentistry "Scuola Medica Salernitana", University of Salerno, Salerno, Italy

### ABSTRACT

**Objective:** The aim of this study was to compare the effects of different polymerization strategies and the effectiveness of finishing and polishing procedures of composite resins on color stability.

**Materials and Methods:** The samples were divided into 4 main groups according to the polymerization strategy, and all groups except the control group received surface treatment. Each group was subsequently divided into 3 subgroups respectively: Kuraray Clearfil Majesty ES-2 Classic, Premium and Universal. Approximately 24 hours after preparation of the samples, they were immersed for 7 days in a coffee solution. A first color measurement was performed after the preparation of the samples, the second measurement was performed after 7 days in the coffee solution. All measurements were carried out using a dental spectrophotometer to assess the CIE L\*, a\*, b\* color parameters.

**Results:** There was a statistically significant difference between  $\Delta E$  values for different procedures ( $p = 0.003$ ); in particular, the differences were found only between the groups that received surface treatment and the control group. In addition, a statistically significant difference was observed between the values of  $\Delta E$  for different composites in the different procedure groups.

**Conclusions:** Spectrophotometric analysis showed that the additional photopolymerization and oxygen inhibition procedures did not yield better results in relation to color stability. In addition, finishing and polishing provided better color stability compared to not performing these procedures.

**Keywords:** Coffee, Color stability, Composite resin, Polishing, Surface treatment

**Original Article**  
**Discoloration of flowable and universal resin composites immersed in black tea for 30 days**  
 Ayaka Hori-Ishikawa, Yuka Ogawa, Ayako Okada, Nana Sakae, Daichi Aizawa, Masao Hanabasa, Kaoru Ohmori, Takatsugu Yamamoto  
 Department of Operative Dentistry, Tsurumi University School of Dental Medicine, Yokohama, Japan

**Abstract**  
**Purpose:** This study evaluated the discoloration of current flowable and universal resin composites by immersing in black tea over 30 days.

**Materials and Methods:** Three flowable resin composites and three universal resin composites were evaluated. The composites were inserted into a disk-shaped stainless steel mold and properly cured. The surfaces of the composite disk were wet-ground and ultrasonically cleaned. Colors – L\*, a\*, and b\* were measured at the center of disks on a gray background using a spectrophotometer. The disks were immersed in black tea at 37 °C for 30 days, and the colors were repeatedly measured at 1, 3, 5, and 30 days of immersion. Color differences  $\Delta E_{ab}^*$  were calculated from the L\*, a\*, and b\* values. Water sorption and solubility of the composites were also measured as per ISO 4049. The results were statistically analyzed, and regression analyses were done between  $\Delta E_{ab}^*$  and  $\Delta E_{ab}^*$  or sorption/solubility.

**Results:** All the composites showed observable increases of  $\Delta E_{ab}^*$  within the first 5 days of immersion. Values of  $\Delta E_{ab}^*$  ranged from 0.6 to 4.97, and three composites exhibited values above the clinically acceptable value, 3.3. L\* and  $\Delta b^*$  revealed strong correlations with  $\Delta E_{ab}^*$ . Both water sorption and solubility had positive correlations with  $\Delta E_{ab}^*$  at 30 days.

**Conclusion:** Tea immersion induced discoloration of the current resin composites. This discoloration was affected most by the change in brightness and difference in its blue-yellow chromaticity, and the level of discoloration was material-dependent.

(Asian Pac J Dent 2025; 20: 9-15)

**Key Words:** discoloration, flowable composite, solubility, tea, universal composite, water sorption

### Introduction

Adhesive restoration is a conventional technique for the reconstruction of tooth structure lost to dental caries fracture. Among the adhesive restorative materials, resin composites have wide ranges of clinical applications including direct restorations, core build-ups, and lining of indirect restoratives. Light-cured resin composites, in particular, are essential for direct restorations for their adhesiveness, mechanical and esthetic properties [1]. Resin composites first began to be supplied in the form of pastes (hereafter referred to as universal resin composite). Subsequent compositional alterations have produced less viscous resin composites, known as flowable resin composites since 1996 [2]. Flowable composites are dispersed by a syringe through a needle tip, achieving easy handling for filling relatively small cavities or cavities with large undercuts [3,4].

Initially, flowable composites contained hybrid-type fillers that were considerably larger than the current fillers [2]. The filler content was low with approximately 25 wt% to attain sufficient flowability of the composites, making them mechanical properties inferior to those of universal resin composites. Hence, flowable composites were mainly used for small cavities or as cavity liners [2-5]. Subsequent developments in filler technology, i.e., surface treatments and the dispersion techniques produced much smaller fillers [6], which improved the mechanical properties of composites. In addition, viscosity of composites became controllable due to filler/nanomer technology. The flowable composite became applicable in occlusal load bearing areas and allowed for contouring the anatomical forms under the direct syringe application. With such improvements, clinical usage of flowable composites has increased in present day [7].

As described earlier, low viscosity is an advantage of the flowable composites. Flowability is controlled by the comonomer – resin. The major comonomer is bisphenol A-glycidyl methacrylate (Bis-GMA) for current composite resins. Bis-GMA is used to adjust the viscosity to be used alone in composite in terms of manipulation

## The Effects of Fresh Detox Juices on Color Stability and Roughness of Resin-Based Composites

İhsan Yıkılmaz, DDS, PhD,<sup>1</sup> Sinem Akgül, DDS, PhD,<sup>2</sup> Ahmet Hazer, DDS, PhD,<sup>2</sup> Cemille Kedici Altı, DDS, PhD,<sup>3</sup> Serdar Başlangıç, DDS, PhD,<sup>3</sup> & Oya Bal, DDS, PhD,<sup>3</sup>

<sup>1</sup>Department of Restorative Dentistry, Faculty of Dentistry, Gazi University, Ankara, Turkey  
<sup>2</sup>Department of Restorative Dentistry, Faculty of Dentistry, Balıkesir Egeci University, Zonguldak, Turkey  
<sup>3</sup>Department of Restorative Dentistry, Faculty of Dentistry, Ankara University, Ankara, Turkey

### Keywords

Color stability, Resin-based composites, Resin-based composites, Surface roughness.

### Correspondence

İhsan Yıkılmaz, Faculty of Dentistry, Department of Restorative Dentistry, Gazi University, 06510 Eskişehir, Ankara, Turkey.  
 Email: ihsanyikil@gazi.edu.tr

The author declares no conflict of interest related to this study.

Accepted November 18, 2025

doi: 10.1111/apj.12749

### Abstract

**Purpose:** To evaluate the effects of three fresh detox juices, including an orange juice, and red beverage, on the color stability and surface roughness of three aesthetic resin-based composites (RBCs).

**Materials and Methods:** Disk-shaped specimens were prepared with three different color RBCs (Amaris, G-aerial Aesthetic, Clearfil Majesty ES-2) according to the manufacturers' instructions. Forty specimens were prepared for each RBC, and all specimens were stored in artificial saliva at 37°C for 24 hours. The initial color values and surface roughness measurements of the specimens were taken using a spectrophotometer and a profilometer. The specimens were then divided into 4 subgroups (n = 10). All specimens except the control specimens were immersed in their designated fresh detox juices (green, red, or orange) for 10 minutes twice a day. Color and surface roughness measurements were taken on day 15 and day 30, and the results were analyzed by one-way ANOVA and Tukey HSD test. The association between color change and surface roughness was evaluated by Spearman's Rank Correlation analysis.

**Results:** Color changes and surface roughness increased upon exposure to fresh detox juices for 15 and 30 days for all of the RBCs. All of the G-aerial and Amaris groups displayed color changes above the threshold of acceptability, whereas Clearfil Majesty ES-2 displayed a color change above the threshold of acceptability only after exposure to the red beverage for 30 days ( $L^*a^*b^* > 3.7$ ). With regard to surface roughness, Clearfil Majesty ES-2 outperformed the other RBCs ( $p < 0.001$ ). According to Spearman's Rank Correlation analysis, there was no correlation between color change and surface roughness ( $p > 0.001$ ).

