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Aesthetic Dental Designs®

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Accredited Fellow, American Academy of Cosmetic Dentistry

Fellow, International Academy for Dental Facial Esthetics

Member of The American Society For Dental Aesthetics

Diplomat of the American Board of Aesthetic Dentistry

Former Faculty, UCLA Center For Esthetic Dentistry

www.LEGION.dentist, Online Training Challenge for Dentists

Entrepreneur, Software Company Owner, Author/Lecturer, Professional Race Car Driver

Delusional: Winning the Weekly War of Dentistry (Podcast)

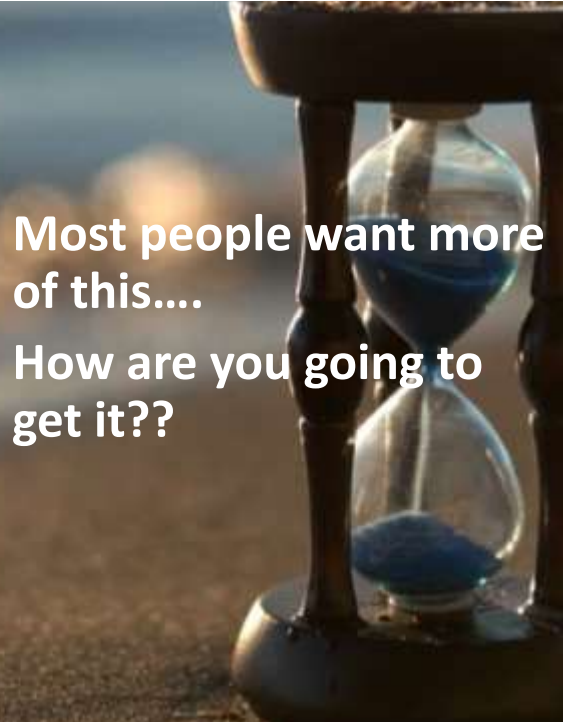


LEGION

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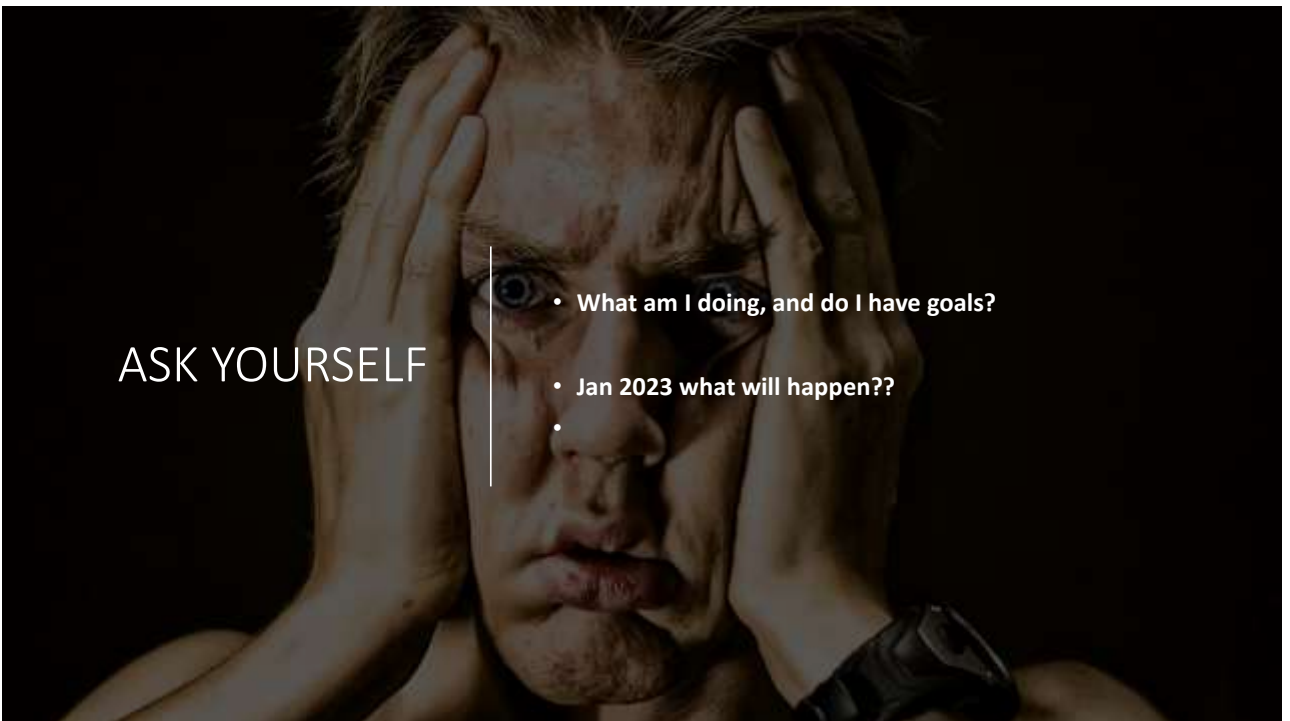
10



Most people want more
of this....

How are you going to
get it??

11



ASK YOURSELF

- What am I doing, and do I have goals?
- Jan 2023 what will happen??
-

12



Why Are YOU Here?

Write It Down!

To Learn:

How to do a Procedure?

How to get more Patients?

How to run a Practice Better?

How to find more Treatment?

How to make more Money?

How to be Faster & Efficient?

See your Friends?

CE Requirements?

13



INSANITY

**“Doing the SAME Thing over and over
again expecting a Different RESULT.”**

—Albert Einstein

16

16

KNOWLEDGE IS POWER

—Francis Bacon (1597)

17



18

Knowledge
+ Action

= Power

19

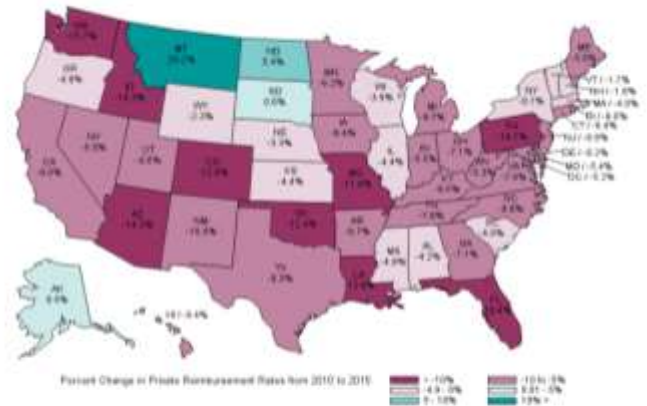


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THE REIMBURSEMENT CRISIS

REIMBURSEMENT RATES DECLINED FROM 2010-2015 IN STATES THAT HOLD 99% OF ALL DENTISTS IN THE US!

Reimbursement rates increased in only 4 states during this time:



Source: ADA HPB Report: State of the Dental Market: Outlook 2016, December 2017

*Delta Dental Letter for Jan 2023

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THE REIMBURSEMENT CRISIS

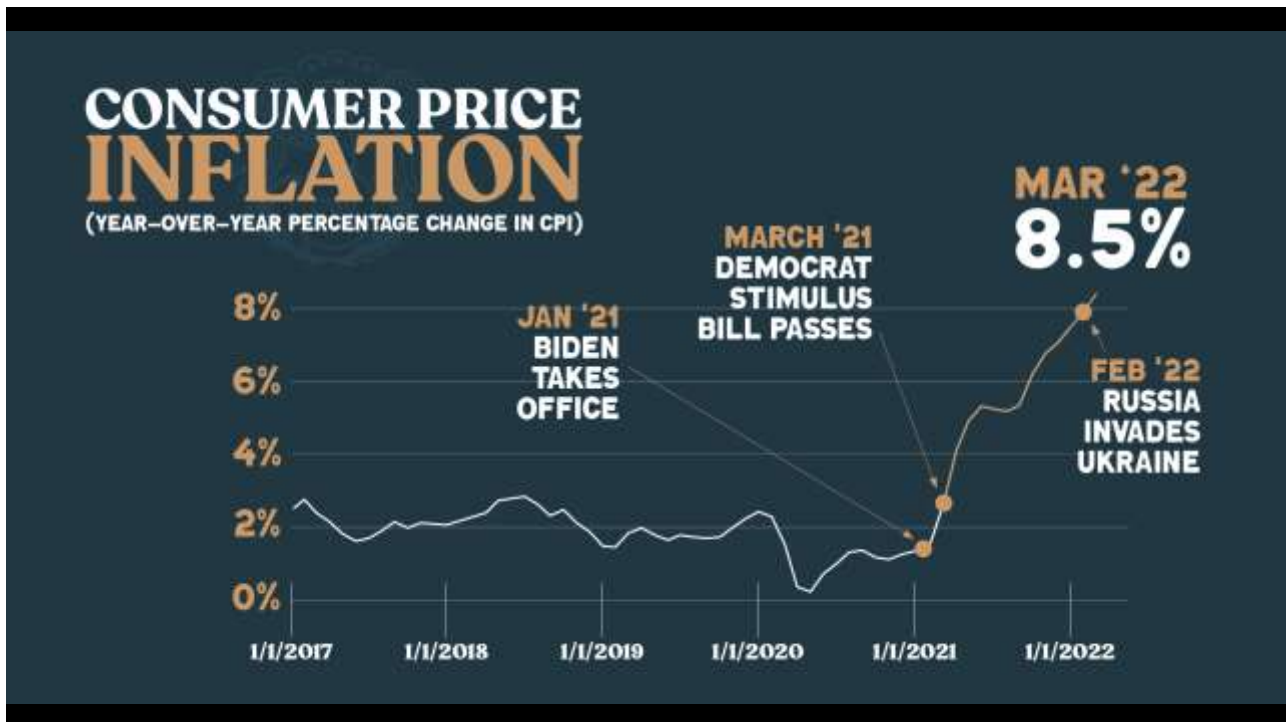
DENTIST EARNINGS WERE FLAT FOR 18 YEARS WITHIN A HIGH GROWTH MARKET!



The **dental market** grew 70% from 1997 to 2015...

...but general dentist **earnings** remained flat!

22



24

Do the dental insurance companies market for you?

How much do out of network dentists get paid for the same services?

25



Insurance Peanuts

- 3-two surface fillings
- 2-three surface composite fillings



\$384.00	\$77.00
\$384.00	\$77.00
\$384.00	\$77.00
\$481.00	\$95.00
\$481.00	\$95.00
\$2,798.00	\$560.00

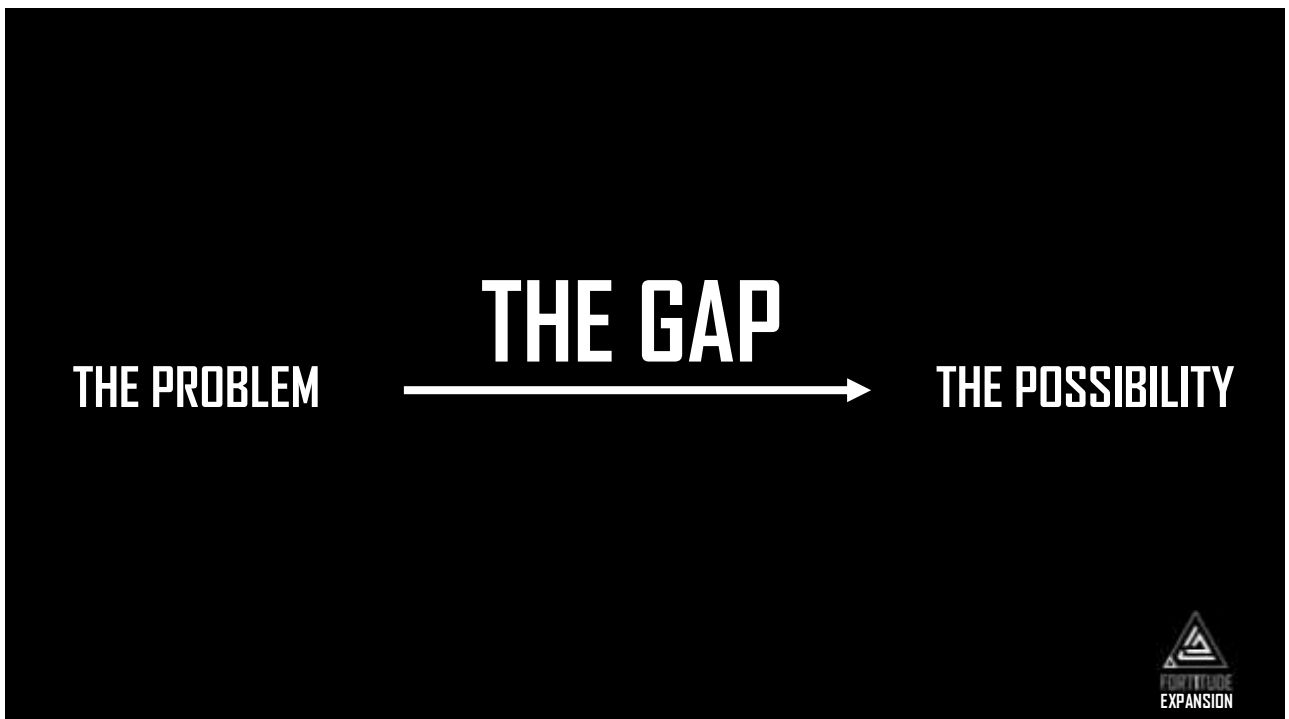
26



27



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29



30



"YOU ARE IMPRISONED BY YOUR OWN MIND FROM
THE STORIES YOU CREATE."



-Todd C. Snyder, DDS

31

How Will You Become More Successful?

32

- 1) What is the goal?***
- 2) What is the plan??***
- 3) What are you thinking?***
- 4) What is the patient thinking?***

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CHANGE!!!

