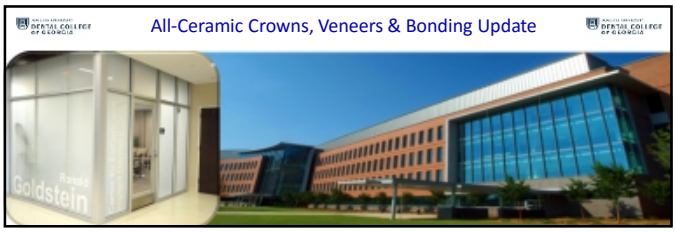


DISCLOSURE

- Center Grant	Nobelbiocare
- Consultant	Kuraray Noritake
- Donated Products	3M Espe Brasseler 3 Shape

DISCLAIMER

Techniques and principles reviewed in this all-day program are derived from my personal teaching and clinic experience.

They do not constitute a guarantee for success, the attendees should form their own opinion.

Gerard Chiche L.L.C.

PLEASE NOTE

PLEASE NOTE

VIDEOTAPING OF THE PRESENTATION IS PROHIBITED .

TAKING PICTURES OF THE PATIENTS FACES IS PROHIBITED. IT IS ILLEGAL AND IT IS AN INVASION OF PRIVACY.

TAKING PICTURES OF THE PRESENTATION (EXCEPT FACES) IS ALLOWED.

PLEASE NOTE

Gerard Chiche L.L.C.

Upper Lip Line →
Lower Lip Line →

Treatment Plan from Incisal Edge Up

1. PROPER LENGTH
2. INCISAL PROFILE
3. SMILE LINE DESIGN
4. TOOTH PROPORTIONS

I

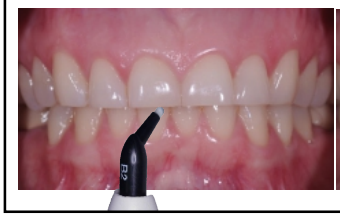
Esthetic Design

I. Pleasing Display

1. Male Pt.	0.5 - 2 mm.
2. Female Cons.	2.0 - 3 mm.
3. Female Spark.	3.5 - 4.5 mm.

Kinetics of Anterior Tooth Display
Vig , Brundo 1978

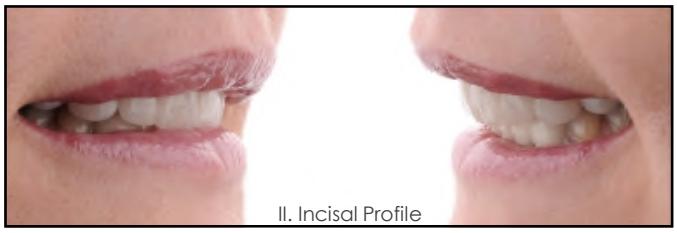
Dynamics of the Maxillary Incisor
Dickens , Sarver, Proffit 2002

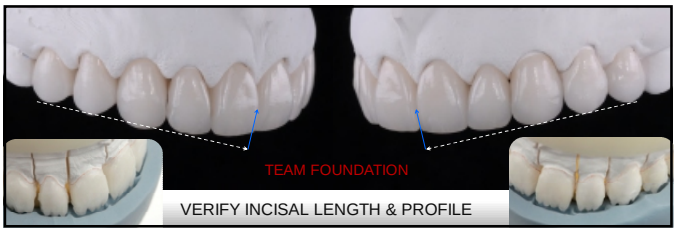


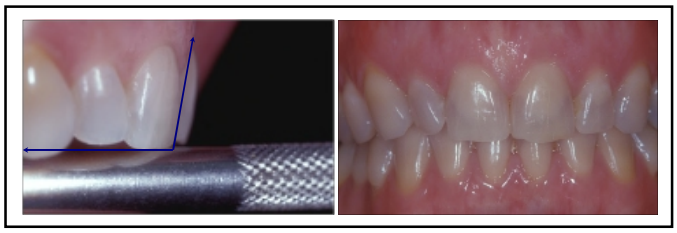
WAX-UP at KNOWN LENGTH

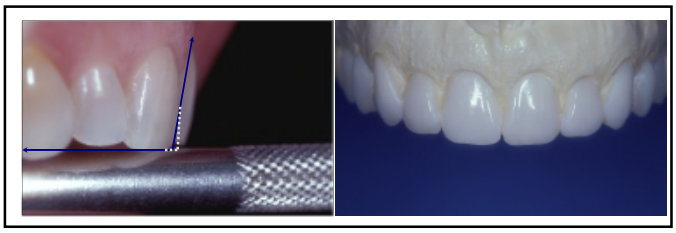
Treatment Plan
From Incisal Edge UP

Central Length
Short Face: 10.0 mm.
Medium Face: 10.5 mm
Long Face: 11.0 mm & up


II. Incisal Profile


TEAM FOUNDATION
VERIFY INCISAL LENGTH & PROFILE






THIN ADDITIVE LAYER
RECHECK LOWER LIP !


CONVEX
FLAT
CONCAVE
TOO CONVEX
III. SET SMILE LINE

ONE-ARCH" TREATMENT

1. Adjust VDO
2. Gain Space
3. Increase Length
4. Improve Overbite
5. Reduce Anterior Force

Amy & Aram

UPRIGHT BICUSPIDS = LESS INTERFERENCES , MORE LENGTH, LESS WEAR

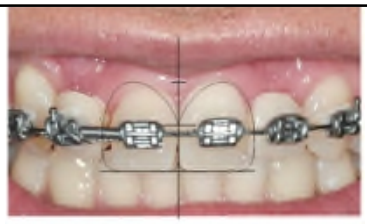
III. SET PROPORTIONS

10 mm. L

7.5-8.0 mm

11 mm. L

8.5-9.0 mm



Rule: When Set Proportions

Optimize Canine Guidance

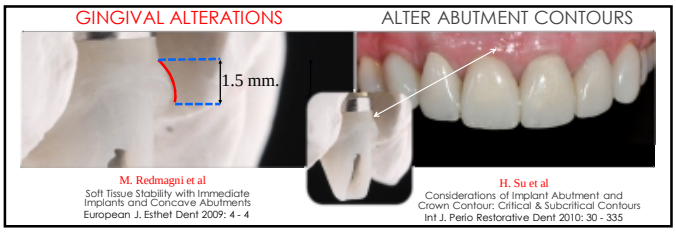
Relative Width

54 patients
16-72 years

8 and 9 : 8.5 mm.
7 and 10 : 6.5 mm.
6 and 11 : 7.5 mm.