**Conclusions:** Exposure to the fresh detox juices used in this study led to similar color changes in the RBCs used in this study.

Resin-based composites (RBC) are highly popular in restorative dentistry, but, as for the use of any restorative material, clinical failures are unavoidable. It has been reported that the reasons for replacing composite restorations include secondary/recurrent caries, marginal discoloration, bulk discoloration, marginal/bulk factor of the restorations, fracture of tooth and pain or sensitivity. Unacceptable color change is the primary reason for replacing RBC restorations in anterior teeth.<sup>1,2</sup> Color change certainly occurs in restorative materials, but it is the degree of the color change that is important. Because small color changes in restorative materials are largely undetectable by the human eye, restoration replacement is not required for materials that display small color changes, but for materials that display large color changes, such as anterior teeth, when the color harmony between the restoration and the dental tissues deteriorates, replacement of the restoration is inevitable.<sup>3</sup>

Different factors affect discoloration of RBCs by three basic mechanisms: intrinsic discoloration, surface/subsurface degradation, and extrinsic discoloration. Intrinsic discoloration is defined as the discoloration of materials independent of external factors. The chemical structure of the material, including the type of monomer, the filler size, and the distribution, as well as the degree of conversion and the physicochemical reactions of the material in the body affect intrinsic discoloration.<sup>4</sup> Surface/subsurface degradation occurs when staining agents react with superficial composite layers. A rough restoration surface, bad finishing, and poor curing by contaminating colored foods and beverage may cause extrinsic discoloration.<sup>5,6</sup>

# 4 CLEARFIL MAJESTY ES Composites Tested in 4 Papers



# Color Stability Results for Flowables:

## $\Delta E_{ab}$ (Value & Chroma Changes)

Hori-Ishikawa et al. Asian Pac J Dent 2020; 20: 9-15

Original article  
**Discoloration of flowable and universal resin composites immersed in black tea for 30 days**

Ayaka Hori-Ishikawa, Yuka Ogawa, Ayako Okada, Nana Sakacada, Daichi Aizawa, Masao Hanabusu, Kaoru Ohmori, Takatsugu Yamamoto

Department of Operative Dentistry, Tsurumi University School of Dental Medicine, Yokohama, Japan

**Abstract**  
**Purpose:** This study evaluated the discoloration of current flowable and universal resin composites by immersing in black tea over 30 days.

**Materials and Methods:** Three flowable resin composites and three universal resin composites were evaluated. The composites were inserted into a disk-shaped stainless steel mold and properly cured. The surfaces of the composite disks were wet-ground and ultrasonically cleaned. Colors ( $L^*$ ,  $a^*$ , and  $b^*$ ) were measured at the center of disks on a gray background using a spectrophotometer. The disks were immersed in black tea at 37°C for 30 days, and the colors were repeatedly measured at 1, 3, 5, and 30 days of immersion. Color differences ( $\Delta E^*_{ab}$ ) were calculated from the  $L^*$ ,  $a^*$ , and  $b^*$  values. Water sorption and solubility of the composites were also measured as per ISO 4049. The results were statistically analyzed, and regression analyses were done between  $\Delta E^*_{ab}$  and  $\Delta L^*$ ,  $\Delta a^*$ ,  $\Delta b^*$  or sorption/solubility.

**Results:** All the composites showed observable increases of  $\Delta E^*_{ab}$  within the first 5 days of immersion. Values of  $\Delta E^*_{ab}$  ranged from 0.64 to 4.97, and three composites exhibited values above the clinically acceptable value, 3.3.  $\Delta L^*$  and  $\Delta b^*$  revealed strong correlations with  $\Delta E^*_{ab}$ . Both water sorption and solubility had positive correlations with  $\Delta E^*_{ab}$  at 30 days.

**Conclusion:** Tea immersion induced discoloration of the current resin composites. This discoloration was affected most by the change in brightness and difference in its blue-yellow chromaticity, and the level of discoloration was material dependent.

(Asian Pac J Dent 2020; 20: 9-15.)

**Key Words:** discoloration, flowable composite, solubility, tea, universal composite, water sorption

### Introduction

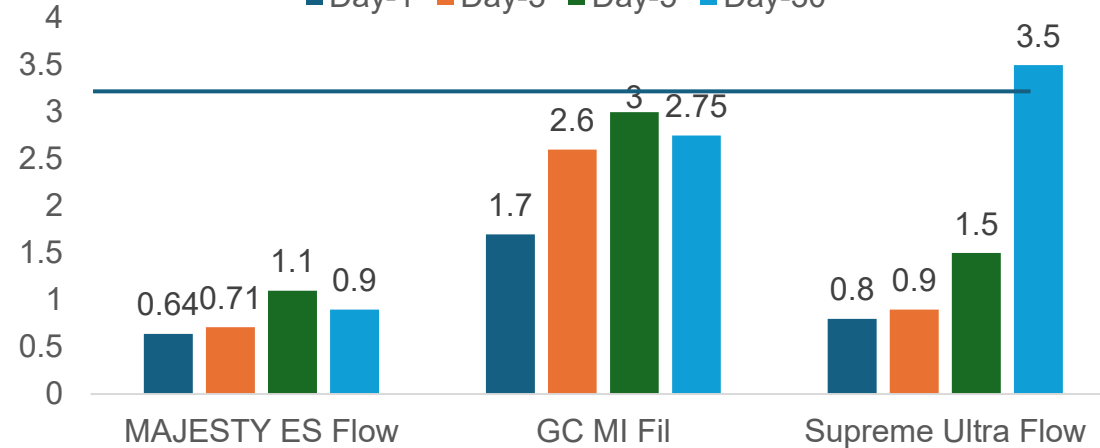
Adhesive restoration is a conventional technique for the reconstruction of tooth structure lost to dental caries/fracture. Among the adhesive restorative materials, resin composites have wide ranges of clinical applications including direct restorations, core build-ups, and lining of indirect restoratives. Light-cured resin composites, in particular, are essential for direct restorations for their adhesiveness, mechanical and esthetic properties [1]. Resin composites first began to be supplied in the form of pastes (hereinafter referred to as universal resin composite). Subsequent compositional alterations have produced less viscous resin composites, known as flowable resin composites since 1996 [2]. Flowable composites are dispensed by a syringe through a needle tip, achieving easy handling for filling relatively small cavities or cavities with large undercuts [3,4].

Initially, flowable composites contained hybrid-type fillers that were considerably larger than the current fillers [2]. The filler content was low with approximately 25 wt% to attain sufficient flowability of the composites, making their mechanical properties inferior to those of universal resin composites. Hence, flowable composites were mainly used for small cavities or as cavity liners [2,5]. Subsequent developments in filler technology, i.e., surface treatments and the dispersion techniques produced much smaller fillers [6], which improved the mechanical properties of composites. In addition, viscosity of composites became controllable due to filler/nanofiller technology. The flowable composites became applicable in occlusal load bearing areas and allowed for contouring the anatomical forms under the direct syringe application. With such improvements, clinical usage of flowable composites have increased in present day [7].

As described earlier, low viscosity is an advantage of the flowable composites. Flowability is controlled by the compounding base resins. The major monomer is bisphenol A-glycidyl methacrylate (Bis-GMA) for current composites due to its mechanical strengths. However, as Bis-GMA is too viscous to use alone in composite in terms of manipulation, other monomers such as urethane dimethacrylate (UDMA) and methylene glycol dimethacrylate (TEGDMA), and certain fillers are compounded to adjust the viscosity [6,8]. Different base resins are frequently utilized in flowable and universal resin composites. Several studies have investigated discoloration of resin composites [7,9-11]. Universal resin composites [10-13].