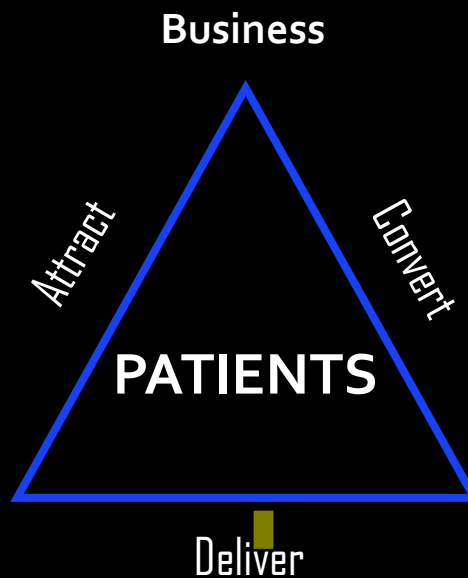
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**“You can’t expect to see change if
you never do anything differently.”**

► —MEG BIRAM

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The Future of Dentistry

- Four years in a row dentist best health care job.
- Predicted employment growth of 17.5% with more than 23,200 new openings over the next 10 years.
- Dental insurance companies are systematically decreasing reimbursements



44

CORPORATE DENTISTRY

- Is growing **15-20%** annually
- They compete for the same patient demographics as the solo practitioner.
- Discretionary income has shrunk for every segment of American society except the top 10%.
- Patient perception of dentists are changing based on work Performed, Marketing Seen and Fees offered.
- Run at lower overheads and have leveraged purchasing power.



45

YOU SPEND MOST OF YOUR TIME WHERE?



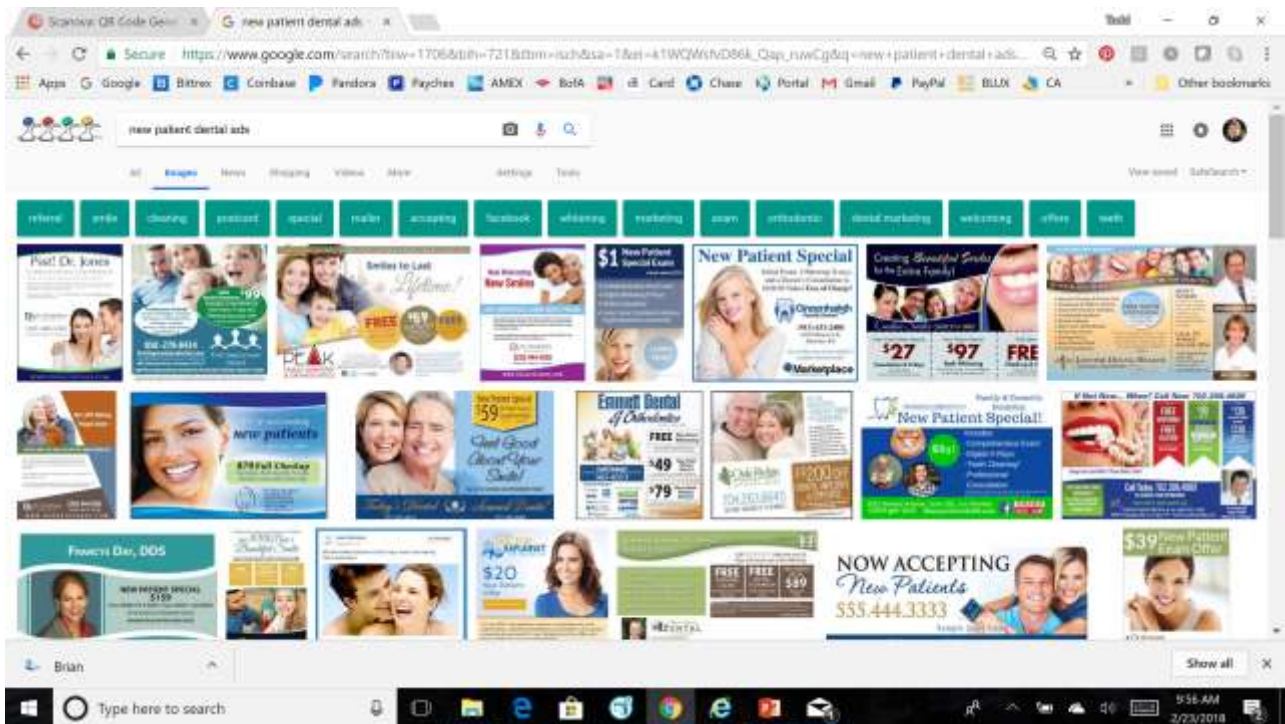
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THE FOUNDATION

Consumer/Patient Impression

- Why YOU?
- They perceive you are?
- Will they go somewhere else for other services?
- Do they think you are capable of providing what they want?
- How can you alter their perception?
- What is your brand image?
 - Your office appearance?
 - Website?
 - Your ads?
 - Your social media?

47



48



Ditch Digger....Down In The Mouth

- Many dentists get focused on there own skills, techniques and utilization of modern dental service technology.
- Most dentists do not have any staff training protocols.
- Most dentists do not have any formal business training.
- Most dentists do not have a marketing or business plan.
- Most dentists don't have a target market or offering.

49

1

SINGULARITY

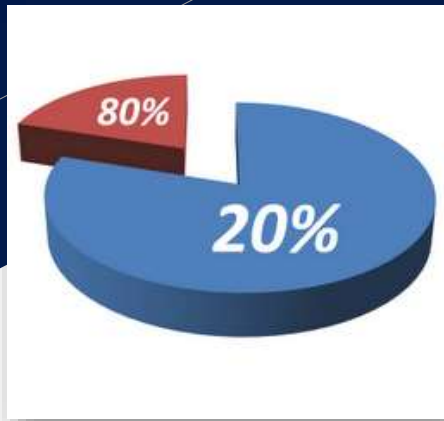
<https://www.legion.dentist/singularity>



50



52



Pareto Principle

80/20 Rule

53

20% of your patients make
80% of your income
20% of your staff produces 80%
of your results
20% of your time produces 80%
of your money/results
Offer more elective dentistry
and/or profitable dentistry



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54

According to the American Academy of Cosmetic Dentistry 50% of patients are unhappy with their smiles and 3 out of 5 people will invest in their smiles.

55

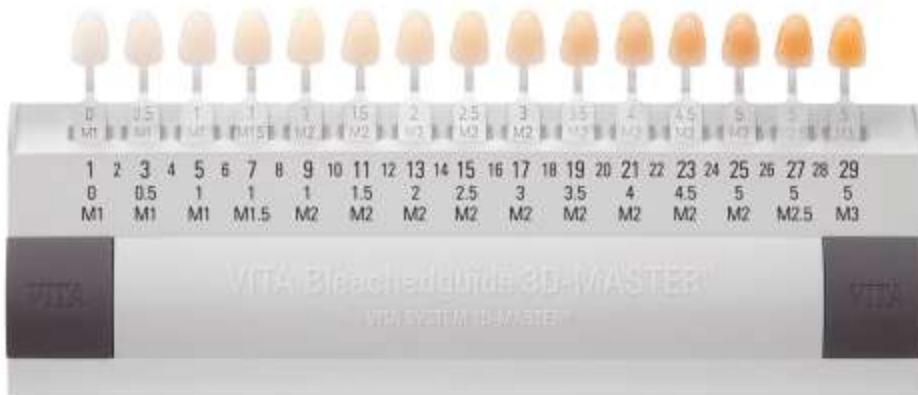


One of the most
powerful & fastest tools
you own to create
cosmetic opportunities??

56

2

Start Here



Immediate Call to Action Motivator

57



Over-the-Counter **Teeth Whiteners**: \$1.4 billion
(MSNBC) ...
(Consumer Reports).

58

Over The Counter Whitening



59

Whitening



60



61

PHOTOGRAPHS

62

3



63

Settings

Portrait

f11
1/200
ISO 100
WB: Flash
Mag ratio: Infinity



Smile

f22
1/200
ISO 100
WB: Flash
Mag ratio: 1:3



Close up

f22
1/200
ISO 100
WB: Flash
Mag ratio: 1:1.5



64



65

Shofu EyeSpecial C-IV



66

Touch Screen
Water Resistant
Can be disinfected
Durable housing
9 different modes



67

<p>Standard</p>		<p>STANDARD MODE</p> <p>For standard intraoral photography</p>	<p>Low glare</p>		<p>LOW-GLARE MODE</p> <p>For photographing details of anterior teeth, working models and indirect restorations</p>
<p>Surgery</p>		<p>SURGERY MODE</p> <p>For intraoral photography from a distance</p>	<p>Whitening</p>		<p>WHITENING MODE</p> <p>For shade comparison between before and after whitening</p>
<p>Mirror</p>		<p>MIRROR MODE</p> <p>For intraoral photography using a mirror. The image taken can be reversed.</p>	<p>Tele macro</p>		<p>TELE-MACRO MODE</p> <p>For photographing anterior teeth, indirect restorations and working models in higher magnification * Attach provided Close-up lens when taking pictures in this mode.</p>
<p>Face</p>		<p>FACE MODE</p> <p>For shooting facial views or half-body portrait</p>	<p>Isolate shade</p>		<p>ISOLATE SHADE MODE</p> <p>You can isolate the shade for optimal shade matching.</p>
<p>Movie</p>		<p>MOVIE MODE</p> <p>Record up to 10 minute videos</p>			

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MAGNIFICATION RANGE

- Chose the magnification ratio/range by rotating the dial key
- Icons to help you determine and select the range properly



72

STANDARD MODE



73

EDIT & DRAW FUNCTION ON THE EYESPECIAL C-III

- Edit functions are ideal for patient education
- Under the Menu key you can:
 - Draw on images to show areas of focus
 - Rotate the image
 - Protect the image against being deleted



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WHITENING MODE

FOR SHADE COMPARISON BETWEEN BEFORE AND AFTER WHITENING

- Similar to “Low-glare” mode but with lower light intensity
- Reduces glare and emphasizes the surface texture and shade
- Delegated Whitening & Imaging Assistant



Upper arch whitened

Lower arch not whitened

75

ISOLATE SHADE MODE

FOR OPTIMAL SHADE MATCHING



76

35mm Pro

EyeSpecial C-III



Quadrant Dentistry

77

35mm Pro

EyeSpecial C-III

**Cosmetic Dentistry**

78

Kodak DCS-N

EyeSpecial C-III

**Cosmetic Dentistry**

79

Closeup Intraoral Photography

\$2000-\$6000 dollars?



83

SHOFU EyeCam

EyeSpecial is not able to take certain pictures very well.



84

SHOFU EyeCam

For these pics, we proudly introduce EYECAM.



This may look familiar to some of you.

85

SHOFU EyeCam

Intraoral Cameras at a Price That Makes Sense

Cameras Guaranteed to Work Seamlessly With Your Practice

MouthWatch cameras make dentists smile. Not only because they cost \$299 or less, but because they work better than cameras that cost many times more.

[PRICING](#) [LEARN MORE](#)

TOP 100
DENTAL SUPPLY
2020

An Award-Winning Camera at a Rewarding Price.

Only \$299 per camera when you buy 3 or more.

Seamless integration with your imaging, guaranteed. MouthWatch doesn't make you choose between quality and cost. A single button-press sends high-quality images straight to charts—without lag. No keyboard, no mouse. Easy purchase backed by free lifetime customer support with our friendly US team. Every camera is backed by a risk-free, 30-day moneyback guarantee.

dental townie choice awards 2020

mouthwatch

www.mouthwatch.com | 877.544.4342

[LEARN MORE ON YOUR MOBILE](#)

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89



90



February 18, 2020

<https://prevudental.com/>

An enhanced smile for Briette [REDACTED] provided by Dr. Todd Snyder

91



92



93

OPPORTUNITY

- Patient wants to fix the small lateral incisor
- No tooth reduction



94

5

Beadline Provisional Mockup



95

Beadline Provisional Mockup



Diagnostic Models with a waxup are duplicated. Special over impression is created and used to deliver temporary mockup

96



97

Show & Sell Possibilities..



99



100

Silginat - Kettenbach
Counter FIT- Multipurpose Replication Silicone
(Clinician's Choice)



101

Silginat - Kettenbach
Counter FIT- Multipurpose Replication Silicone
(Clinician's Choice)



102

Wear Facets & Interferences 3 Sets of Models

- One is untouched for legal documentation
- Second to practice preparations (It will be waxed up)
- Third is a spare to practice on or make bleach trays



103

Mounted and Equilibrated



104

PROVISIONALS

105

Provisionals

- Visalys (Kettenbach)
- TempSmart (GC America)
- Inspire (Clinician's Choice)
- ExperTemp (Ultradent)
- Luxatemp Ultra (DMG)



106



Multifunctional acrylic composite
Crowns, bridges, veneers, inlays,
onlays, & implants
Made without BPA
High Strength
Natural Luster
Low air inhibition layer
High strength

107

VISALYS
CEMCORE
(Dual Cure)

1 Product
2 Indications



108

Cosmetic Provisionals (Bead Line Technique)

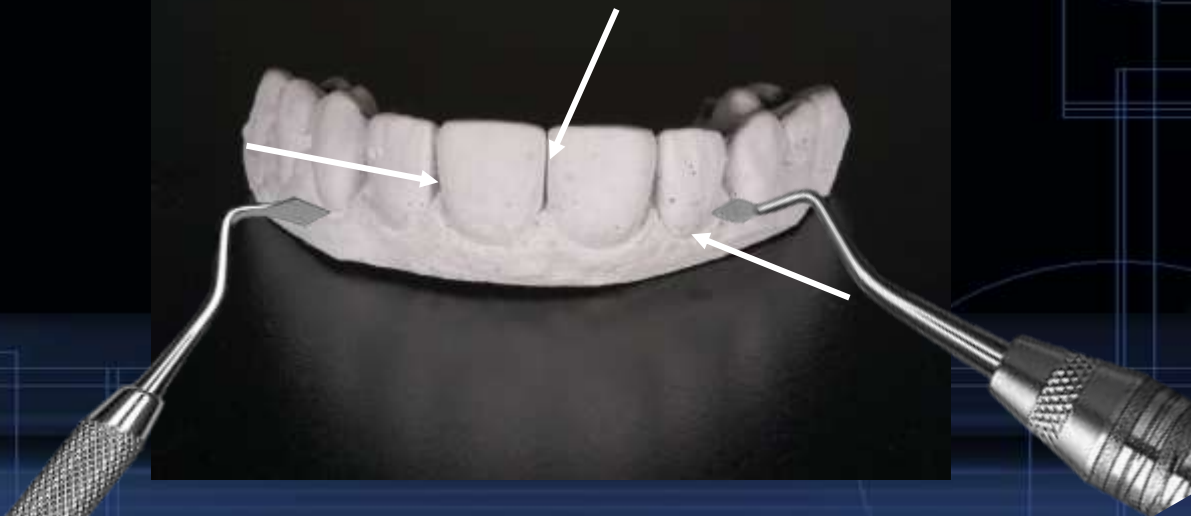


Bead Line Veneer Provisional Restorations. Pract Proced Aesthet Dent 2009;21(3):E1-E7.