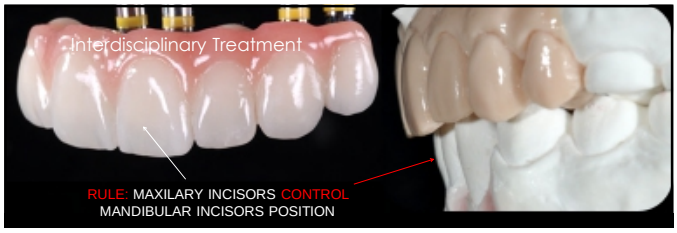
S. Chu
2007

Marko & Aram



I. SET INCISAL LENGTH

II. SET INCISAL PROFILE



Rule: Maxillary Incisors Set-up Dictate Mandibular Incisors Plan

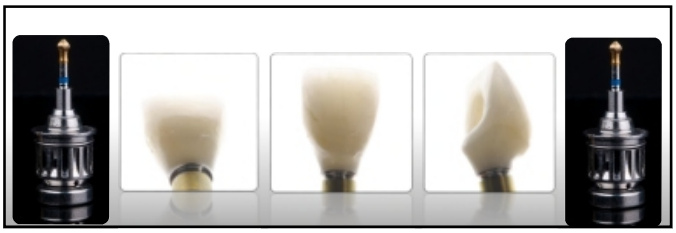
Implant Restorations Goals

1. Proper Sagittal Inclination
2. Incisal Porcelain Thickness
3. Moderate Anterior Guidance

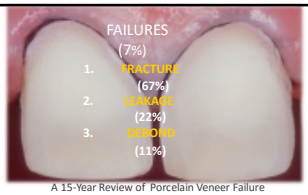
Plan on Mounted Models

Acrylic Provisional

Porcelain Final

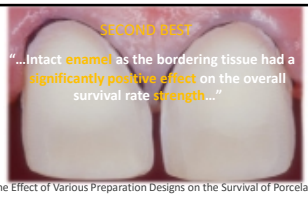


? Expected Longevity ?



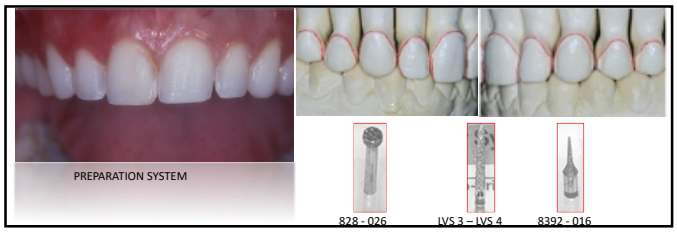
A 15-Year Review of Porcelain Veneer Failure
A Clinician's Observations

FRIEDMAN M.J. COMPENDIUM. 19. 1998

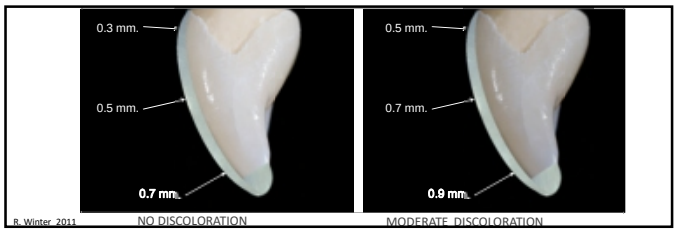


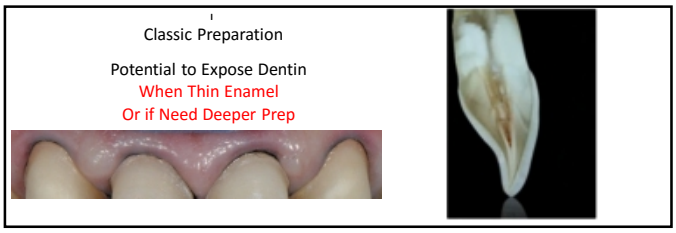
The Effect of Various Preparation Designs on the Survival of Porcelain Laminate Veneers

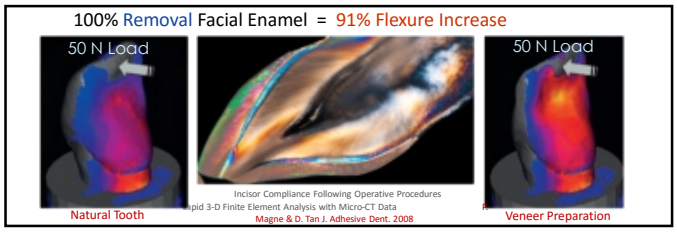
Cotert H. S et al. J. Adhes. Dent 12. 2009 405-411


PREPARATION SYSTEM
828 - 026
LVS 3 – LVS 4
8392 - 016


Classic Preparation
Main Advantage
Intra-enamel Most of Times


0.3 mm.
0.5 mm.
0.7 mm.
0.5 mm.
0.7 mm.
0.9 mm.
R. Winter 2011
NO DISCOLORATION
MODERATE DISCOLORATION


Classic Preparation
Potential to Expose Dentin
When Thin Enamel
Or if Need Deeper Prep


100% Removal Facial Enamel = 91% Flexure Increase
50 N Load
50 N Load
Natural Tooth
Veneer Preparation
Incisor Compliance Following Operative Procedures
Rapid 3-D Finite Element Analysis with Micro-CT Data
Magne & D. Tan J. Adhesive Dent. 2008


HIGH FLEXURE

Feldspathic Veneers Best Indicated if Low Flexure Situation.

E. McLaren & B. Lesage Compendium 2011; 32:3

LOW FLEXURE ⟶
1. Bonding Substrate All Enamel
2. Minimum Porcelain Extension
3. Low Occlusal Function

Lithium Disil. Veneers Best Indicated if High Flexure Situation.