3.3 & Below Acceptable

■ Day-1 ■ Day-3 ■ Day-5 ■ Day-30



Re: Discoloration: **“CLEARFIL MAJESTY ES Flow showed the lowest means at every interval of measurement”**

# Color Stability Results for Packable Universal Shades:

## $\Delta E$ ab (Value & Chroma Changes)

Hori-Ishikawa et al. *Asian Pac J Dent* 2020; 20: 9-15  
 Original article  
**Discoloration of flowable and universal resin composites immersed in black tea for 30 days**  
 Ayaka Hori-Ishikawa, Yuika Ogawa, Ayako Okada, Nana Sakaeda, Daichi Aizawa, Masao Hanabusa, Kiyori Ohmori, Takatsugu Yamamoto  
 Department of Operative Dentistry, Tsurumi University School of Dental Medicine, Yokohama, Japan

**Abstract**  
**Purpose:** This study evaluated the discoloration of current flowable and universal resin composites by immersing in black tea over 30 days.  
**Materials and Methods:** Three flowable resin composites and three universal resin composites were evaluated. The composites were inserted into a disk-shaped stainless steel mold and properly cured. The surfaces of the composite disks were wet-ground and ultrasonically cleaned. Colors ( $L^*$ ,  $a^*$ , and  $b^*$ ) were measured at the center of disks on a gray background using a spectrophotometer. The disks were immersed in black tea at 37°C for 30 days, and the colors were repeatedly measured at 1, 3, 5, and 30 days of immersion. Color differences ( $\Delta E^*ab$ ) were calculated from the  $L^*$ ,  $a^*$ , and  $b^*$  values. Water sorption and solubility of the composites were also measured as per ISO 4049. The results were statistically analyzed, and regression analyses were done between  $\Delta E^*ab$  and  $\Delta L^*$ ,  $\Delta a^*$ ,  $\Delta b^*$  or sorption/solubility.  
**Results:** All the composites showed observable increases of  $\Delta E^*ab$  within the first 5 days of immersion. Values of  $\Delta E^*ab$  ranged from 0.64 to 4.97, and three composites exhibited values above the clinically acceptable value, 3.3.  $\Delta L^*$  and  $\Delta b^*$  revealed strong correlations with  $\Delta E^*ab$ . Both water sorption and solubility had positive correlations with  $\Delta E^*ab$  at 30 days.  
**Conclusion:** Tea immersion induced discoloration of the current resin composites. This discoloration was affected most by the change in brightness and difference in its blue-yellow chromaticity, and the level of discoloration was material dependent.

(Asian Pac J Dent 2020; 20: 9-15)

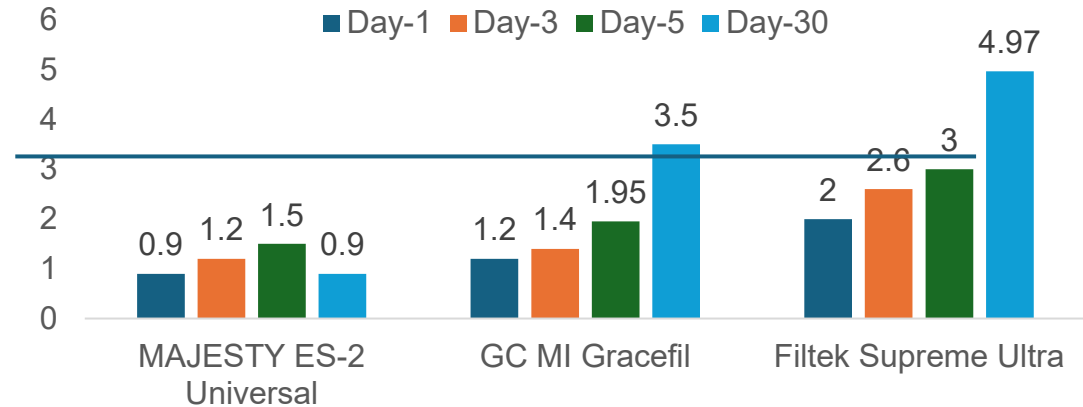
**Key Words:** discoloration, flowable composite, solubility, tea, universal composite, water sorption

**Introduction**  
 Adhesive restoration is a conventional technique for the reconstruction of tooth structure lost to dental caries/fracture. Among the adhesive restorative materials, resin composites have wide ranges of clinical applications including direct restorations, core build-ups, and lining of indirect restorations. Light-cured resin composites, in particular, are essential for direct restorations for their adhesiveness, mechanical and esthetic properties [1]. Resin composites first began to be supplied in the form of pastes (hereinafter referred to as universal resin composite). Subsequent compositional alterations have produced less viscous resin composites, known as flowable resin composites since 1996 [2]. Flowable composites are dispensed by a syringe through a needle tip, achieving easy handling for filling relatively small cavities or cavities with large undercuts [3,4].

Initially, flowable composites contained hybrid-type fillers that were considerably larger than the current fillers [2]. The filler content was low with approximately 25 wt% to attain sufficient flowability of the composites, making their mechanical properties inferior to those of universal resin composites. Hence, flowable composites were mainly used for small cavities or as cavity liners [2,5]. Subsequent developments in filler technology, i.e., surface treatments and the dispersion techniques produced much smaller fillers [6], which improved the mechanical properties of composites. In addition, viscosity of composites became controllable due to filler/anomomer technology. The flowable composites became applicable in occlusal load bearing areas and allowed for contouring the anatomical forms under the direct syringe application. With such improvements, clinical usage of flowable composites have increased in present day [7].

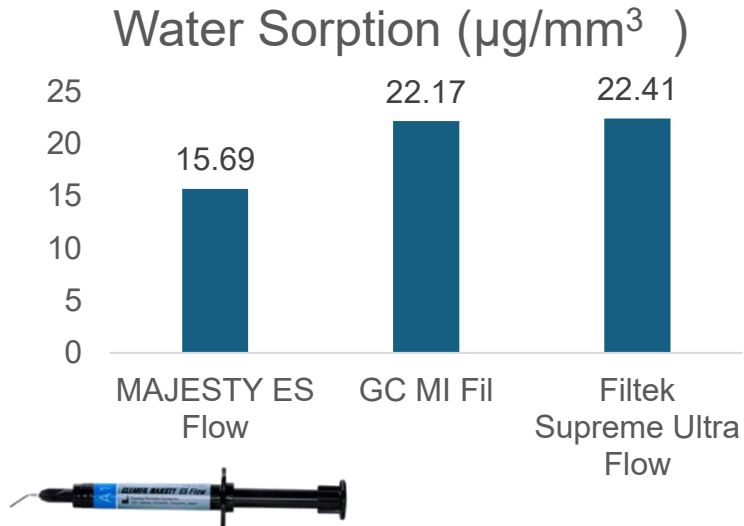
As described earlier, low viscosity is an advantage of the flowable composites. Flowability is controlled by the compounding base resins. The major monomer is bisphenol A-glycidyl methacrylate (Bis-GMA) for current composites due to its mechanical strength. However, as Bis-GMA is too viscous to use alone in composite in terms of manipulation, other monomers such as urethane dimethacrylate (UDMA) and trimethylene glycol dimethacrylate (TEGDMA), and certain  $\alpha$ -methyl methacrylates are compounded to adjust the viscosity [6,8]. Different base resins are frequently utilized in flowable and universal resin composites. Previous studies have investigated discoloration of resin composites [7,9-11].