110

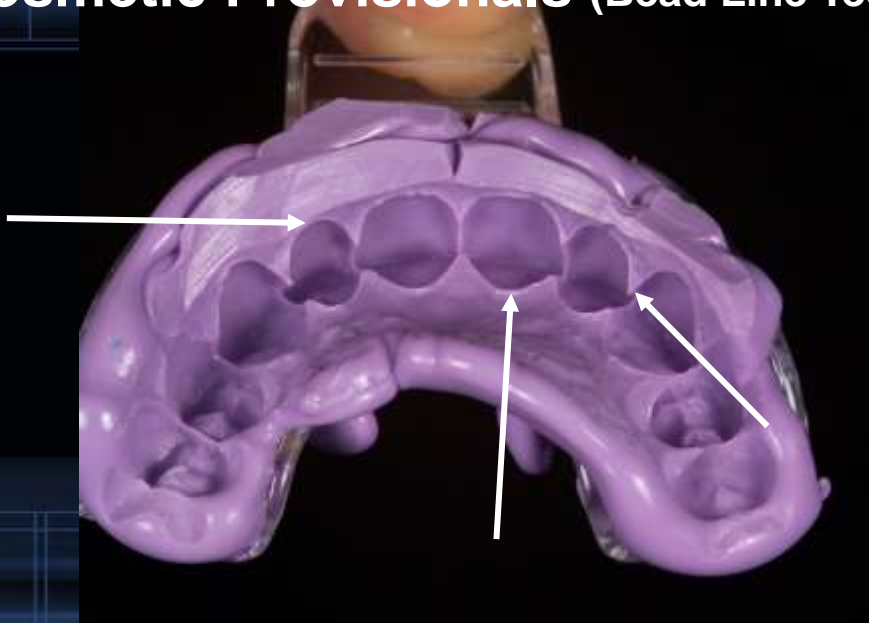
Cosmetic Provisionals (Bead Line Technique)

Scribe a 0.5mm-1mm groove into tissue & a little on tooth



111

Cosmetic Provisionals (Bead Line Technique)



112

Cosmetic Provisionals (Bead Line Technique)



113

Cosmetic Provisionals (Bead Line Technique)



No Polish Necessary if you use a good model

114

Cosmetic Provisionals (Bead Line Technique)



115

Cosmetic Provisionals (Bead Line Technique)



116

Cosmetic Provisionals (Bead Line Technique)



117

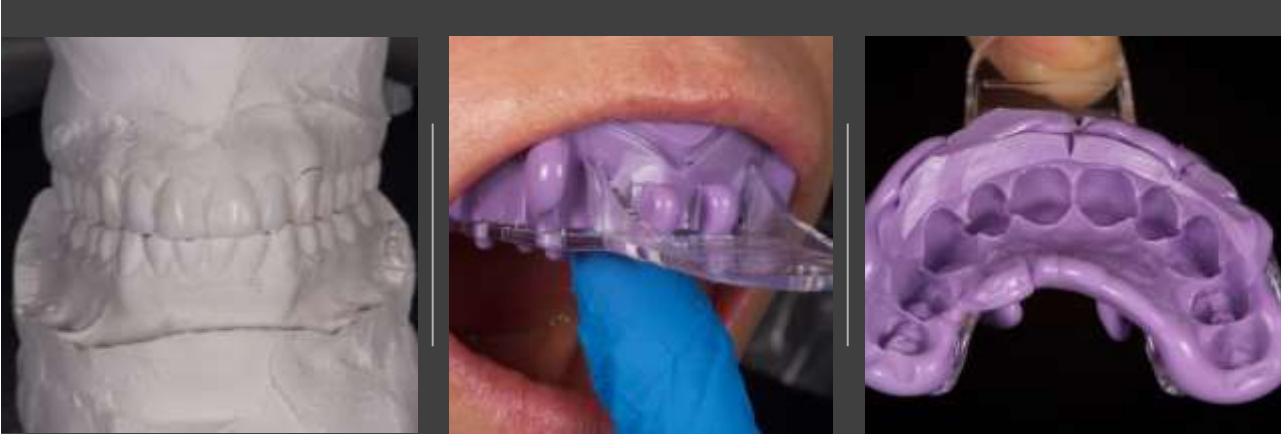


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Minimally Invasive Veneers....
Why? Benefits??

119



Beadline Provisional Mockup

(No etching, no bonding, mechanical retention only)

120



Mockup

121



Depth Cuts

122



Photos for Laboratory Technician

123



Provisional Restorations

(No etching, no bonding, mechanical retention only)

124



125



126



LuxaCrown
Chairside Crown & Bridge Material

Compressive Strength
333 MPa

*Displayed high compressive strengths similar to composite resin material. Data on file.

Wide Range of Indications:
Implant, Pediatric, Geriatric, Cosmetic, Root Canal Cases

FIVE Shades

A1 A2 A3 A3.5 B1

24 3-unit Bridges/ Cartridge



5 Minutes to Create a Crown

36 Single Crowns/ Cartridge

Flexural Strength
154 MPa

*Exhibited high flexural strength as compared to ceramic. Data on file.

Fracture Toughness
2.00 MPa·m^{0.5}

*Increased overtime in comparison to materials that decreased over time. Data on file.

Barcol Hardness
66

Last up to 5 Years

ADA Codes: 02394 | 02710

DMG

127

AESTHETIC TEMPORARY CEMENT

ClearTemp LC-Ultradent



128



Final Restorations

129



Provisionals Mimic The Final Restorations

130



131

PROVISIONALS



132



133

What are we seeing on the surface?

- Implement technology and less invasive dentistry



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Diagnosis

My Mission

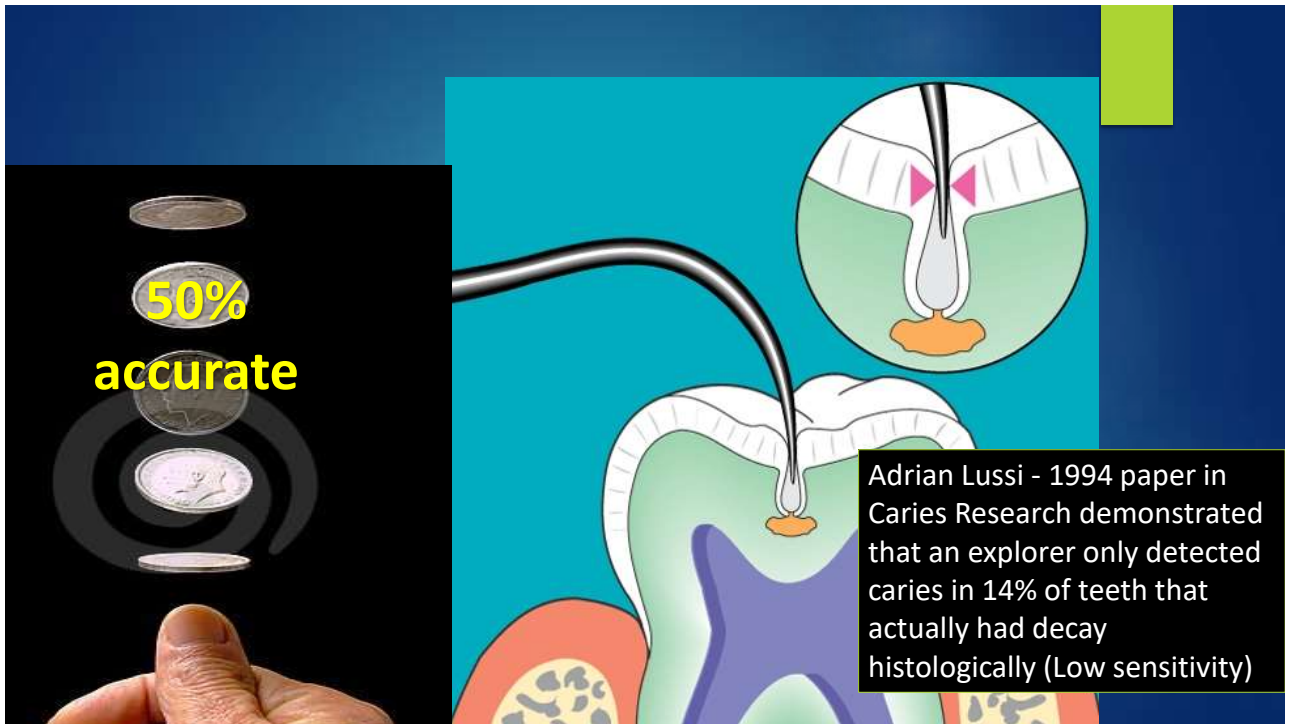
To make you think differently on your next case.

How good is your diagnosis?

Are you still diagnosing with this??



136



137

Pathology Driven Diagnostics



138

RADIOGRAPHIC ANALYSIS

IN NEW ORLEANS, C. EDMOND KELLS WAS THE FIRST DENTIST TO TAKE DENTAL X-RAYS IN 1896.



139



Since 1896



Existing Tooth Decay Diagnostics

Gold standard detection methods (visual & x-ray) fundamentally unchanged for decades.

<50%

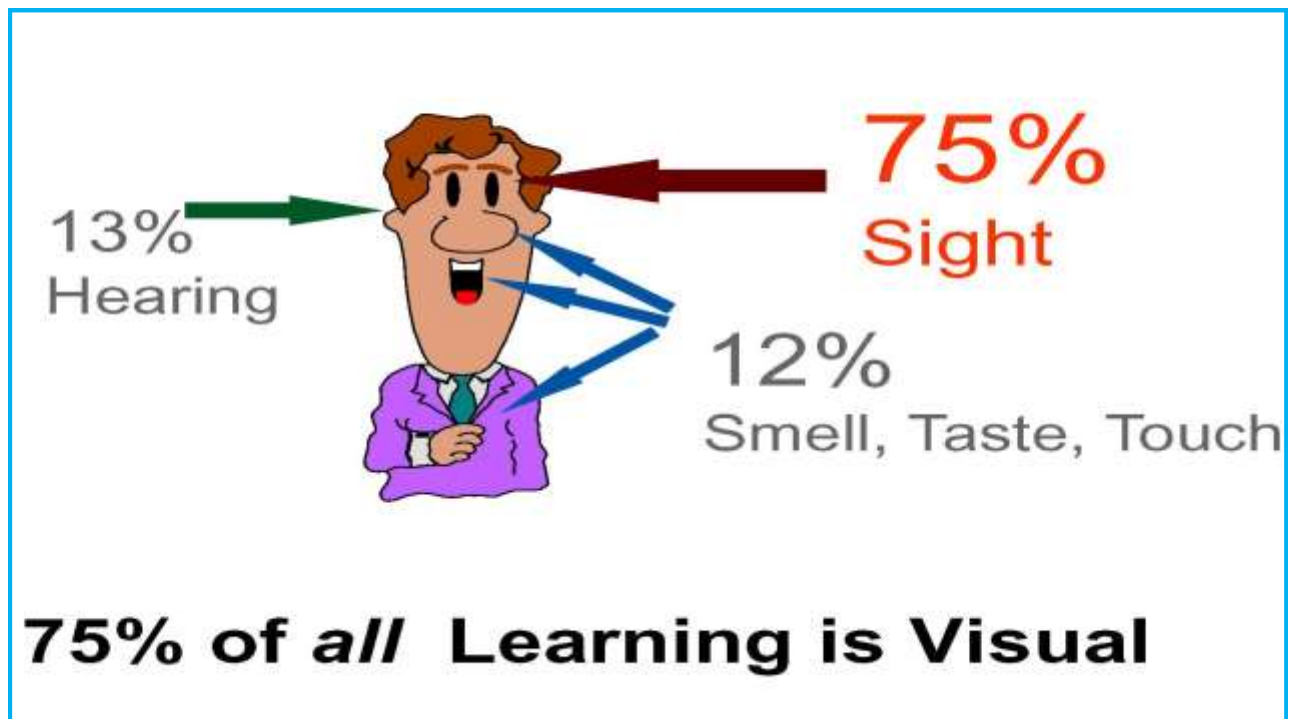
Tooth Decay Detected

140



DIGITAL SENSORS

141



142

How do you **diagnose** decay??



Thru intraoral photographic interpretation?

