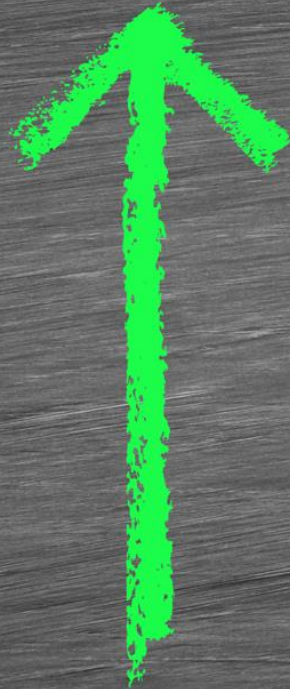


EFFICIENCY



Speed



Quality



Costs

Efficient Fundamental
Dentistry

Timothy M. Bizga, DDS, FAGD



Dr. Timothy Bizga
Attendees Receive:

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Objectives

- Share my experience and tell stories
- Be authentic
- Have fun



A stethoscope with a black chest piece and silver tubing is positioned diagonally across the frame. In the upper right corner, a portion of a white computer keyboard is visible. The background is a plain, light gray surface.

Myth #1

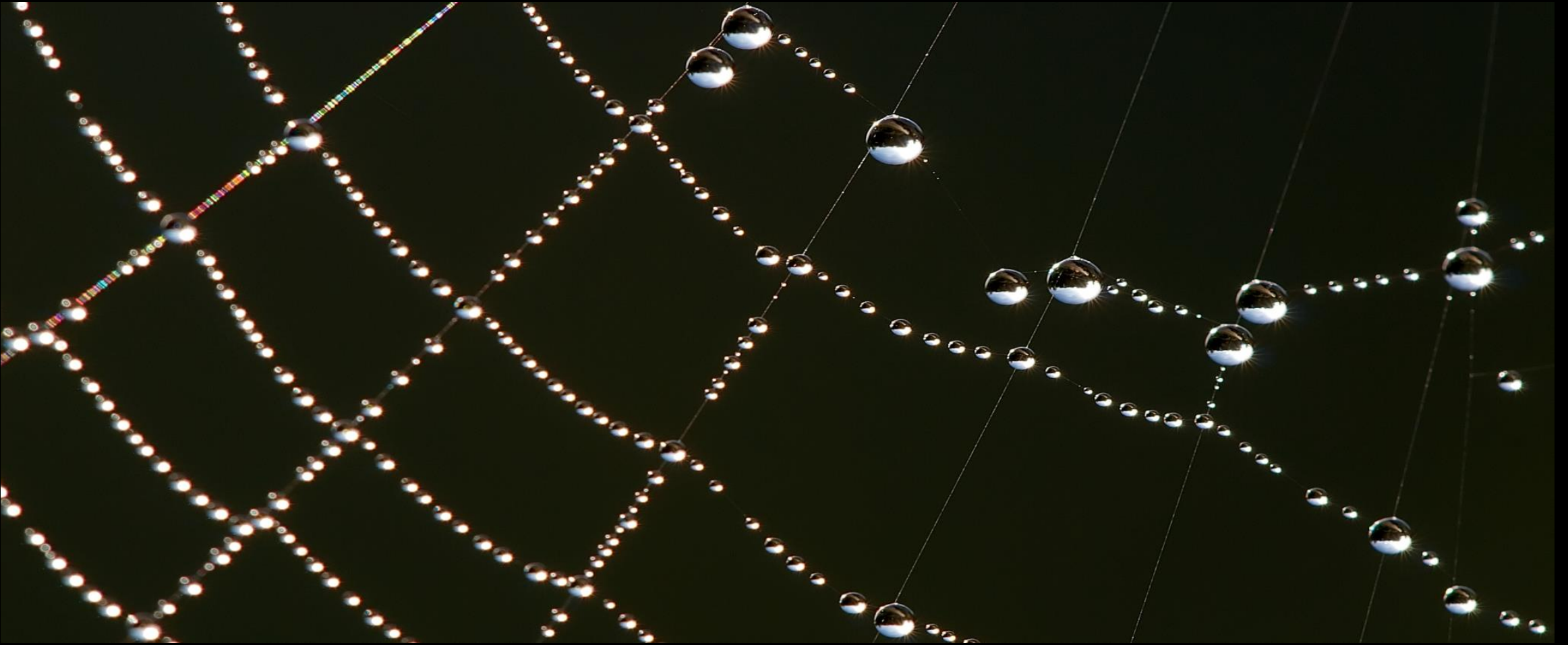
SOMEONE is carefully evaluating the clinical effectiveness of new products and techniques



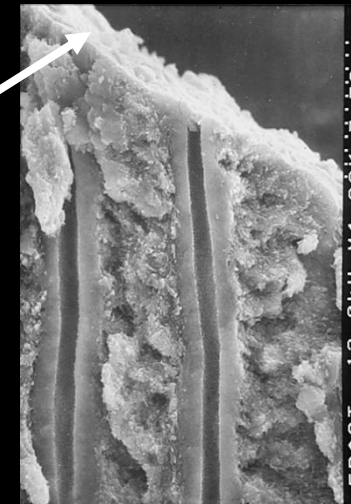
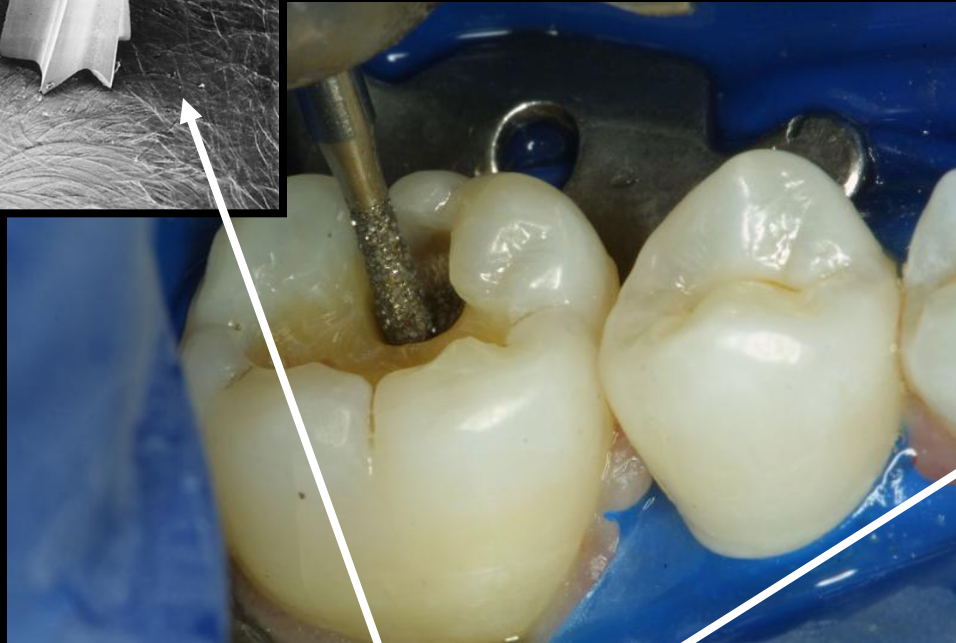
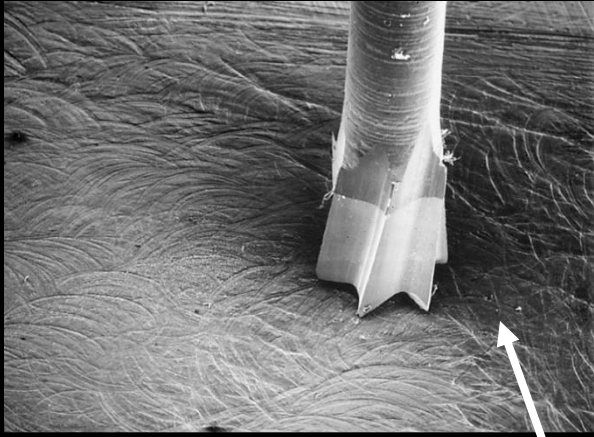
Myth #2

IN VITRO testing can effectively mimic clinical behavior

Adhesives



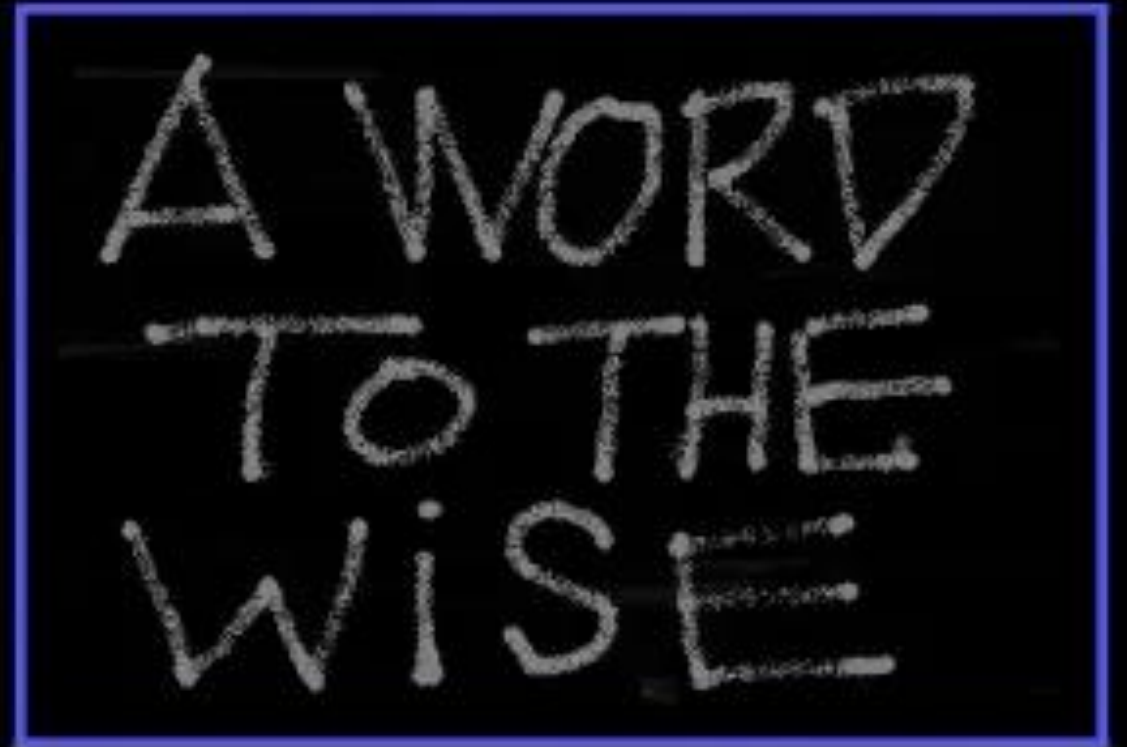
The Evolution of Dentin Adhesion Based on Treatment of the “Smear Layer”



Smear Layer

From the desk of Dr. Tim

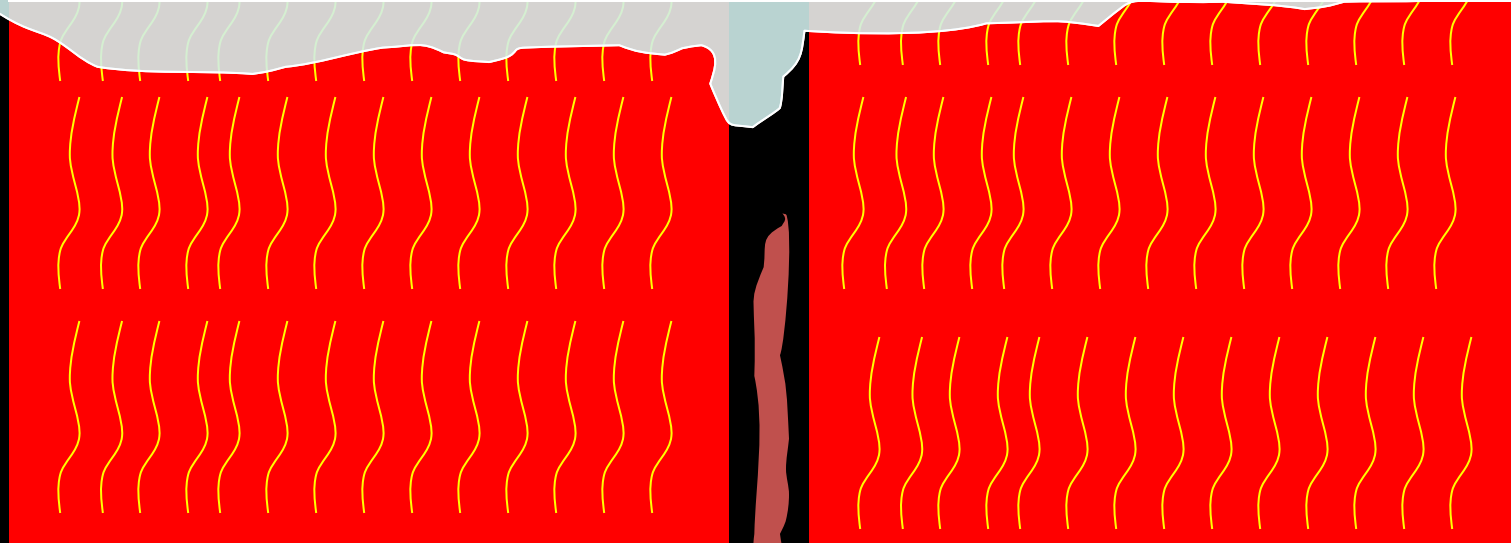
- There is no such thing as a “simpler” way to bond. Whether you self-etch or total-etch or anything in-between, there are two ways to go about your business—the right way AND again.