### 3.3 & Below Acceptable

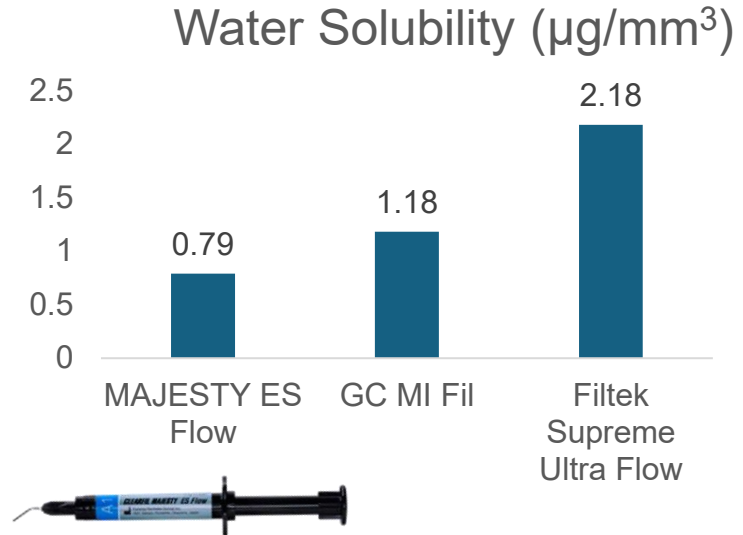


# Water Sorption & Solubility:

## Water Sorption $W_{sp}$ (Flowables)



## Water Solubility $W_{sl}$ (Flowables)



# As I see it: The race is on!

We will see porcelain performance  
from composite (color and polish  
retention)

# As I see it: The race is on!

We are moving away from hand manipulated paste composite and toward injectable “Super flowables” (Kuraray) or “Injectables” (GC).

# Transform the way you work

Start injecting with our strongest  
direct restorative ever\*

**G-ænial™ Universal  
Injectable**



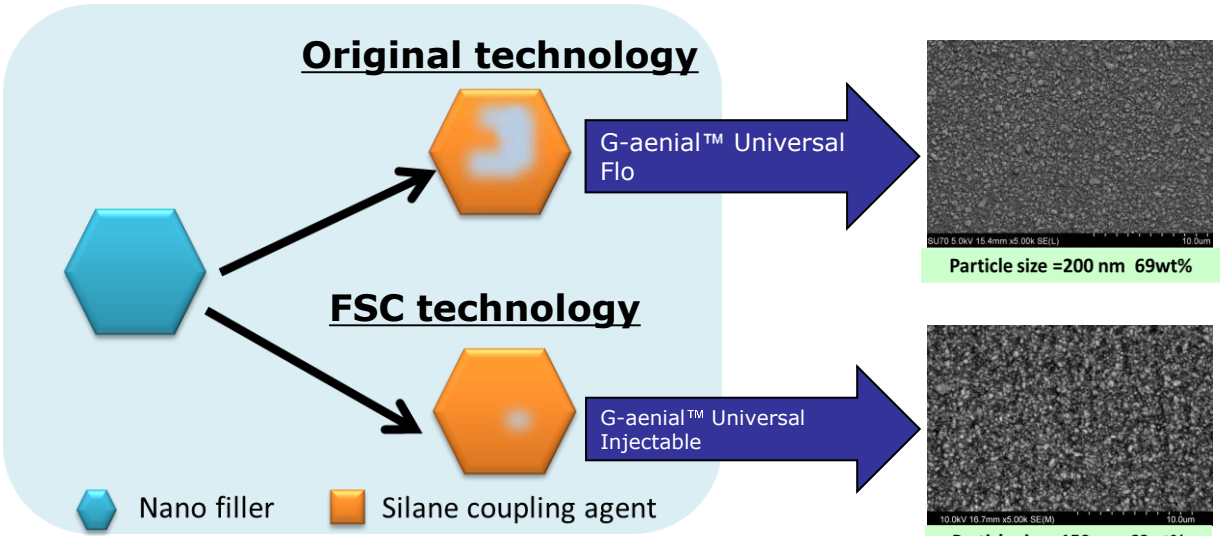
## What is G-aenial™ Universal Injectable?

***“G-aenial™ Universal Injectable (“GUI”) is an injectable high-strength ultra-fine particle composite with ideal viscosity, handling, and adaptation characteristics that may be used for long lasting esthetic restorations.”***

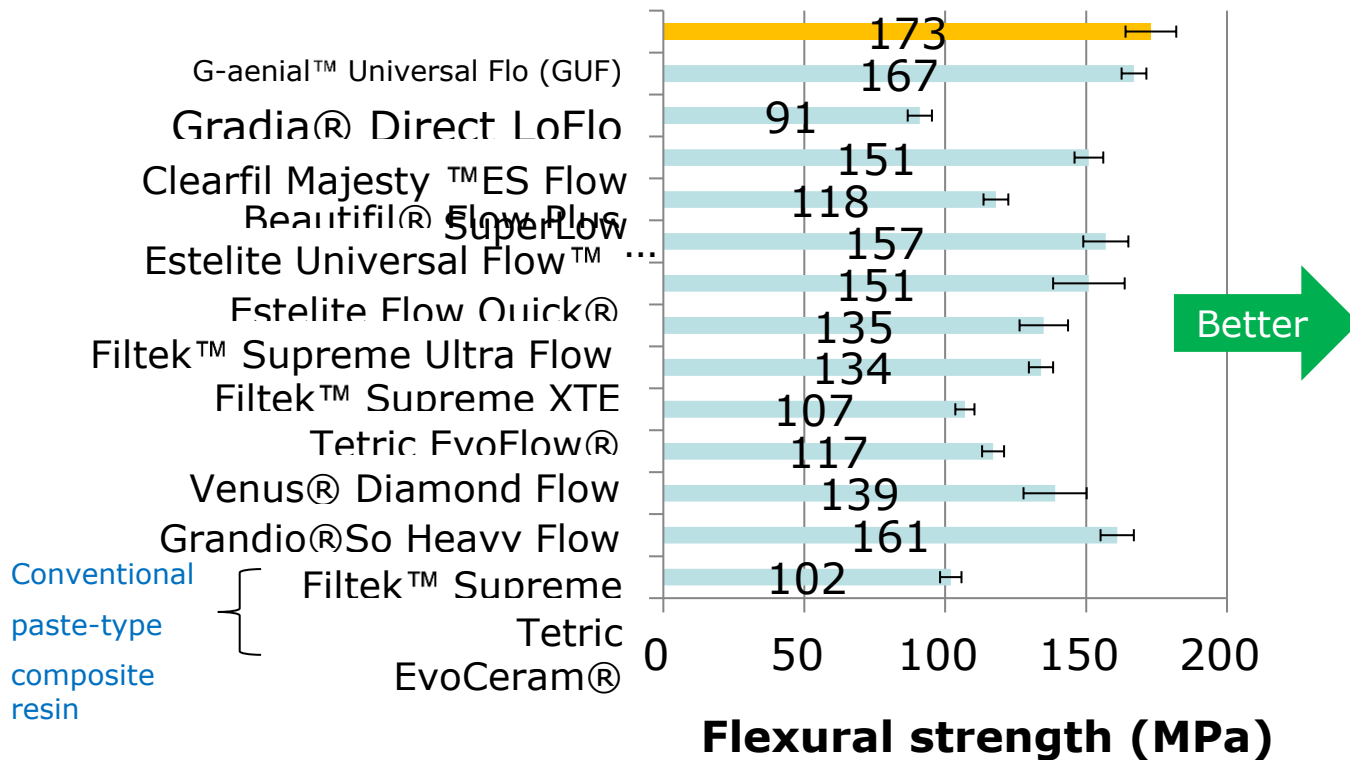
# New Technology – Full Coverage Silane Coating

## High Density Resin with Full Coverage Silane Coating (HDR with FSC Technology)

- Full silane coating of ultra-fine particles allows particles to disperse homogeneously and in higher density within resin matrix
- This, along with finer ultra-fine filler, delivers **high physical strength, wear resistance** and **improved handling**