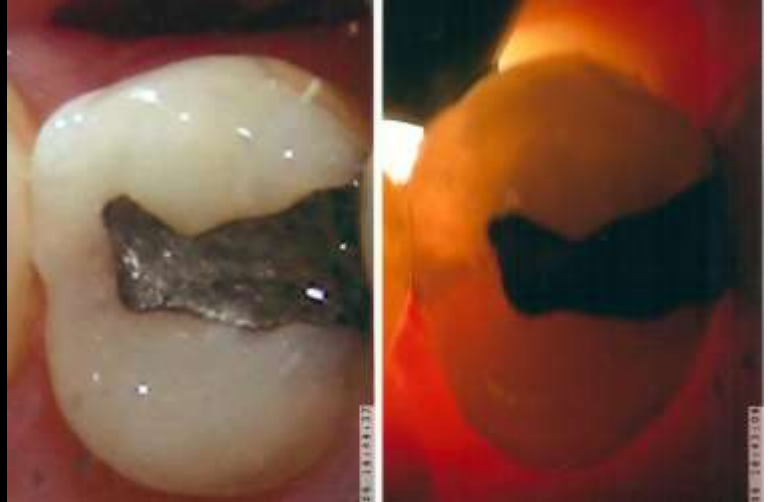
144

Fiber Optic Transillumination



147

Fiber Optic Transillumination



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CariVu Fiber Optic Transillumination

TIP

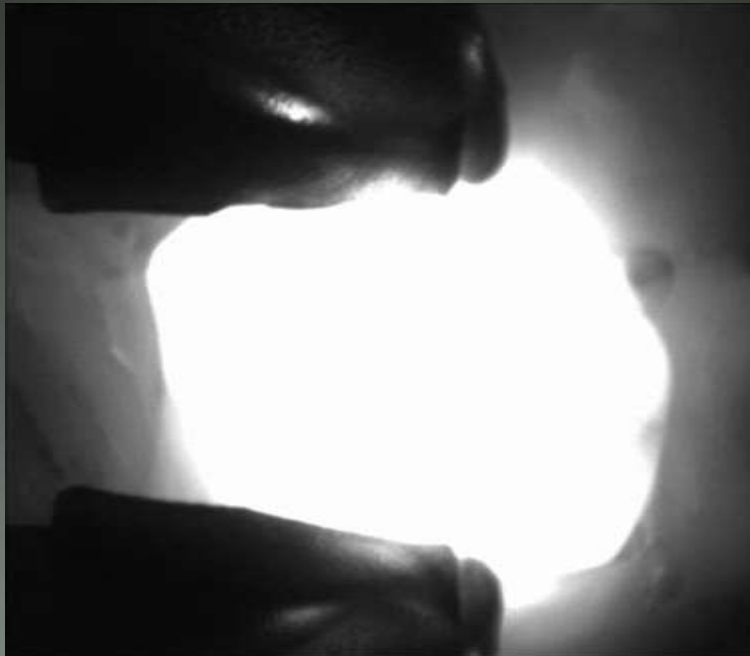
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CariVu: Transillumination

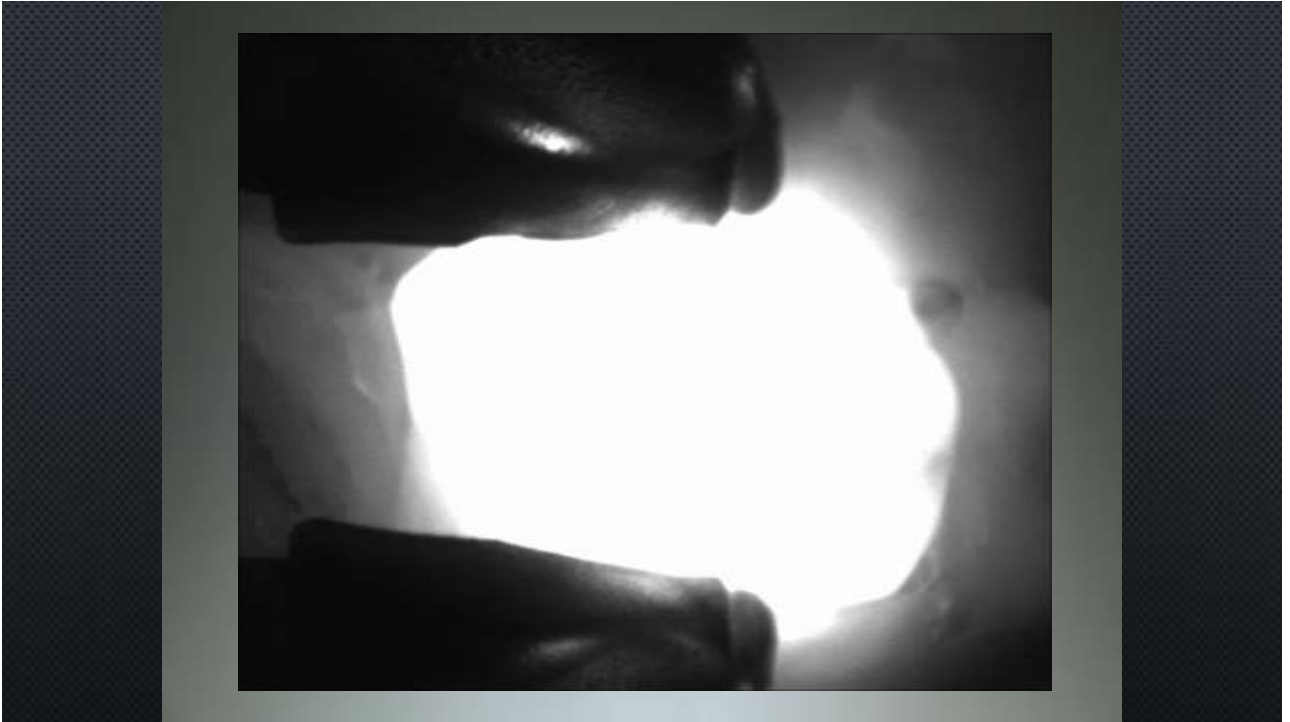


- Near Infrared light...no radiation
- Enamel appears transparent or light
- Porous lesions appear **darker** by trapping and absorbing the light: these include cracks and caries
- Video capture....live scans
- Stored in Dexis, excellent for communication to patient and yes...to insurance companies

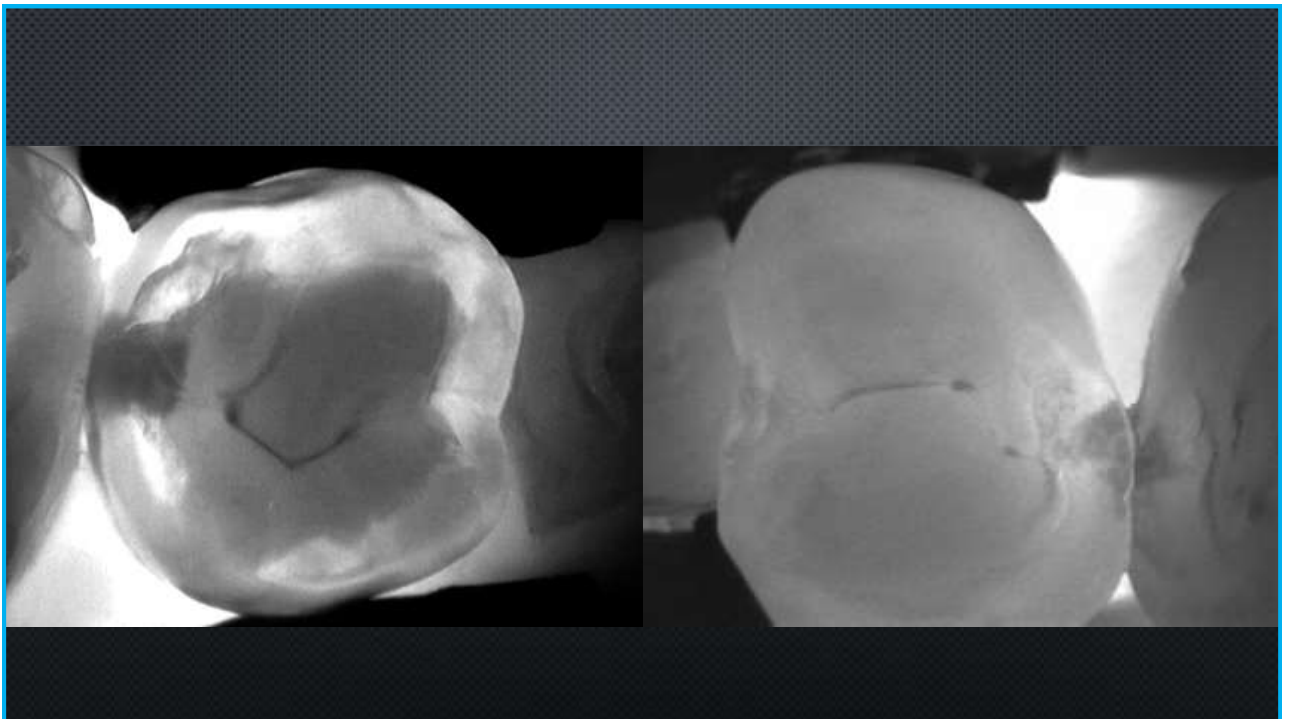
150




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152



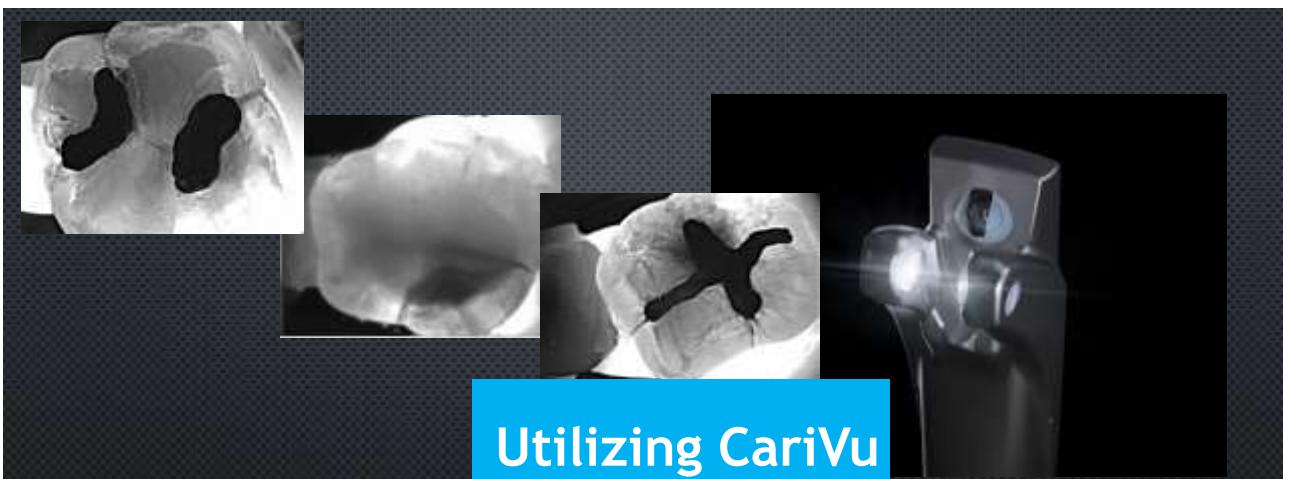
153



Utilizing CariVu

With proximal surfaces, one can identify where the lesions are buccally and lingually

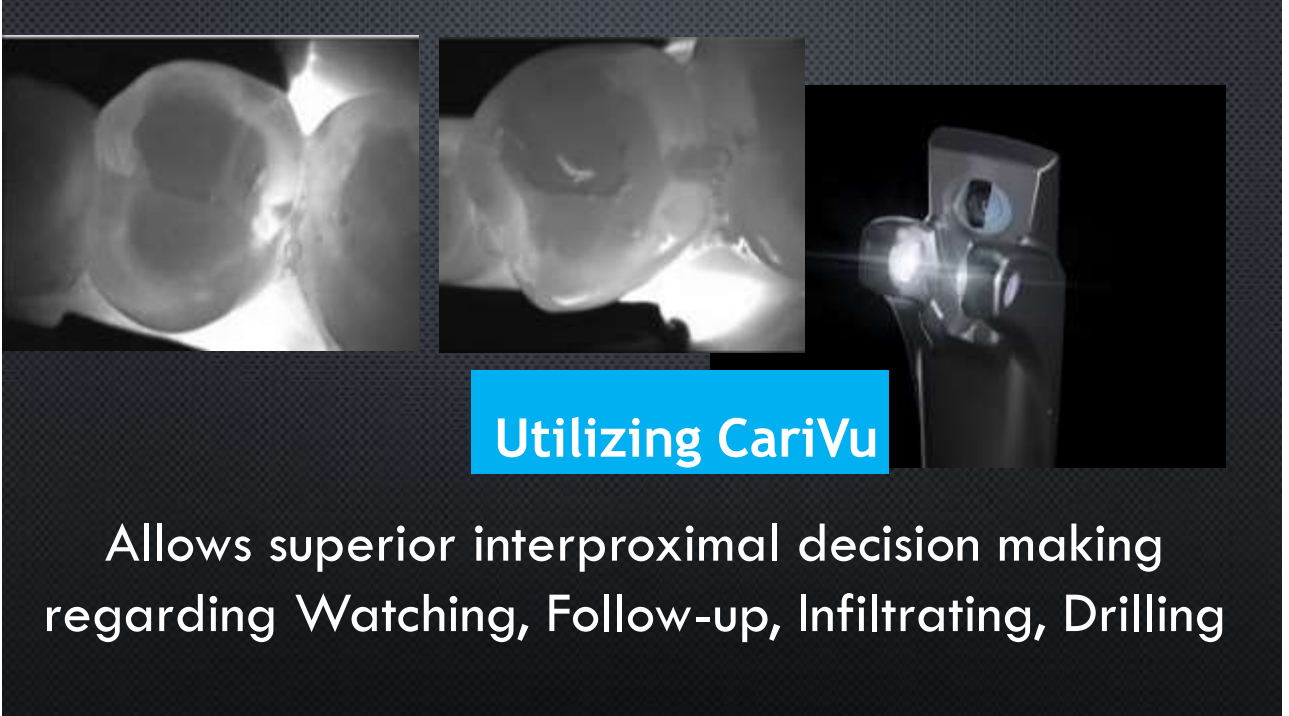
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Utilizing CariVu

For identifying **cracks**, and to a certain level, the **severity** of the cracks