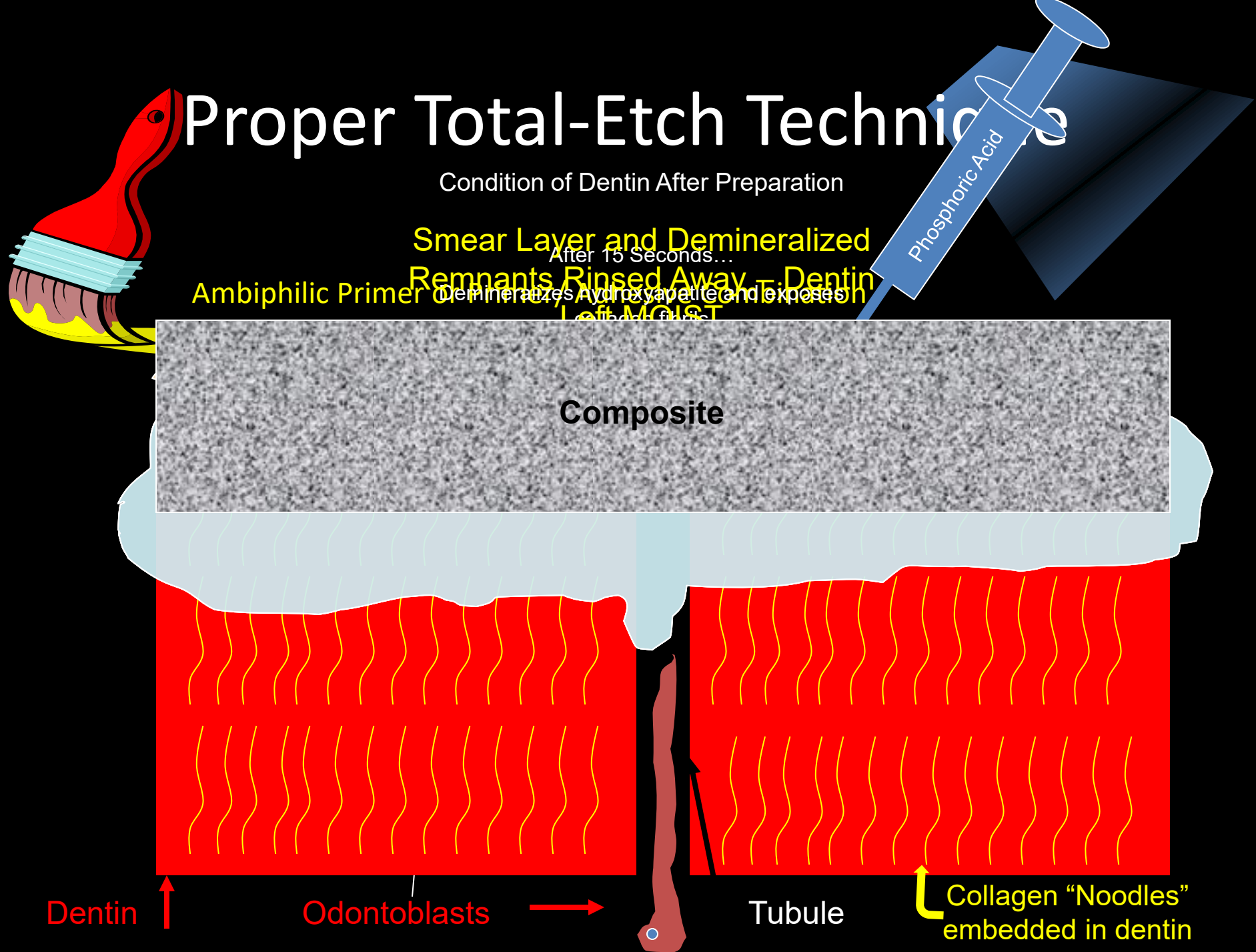
Self-Etching Systems

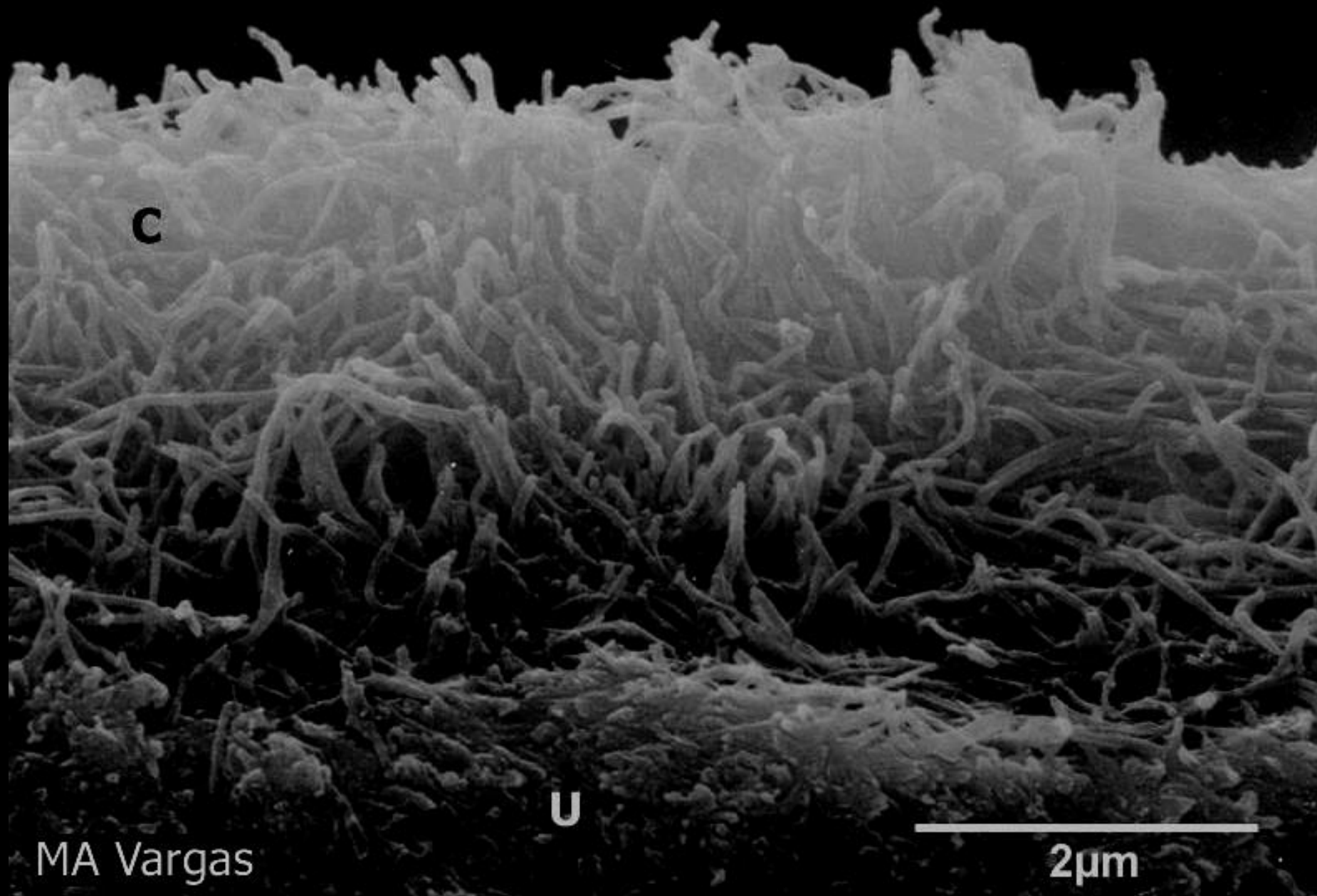
Self-Etching Reaction

Smear layer is “solubalized” into the adhesive and acidic monomers demineralize hydroxyapatite while simultaneously filling voids created with resin
Self-Etch Acidic Monomers – Allow to “dwell” for 20-30 seconds

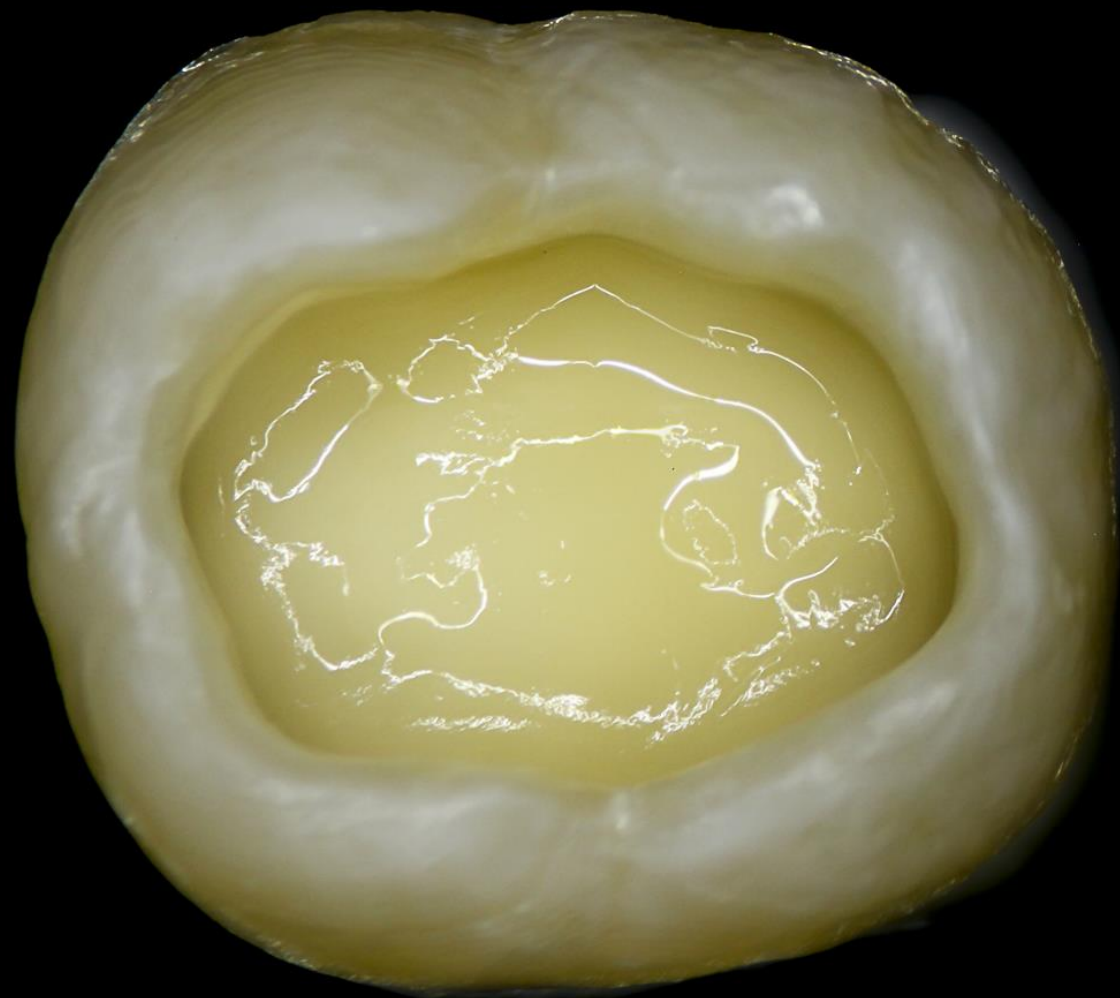


Total-Etching Systems





Wet Dentin



Air Dry 2 Seconds



Air Dry 5 Seconds



Air Dry 2 Seconds

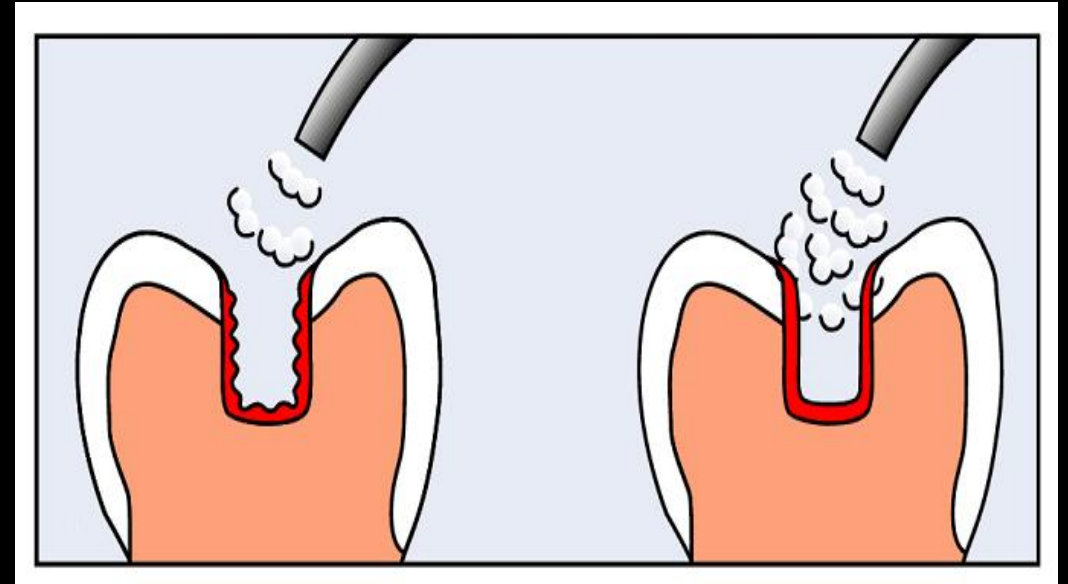


LESSONS
LEARNED



Importance of Air Drying

Evaporating the solvent is critical
to maximizing the effectiveness
of the bonding agent



LESSONS
LEARNED



TOP reasons for post-Op Sensitivity

1. Etch longer than 5-8 seconds on dentin
 - Ethanol and Acetone based adhesives can ONLY go 3 microns by capillary action
 - After 30 seconds you have effectively etched 5 microns and the adhesive cannot penetrate
2. Over drying Dentin
3. Solvents not removed in the drying step!
4. Not enough adhesive placed!
5. Under Curing



Seal!

Insufficient cure continues to be an issue

37% of composite restorations are being insufficiently cured.

An insufficient cure can lead to adverse effects on physical properties, such as

- reduced bond strengths,
- breakdown at the margins & microleakage,
- and ultimately secondary caries.

Boksman, L., Santos GC., (2012). Principles of Light Curing. Inside Dentistry, Volume 8, Issue 3. d failure.





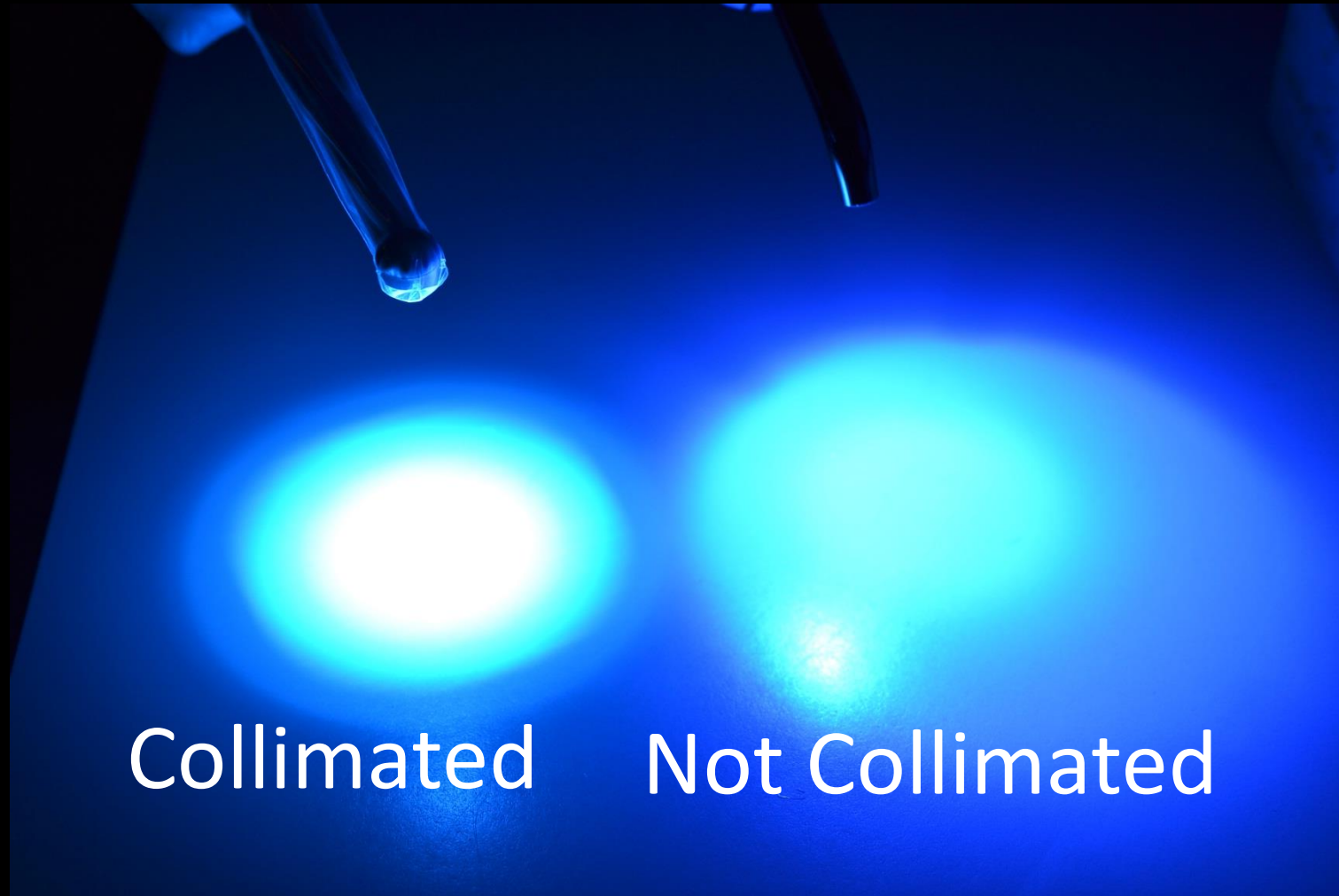
Proper Light Use

- **Light curing should be based on depth**
- Deeper preps require longer curing times