# High Flexural Strength



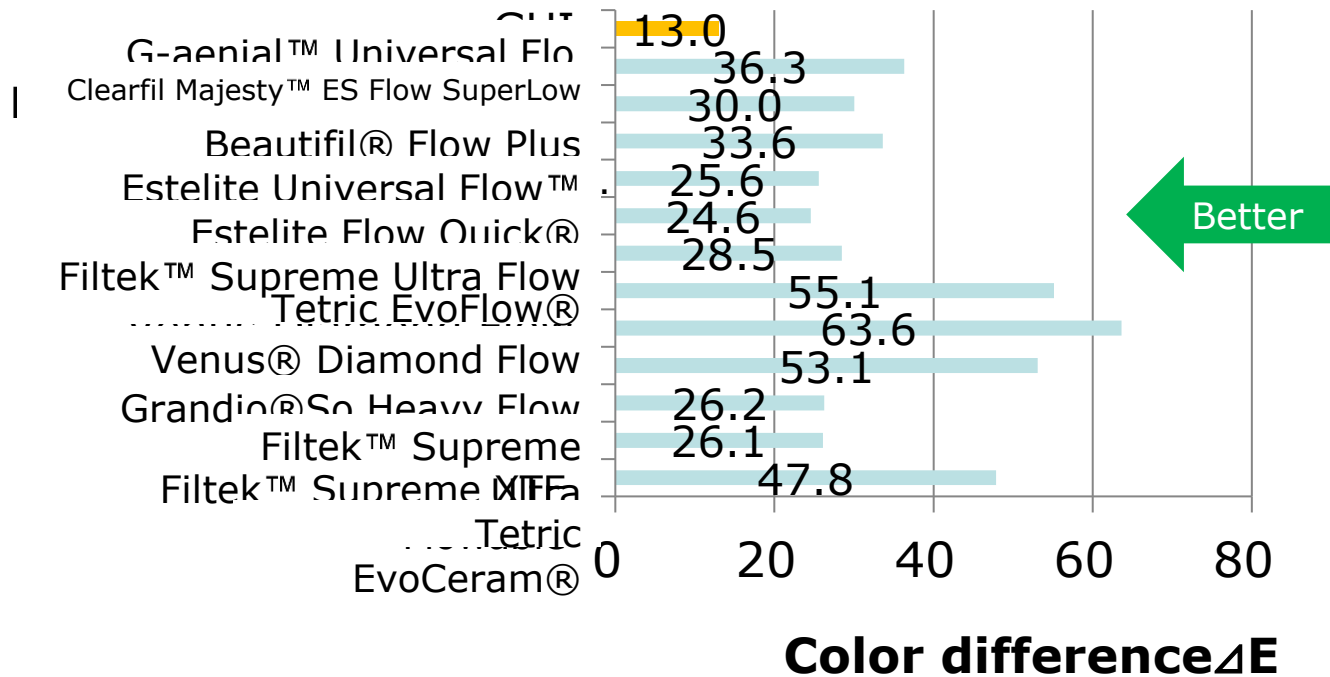
► GUI has the highest flexural strength among all the competitive products in the market. → **Low risk of chipping or fracture.**

# High Resistance to Discoloration



Discoloration after 1 week of immersion in 2% curry extract

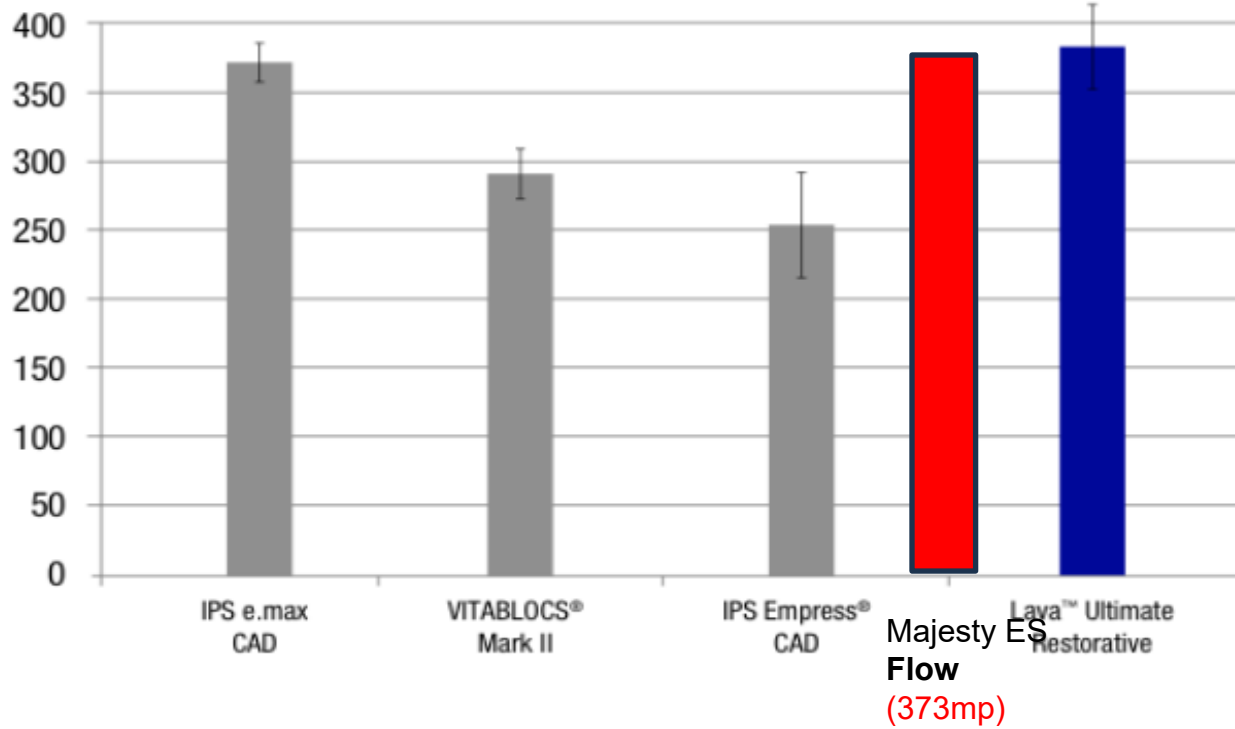
## Discoloration



The GUI restoration retains its natural color better than all other products in the competitive set