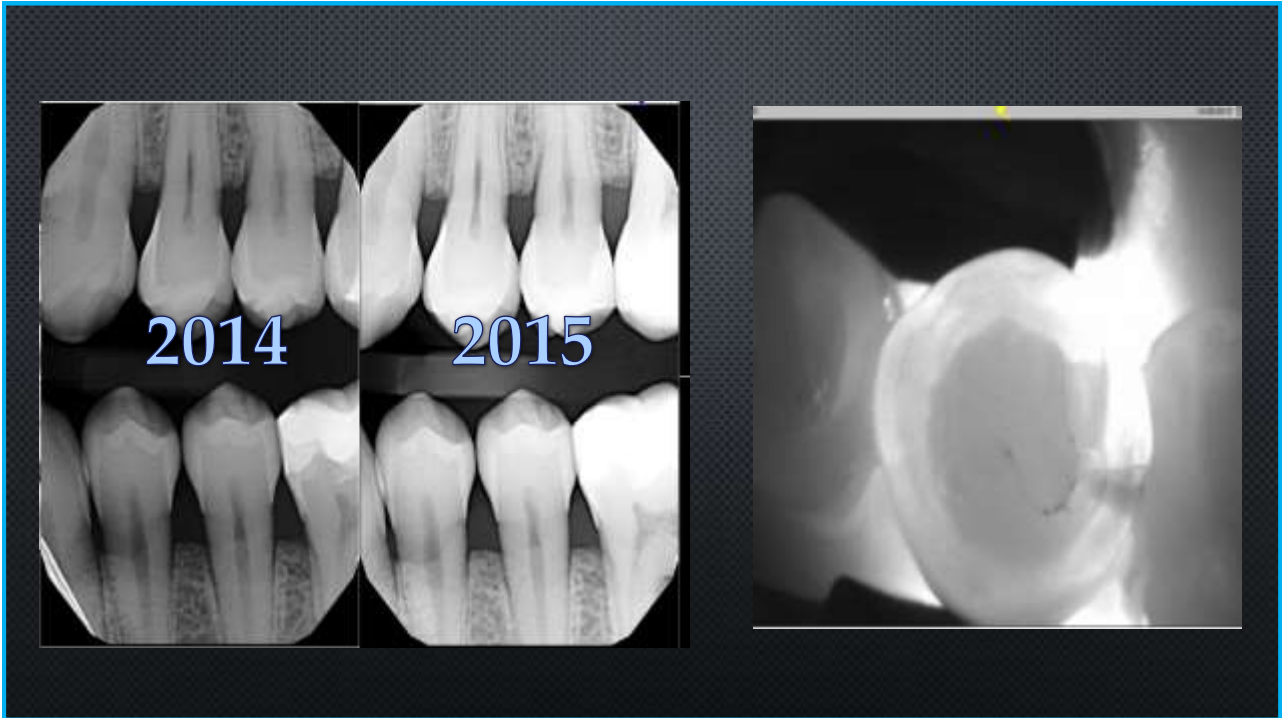
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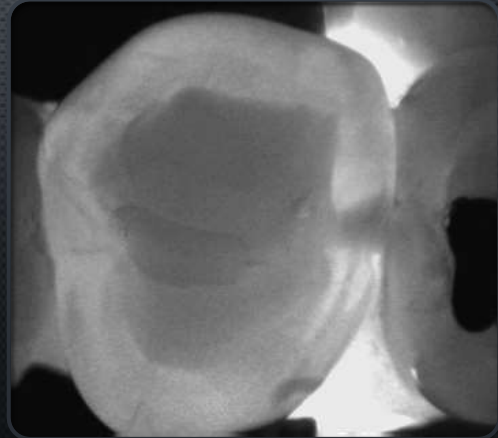
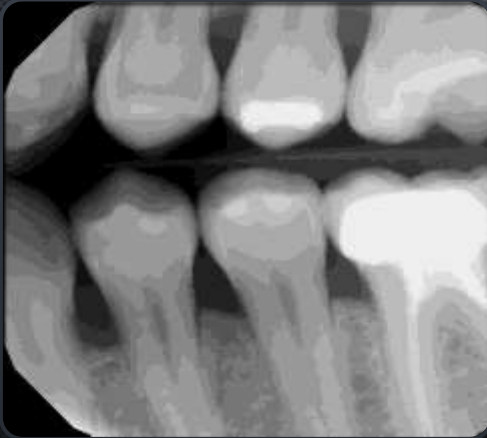


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WHERE IS THE CAVITY?



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Short Learning Curve

What does a caries lesion really look like? The transillumination technology of DEXIS™ CariVu™ can reveal its shape and size!

Healthy						Established
Diagnosis						
Sound surface	First detectable signs of an enamel caries lesion	Established enamel caries lesion	Established enamel caries lesion which reached the DEJ at a single point	Dentin caries due to an established enamel caries lesion with extended involvement of the DEJ	Established dentin caries	

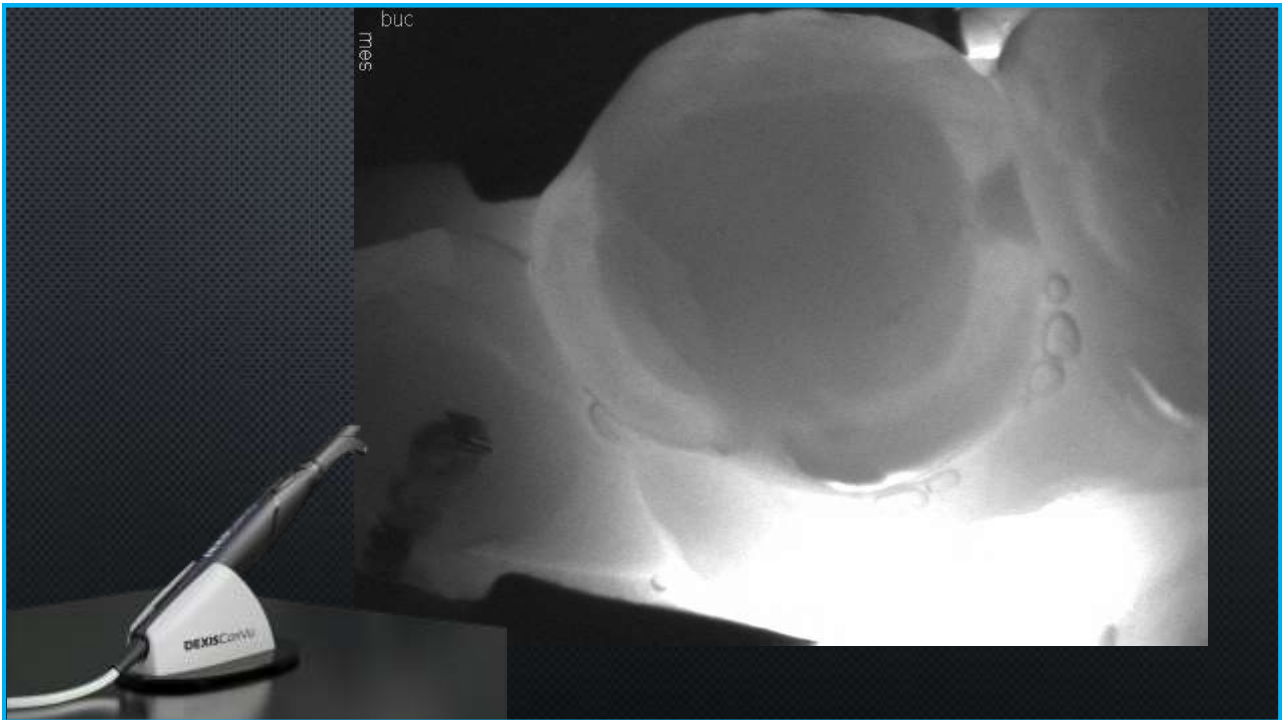
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ANOTHER EXAMPLE

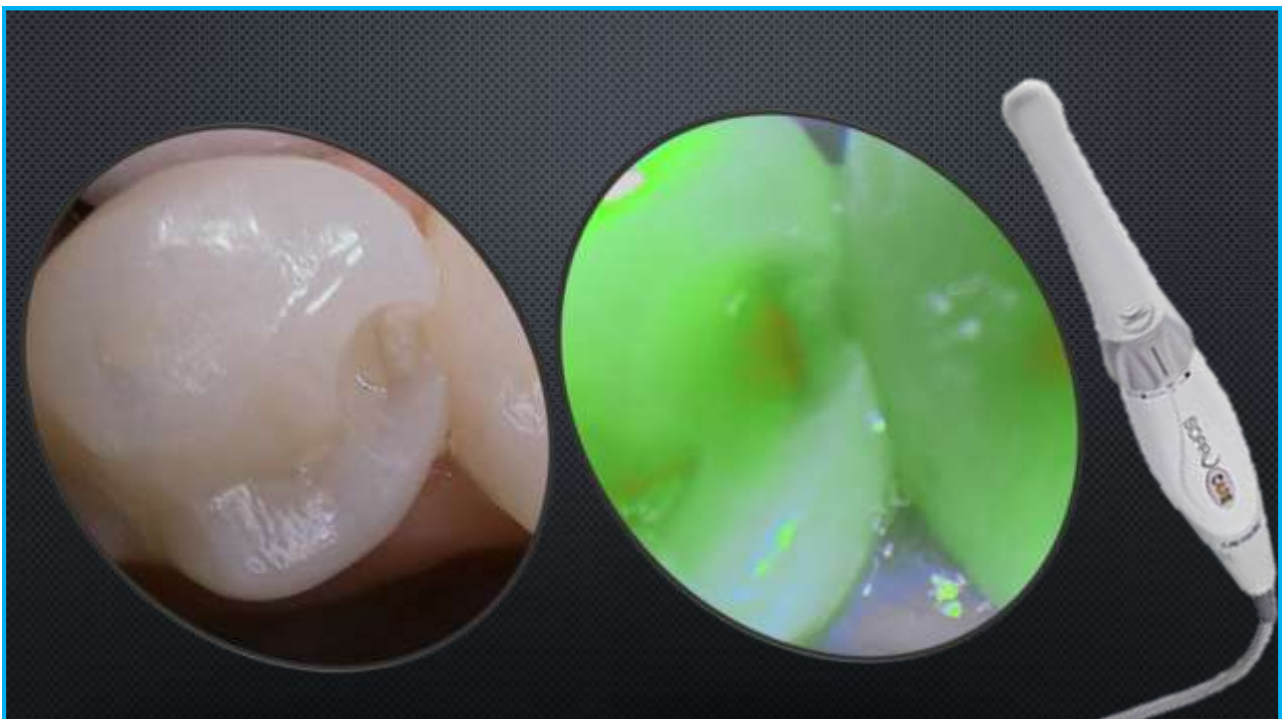
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165



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MINIMALLY INVASIVE DENTAL CARE

- FIND CAVITIES & DEMINERALIZATION EARLIER
- SMALLER, EASIER TO PLACE FILLINGS
- SAVES PATIENTS TOOTH STRUCTURE
- SAME CDT FEES JUST DONE FASTER

**EASILY
DIAGNOSING 5X
MORE DECAY**

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168



169



170



171



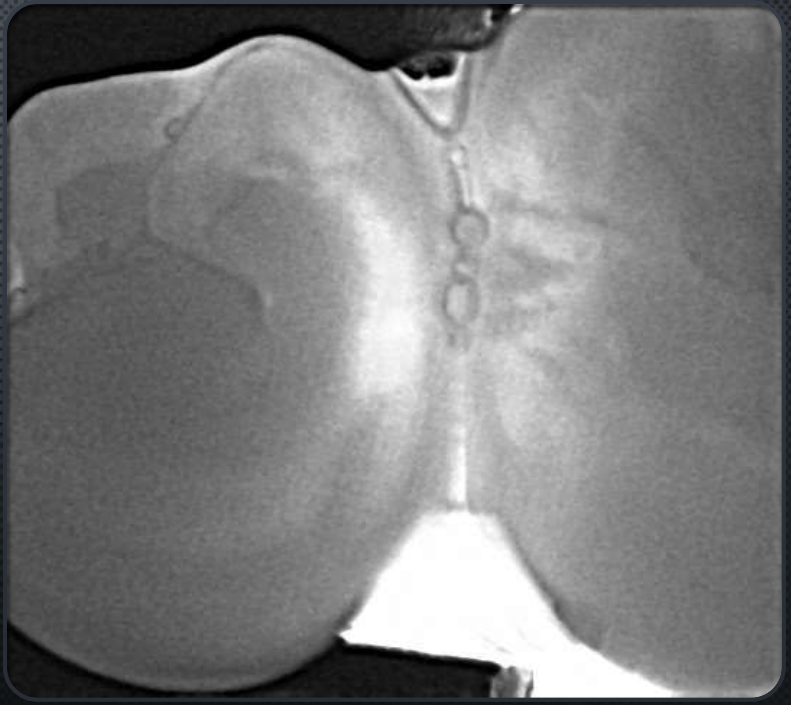
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RESTORING SMALL DEFECTS



173

LOOK FOR GROOVES
AND PITS TO
DETERMINE POSITION
OF DEFECT



174



RESTORING SMALL DEFECTS

175



TIP



TRIODENT
WEDGE GUARD

176



RESTORING SMALL DEFECTS

178

TRIODENT V3 RING (ULTRADENT)



179

FAST EASY



180



181



182



183



184

- **Light-Cured Dental Adhesive**

All-Bond Universal is a universal adhesive it can be used with direct and indirect restorations and is formulated to be compatible with light-, dual- and self-cured materials. The versatility of All-Bond Universal makes it an indispensable part of any dental practice.

- **Unique Benefits:**

- Not moisture sensitive use on wet, dry or moist tooth structure
- Impressive bond strength to ALL substrates
- Use with ALL direct and indirect restorations (<10 micron thickness)
- Ideal chemical balance for both total- and self-etch adhesion from one bottle
- Compatible with ALL resin cements (no additional activator required)
- Virtually no post-operative sensitivity

- **Clinical Significance:**

- All-Bond Universal offers the flexibility for total-, self- and selective-etch procedures
- All-Bond Universal is compatible with all light-, self- and dual-cured resin composite and cement materials for all direct and indirect procedures
- All-Bond Universal works with dual cure resins, NO activator is required



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187



188



189



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INJECTABLE COMPOSITES

198

Failing Amalgam



200

Preparation Design



201

Sectional Ring System



202

Phosphoric Acid Etchant



203

Uni-Etch is a 32% semi-gel phosphoric acid etchant available with Benzalkonium Chloride (BAC) and designed for **etching** tooth structure prior to bonding.



204

Select HV Etch is a 35% high viscosity phosphoric acid etchant available with Benzalkonium Chloride (BAC) and is designed for pin-point accuracy.



205

◆ **Light-Cured Dental Adhesive**

All-Bond Universal is a truly universal adhesive it can be used with direct and indirect restorations and is formulated to be compatible with light-, dual- and self-cured materials. The versatility of All-Bond Universal makes it an indispensable part of any dental practice.