Beam Collimation and Performance Over Distance

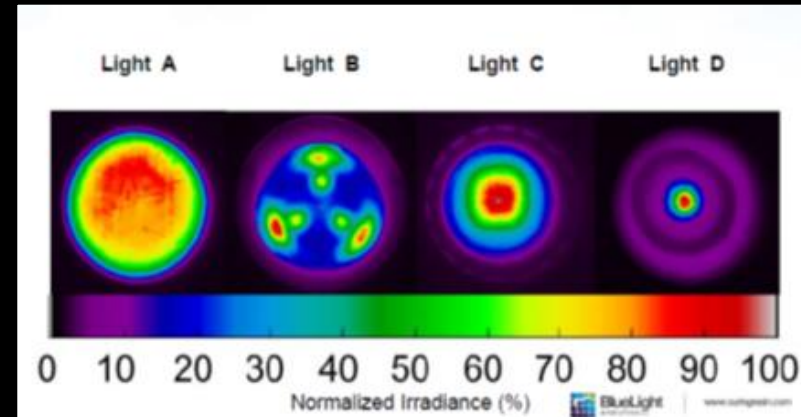


Beam Collimation and Performance Over Distance



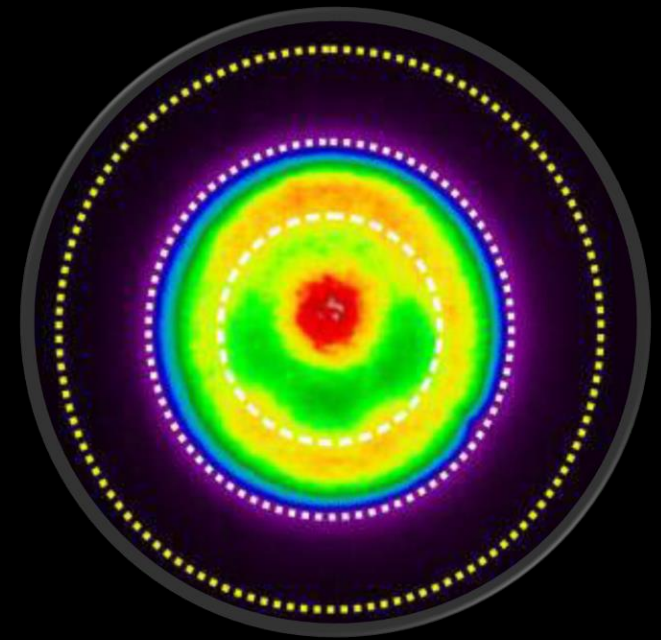
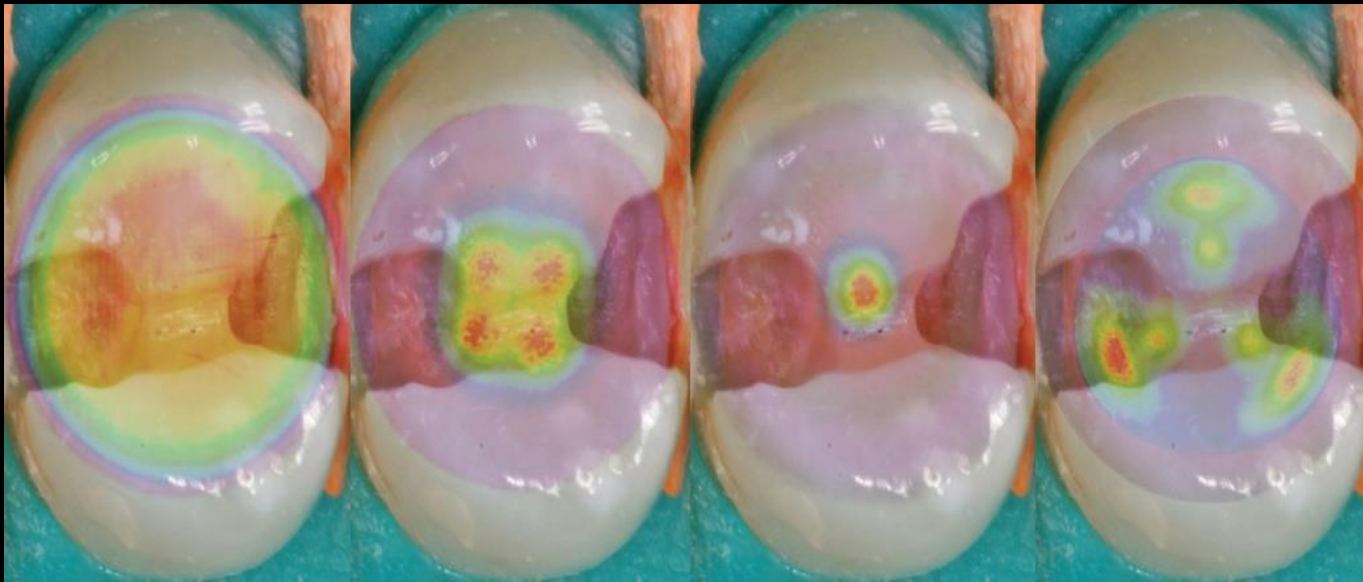
Distribution of LEDs

There are hot and cold spots within the curing light tip, and they vary with every light.

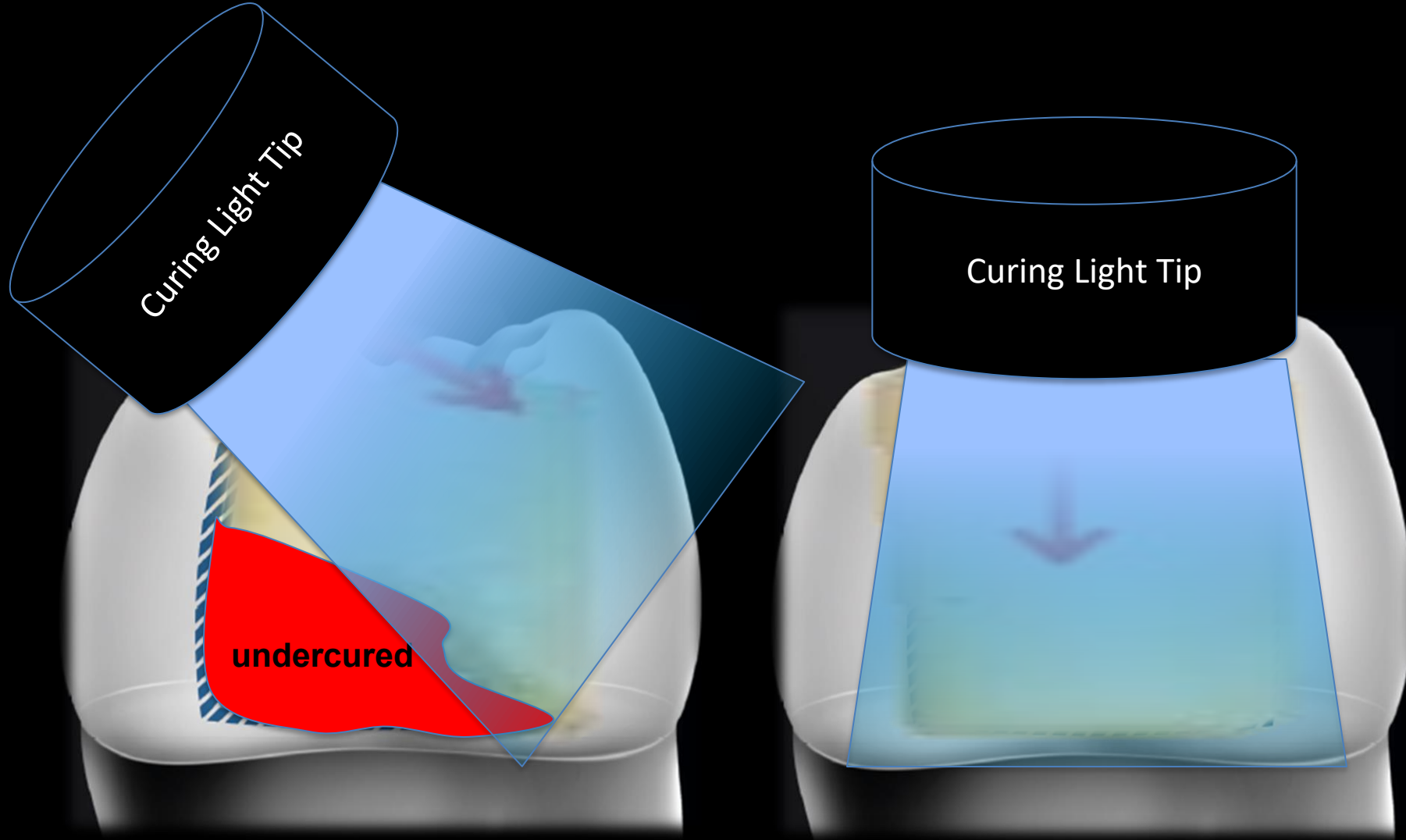


Beam Profile

The effective part of the light beam should be evenly distributed across the face of the light tip to maximize curing effectiveness and minimize the negative impact of operator technique.



Effect of Light Angle on Curing





Most lights only deliver 35% of stated output to
bottom of deep box

How does your light perform where it counts?





 pinkwave™

VA
VISTA | APCX

Patented



Goodbye Blue, Hello Pink

PinkWave was distinctly designed to enhance the efficacy of curing procedures. PinkWave is equipped with Apex's Patented QuadWave™ Technology which leverages four different wavelengths to ensure peak performance. Along with the standard blue light, PinkWave also employs red, near infrared (NIR) and UV light, which together, make up the only pink light on the market. This innovative approach to curing has never been achieved before and results in both doctor and patient benefits.

- Built in Transilluminator
- 3 curing modes — Boost, Standard, and Ramp
- 1640 mW/cm² on Standard mode and 1865 mW/cm² on Boost mode

PinkWave™ Compared to Standard Blue Light



Decrease in Shrinkage



Increase in Polymerization



Increase in Curing Area



Depth of Cure



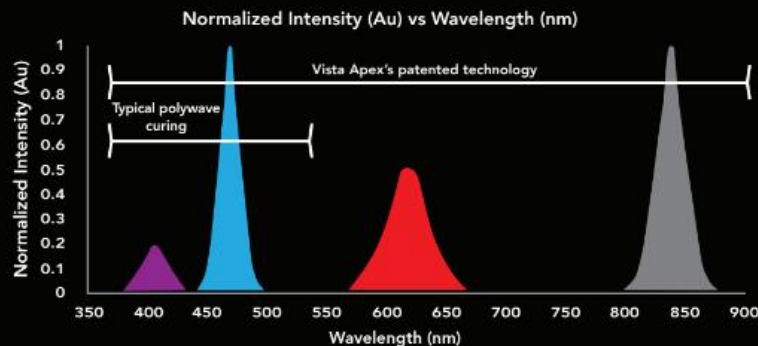
Lightweight

How you cure matters

quadwave™
Technology

PinkWave™ QuadWave™ Technology leverages four different wavelengths to ensure peak performance:

- UV-photo Initiators
- CQ Initiator
- Enhanced Polymerization
- NIR – Enhanced Polymerization



Largest Curing Area



Transilluminator



Easy posterior access

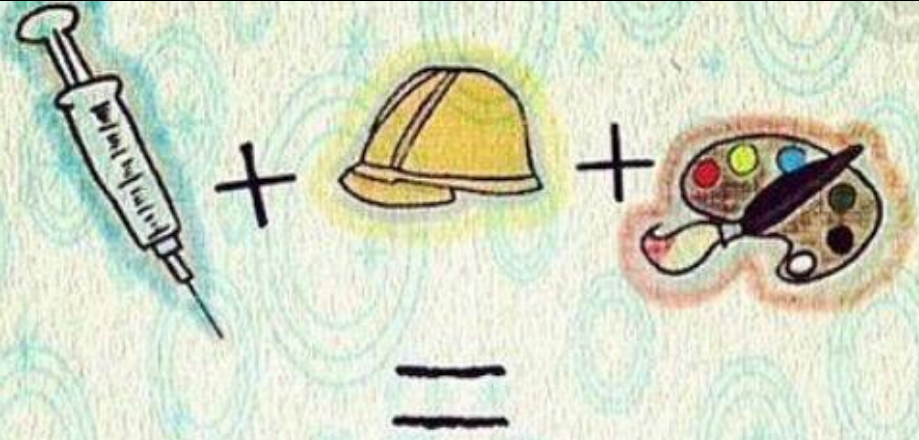


Ordering Information

PinkWave™ Kit 90734

- (1) Cordless Curing Light
- (1) Induction Charging Base
- (1) Power Cord
- (5) Autoclavable Light Shields
- (100) Barrier Sleeves





@rafal_draw
dentist

d : d octor

en : en gineer

tist : ar tist

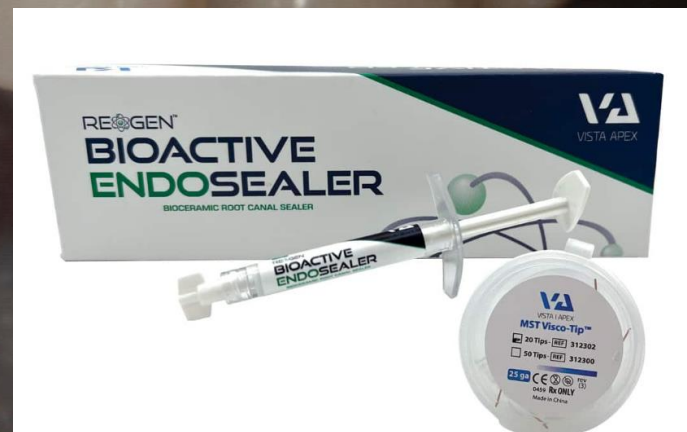
Patient Assessment

- 55 yo male
- He is quiet, nervous, and in because his wife brought him
- When questioned, he states “everything is fine, but was told he needs an implant for #10”
- Wife begins to state “everything is not fine, He needs a smile for our sons graduation.”