HIGH FLEXURE ⟶
1. Bonding Substrate Dentin ++
2. Significant Porcelain Extension
3. High Occlusal Function
4. Complex Preparation

Clear
White

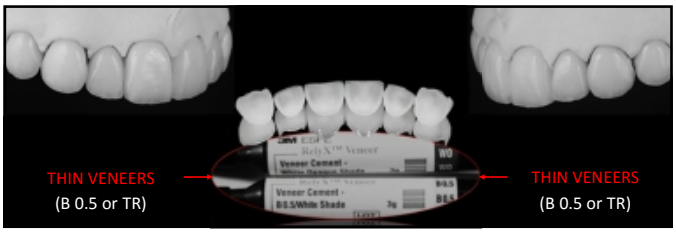
REALITY RATING
LIGHT/ DUAL CURE

1. INSURE / INSURE LITE
2. NX3
2. VARIOLINK II
3. VITIQUE
4. LUTE-IT!
5. CALIBRA

LIGHT CURE ONLY

1. RELY X VENEER CEM
2. VARIOLINK VENEER
3. DA VINCI
4. ACCOLADE PV
5. CHOICE 2

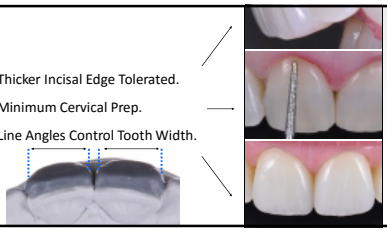
Clear
White
(Thin Veneers)

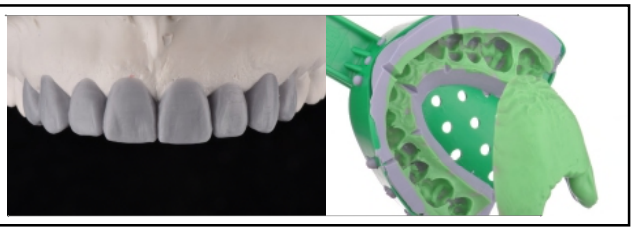


"Low-Prep" Veneers

Undersized + Retrusive Incisors

1. Thicker Incisal Edge Tolerated.
2. Minimum Cervical Prep.
3. Line Angles Control Tooth Width.

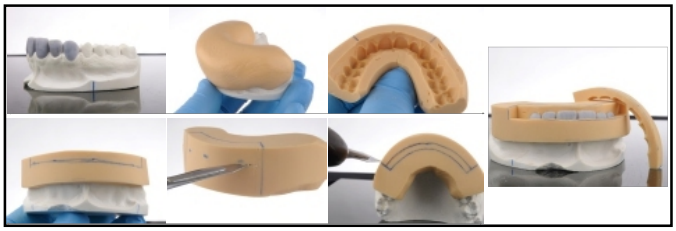


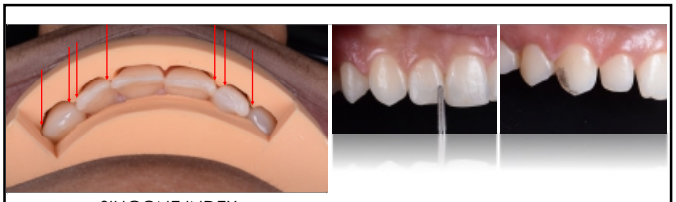


Additive & Low Veneer Preps

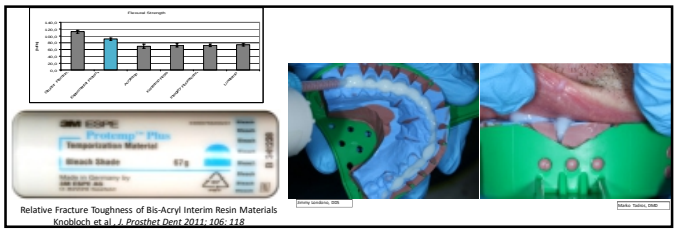
Advantages
.Provides Maximum Enamel!
.Increases Veneer Strength.

Precautions
.Need Additive Wax-up.
.Needs Precise Technique.
.Needs Esthetic Try-in

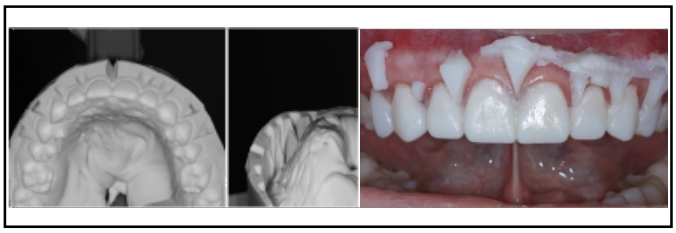




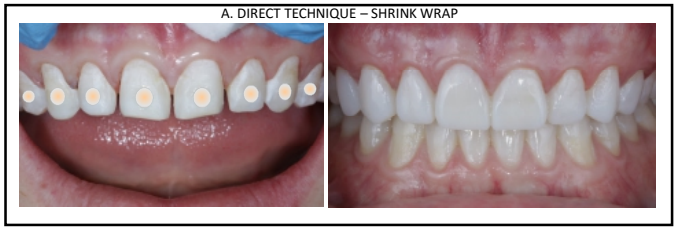
SILICONE INDEX

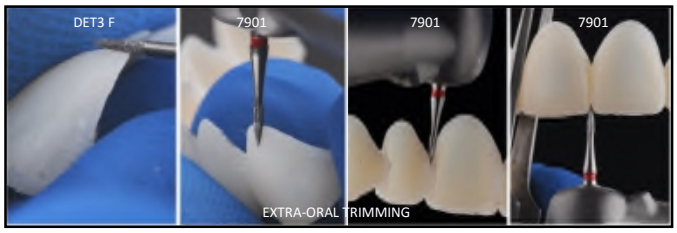


Relative Fracture Toughness of Bis-Acryl Interim Resin Materials
Knobloch et al. *J. Prosthet Dent 2011; 106: 118*



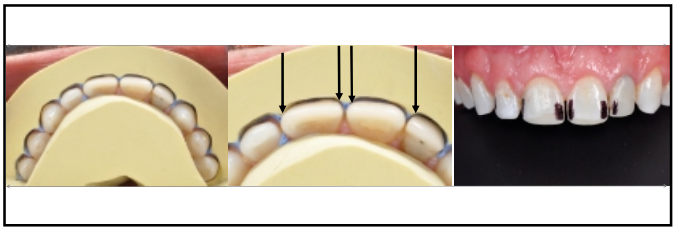
A. DIRECT TECHNIQUE – SHRINK WRAP





Limited Treatment – Level I

• Veneer Ceramics	Lithium Disilicate
• Bonding Substrate	Maintain Enamel
• Available Thickness	Augment Labial Volume
• Required Compliance	Occlusal Guard
• Difficult Cases	Test Drive w. Composites



Increase in VDO = Low-Prep Mandibular Veneers

Safety of Increasing Vertical Dimension of Occlusion: a Systematic Review

J. Abduo. Quintessence Int 2012

• Magnitude	Maximum 5.0 mm. Meas. Anteriorly.	Gough, Dahl, Ormanier.
• Patient Adapts	Resolution 1-2 weeks (2 days - 3 mo.)	Carlsson, Rivera, Abekura, Tryd
• EMG Activity	Back to pre-treatment levels 2 -3 mo.	Carlsson, Dahl, Gough, Manns
• Relapse	Unknown, Relatively Stable.	Gough, Dahl, Ormanier.

Fabricating short-term interim restorations from edentulous tissue conditioner material.