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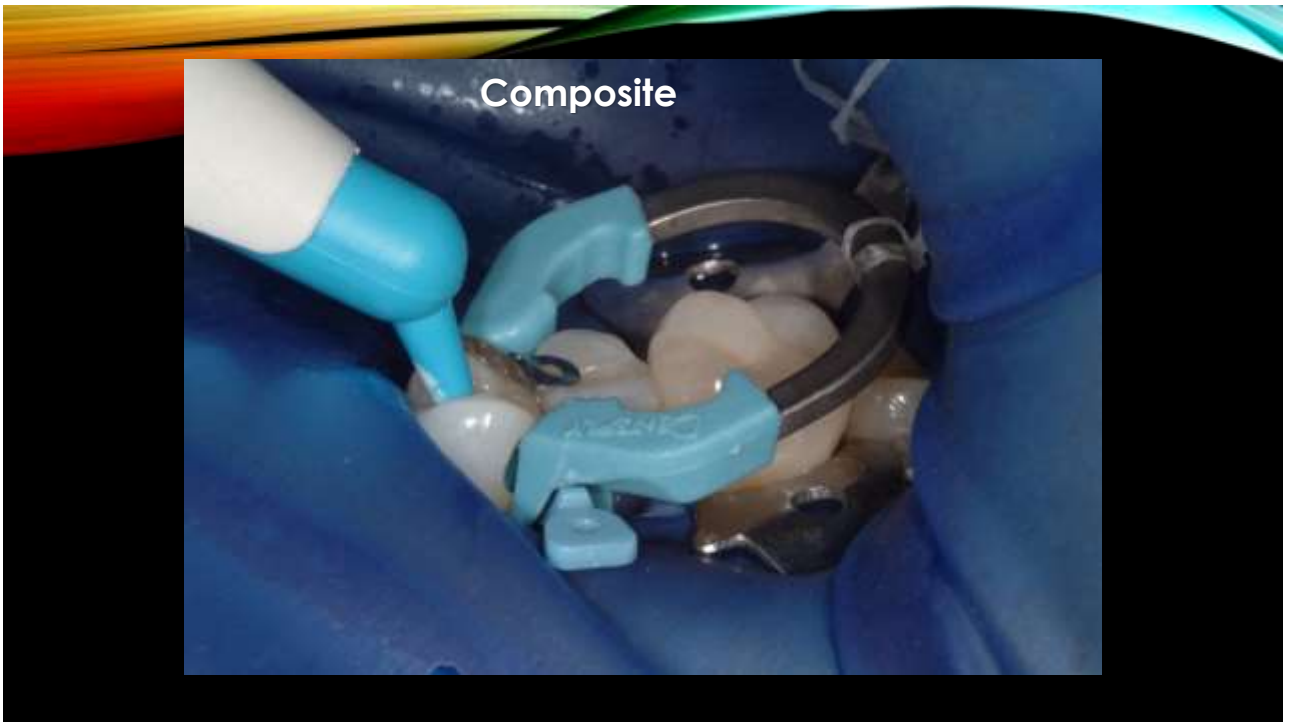
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210



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Cavity Depth	Product Recommendation
Up to 2 mm	G-aenial™ Flo X or
	G-aenial™ Universal Injectable
Up to 4 mm	G-aenial™ BULK Injectable
4-6+ mm	G-aenial™ BULK Injectable & G-aenial Sculpt®

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G-AENIAL BULK INJECTABLE – AVAILABLE SHADES

A1 & A2 shades available

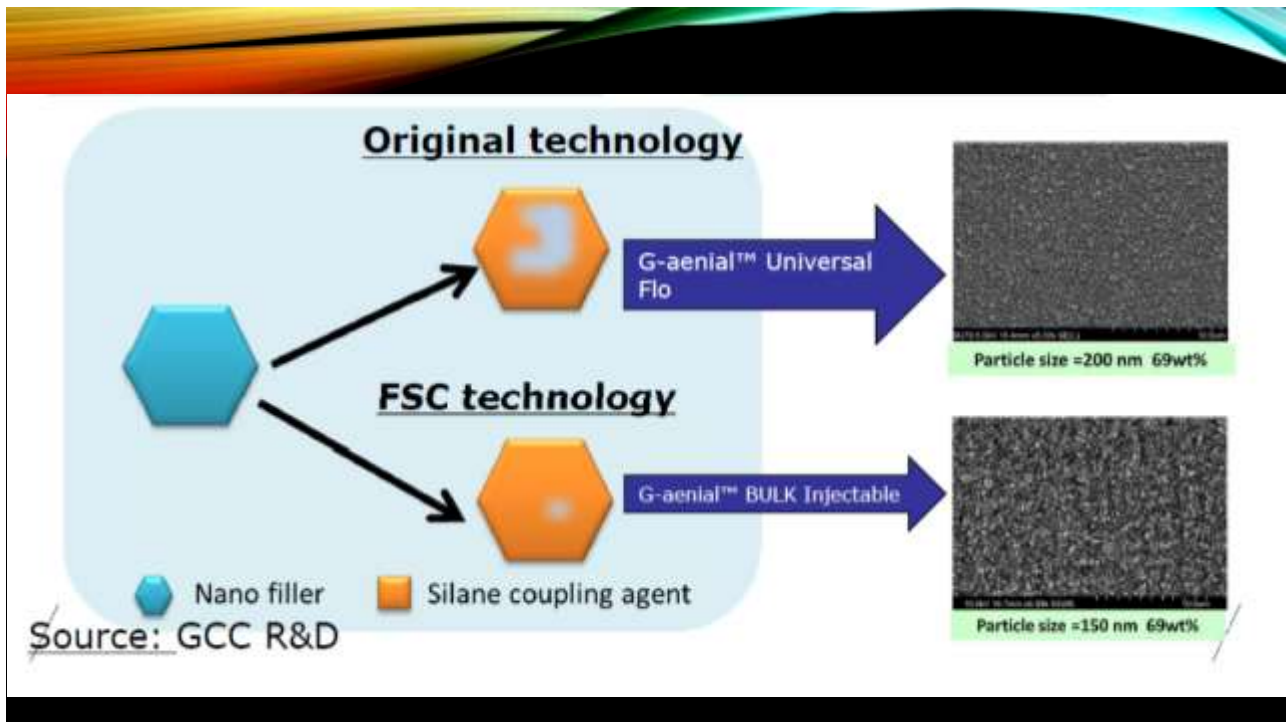


213

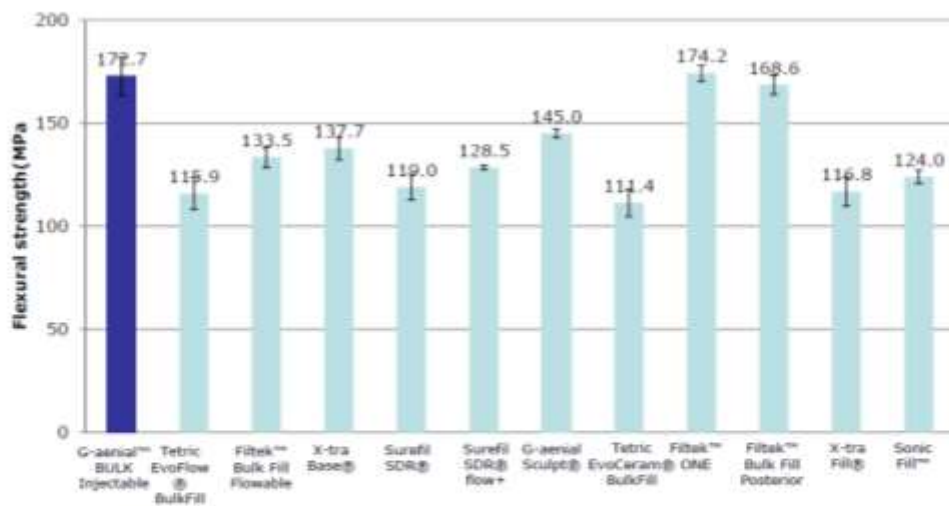
G-AENIAL BULK INJECTABLE

- Injectable high strength nanoparticle composite with ideal viscosity handling and adaption characteristics that may be used as a one step application for bulk filling up to the occlusal surface without the need for capping or veneering with another composite

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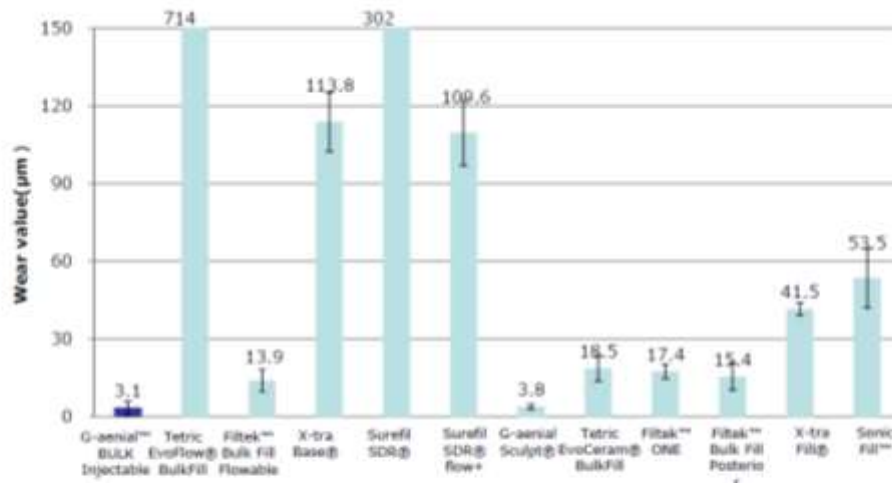
215



G-aenial™ BULK Injectable exhibits very high Flexural Strength, which translates to a **lower risk of chipping or fracture.**

Source: GCC R&D

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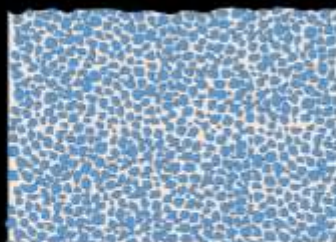
G-aenial™ BULK Injectable shows the highest wear resistance compared to the competitive set. This measure indicates that **the material will provide a highly durable and long-lasting restoration.**

Source: GCC R&D

217

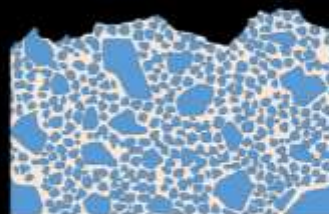
WEAR RESISTANCE

GBI features **nano-particle filler technology**. When combined with Full-Coverage Silane Coating (FSC) technology, the result is a homogeneous, uniformly dispersed layer. Some competitive products feature larger particles which may be "plucked" from the surface when subjected to opposing forces within the mouth, leading to the deterioration of the restoration over time.



Small fillers

Small filler is dispersed uniformly, occlusal load is distributed equally and sustains less damage to the surface of material.



Large fillers

When high load is applied, large filler particles come off easily, causing an uneven surface which leads to a higher degree of wear.

Source: GCC R&D

218



219



220



221



222



223

G-aenial BULK Injectable

"operates like a flowable but performs like a restorative"



- Bis-GMA free / Radiopaque
- High Strength & Wear Resistance
- High density uniform dispersion nanofiller technology
- Sculptable

224



225



226



227

COMPOSITE PLACEMENT REVIEW

- Etch enamel and Self etch dentin
- OR Total Etch
- Flowable on just the pulpal floor 0.5mm
- Horizontal layering (2mm Increments)
{Stay within similar dentin bond strengths}
- OR Dentin Replacement & Cap
- OR Bulk Fill
- Complete curing (use LED curing lights)

https://www.aegisdentalnetwork.com/id/2017/06/the-protocols-of-biomimetic-restorative-dentistry-2002-to-2017?page_id=296

228

"C-FACTOR" DEFINITION

Configuration Factor:

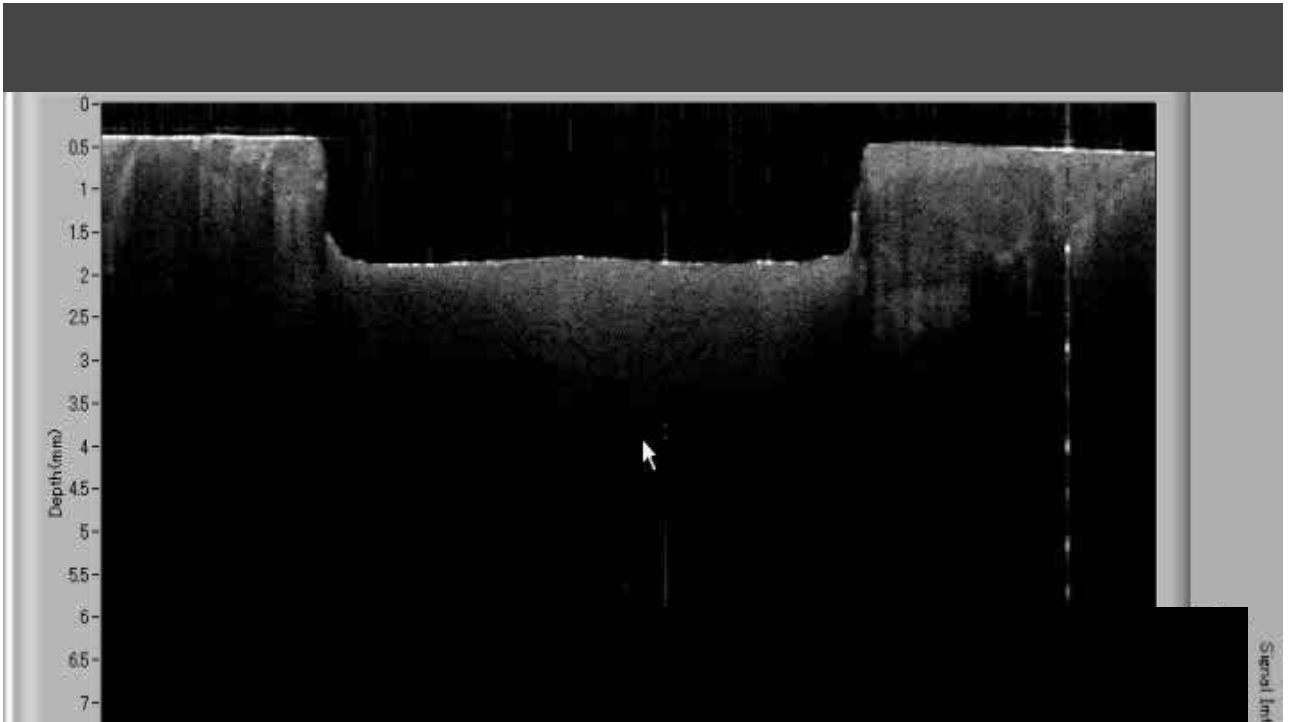
**"The ratio of bonded
to un-bonded (free) surfaces"**