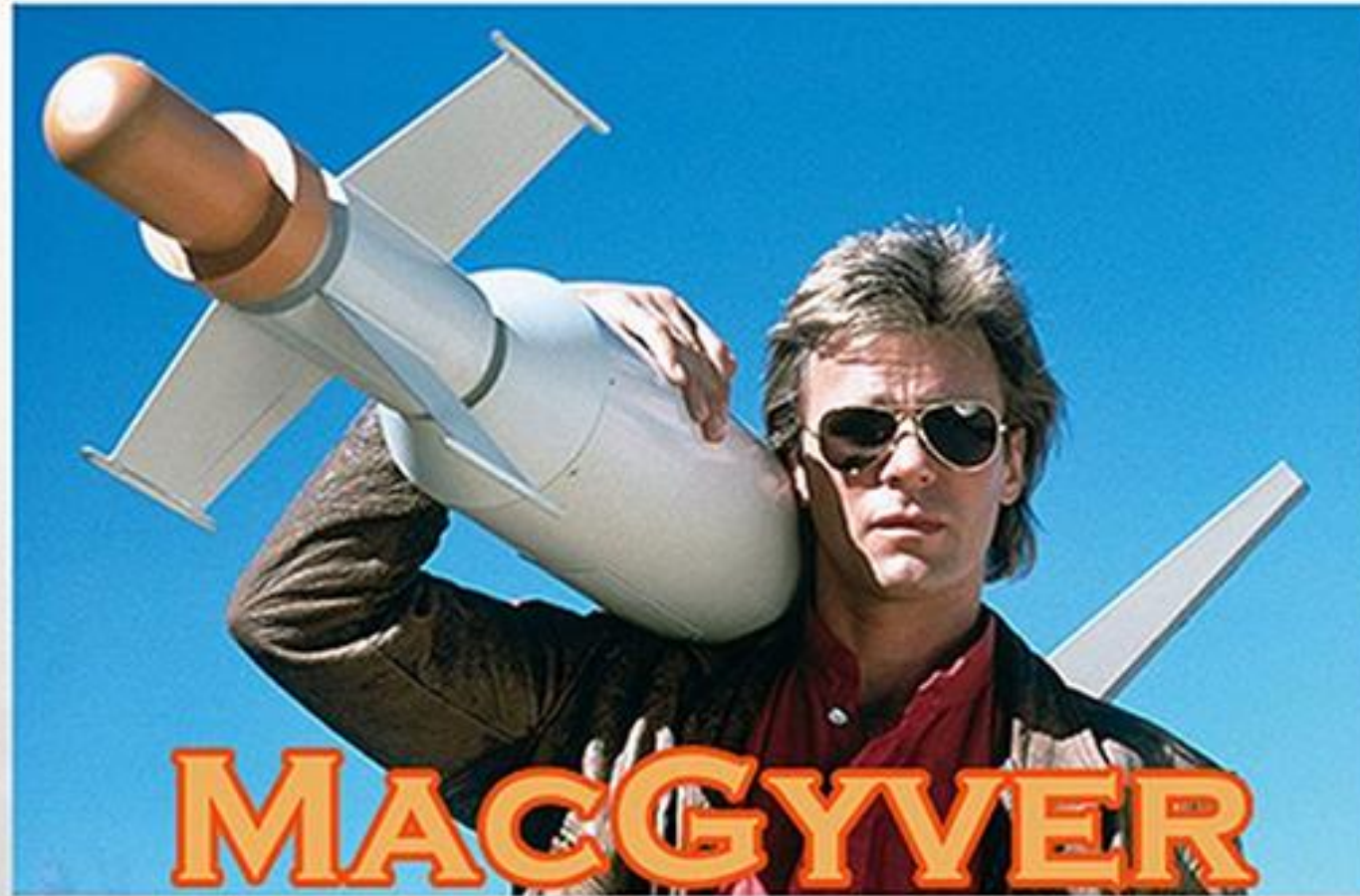


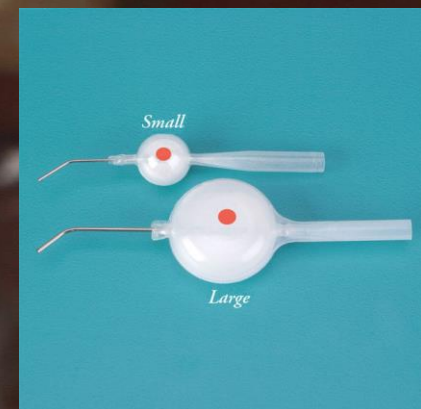






More MacGyver Moves







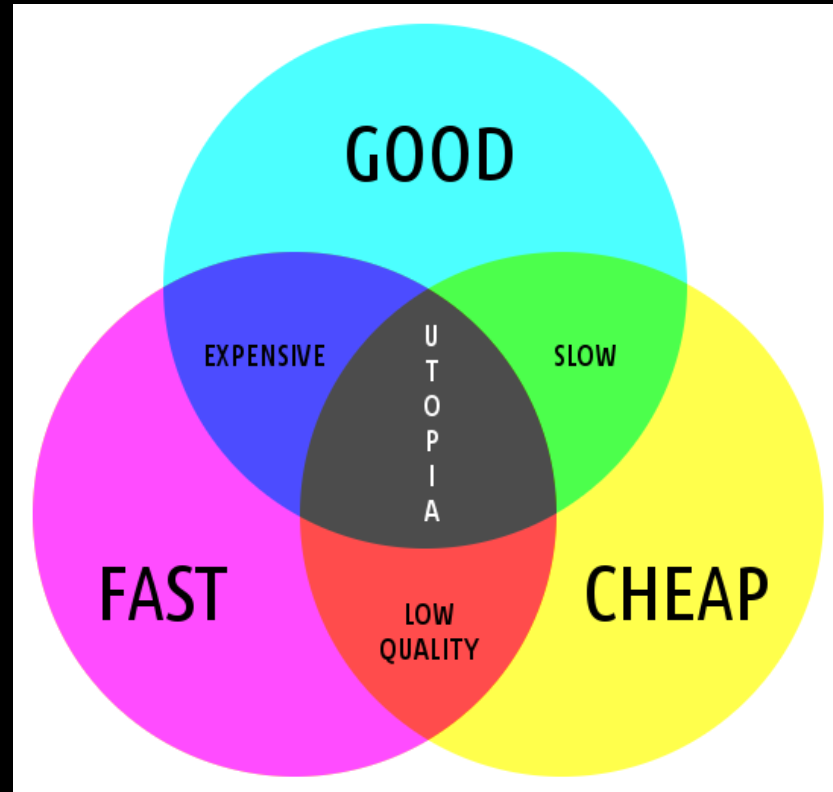


5 Year Recall



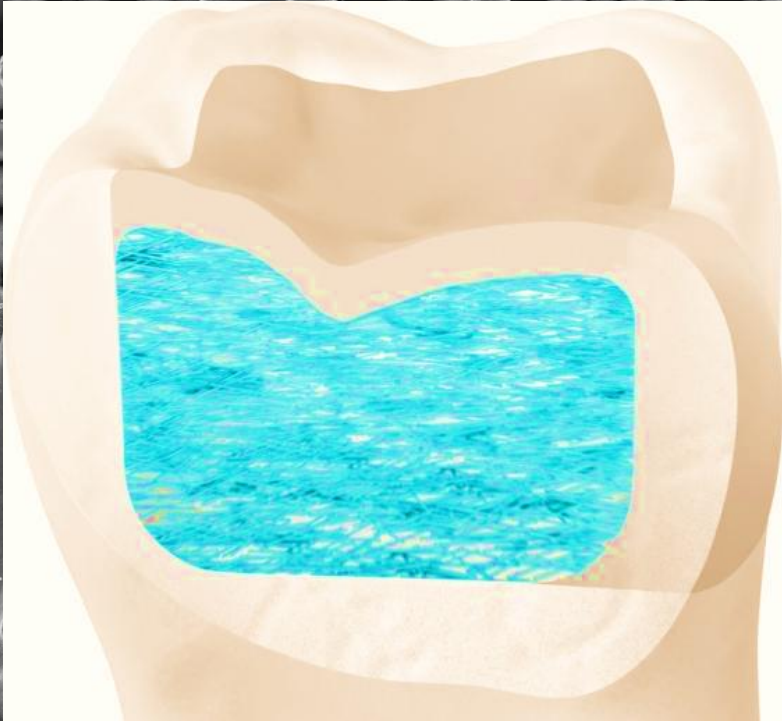
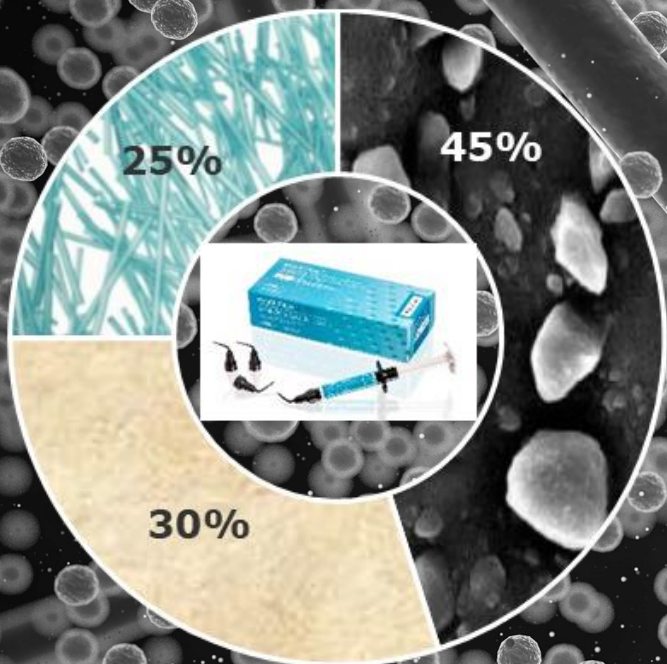
Bringing It Together

Excellence ADDS Value...Perfection COSTS Time









Conventional composite



Fibre-reinforced composite



Choose between a fast bulk placement and a more esthetic option



Dentin
shade

Depth of cure
2.0mm



Bulk
shade

Depth of cure
5.5mm



Optimal for **more esthetic results**
and **core build-up**

Optimal for **deep posterior cavities** and
for **fast placement**

Patient Assessment

- He is a 42 y.o. male
- He has recently lost an implant, hates his flipper and is uncertain of next steps. He asks a lot of questions and is looking for guidance. He expresses he is tired of bouncing between multiple offices.
- The implant has failed twice, is this a good option for a third try? What is possible in the interim?

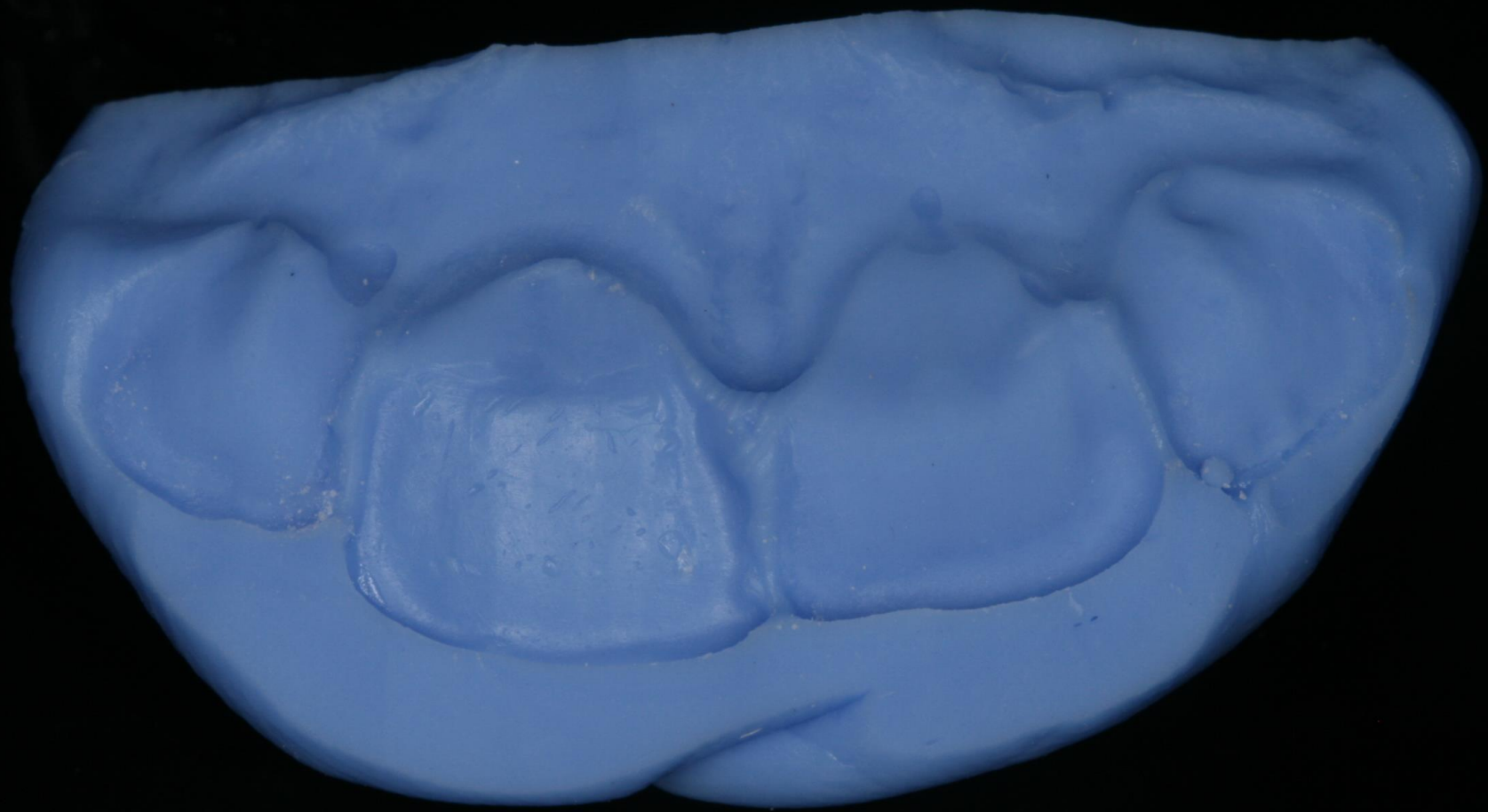














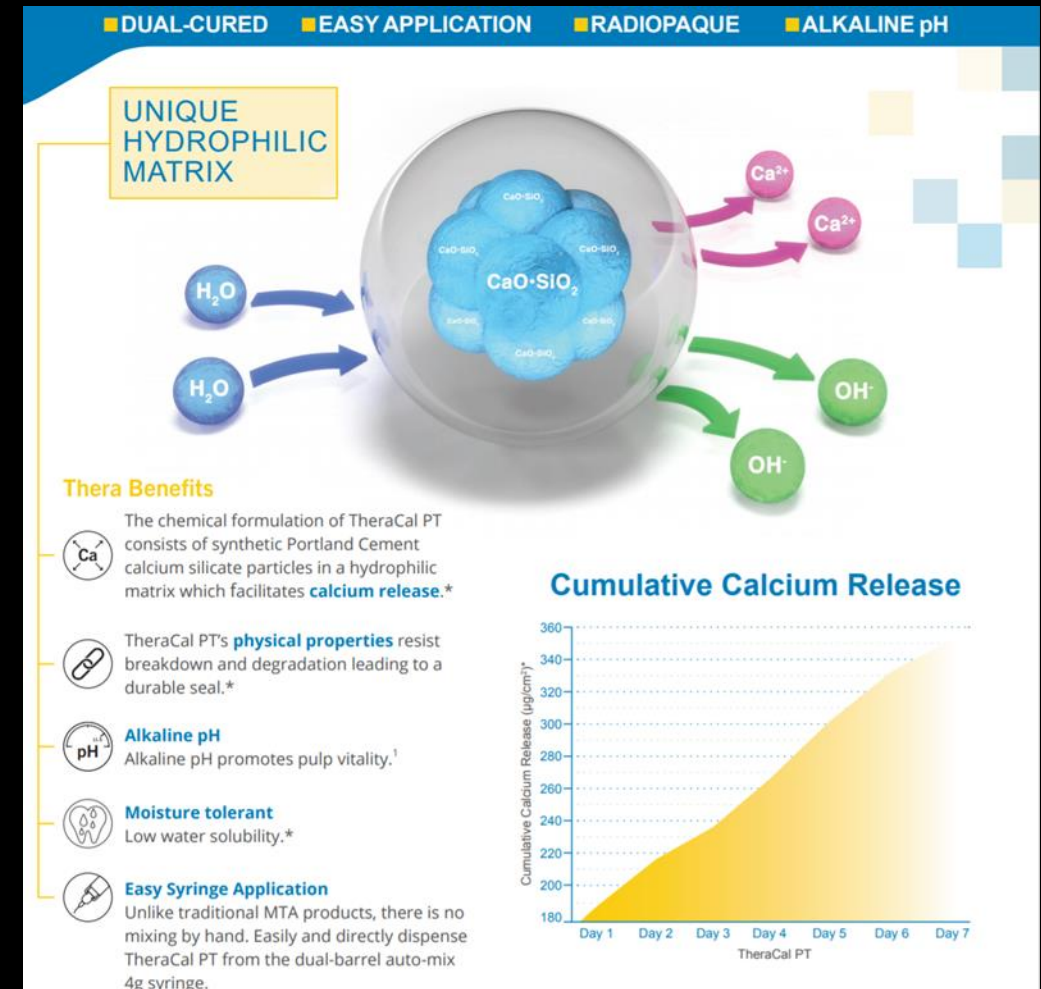




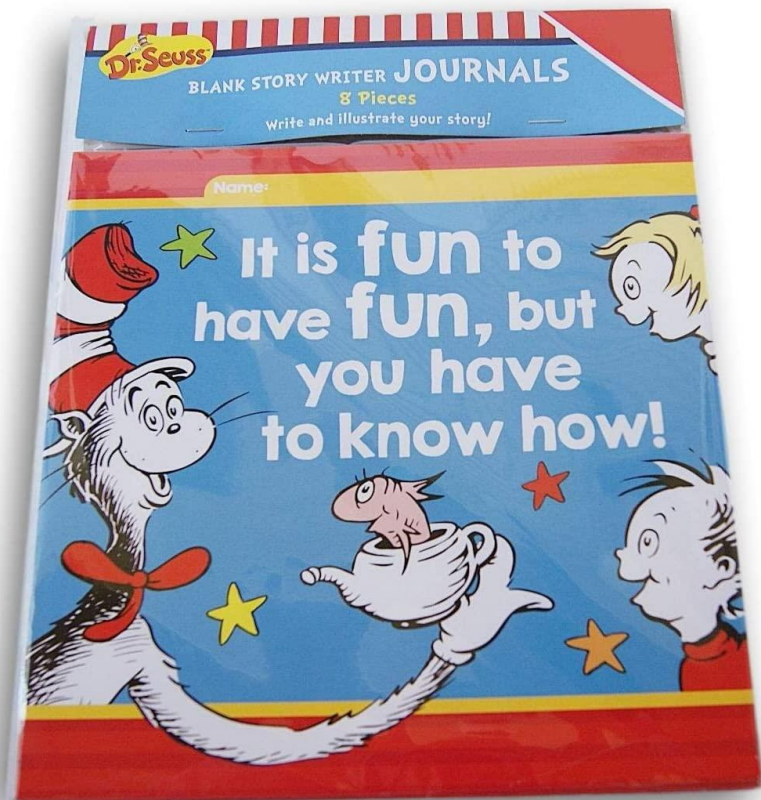
MTA Materials

1. Highly BIOCOMPATIBLE
2. Excellent sealing properties
3. Stimulates dentin formation
4. Alkaline Ph (about 12.5)
5. Moisture tolerant
6. Long-term stable

Torabinejad (et al) (1999). Clinical Applications of mineral trioxide aggregate. JOE 25(3) 197-205



What to do if the pulp is Exposed?