R.Elkattah, J. Kim, J. Londono

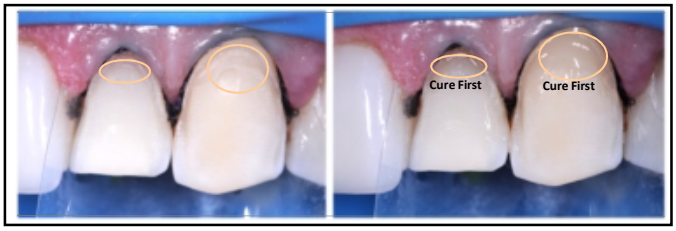
J Prosthet Dent Online 2015

VENEER CEMENT SELECTION

1. Thin vs. Thick Veneer
2. Tissue Health
3. Number of Veneers

Sticky Viscous Cement Da Vinci

Low Viscosity Cement Rely Veneer



Shear Bond Strength of Porcelain Laminate Veneers to Enamel, Dentine and Enamel-Dentin Bonded with Different Adhesive Luting Systems

Ozturk, Bolay, Hickel, Ilie

Journal of Dentistry 41 2013

Table 3 – Mean shear bond strengths (MPa) and standard deviations of the groups.

Groups	N	Mean MPa (SD)
Group RV-E	15	22.46 (9.2)[ab]
Group RV-E-D	15	28.73 (9.2)[a]
Group RV-D	15	5.46 (6.6)[c]
Group VV-E	15	24.75 (6.9)[a]
Group VV-E-D	15	23.67 (5.8)[ab]
Group VV-D	15	13.94 (6.2)[b]
Group V2-E	15	23.64 (13.1)[ab]
Group V2-E-D	15	23.05 (7.8)[ab]
Group V2-D	15	13.78 (6.8)[b]

Precuring of self-etching bonding agents and its effect on bond strength of resin composite to dentin and enamel

J. Luke Chapman, DDS*/John C. Burgess, DDS, MS*/ Stefan Holst, DMD, PhD, PhV-Doz Dr Med Dent†/Avishai Sadan, DMD*/ Markus B. Blatz, DMD, Dr Med Dent‡

Table 2 Shear bond strengths (MPa) to enamel and dentin with the bonding agent cured separately (PRC) and simultaneously with the resin composite (CDC)

	Adper Prompt-L-Pop		Clearfil SE Bond		Xeno III	
	PRC	CDC	PRC	CDC	PRC	CDC
Enamel	8.0 ± 2.9	13.4 ± 4.1	19.3 ± 4.5	18.7 ± 5.0	18.9 ± 3.1	17.8 ± 4.5
Dentin	8.9 ± 3.2	5.4 ± 1.6	15.8 ± 5.2	6.0 ± 2.5	10.9 ± 5.2	4.0 ± 3.1

5th Generation is 3 steps on Enamel and Dentin (Larger amounts)

BONDING VENEERS

BONDING PRECAUTIONS

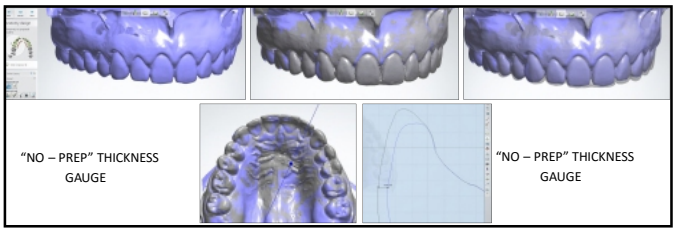
1. Microblast or roughen Dentin
2. R
3. Cure ! parately

GINGIVECTOMY : ONLY if > 3 mm. Preop.

3 mm RULE

Priorities

- CEJ Location — Veneer Extent.
- Gal Margin – Bone Crest — Gingivectomy > 3 mm.
- Root Length — Bone Resection.

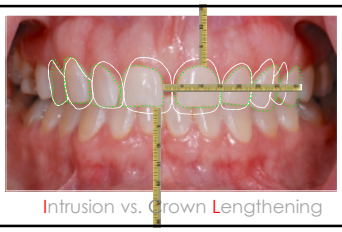


LOW PREP VENEERS

1. CEJ Location 2. Root Length 3. Restoration Type

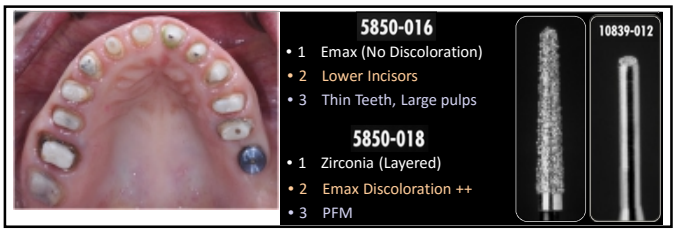
EX3

CEJ Level = Maximum Veneer Extent



Intrusion vs. Crown Lengthening

1. CEJ Location 2. Root Length 3. Restoration Type



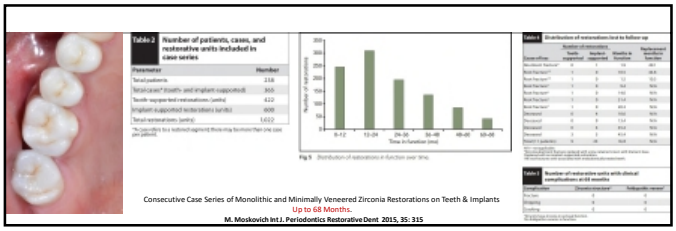
Glass Ceramics

- **1 Best Translucency**
- **2 Reduced Facial Thickness**
- **3 Convenient & Versatile**
- **4 Combines with Veneers**
- **5 Plan Masking Strategy**

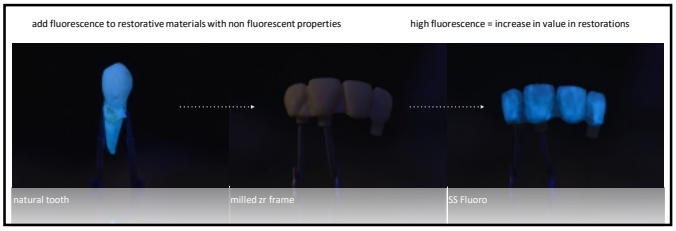
CONSENSUS: LITHIUM DISILICATE for ANTERIORS ZIRCONIA for POSTERIORS