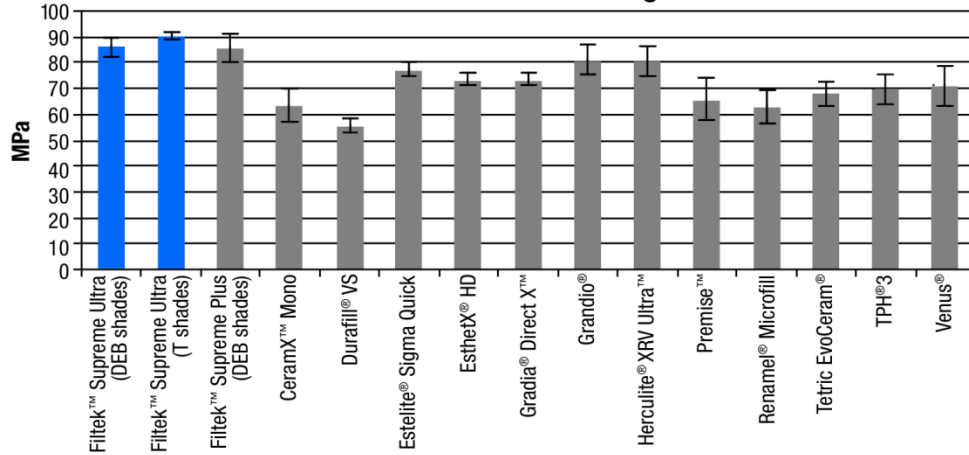


## High Compressive Strength (MPa)



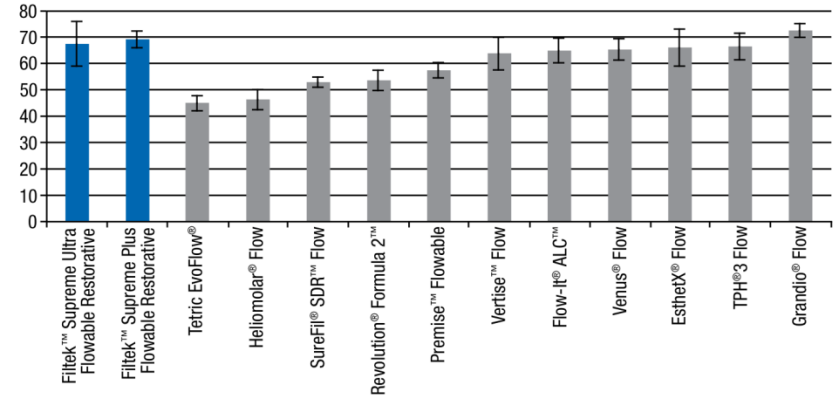
# Composites

## Diametral Tensile Strength

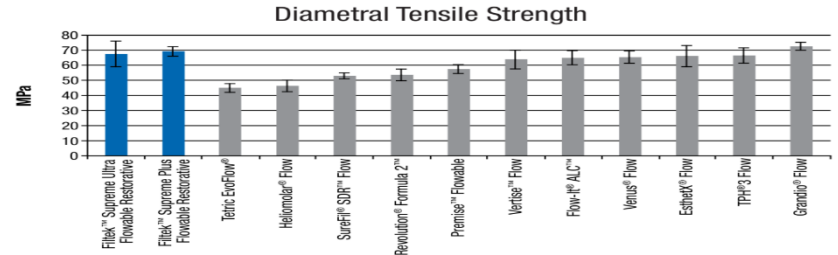
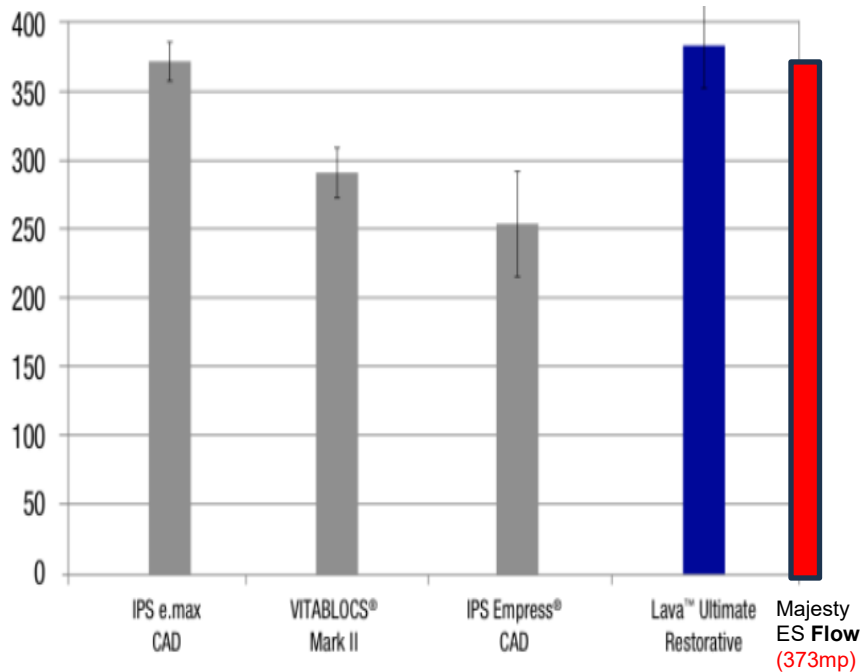


# Flowables

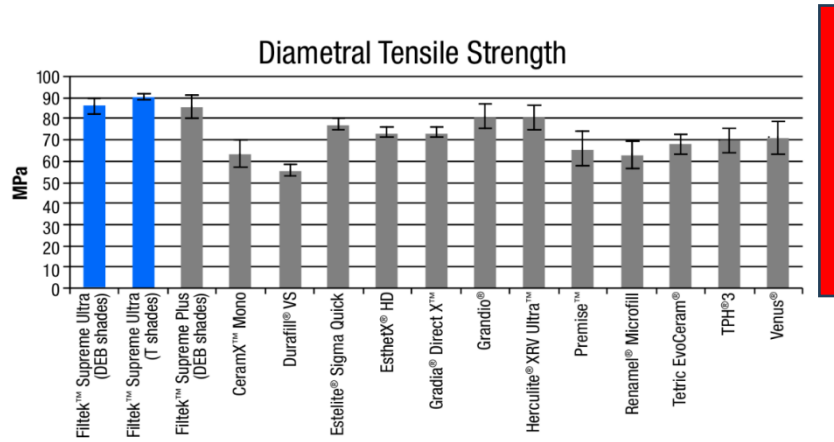
## Diametral Tensile Strength



# In general composites are 3 to 4 times stronger in compression than in tension

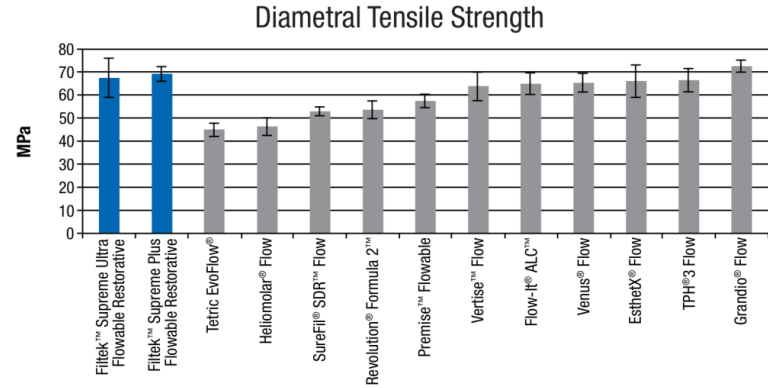


# Composites



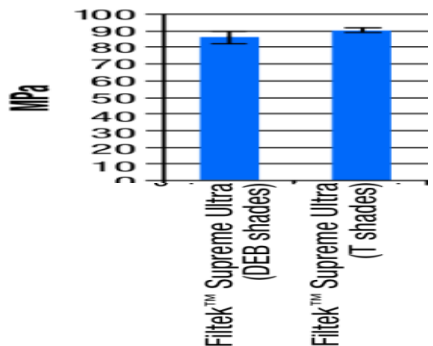
Majesty  
ES Flow  
(148mp)

# Flowables

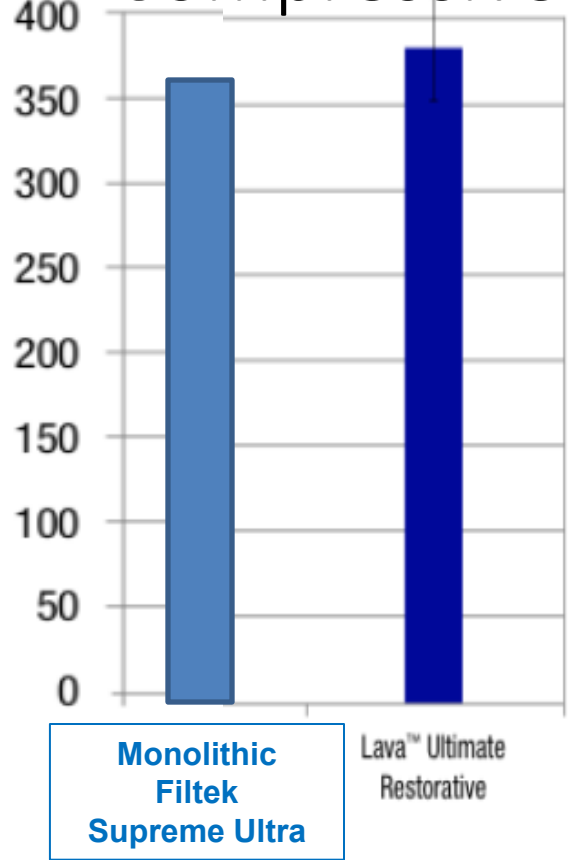


The compressive strength of composite is generally 3x to 4x higher than tensile strength

# Tensile



# Compressive



Before



After



Dr. John Yun  
Toronto, ON





Dr. David Carroll,  
Prosthodontist,  
Aventura FL





Dr. Scott Kollen  
Vancouver, BC



*Dr. Scott Kollen*  
D.M.D.