PEDIATRIC PRODUCT
TheraCal PT® (BISCO)



Award-Winning Features:

No Mixing: Dual-barrel syringe is dispensed directly into tooth.

Calcium Release: Offers additional assurance in maintaining tooth vitality over time.

Evaluator Comments:

- "Easy application with bendable metal cannula."
- "Great consistency – it flows well while adapting to surfaces...even axial walls."



Descriptive Not Prescriptive Ways to Sort Whether to Crown OR Big Fill

1. Missing both marginal ridges & fill is TWO THIRDS of occlusal table...CROWN
2. Decay extends grossly SUB-G and wraps around line angles AND isolation is an issue...CROWN
3. Pain on release YET VITAL...CROWN
4. Unsure of pulpal health...FILL
5. Emergency tx, patient traveling out of town, request a quick fix...FILL



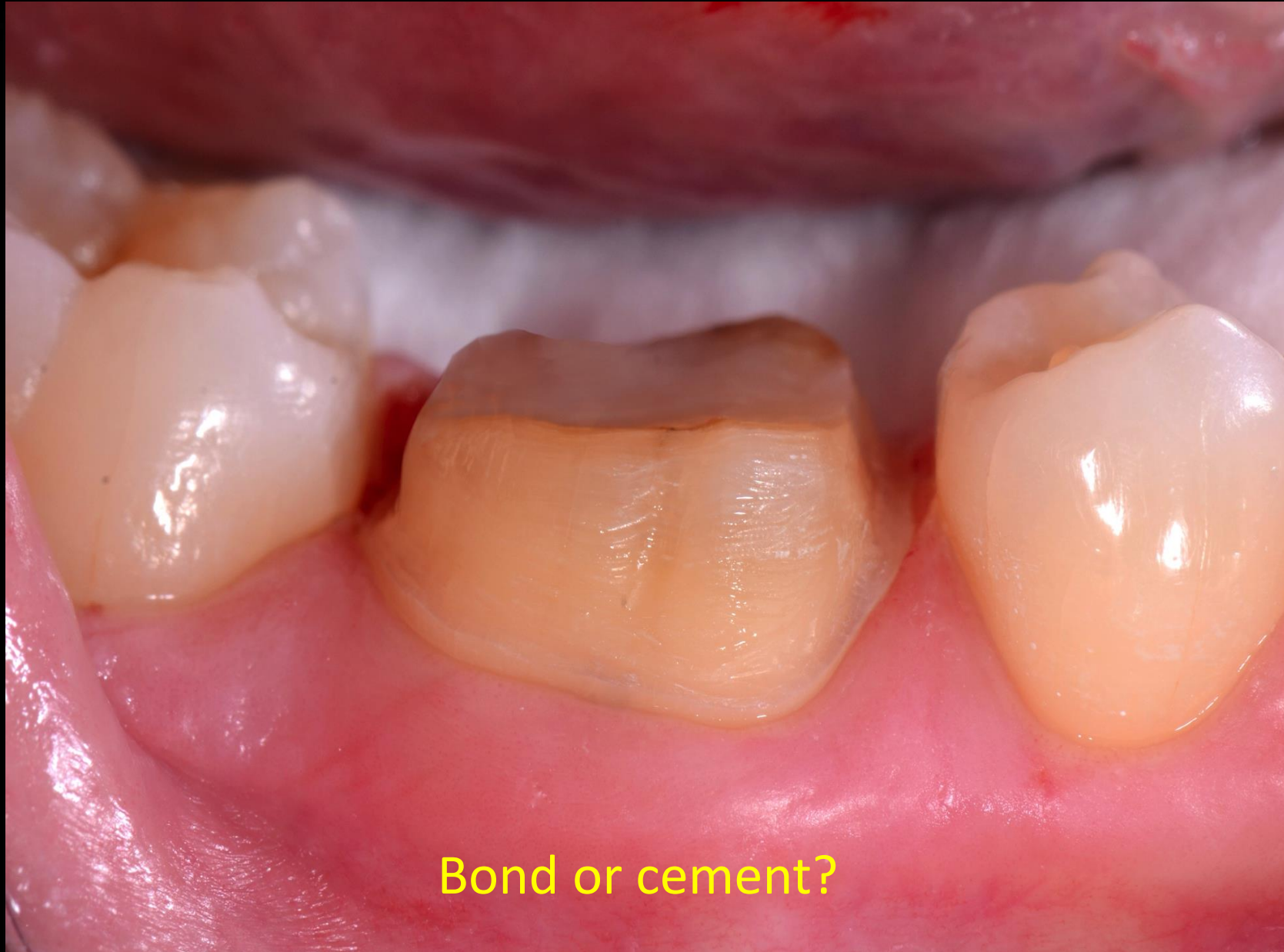


My cementation thought process.....



1. Location of my Prep?
 - Anterior or Posterior?
 - Will isolation be a factor?
 - If YES...think conventional cementation and ensure your PREP is retentive in design
2. What Material Am I Using?
 - What is of more pressing value:
 - ✓ Strength- Gold or Full Contour Zirconia
 - ✓ Esthetics- Celtra Duo, Emax, Glass Ceramics
 - ✓ Both?- PFM or PFZ
3. What is my prep design?
 - Is my prep retentive?
 - Calibra Bio
 - Is my prep deficient in any way?
 - Calibra Ceram with Prime & Bond Elect

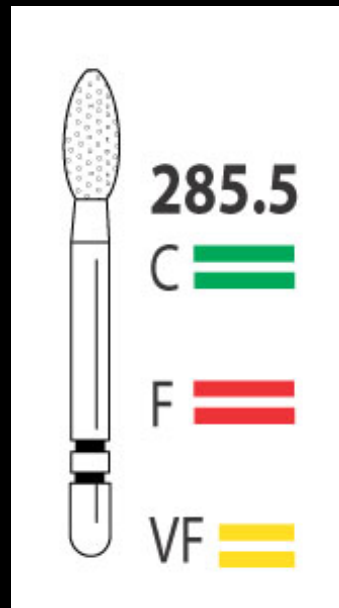
*Note isolation is key factor to successful bonding and outcomes using Calibra Ceram

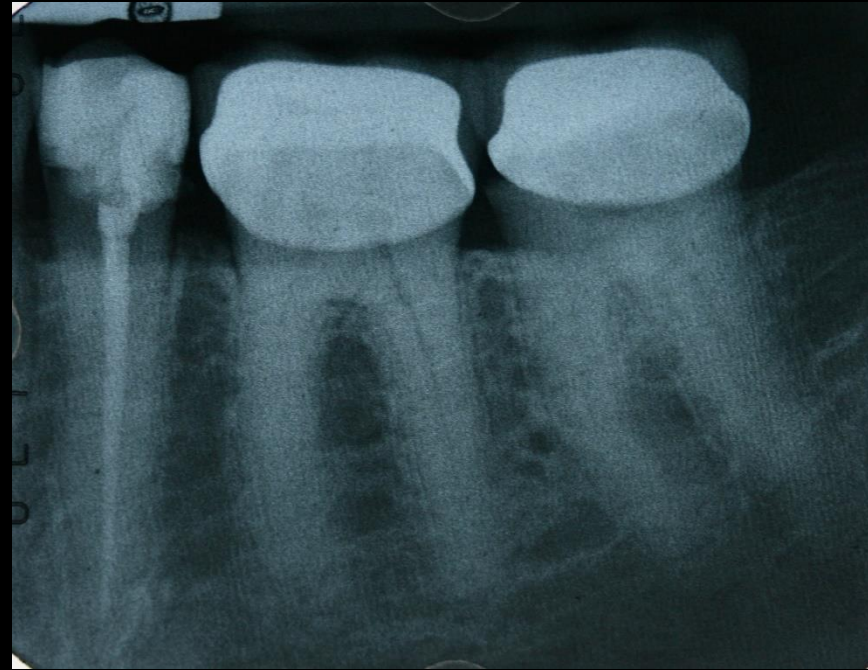
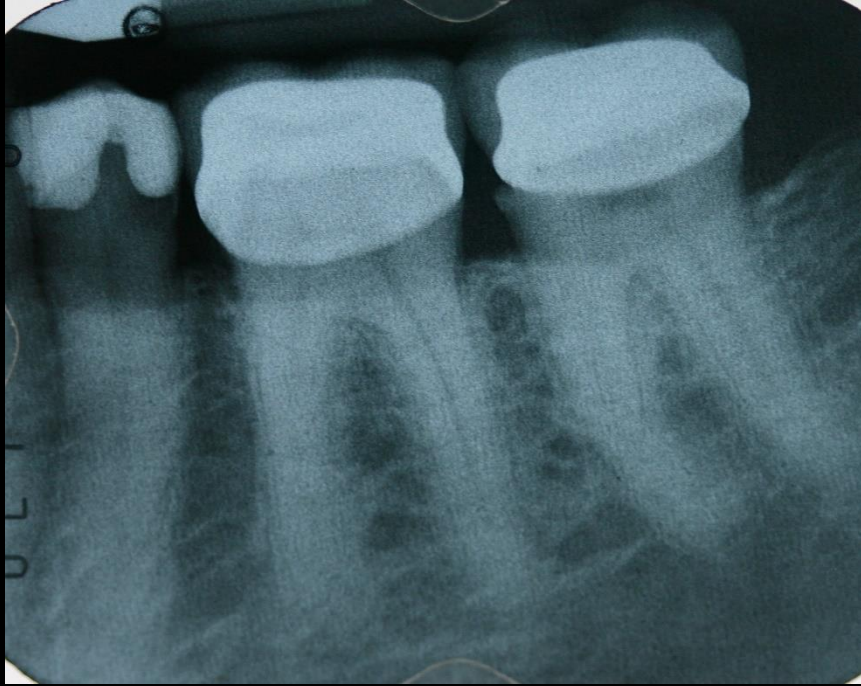


Bond or cement?

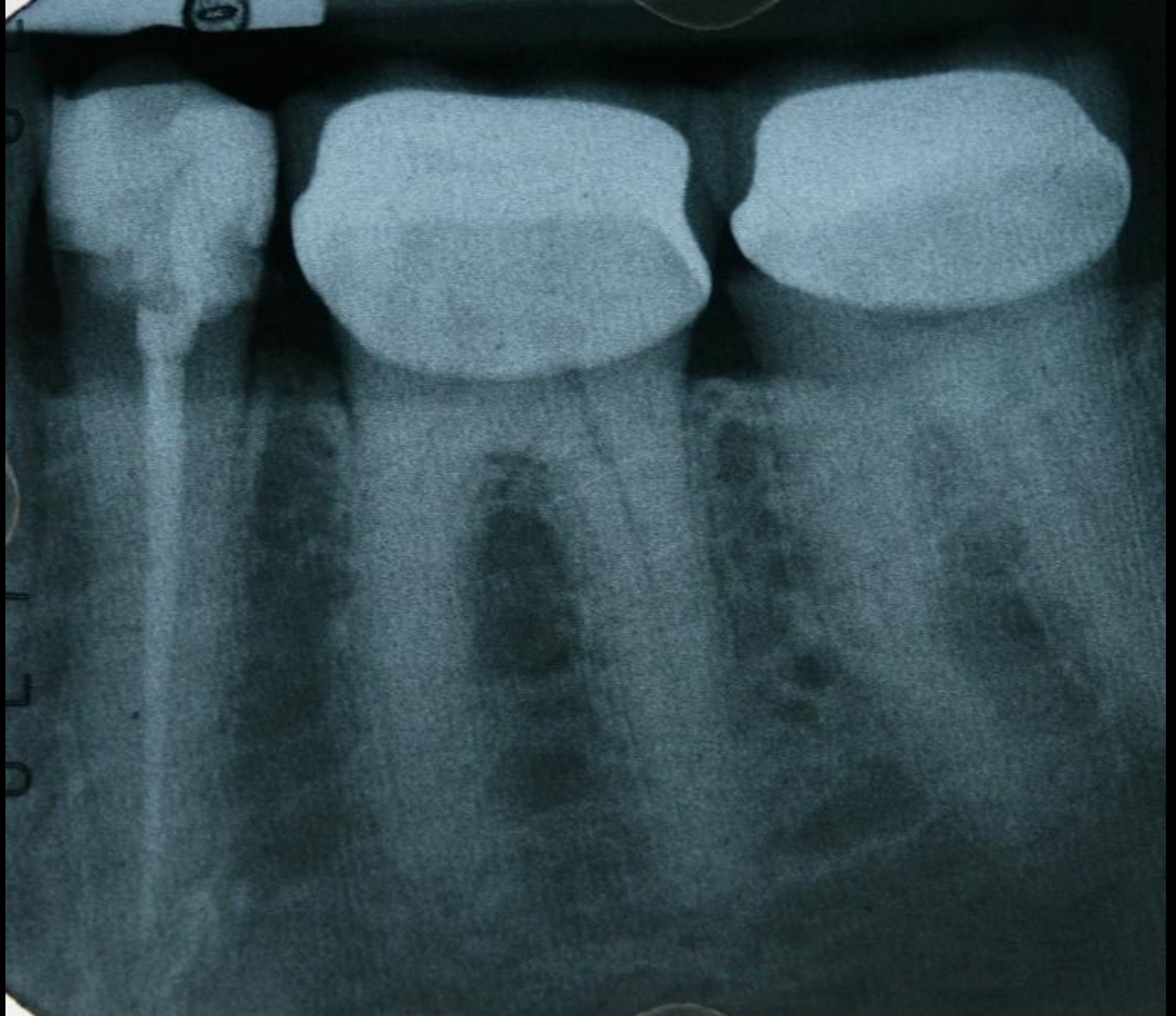
Fun Facts About Diamonds Burs

- 20% of Dental Diamond Shapes Create 80% of Preps
- The Football 285.5C is the #1 used diamond shape
- 6 of the top 10 are “Chamfer” round-end taper shapes, Round- End Tapers (Chamfer 770.8C used as control in clinical studies)
- Flat-End Tapers, Beveled Cylinders and Flames next most frequently used shapes





Prep Sequence



Purpose of a Post



- To Keep the Core in Place, Especially Against Compressive Strength
- To Distribute Stress Along the Axis of the Tooth



Abstract

Aurélio IL, Fraga S, Rippe MP, Valandro LF. Are posts necessary for the restoration of root filled teeth with limited tissue loss? A structured review of laboratory and clinical studies. *International Endodontic Journal*, **49**, 827–835, 2016.