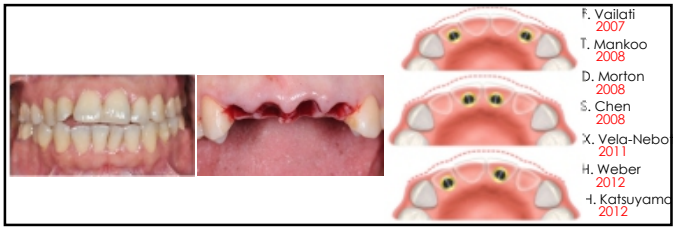
Zirconia Ceramics

. 1 Discolored Teeth.
. 2 No Bonding Required.
. 3 Fixed Partial Dentures.
. 4 Full-Contoured Molars.
. 5 Full-Arch Implant FPD's



Consecutive Case Series of Monolithic and Minimally Veneered Zirconia Restorations on Teeth & Implants
Up to 68 Months.
M. Moskovich Int J. Periodontics Restorative Dent 2015, 35: 315







Zirconia Connector Size

6.0 mm² Ant. Cantilever
7.0 mm² Ant. FPD 1 Pontic
9.0 mm² Post. FPD 1 Pontic
12.5 mm² Post. FPD 2 Pontics

Raigrodski, 2006, Larson 2007, Studard 2007, Zasse 2012

FPD Options

Lithium Disil. Connector Size

8.0 mm² Ant. Cantilever
12.0 mm² Ant. FPD 1 Pontic
16.0 mm² Post. FPD 1 Pontic

Teitru, 2012, Kern 2012, Sun 2013

Recommended Body Firing Temperature

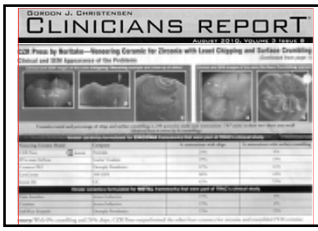
Cerabien CZR 930 – 940 Deg. C
Vita VM9 910
Wieland Zirox 900 – 930

Long-Term Retrospective Dental Laboratory Survey of Zirconia-Based Crowns
IADR 2010 Abstract # 148370, 2011
Raigrodski A., Dogan S., Englund G.

Performance of Zirconia Based Crowns and FPDs in Prosthodontic Practice
IADR 2010 Abstract # 40705, 2010
Nathanson, Chu, Yamamoto, Stappert,C.

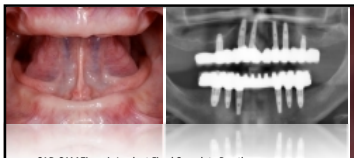
Clinical Comparison of Zirconia, Metal, Alumina Fixed-Prosthesis Frameworks Veneered with Layered or Pressed Ceramics: A Three-Year Report
J. Am. Dent. Assoc. 2010;141;1317-1329
R. P. Christensen, B. J. Ploeger

Clinical survival of posterior zirconia crowns in private practice
IADR 2010 Abstract# 134121
Blatz M, et al


GORDON J. CHRISTENSEN
CLINICIANS REPORT

"…CZR Press veneer ceramic for zirconia was the exception with a performance comparable with that of veneer ceramics for metals…"

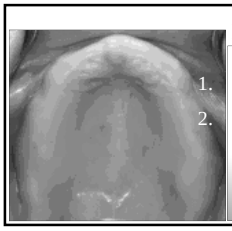
A Clinical Comparison of Zirconia, Metal and Alumina Fixed-Prosthesis Frameworks Veneered with Layered or Pressed Ceramics: A Three-Year Report
R. P. Christensen and B. J. Ploeger
J. ADA 2010;141;1317




CAD-CAM Zirconia Implant Fixed Complete Prostheses
Clinical Results &Technical Complications up to Four Years in Function
Papaspyridakos P. et al
Clin. Oral Impl. Res. 2013

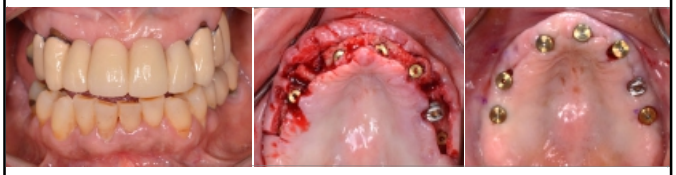
Dr. B. Ferguson, S. Ainplee & Mr. A. Torosian

Edentulous Maxilla - Fixed Restorative Options

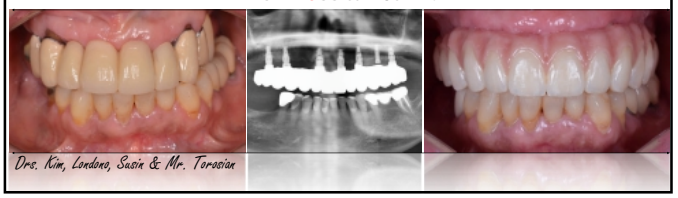


1. Fixed Hybrid: Economical, Practical, Versatile.
2. Full Zirconia: Additional Strength for Bruxer.
   More Esthetic.
   More Color Stable.

Materials Selection

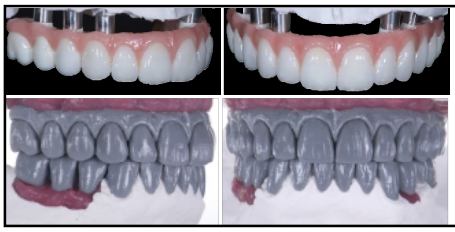


PROVIDE OCCLUSAL GUARD !