Feilzer, DeGee, Davidson (1987),
Universiy of Amsterdam, ACTA

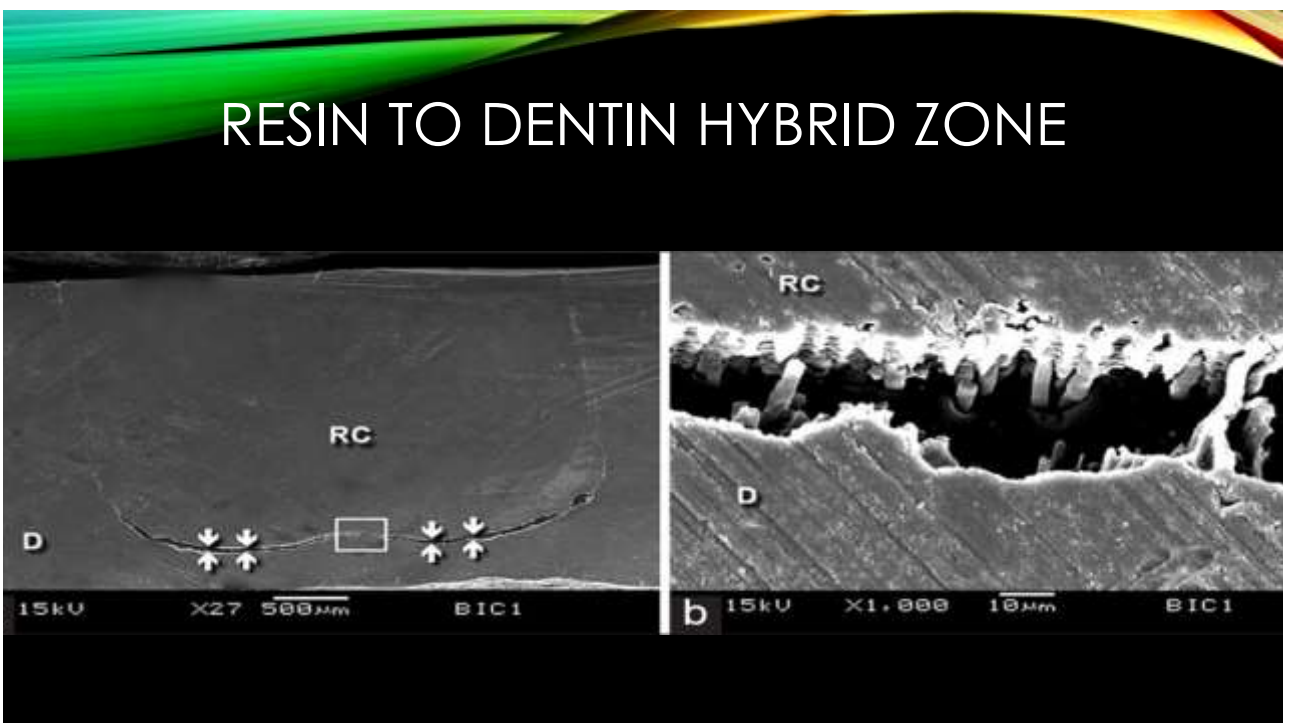
229



230



231



232

“Adhesive dentistry could be expressed as a simple relationship between bonds and stress. If the bonds can withstand the stress, the restorative technique will be successful.”

Unterbrink and Liebenberg (1999)

233

“C-FACTOR”


Base/ Lining



Excellent Flow & Handling



234



(RFA-DE-10-004)

"Tooth-colored resin restorations have an average replacement time of 5.7 years due to secondary caries precipitated by bond failure."

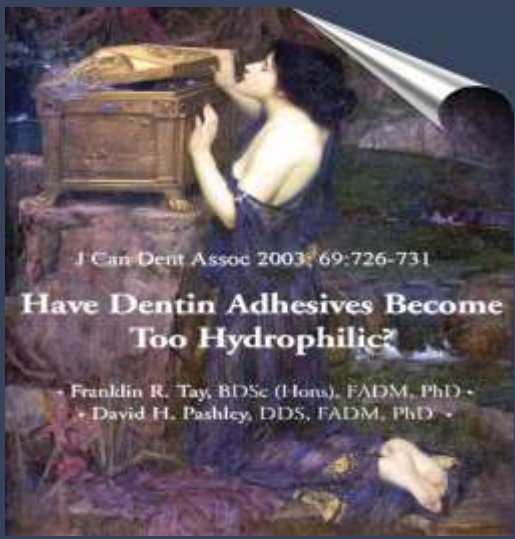
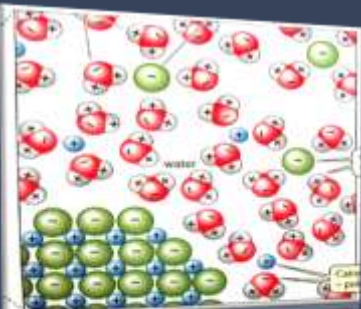
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3148178/>

255

i *Factors that compromise bond durability in restorative dentistry*

Hydrophilic dentin bonding

We challenged that current dentin adhesive designs that incorporate increasing concentrations of hydrophilic monomers are going in the wrong direction

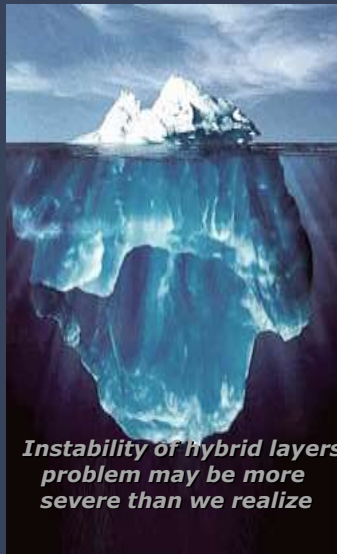



*Water sorption
Polymer swelling
Decline in mechanical properties
Leaching of hydrolyzed resin components*

256

i Factors that compromise bond durability in restorative dentistry

Hydrophilic dentin bonding



RESEARCH REPORTS J Dent Res 2005; 4:741-746

J. Hebling¹, D.H. Pashley²,
L. Tjäderhane³, and F.R. Tay^{2,4*}

Chlorhexidine Arrests Subclinical Degradation of Dentin Hybrid Layers *in vivo*



Intact hybrid layers created by a simplified etch-and-rinse adhesive in caries-affected primary dentin partially disappeared after **6 months** of intraoral function

257

i Factors that compromise bond durability

Hydrophilic dentin bonding

RESEARCH REPORTS

J Dent Res 2004; 83:216-221

D.H. Pashley^{1*}, F.R. Tay², C. Yiu³,
M. Hashimoto⁴, L. Breschi⁵,
R.M. Carvalho⁶, and S. Ito⁶

Collagen Degradation by Host-derived Enzymes during Aging

Demineralizing dentin is like opening the Pandora's box, releasing endogenous enzymes (Matrix Metalloproteinases - MMPs) that were trapped within the mineralized dentin matrix.

In the presence of water (such as that derived from water sorption or from adhesives, MMPs (2,8 & 9) can breakdown collagen fibrils that are not protected by intrafibrillar minerals

Sukala et al. (2007)
Mazzoni et al. (2007)



258

BOND DEGREATION

- Pashley DH, Tay FR, Imazato S. How to increase the durability of resin-dentin bonds. Compend Contin Educ Dent. 2011 Sep;32(7):60-4, 66.

Resin-dentin bonds are not as durable as was previously thought. Microtensile bond strengths often fall 30% to 40% in 6 to 12 months.

259

Adhesives



261

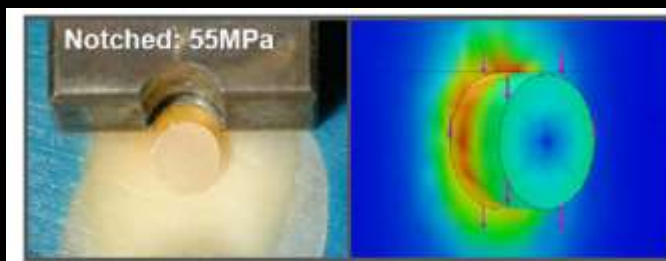
•Courtesy Pacific University (Dr Marc Guisberger)



262

INSTRON

- Ultra Tester (Ultradent)
- Ultra Jig (Ultradent)



263

Courtesy Pacific University (Dr Marc Guisberger)

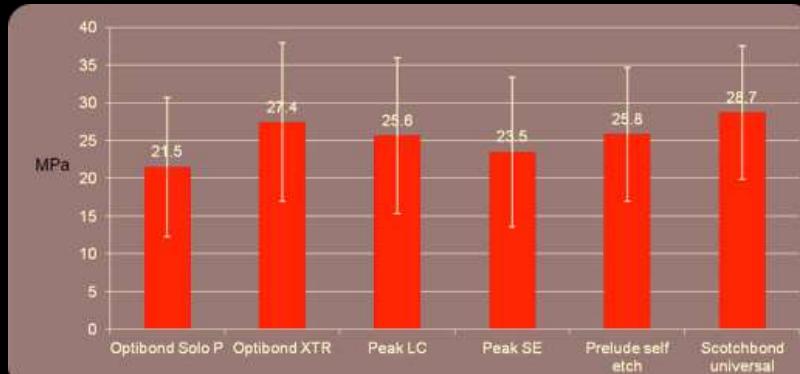
SHEAR BOND TEST RESULTS - 2012



264

Courtesy Pacific University (Dr Marc Guisberger)

SHEAR BOND TEST RESULTS - 2012



265

Van Meerbeek B, et al. Relationship between bond-strength tests and clinical outcomes. Dent Mater (2009), doi:10.1016/j.dental.2009.11.148

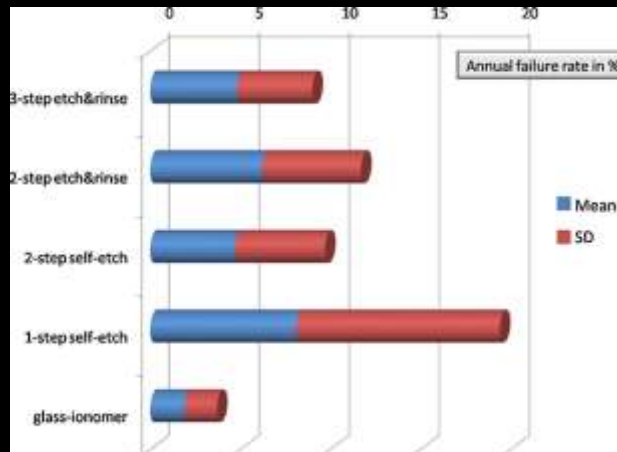


Fig. 15 – Graph representing the mean annual failure rates per adhesive class, determined according to a systematic review of Class-V clinical trials of adhesives during the period 1998–2004 [2].

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CLINICAL TIPS WITH UNIVERSAL ADHESIVES

1. Air Dry The Water Based Adhesive or Primer Fully To Evaporate Water. The Universal, Single-Bottle Adhesives Have Higher Concentration of Water & Alcohol, So Make Sure To Air Dry About 10's Until Water Is Evaporated.
2. Inadequate Drying Will Result in Lower Bond Strengths Water, Alcohol & Acetone Prevent The Resin From Curing So They Must Be Evaporated.

267

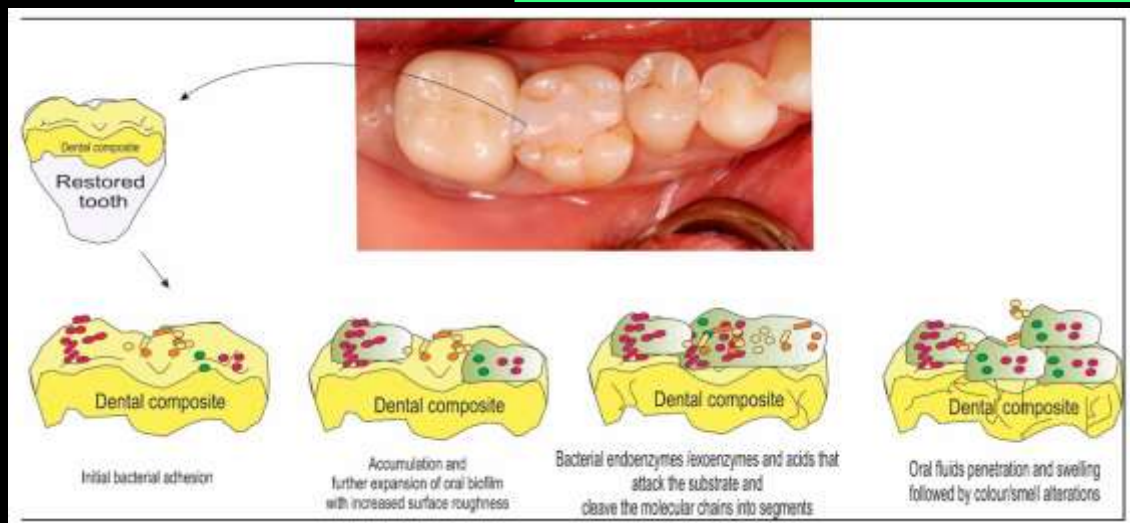
DRAWBACKS OF ANY COMPOSITE RESIN

- Material placement techniques
- Variable substrate
- Polymerization stress & shrinkage
- Water absorption
- Hydrophobic bonding agents
- Decreased adhesive bond strength over time
- MMPs and Cathepsins
- Microleakage



268

ORAL BACTERIA DEGRADATION OF RESIN RESTORATIONS



269

MORE RESEARCH

American Journal of Dentistry Oct 2017

- <https://www.researchgate.net/publication/321184952> The role of adhesive materials and oral biofilm in the failure of adhesive resin restorations

270

Why Glass Ionomers?