Guidelines for post placement are lacking in respect of the amount of tooth structure, particularly in cases in which $\geq 50\%$ of coronal structure is preserved. The aim of this review was to provide evidence-based principles for the use of posts in the restoration of root filled teeth with limited tissue loss. A literature search of laboratory and clinical studies published between 2000 and 2014 was conducted in PubMed. Included studies contained at least one study group with root filled teeth restored without a post, presented at least one group with root filled teeth with limited tissue loss, and, in the case of laboratory studies, performed mechanical cycling prior to a fracture resistance test. Based on the evidence from laboratory studies, root

filled premolars and molars with limited tissue loss can be restored without posts, particularly when total coverage is planned. However, when no cusp protection is provided, post placement appears to be beneficial in premolars. Evidence regarding the best restoration option for root filled incisors with limited tissue loss remains controversial. When total coverage is intended, reconstruction seems to be successfully performed by restoration with composite. However, some reports consider that post insertion increases fracture loads. The review of clinical studies demonstrated that survival of teeth with substantial tooth tissue is not influenced by the use of posts. Exceptions were found when only premolars were investigated; in these cases, post placement was associated with greater survival rates in crowned teeth and fewer root fractures in teeth without cusp protection.

Keywords: clinical studies, endodontically treated teeth, *in vitro*, posts.

Received 3 March 2015; accepted 26 August 2015



1. Buccal/Lingual Reduction



2. Break Contact
 3. Reduce Occlusal
 4. Add secondary Retention
-

What Really Causes Crowns to Dislodge?

- Resistance to lateral forces and not retention is the determining factor in dislodgement

Wiskott, 1996



Location For Grooves

- Lateral Forces of masticatory cycle and parafunctional habits dislodge crowns
- Resistance to lateral forces is the determining factor in a crown's resistance to dislodgement

Wiskott, 1996

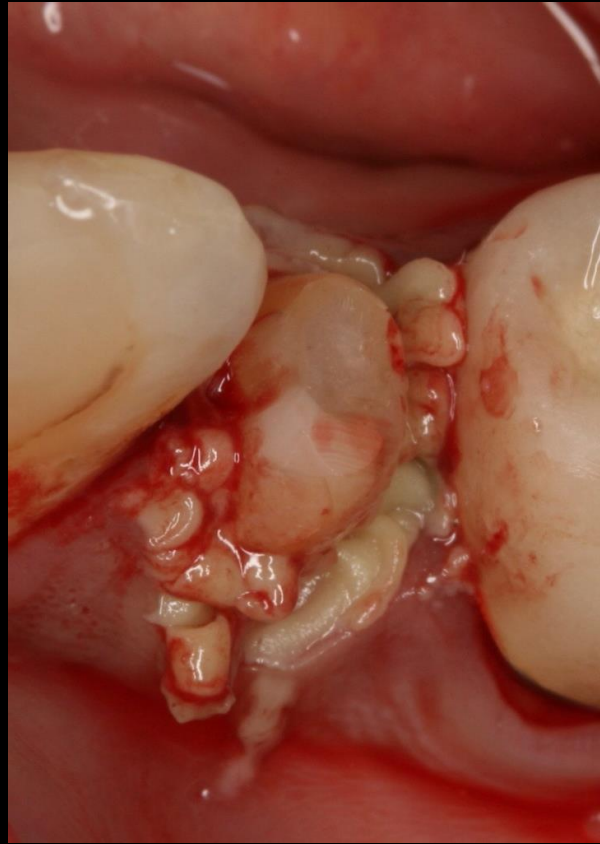
- Proximal grooves provide complete resistance to FL forces whereas B or L grooves provide only partial resistance

Woolsey, 1978



Turn water OFF to final crisp your margin detail





5. Traxodent



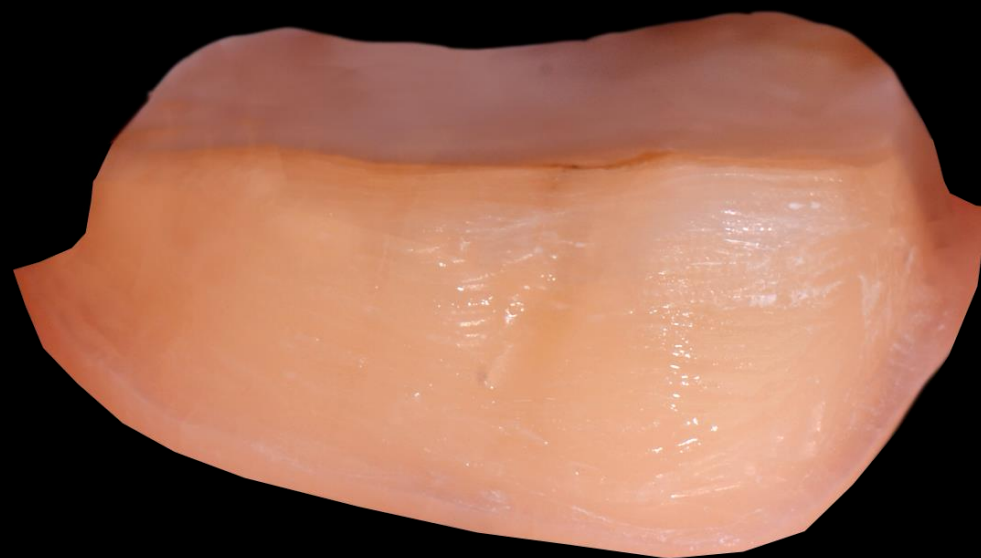
Model to Final



Bond or cement?



Bond or cement?



Bond or cement?



Bond or cement?

How Can Resistance Form Be Increased When There Is Excessive TOC?

- Reducing the TOC from 20° to 8° in the cervical 1.5 mm of the axial walls significantly increased the resistance form

Proussaefs, J Prosthet Dent 2004;91:33-41





Remove and
Refine





Prep and Temp



Cements-Product Indications

Cements/ Substrate	Glass Ionomer	Resin Modified GI	Self Adhesive Resin	Traditional Resin
Metal Crowns & Inlay/Onlay	Yes	Yes	Yes	Yes
PFM's	Yes	Yes	Yes	Yes
All Zirconia	Yes	Yes	Yes	Yes
Reinforced Core	Yes	Yes	Yes	Yes
All Ceramic	No	No	Yes	Yes
Ceramic Inlays and Onlays	No	No	Yes	Yes
Endodontic Posts	Yes	Yes	Yes	Yes
Bridges	Yes	Yes	Yes	Yes
Implants	Yes	Yes	Yes	No
Veneers	No	No	No	Yes



*** RETENTIVE PREPARATION ***

Restoration	Cement	
Weak (veneer)	Strong	
Not strong (eMax and Celtra)	Strong	
Strong (PFM, Zr,Al)		Any Cement
	High	Low

Cements- Product Indications

Cements/ Substrate	Glass Ionomer	Resin Modified GI	Self Adhesive Resin	Traditional Resin
Metal Crowns & inlay/Onlay	Yes	Yes	Yes	Yes
PFM's	Yes	Yes	Yes	Yes
All Zirconia	Yes	Yes	Yes	Yes
Reinforced Core	Yes	Yes	Yes	Yes
All Ceramic	No	No	No	Yes
Ceramic Inlays and Onlays	No	No	Yes	Yes
Endodontic Posts	Yes	Yes	Yes	Yes
Bridges	No	No	Yes	Yes
Implants	Yes	Yes	Yes	No
Veneers	No	No	No	Yes



*** NON-RETENTIVE PREPARATION ***

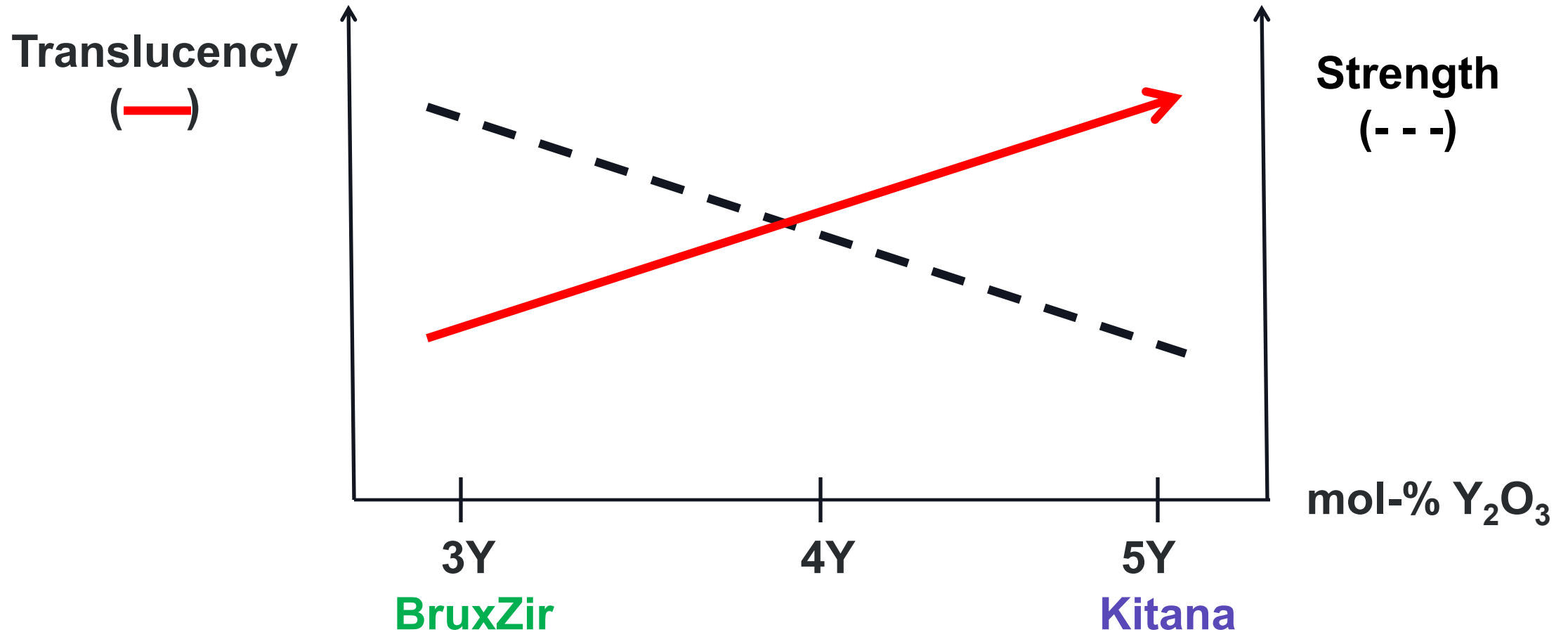
Restoration	Cement	
Weak (veneer)	Strong	
Not strong (eMax and Celtra)	Strong	
Strong (PFM, Zr,Al)		Any Cement
	High	Retention Low

Final Crown Pearls

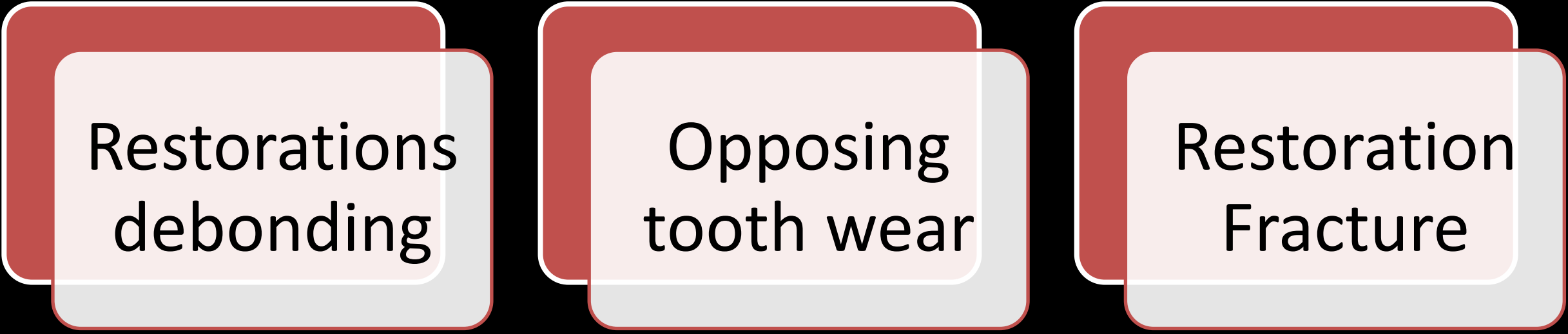
1. Use 847KR or Gingival Curettage bur...0.8mm margin (OR LESS...mind your axial reduction!!!!)
2. Add mesial/distal boxes or slots for Resistance Form
3. Crisp margins, coupled with utilizing hemostasis agents
4. Belt and suspenders approach (prep & cement)

Material	Recommended Cement	Clinical Tips
Feldspathic Porcelains	Adhesive Resin Self-adhesive Resin	- Etch the porcelain with hydrofluoric acid - For bonding to porcelain, use a silanating agent or appropriate ceramic primer
Leucite-Reinforced Ceramics	Adhesive Resin Self-Adhesive Resin	- Etch the porcelain with hydrofluoric acid - For bonding to porcelain, use a silanating agent or appropriate ceramic primer
Lithium Disilicate Ceramics	Adhesive Resin Self-Adhesive Resin Conventional Cement	- Etch to porcelain with hydrofluoric acid - For bonding to porcelain, use a silanating agent or appropriate ceramic primer - Can be conventionally cemented when retention is adequate (eg, >4mm height)
Zirconia-Based Ceramics	Conventional Cement Adhesive Resin Self-Adhesive Resin	- Good retention = conventional cement - Otherwise, use resin cement - Sanblast, use zirconia primer on intaglio - No silane, No hydrofluoric acid - Consider Ivoclean

Influence of the Yttria (Y_2O_3) on Zirconia



3 Most Common Complications with Zirconia



Restorations
debonding

Opposing
tooth wear

Restoration
Fracture

Hammer Test

How do we treat this surface?



Zirconia:



Silica-free, acid-resistant, polycrystalline ceramic

Since Zirconia does not contain glass, etching is not possible. Hydrofluoric acid usually works by removing a portion of the glassy matrix in a ceramic, thus “etching” the restoration and creating micro-mechanical retention



GC Initial™ IQ POZ: Pressed



Zirconia Bridge
Substructure



GC Initial™ Zr: Layered



Zirconia Coping
Substructure



Solid Milled Zirconia Crown: No treatment except GC

Initial™ IQ Lustre Paste









Bonding Zirconia

Groups	Shear bond strength (MPa) [mean $\pm$ SD]
Group 1: Control	25.8 $\pm$ 6.1
Group 2: MDP, saliva, water	20.6 $\pm$ 6.3*
Group 3: MDP, saliva, phosphoric acid	11.9 $\pm$ 3.6
Group 4: MDP, saliva, Ivoclean	17.9 $\pm$ 4.4
Group 5: Saliva, particle abrasion, MDP	23.1 $\pm$ 1.7*
Group 6: Saliva, water, MDP	10.4 $\pm$ 3.6
Group 7: Saliva, phosphoric acid, MDP	9.9 $\pm$ 2.0
Group 8: Saliva, Ivoclean, MDP	22.7 $\pm$ 3.8*

*Groups identified with an asterisk are not statistically different from the control.

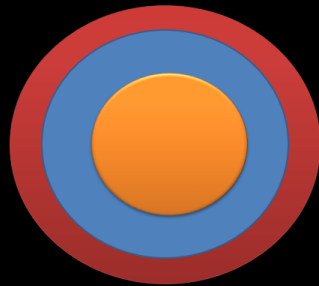


Angkasith P, Burgess J, Bottino M, Lawson N. Cleaning Methods for Zirconia Following Salivary Contamination. Journal Of Prosthetics: Official Journal Of The American College Of Prostodontists[serial online]. July 2016;25(5):375-379. Available from: MEDLINE Complete, Ipswich, MA. Accessed February 1, 2018.