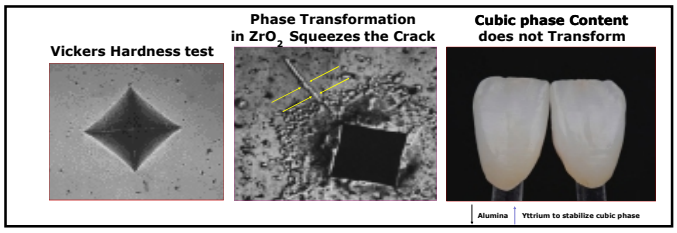
PROVIDE OCCLUSAL GUARD & MANDIBULAR METAL-ACRYLIC HYBRID

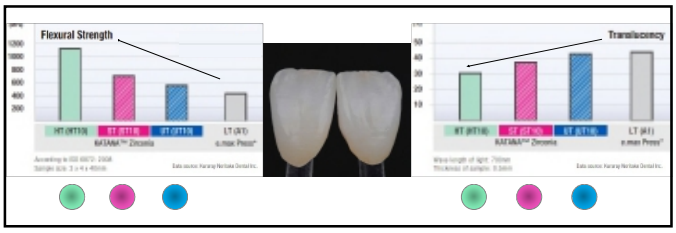
1. PROVIDE OCCLUSAL GUARD 2. MANDIBULAR METAL-ACRYLIC HYBRID

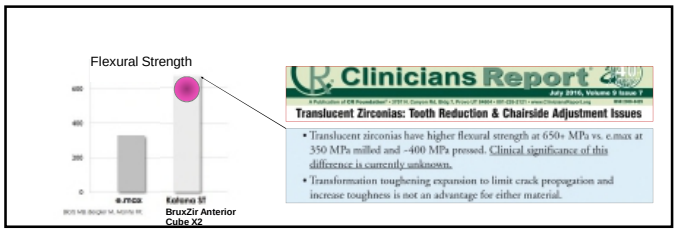


PROTECTION DESIGN

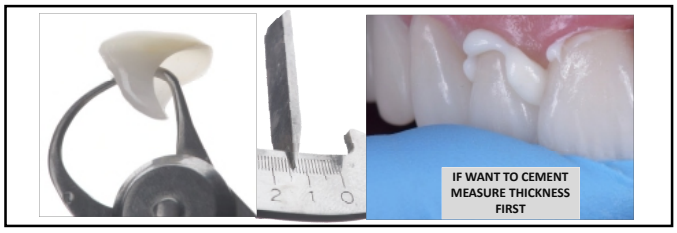
1. All Functional areas in zirconia Include Incisal Edges.
2. Occlusal Guard Mandatory.
3. Mandibular Opposing Hybrid.
4. Minimum 2 mm. Surrounding Screw Channels.
5. Maximize Incisal Edge Thickness.
6. Provide Shallow Anterior Guidance.
7. 6 implants (Min.) - 8 vs Natural Dent.


Vickers Hardness test
Phase Transformation in ZrO_2 Squeezes the Crack
Cubic phase Content does not Transform
Alumina
Yttrium to stabilize cubic phase

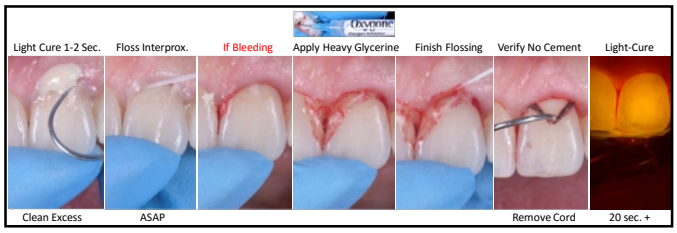

Flexural Strength
Translucency

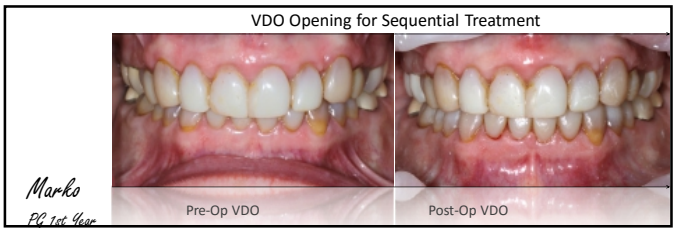

Flexural Strength
e.max
Katana ST
BruxZir Anterior
Cube X2
Clinicians Report
Translucent Zirconias: Tooth Reduction & Chairside Adjustment Issues
• Translucent zirconias have higher flexural strength at 650+ MPa vs. e.max at 350 MPa milled and ~400 MPa pressed. Clinical significance of this difference is currently unknown.
• Transformation toughening expansion to limit crack propagation and increase toughness is not an advantage foe either material.


TRANSLUCENT ZIRCONIA
Flexural Strength
Resin Ionomer


IF WANT TO CEMENT MEASURE THICKNESS FIRST


Translucent Zirconias: Tooth Reduction & Chairside Adjustment Issues
TRAC
Fig 1. WARNING: Translucent zirconia can fracture at seating if substantial chairside adjustment has been performed.



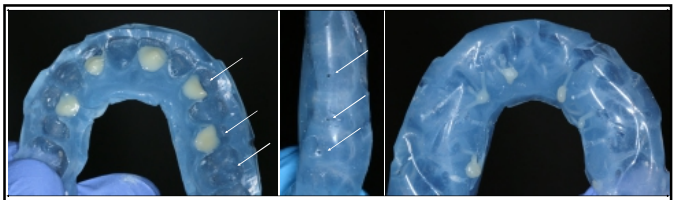


1. Minimum Wax Up on Occlusal Surfaces
Uncovered Areas = Vertical Stops

1. Wax Up far away from Gingival Tissues

2. Etch Every Other Tooth H3PO4 – HF on Porcelain (W. Hall)

3. Bond and Load Clear Matrix with High-Filler Load Flowable Composite



4. Clear Silicone Matrix has Occlusal Stops & Small Vent Holes (W. Hall)

4. Small Vent Holes Over Lingual Cusps Minimize Excess on Adjacent Teeth

5. Split Clear Silicone Matrix at Mandible to Facilitate Isolation

New VDO After Occlusal Refining – Ready for Quadrant Work

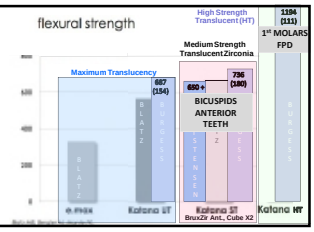
1. Prepare Anterior Teeth

2. Complete & Bond Anterior Crowns

3. Prep. & Complete Posteriors

Composite Buildups Hold VDO

Ceramic Crowns Hold VDO



Accelerated aging of zirconia for monolithic restorations, up to 200 hrs at 134 °C and 2 bars

22.0mm X 3.0mm X 0.2mm

(Steam Hydrothermal Treatment - 1 hr. Simulates 1 yr.)

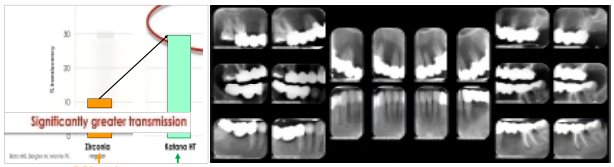
Department of Material Science and Engineering.

Department of Oral Rehabilitation

System	Initial Flexural Strength Mean(SD)	Aged Flexural Strength Mean(SD)
Katana HT	1052(84)	1099(70)
Katana ML	875(130)	999(70)
Bruxzir	1248(73)	N/A (fractured during aging)
Prettau	1612(197)	N/A (fractured during aging)

Flinn BD, Raigrodski AJ, Mancl L, et al. JPD 2017 (117: 303)

"The decrease in flexural strength was related to the increase in monoclinic phase from long-term degradation" JPD 2014 (112: 377)

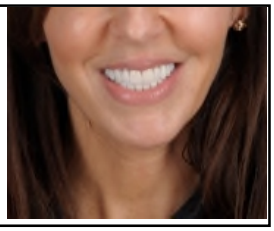


Translucent Zirconia

(Maximize Thickness, Strength, Thick Connectors, Case selection)

- 1. Strength = Cement versus Bonding for Simplicity.
- 2. Cementing is more Realistic if gingivitis or deep margins.
- 3. Anterior region for a Bruxer.
- 4. Translucent zirconia FPD with adequately designed Connectors.
- 4. Esthetic Transition from Emax incisors to FPD from Canines back.