- Bioactive material
 - affinity to tooth structure. when placing a glass ionomer a weak acid or conditioner is used to aid in releasing calcium and phosphate ions from the tooth structure. These calcium and phosphate ions combine into the surface layer of the glass ionomer and form an intermediate layer called the interdiffusion zone. This bond layer can be very strong and significantly reduce the microleakage that would occur at the margins of the restoration.
- Very good fluoride and ion release helps remineralize tooth structure in the remineralization–demineralization process that naturally occurs in the oral cavity.
- They chemically bond to enamel and dentin.

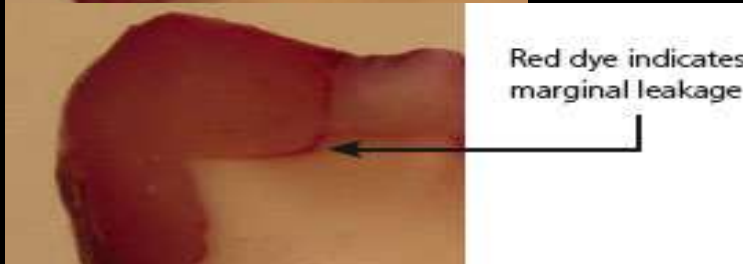
272

Why Glass Ionomers?

- They produce good marginal integrity.
- They shrink only one ninth the amount of composite material.
- They are fluoride-rechargeable.
- There are no free monomers in the material.
- The cavity preparation can be bulk-filled, making the materials easy to place.
- They exhibit excellent biocompatibility.

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GLASS IONOMER SANDWICH



- Class I, II, III & V posterior restorations
- Open & Closed Sandwich techniques
- Composite replacement
- Amalgam replacement
- High caries risk patients
- Pediatric patients
- Geriatric patients
- Special needs patients
- Long term resistance to microleakage

274

microleakage testing in vitro using three different bases under composites

T. DUONG, L. TRAN, R. PERRY, G. KUGEL, *Special Issues of the Journal of Dental Research*. ABSTRACT #0366
> Tufts University School of Dental Medicine, Boston, MA, USA.

abstract:

Objective: To compare Class II microleakage in vitro of three different bases placed under composite restorations.

Methods: Thirty-six extracted molars were prepared as Class II MO/DO: 2mm occlusal depth, 2mm axial box depth, 3-5mm gingival box width, and 1mm gingival margin below CEJ. Teeth were randomly divided into three groups of twelve (groups 1-2 = glass ionomer; group 3 = flowable resin): Group 1-Riva Light Cure GI (SDI), Group 2-Riva Self Cure GI (SDI), Group 3-Esthet-X Flow (DENTSPLY Caulk). All groups were primed with Clearfil SE Bond Primer and Bond (Kuraray). All samples were then restored using ICE nano-hybrid Composite (SDI), finished and polished. Restorations were thermocycled for 300 cycles between 5°C and 55°C with a dwell of 30 seconds and then placed in 0.5% aqueous basic fuchsin dye for 24 hours at 37°C. Samples were sectioned mesiodistally and scored independently by two evaluators for microleakage at the occlusal-cavo and proximal-cavo surfaces under a 40x stereomicroscope. Dye penetration was evaluated using a scoring system:

0 = no penetration, 1 = penetration in enamel/cementum, 2 = penetration at the axial wall, 3 = penetration beyond the axial wall.

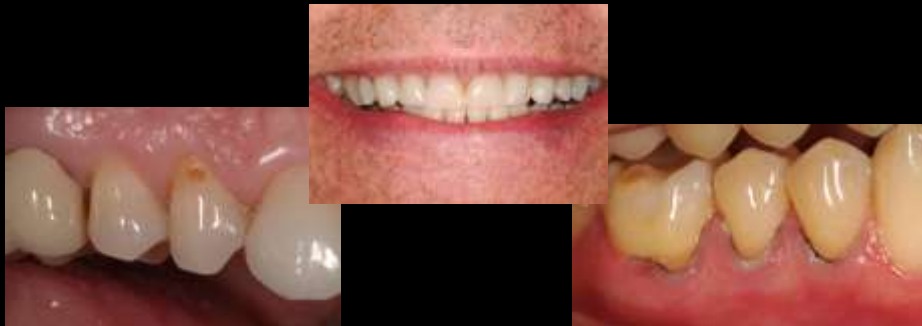
Results: A Kruskal-Wallis test revealed no statistically significant difference in microleakage between the three groups at the occlusal-cavo surface ($p > 0.05$). Group 3 was found statistically different at the proximal-cavo surface. Group 3 yielded the most microleakage at both interfaces while Group 2 showed no axial wall penetration at either interface.

Conclusion: Both light-cured and self-cured glass ionomers were more resistant to microleakage than a flowable resin on both occlusal-cavo and proximal-cavo surfaces.

275

ABFRACTION LESIONS

- Sometimes it presents as single teeth due to excursive interferences or as a pivot, fulcrum or "teeter totter" tooth.
- Other times there are more in a quadrant and there is severe wear to the occlusion.
- Other times it maybe on the facials of anterior teeth, where there is wear on the incisal edges or wear facets on the linguals, however little to no wear on posteriors.
- Occlusal guards should be fabricated along with an occlusal analysis in CR on models.



276

Flowables?



277

TYPICAL COMPOSITE BREAKDOWN

Microleakage and missing fillings from high occlusal loads on teeth can cause large cervical stress concentrations resulting in disruption of the bonds between the hydroxyapatite crystals and the eventual loss of cervical enamel and dentin.



278

ABFRACTION LESIONS & CLASS V RESTORATIONS

LATIN WORDS, AB – “AWAY”, FRACTION – “BREAKING”

- Pathological loss of tooth structure caused by biomechanical loading forces.
- Static and cyclic flexural overloading of tooth structure ultimately leading to fatigue and failure of tooth structure away from the point of loading.



279

Van Meerbeek B, et al. Relationship between bond-strength tests and clinical outcomes. Dent Mater (2009), doi:10.1016/j.dental.2009.11.148

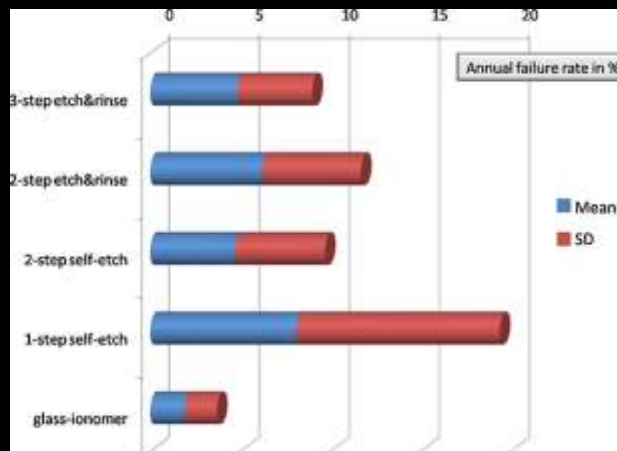


Fig. 15 – Graph representing the mean annual failure rates per adhesive class, determined according to a systematic review of Class-V clinical trials of adhesives during the period 1998–2004 [2].

280

RESIN MODIFIED GLASS IONOMERS (RMGI)

- Light cured
- Dual cured
- High flexural strength
- Lower compressive strength than conventional G.I.
- Good polishability
- Excellent wear
- Hydrophilic
- Fluoride release
- No microleakage
- No adhesives
- Acid resistant layer
- Reduces sensitivity
- True chemical adhesion



281

GC FUJI AUTOMIX LC



282

Replacing Existing Restorations & Decay

- Resin bonding is mostly due to the intertubular dentin.
 - Deep preparations have less intertubular dentin.
 - More moisture present due to odontoblastic tissues and fluid
 - Higher risk of post-op sensitivity
 - Use a New Advanced Adhesive and Flowable
- Glass Ionomer (GI)
 - True adhesion to tooth structure
 - Bonds to moist dentin
 - Less technique sensitive
 - Fluoride release
 - Decreased gap formation and cusp deformation
 - Coefficient of thermal expansion is similar to dentin
- No post operative sensitivity
 - Use on dentin & cementum
 - Base out deep areas
 - Place resin/composite on top of GI



Dentin Bond Strengths of Simplified Adhesives: Effect of Dentin Depth. Compendium June 2006, p.340-345
Using Cavity Liners with Direct Posterior Composite Restorations. Compendium June 2006, p.347-351

283



RESIN MODIFIED GLASS IONOMER RESTORATION

Post-Op Photo – notice unlike typical class V composite RMGI restorative material.

284

TIP

Restorative Therapy- Case

Typical treatment involves the placement of a #00 retraction cord on each tooth followed by a shade selection. Roughen tooth structure with air abrasion. Place cavity conditioner on all areas to be restored for 10 seconds, then wash and dry.



285

Restorative Therapy- Case

Mix RMGI and syringe into place. Utilize hand instruments to shape and remove gross excess. Cure each tooth for 20 seconds. Remove excess and contour using a handpiece with fine diamond burs. Teeth should be isolated from saliva.



286

Restorative Therapy- Case

After contouring the restorations can be coated with a self etch adhesive coating, and cure for 10 seconds.



287

Restorative Therapy- Case

Ten year post-op photos show the integrity of the material is still excellent. Note the lack of marginal microleakage stain often present with composite restorations.

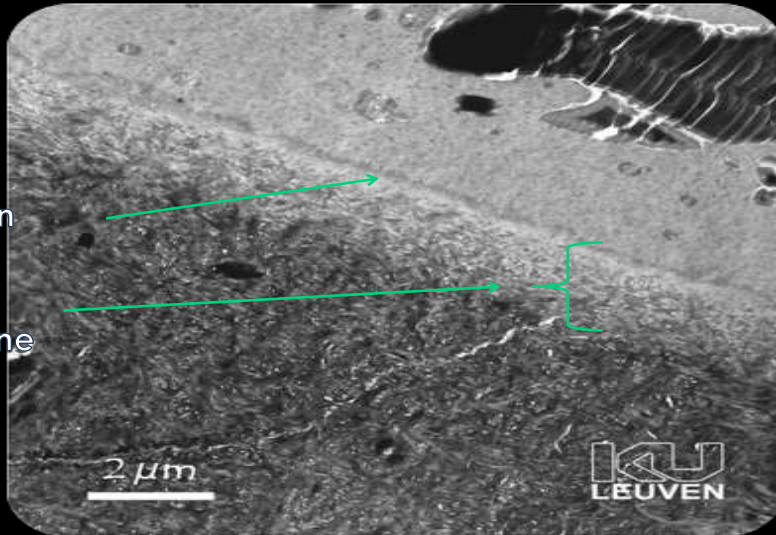


288

GLASS IONOMER INTERFACE

Dentin Margin

Acid Base
Resistant Zone



Interface Analysis (TEM)

CARDOSO et al. J Dent 2010

289

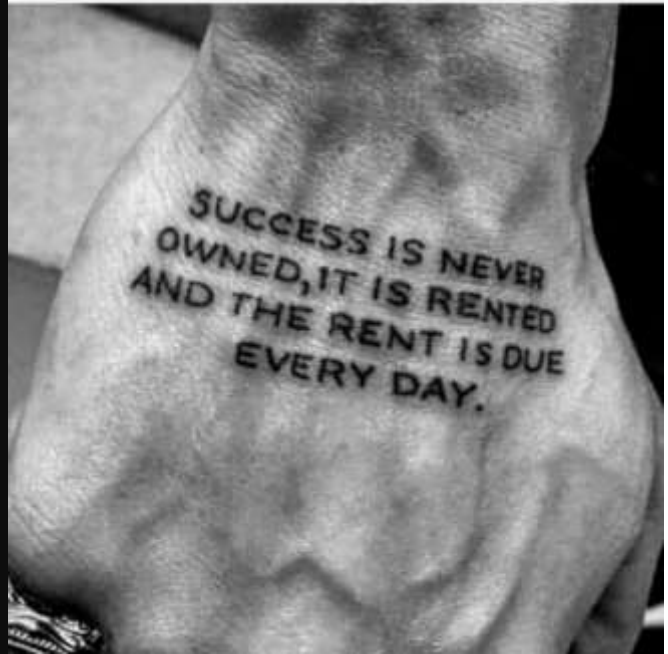
RESIN MODIFIED GLASS IONOMER



290

IF you want SUCCESS

- YOU HAVE TO DO WHAT OTHERS DON'T
- YOU HAVE TO BE WILLING TO DO THE WORK
- YOU HAVE TO BE CONSISTENT



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Dr. Todd Snyder
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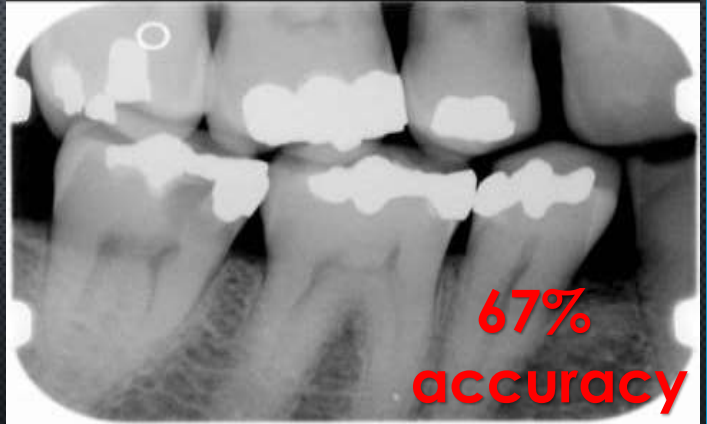
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HOW DO YOU **DIAGNOSE** DECAY??



Approximately 25% demineralization must occur to see a cavity on a conventional radiograph. Equates to 40-60% demineralization on the tooth surface. Radiographs miss 70-80% of occlusal cavities.

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564

565

566

567

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