Selection Criteria

Threshold of Adaptability

- BLUE is the RANGE that patient remains asymptomatic within
- ORANGE is normal function
- RED is the area OUTSIDE the patients RANGE, and is where the patient will be symptomatic



Pro Tip: the threshold varies between patients AND varies on the same patient over time

From premolar to premolar (you can likely choose any material with success)

First molars (Full contour zirconia or PFM)

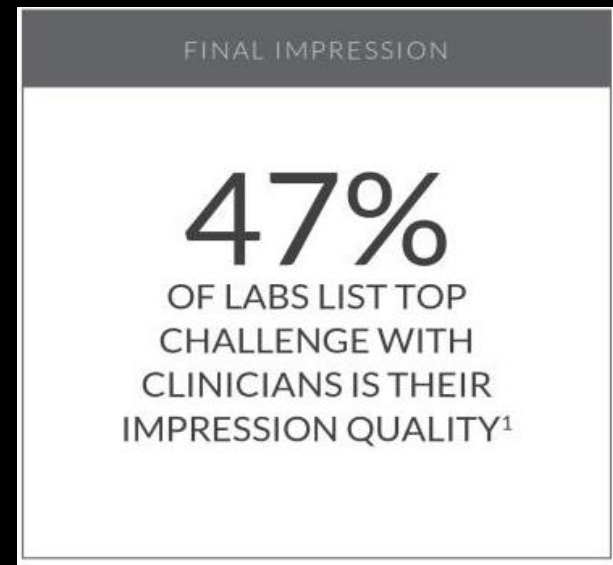
Second Molars (Full contour zirconia or FGC*)

This is the guy who makes your crowns



Fixed Prosthodontic Landscape

- What is the average total revenue of a single unit?
 - Full fee vs. Insurance
- Office Profitability
 - Direct vs. Indirect?
- What does this mean to the office?
 - Efficiency and Effectiveness



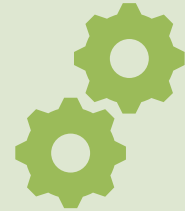
3 Pillars of Indirect Fabrication



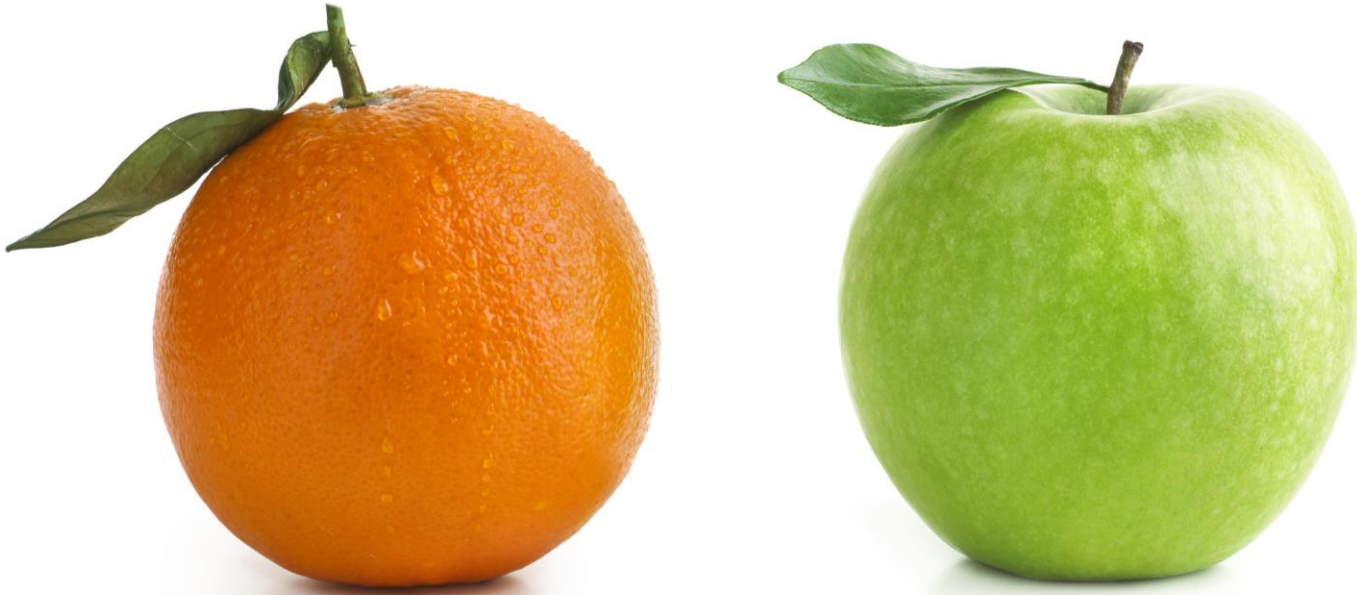
ACQUISITION



DESIGN

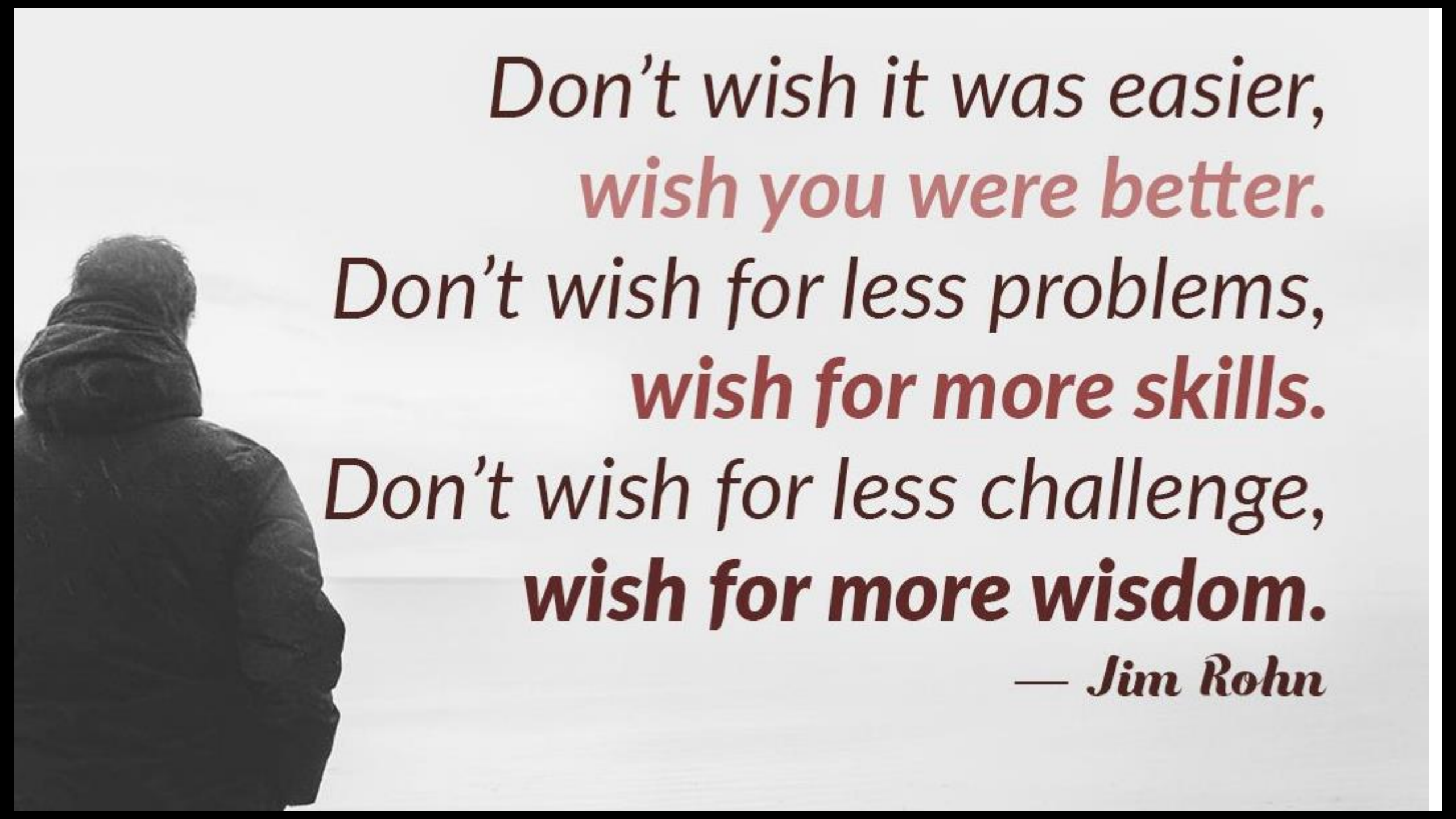


FABRICATION



Workflow Comparison Takeaways

- Digital provides preview of final before you cut a tooth
- Digital offers you more control over design
- Digital offers greater consistency in final product
- Digital creates a time savings opportunity
- Digital reduces potential of cross-contamination

A person wearing a dark, hooded jacket is seen from the back, looking out over a vast, misty or snowy landscape. The person's head is slightly bowed, and their hands are tucked into their pockets. The background is a soft, out-of-focus expanse of white and light gray, suggesting a winter scene. The overall mood is contemplative and serene.

Don't wish it was easier,
wish you were better.

Don't wish for less problems,
wish for more skills.

Don't wish for less challenge,
wish for more wisdom.

— *Jim Rohn*

A Word on Occlusion

- Everything works and everything doesn't...Learn to Identify when it DOESN'T
- Occlusion is SIMPLE
 - When the jaw is closed all teeth touch at the same time
 - When power is applied neither teeth nor jaw deflect
 - In movements away from fully contacted position no back tooth hits before, harder, or after front teeth

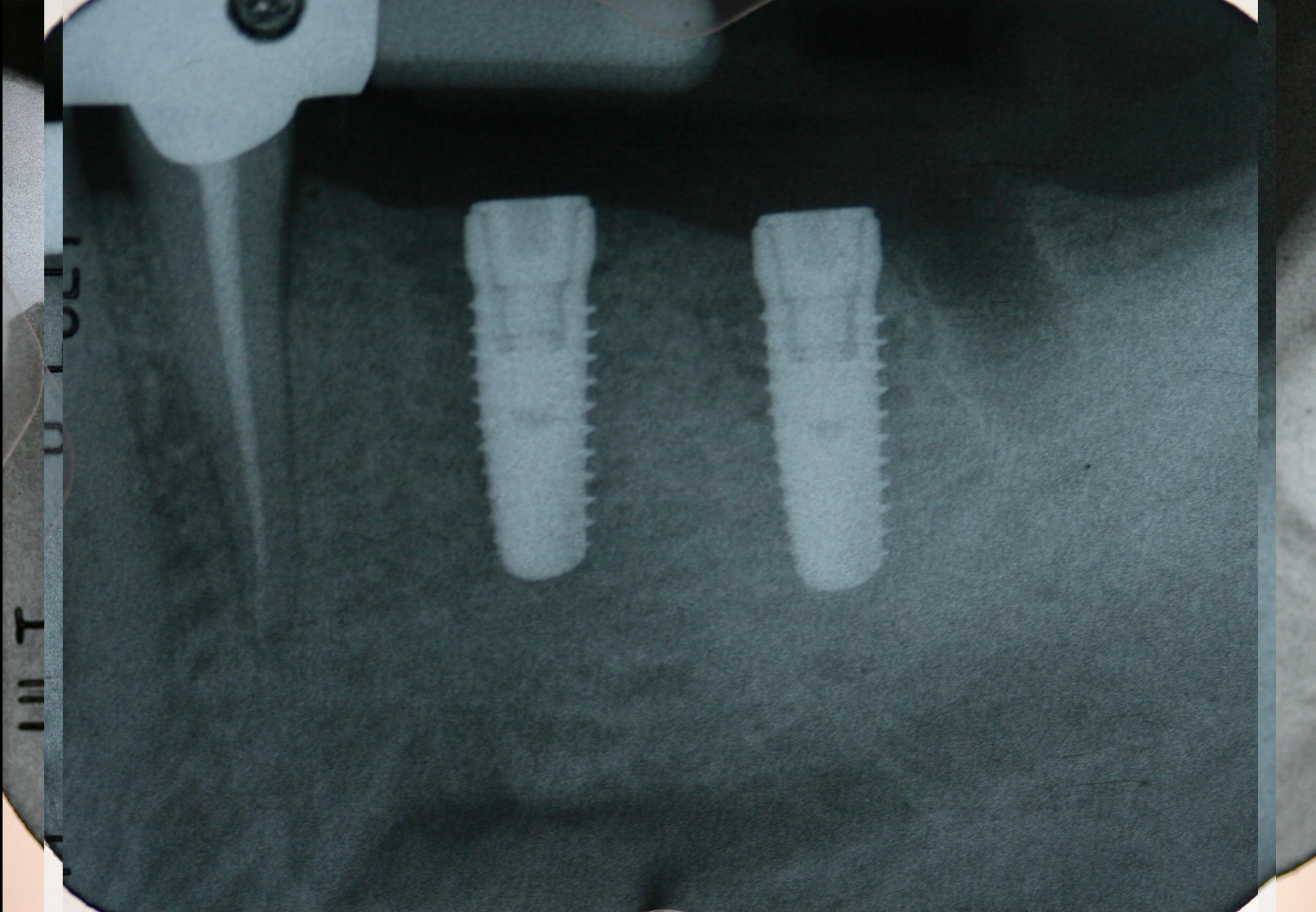
Patient Assessment

- He is a 71 y.o. male
- He has been a friend of my fathers for years and he recently called to say his implant crown was loose. He used to be talkative and light-hearted. After by-pass surgery his personality is more blunt, direct, and confrontational.
- Think: What is going on here? How might you go about presenting treatment to this patient? What alternatives can you consider?



- These implants were placed in the 1980s





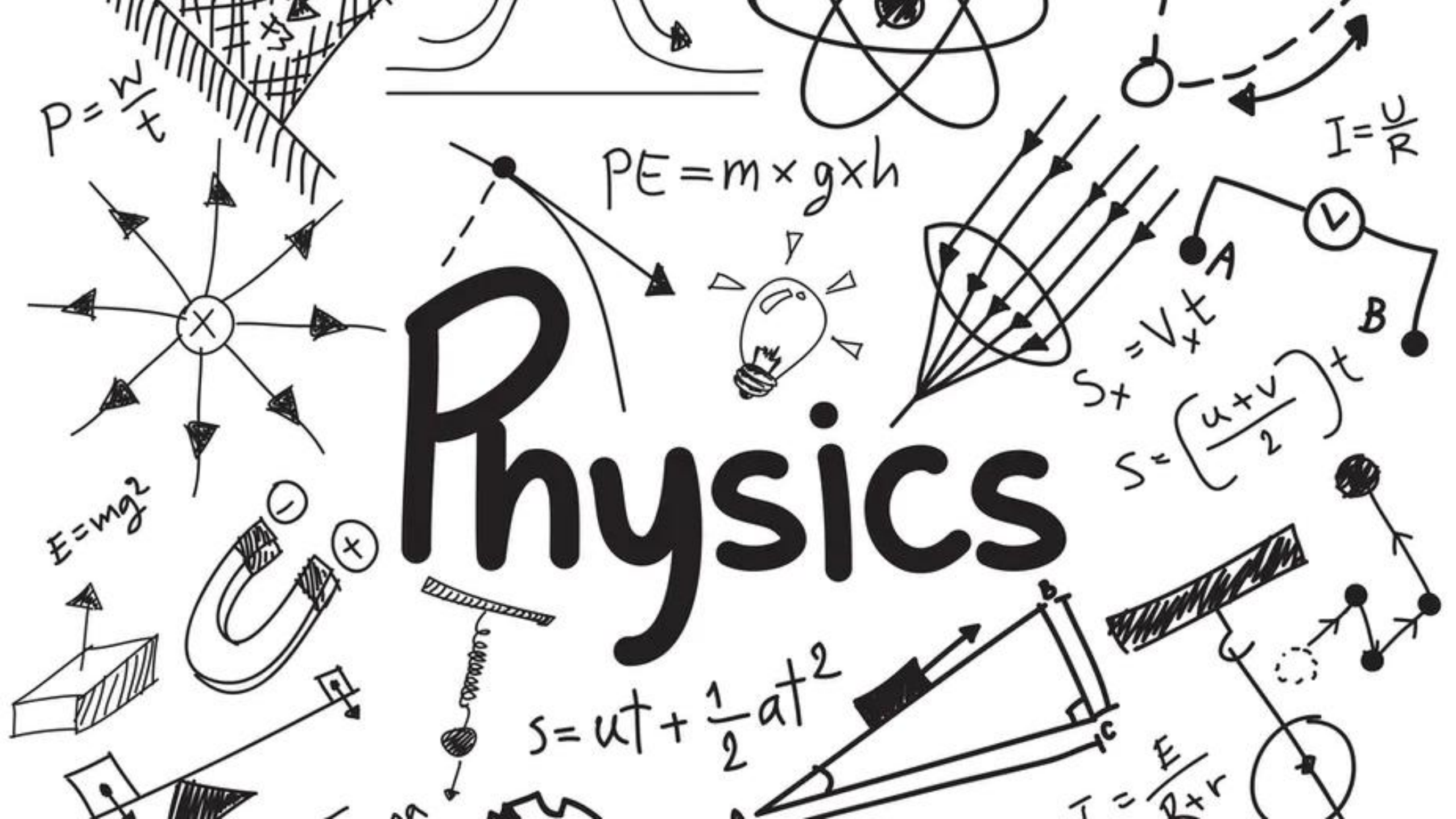


Lessons Learned



1. Implant platform width is as important as length
2. Do not underestimate force loads patients can place on these restorations (Brachyfacial)
3. History may be the best predictor of future events
4. Personality can change after major life events

Physics





Your Mission
Should You Choose to Accept...