Dr. Antonio  
Mendoza,  
Barcelona  
Spain





 vnsdentistry

**Bioclear Matrix System**

8 HOURS AGO





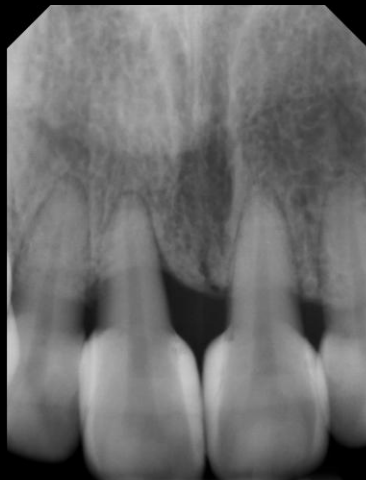
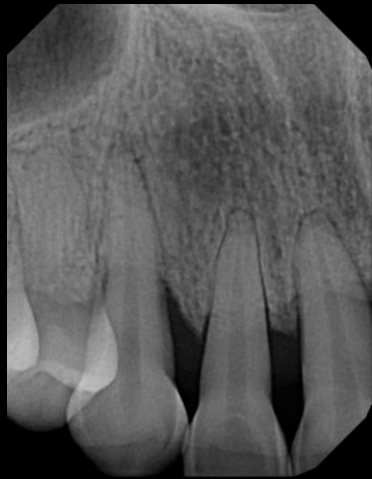
Courtesy Dr. Charles Regalado

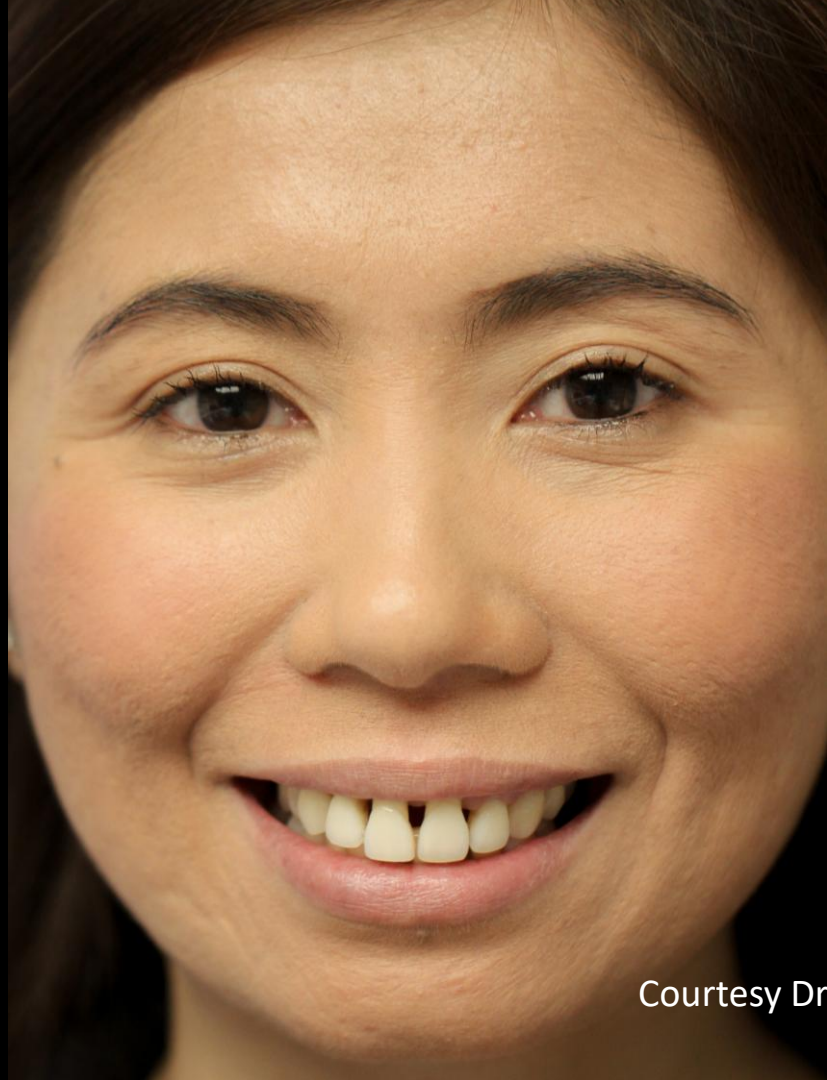


Courtesy Dr. Charles Regalado









Courtesy Dr. Charles Regalado



# Injection Overmolding: Possibilities and Long-Term Outcomes

## Finishing Ortho Cases

A young orthodontist with beautiful teeth...