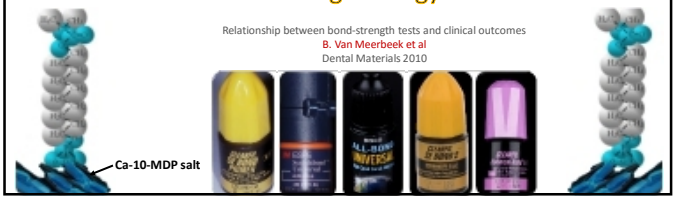
The Journal of Cosmetic Dentistry April 2016



WEBBED PROPHY CUP

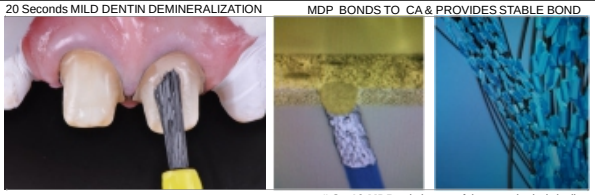
Bonding Strategy

Relationship between bond-strength tests and clinical outcomes
B. Van Meerbeek et al
Dental Materials 2010



20 Seconds MILD DENTIN DEMINERALIZATION

MDP BONDS TO CA & PROVIDES STABLE BOND



" **Ca-10-MDP** salt is one of the most hydrolytically stable salts" (Perdigao 2013)

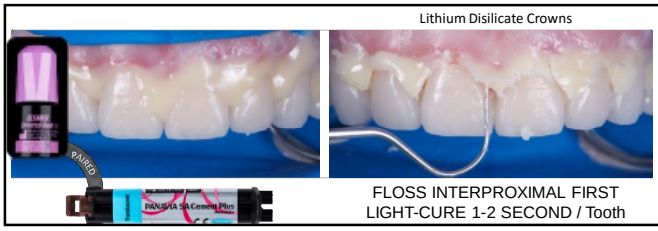
R. Bansal et al JDR Abstr 2014

LITHIUM DISILICATE **Dual-Cured Cement paired with Self-Etch Adhesive**

Paired SE Adhesive / Cement Examples

BOND TWO CROWNS AT A TIME

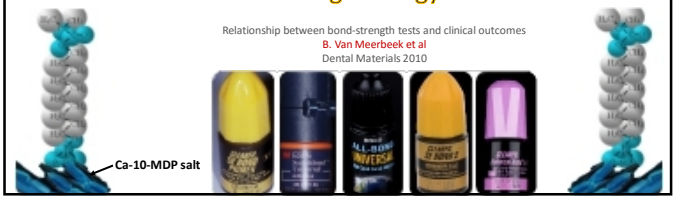
Lithium Disilicate Crowns

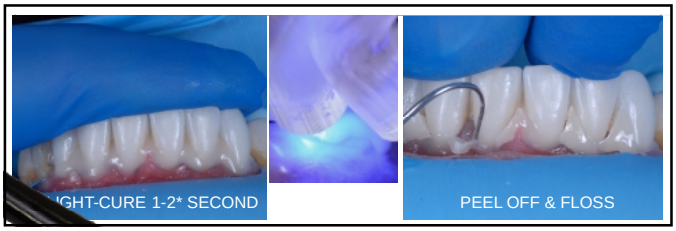


FLOSS INTERPROXIMAL FIRST
LIGHT-CURE 1-2 SECOND / Tooth

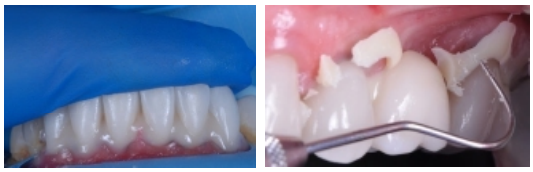
Bonding Strategy

Relationship between bond-strength tests and clinical outcomes
B. Van Meerbeek et al
Dental Materials 2010

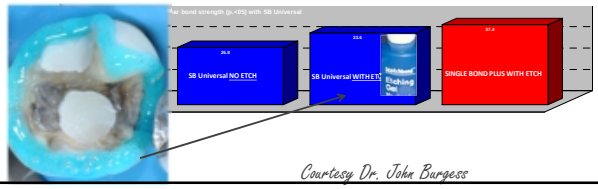


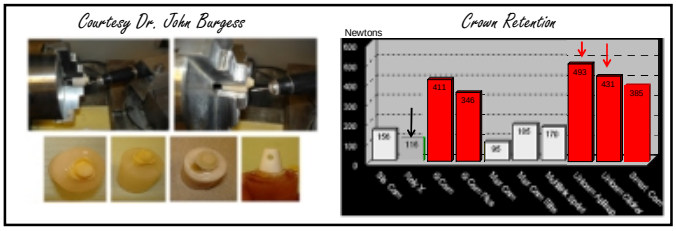


FOR BEST BOND AVOID MICRO-MOVEMENTS 6' DURING CLEANING

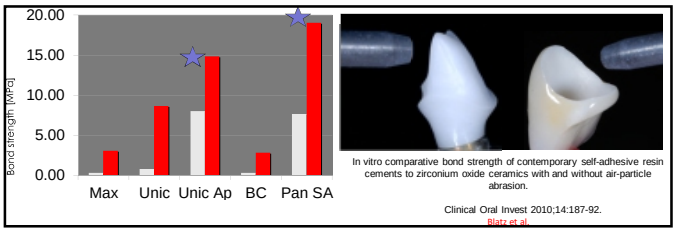


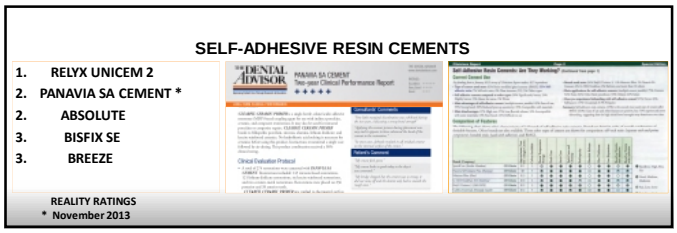
HOLD RESTORATION DOWN WHEN CLEAN ! NEED FINGER PRESSURE !