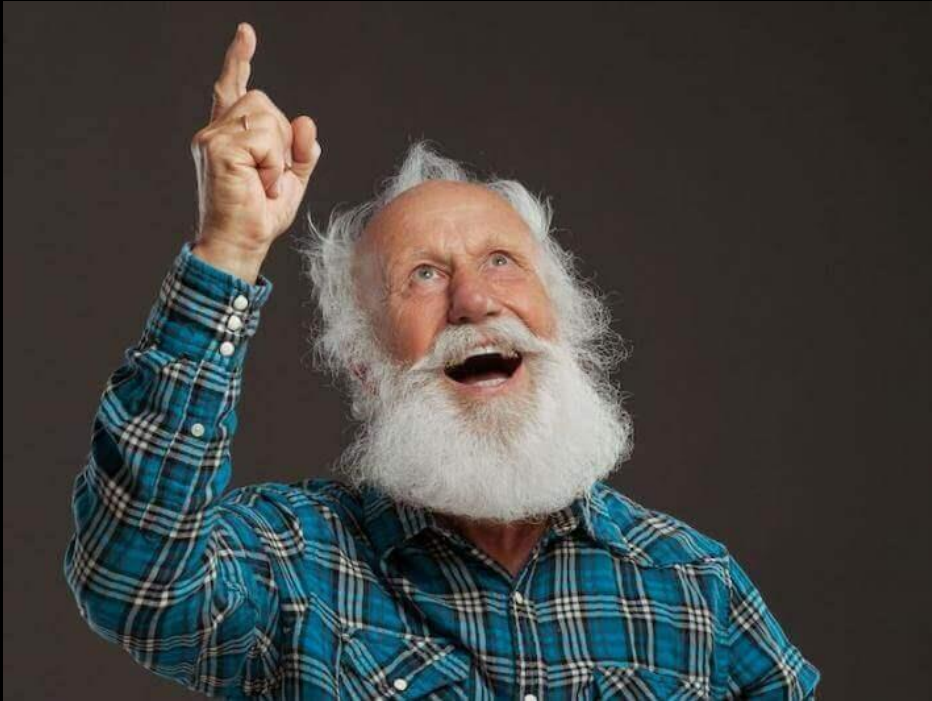


What is so difficult about occlusion?

- The challenge is it is UNPREDICTABLE, and VARIES patient to patient



As a Result



Poorly Taught



Poorly Understood



Appears Difficult



Makes Dentist Apprehensive to Treat

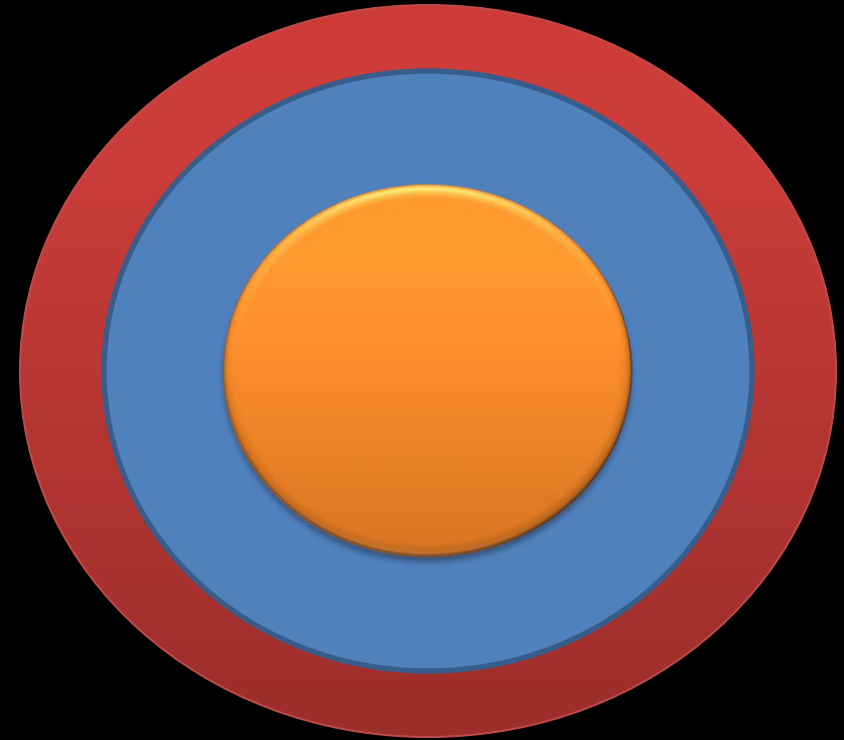
Common questions about occlusion

1. If I use the patient's current occlusion, will I be OK?
2. If I REMOVE existing occlusion, how do I recreate it?
3. If patient has severe tooth wear, how can I predict successful treatment
4. How do I know what kind of appliance to make?
5. What do I do if that patient is skeletal Class II or Class III
6. What do I do if my patient has pain?
7. Why, how, and when should I equilibrate?
8. How do I sequence complex occlusal treatment and bite records?



Threshold of Adaptability

- BLUE is the RANGE that patient remains asymptomatic within
- ORANGE is normal function
- RED is the area OUTSIDE the patients RANGE, and is where the patient will be symptomatic



Pro Tip: the threshold varies between patients AND varies on the same patient over time

Takeway



Identify when a patient IS NOT within their adaptive threshold



Learn how to alter it

What does this look like in practice?



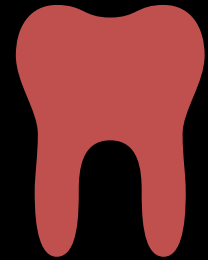
Evaluate on each patient



Joints



Muscles



TEETH

Diagnosis

1. Physiologic

- AM I going to alter it?
- WHERE am I going to alter it?
- Anterior Teeth are SAFER to alter

2. Pathologic

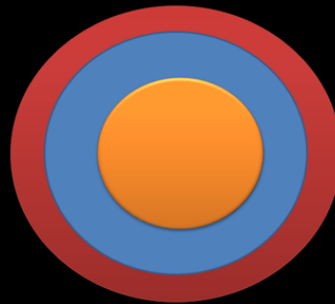
- HOW am I going to alter it?



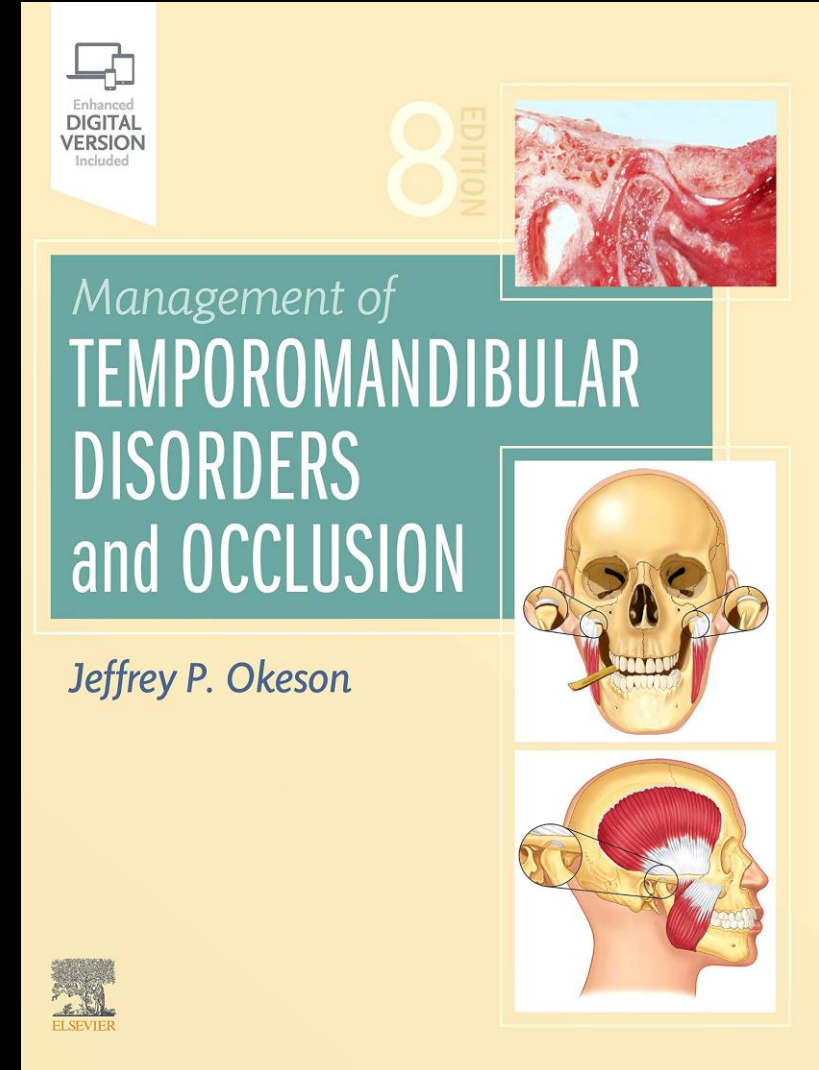
- Much of what we do with appliance therapy, is to allow the patient to find or return to adaptive normal

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All appliances protect teeth from wear and fracture



Options

- Anterior bite plane
 - Best for decreasing muscles activity
 - Offers little joint support if muscle activity does not decrease



Options

- Full coverage with Anterior Guidance
 - Reduces joint loading during clenching
 - Reduces muscle activity during excursions
 - Aka “The Michigan Splint”



Options

- Full Coverage Flat Plane
 - Supports joints in clenching and excursions
 - DOES NOT REDUCE MUSCLE ACTIVITY



Options

- Posterior Coverage ONLY
 - Full support of the joints with no intention to decrease muscle activity
 - Often used when pain is associated with joint movements during translation
 - Known as the “Gelb appliance”



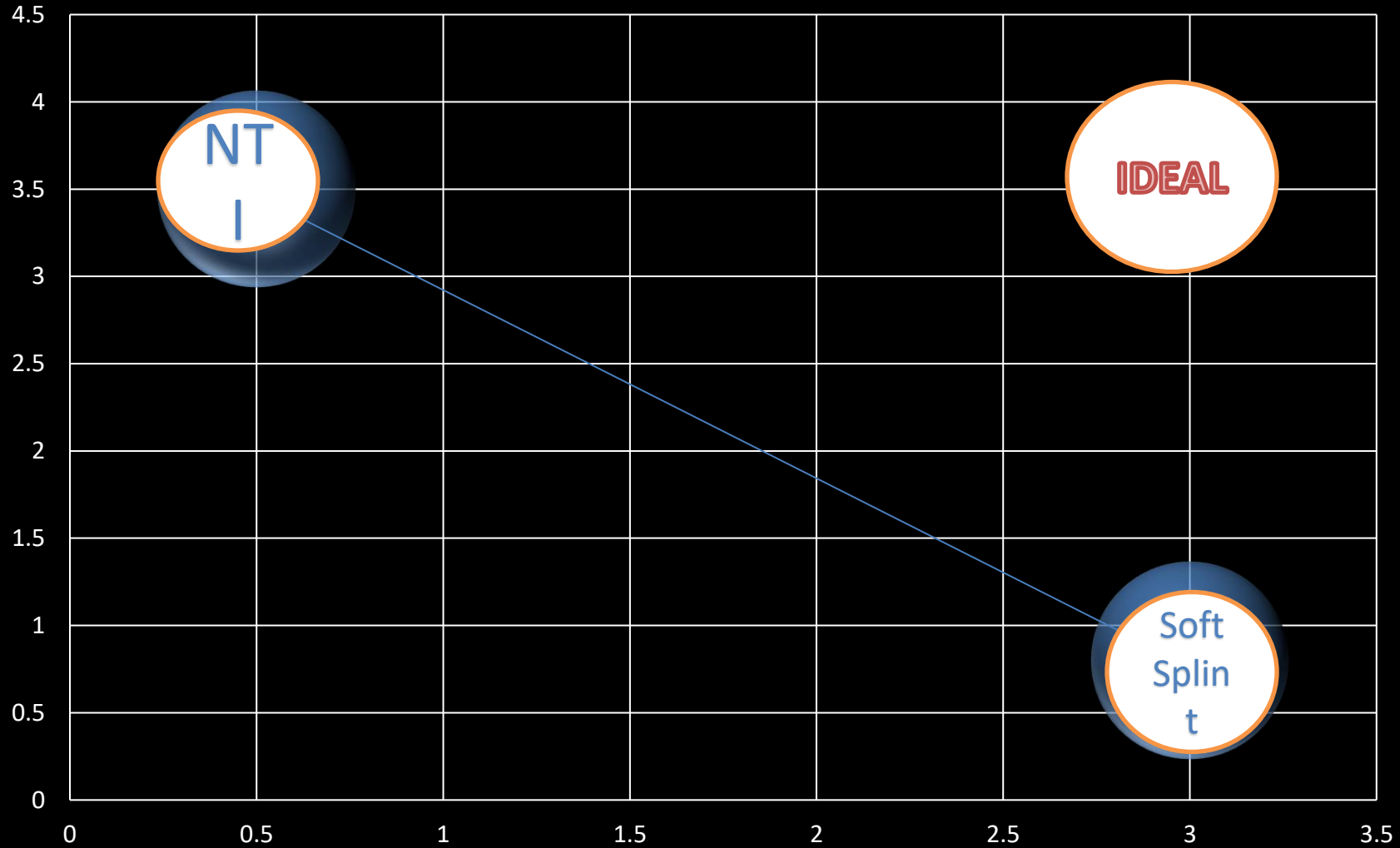
Options

- Full Soft Splint
 - MAX Joint protection
 - No decrease in muscle activity



Appliance Effectiveness

Decreasing
Muscle Activity



*Ideal
created with
therapeutics
like Botox®

Increasing
Joint Support



Review of Today

- Understand the market we exist in today
- Use the tools to get the job done faster and better
- Create an overwhelming positive experience in your business
- Empower your team
- Keep People FIRST

“There is no difference between the feeling of helping a patient or standing to the applause of a Broadway audience—it is all about JOY, and that feeling is the [exact] same in both venues. People only think that there is a difference, but they are wrong. Choose to be happy with what you find yourself doing at the present moment. Find your joy.” ~Rory O’Malley





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