# She HATED Her Black Triangles



Immediate post-operative



6 months post-operative



6 years post-operative





Pre-op



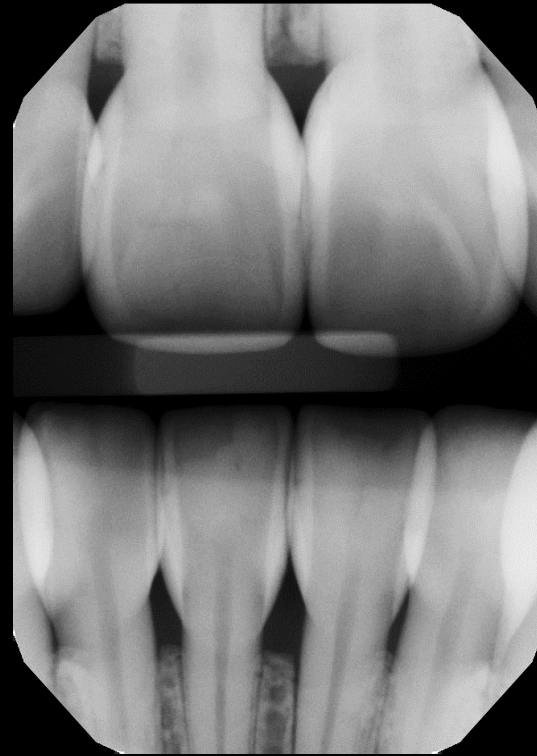
Post-Op



6 Years Post-Op

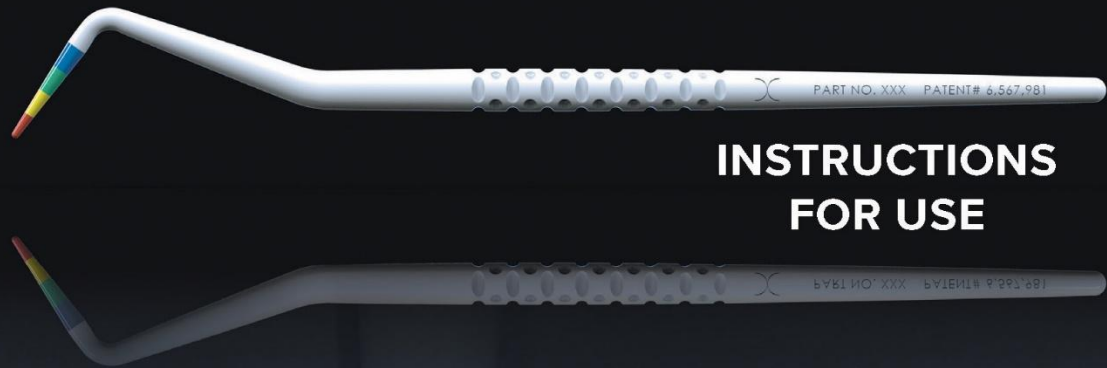


Pre-op



6 Years Post-Op

# BT MATRIX

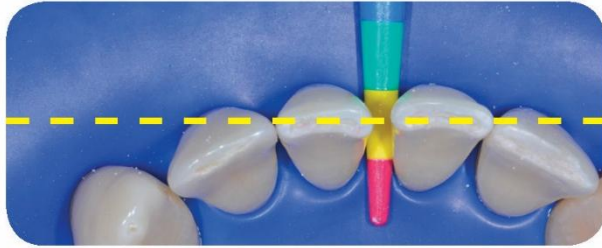


## INSTRUCTIONS FOR USE

 BIOCLEAR

# BLACK TRIANGLE SYSTEM INSTRUCTIONS FOR USE

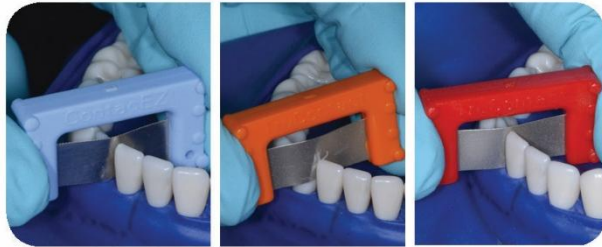
1  
GAP  
SIZING



2  
DISCLOSE  
AND CLEAN



3  
CONTACT  
OPTIMIZATION



4  
MATRIX  
INSERTION



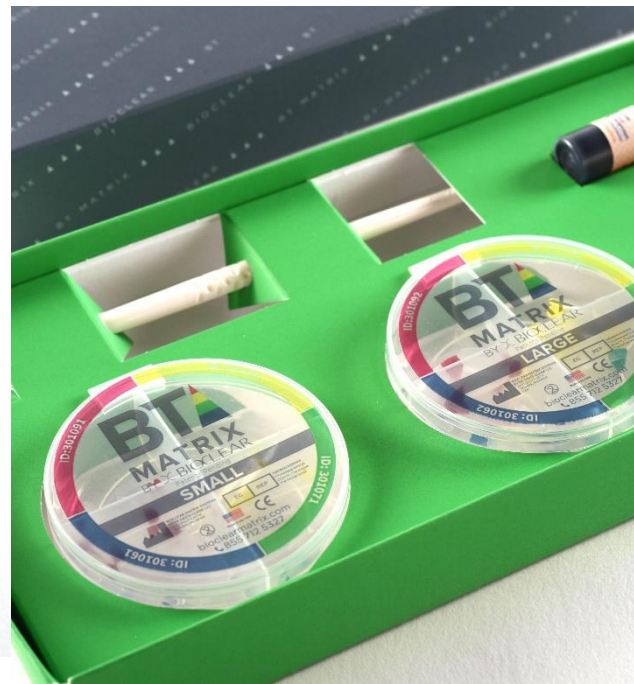
5  
ETCH  
AND RINSE



6  
ADHESION,  
INJECTION MOLD,  
LIGHT CURE,  
RELEASE MATRIX,  
FINISH



**BT**  
**MATRIX**  
BY ∞ BIOCLEAR



# BT



## MATRIX

BY ∞ BIOCLEAR



# Rock Star Polish

1



2



The Art and Science of Perfect Contacts: How do we best temporarily displace the teeth so that when the matrix comes out, the teeth “bounce” back together?

1. If the contact is intact, we gently sand the contact until it is friendly, then the matrix itself plus gentle prying of the teeth will displace the teeth
2. Use a wedge
3. Use a powerful separator
4. Spot Weld/Push Pull Technique

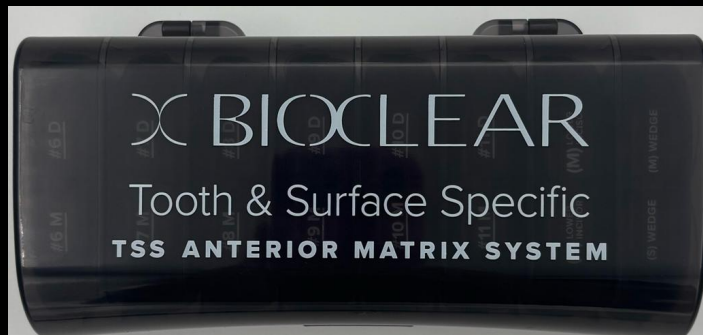
The Art and Science of Perfect Contacts: How do we best temporarily displace the teeth so that when the matrix comes out, the teeth “bounce” back together?

## 5 The Direct Contact Strut



Let's quickly review several types of anterior cases  
and best matrix system for the case:

Anatomic or **BT/DC?** (Black Triangle/Diastema Closure)







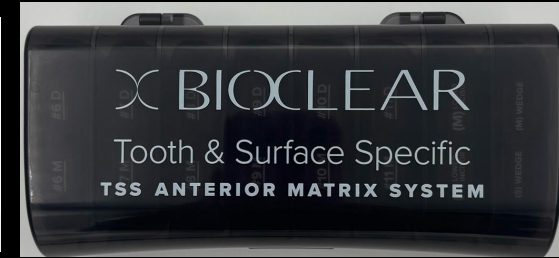
The monolithic restoration can create adequate non-layered polychromaticity with **Body** shade



17 year old male. Had emotional issues and had ortho brackets on for many years without returning to complete orthodontic care. Left with rampant decay. Injection molded A2 **BODY** composite

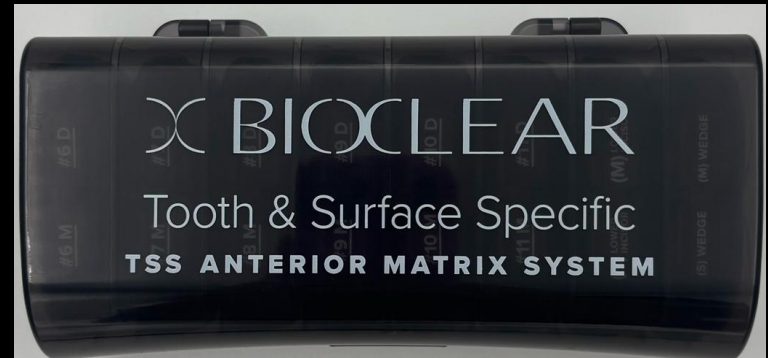


## Which Matrix Type?





Which Bioclear kit?





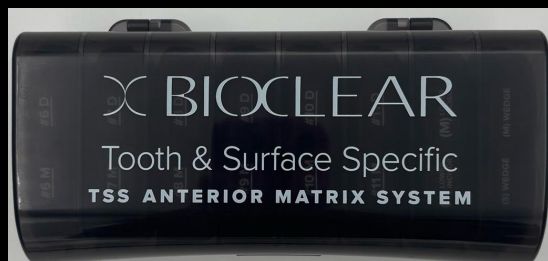
- If you think you will lose your contacts, you need to prep and then take each to 80% shape before you move to the next tooth.
- Bioclear method benefits from leverage and landmarks
- Creation of 3 facial planes is key
- Monolithic composite in the body shade is generally beautiful to the patient. Why?



Case by recent  
attendee of  
Learning Center 4-  
day Certification  
Course



# Which Bioclear Kit?



Which Bioclear Kit?

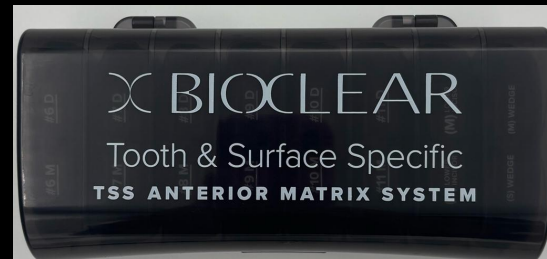




Courtesy Dr.  
Les Miller



# Which Bioclear kit or kits?





Both