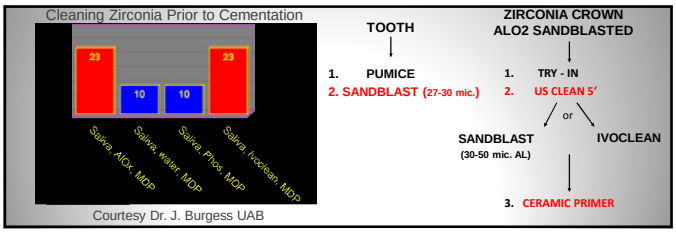


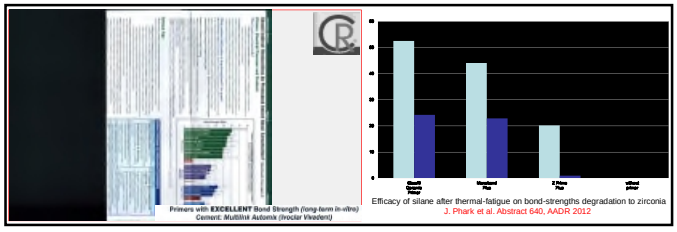



ZIRCONIA
1. Resin Ionomer
2. Adhesive Cement
if Need More Retention
SIMPLICITY

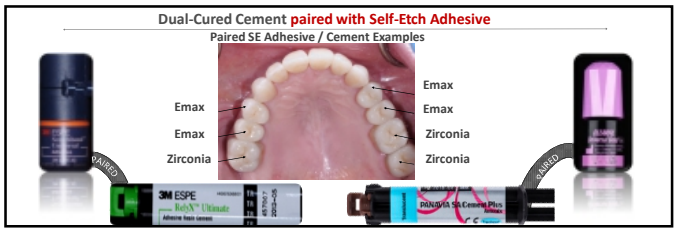

20.00
15.00
10.00
5.00
0.00
Bond strength [MPa]
Max
Unic
Unic Ap
BC
Pan SA
In vitro comparative bond strength of contemporary self-adhesive resin cements to zirconium oxide ceramics with and without air-particle abrasion.
Clinical Oral Invest 2010;14:187-92.
Blatz et al.


SELF-ADHESIVE RESIN CEMENTS
1. RELYX UNICEM 2
2. PANAVIA SA CEMENT *
2. ABSOLUTE
3. BISFIX SE
3. BREEZE
REALITY RATINGS
* November 2013

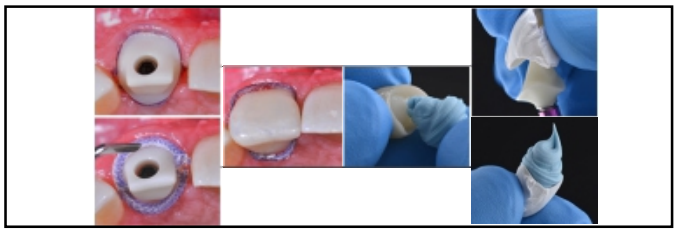

Cleaning Zirconia Prior to Cementation
23
10
10
23
Saliva, AlOx, MDP
Saliva, water, MDP
Saliva, Phos, MDP
Saliva, Ivoclean, MDP
Courtesy Dr. J. Burgess UAB
TOOTH
1. PUMICE
2. SANDBLAST (27-30 mic.)
ZIRCONIA CROWN
ALO2 SANDBLASTED
1. TRY - IN
2. US CLEAN 5'
or
SANDBLAST
(30-50 mic. AL)
IVOCLEAN
3. CERAMIC PRIMER


Efficacy of silane after thermal-fatigue on bond-strengths degradation to zirconia
J. Phark et al. Abstract 640, AADR 2012


ZIRCONIA
1. Resin Ionomer
2. Adhesive Cement
if Need More Retention
3. Same Paired SE / Cement
if want just One Bond system
SIMPLICITY


Dual-Cured Cement paired with Self-Etch Adhesive
Paired SE Adhesive / Cement Examples
Emax
Emax
Emax
Zirconia
Emax
Emax
Zirconia
Zirconia
PAIRED
PAIRED
3M ESPE
RelyX™ Ultimate


Increase Cervical Profile
Abutment Connection
2 weeks
4 weeks
6 weeks




Glass Ceramics
• 1 Best Translucency
• 2 Reduced Facial Thickness
• 3 Convenient & Versatile
• 4 Combines with Veneers
• 5 Plan Masking Strategy


THICKER the CERAMIC the BETTER it will MASK


Cantilever Connector Size
LiSiO2 H. 4.0mm X 2.0 mm Tsitru 2012
LiSiO2 H. 3.6 mm X 2.8 mm Sun 2013
Alvaro
Esthetic Fellow

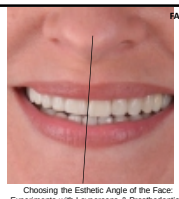
1. MIPP "Crowns"

"...Type of finish line (0.3mm-0.8mm.) did not significantly influence mean fracture strength of pressed lith. disilicate crowns... may not necessitate invasive finish line preps to ensure adhesion on enamel..."

Cortellini, D., "Durability and Weibull Characteristics of Lithium Disilicate Crowns Bonded on Abutments with Knife-Edge and Large Chamfer Finish Lines after Cyclic Loading. "Journal of Prosthodontics 24 (2015) 615-619.

RETRACTOR PHOTO WITH STRAIGHT HEAD

Mistake: Face is Tilted



Choosing the Esthetic Angle of the Face: Experiments with Laypersons & Prosthodontists
D. Behrend et al.
J. Prosthet. Dent. 2011, 106:102

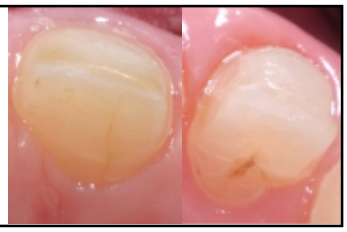
FACE BOW PERPENDICULAR TO STRAIGHT HEAD

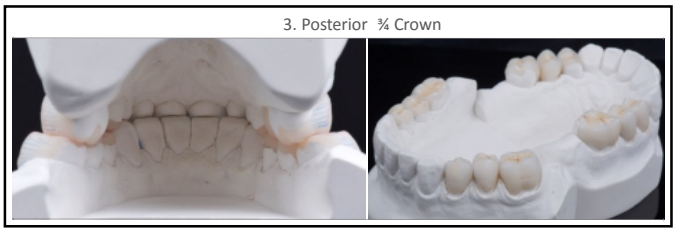
Mistake: Facebow is Tilted

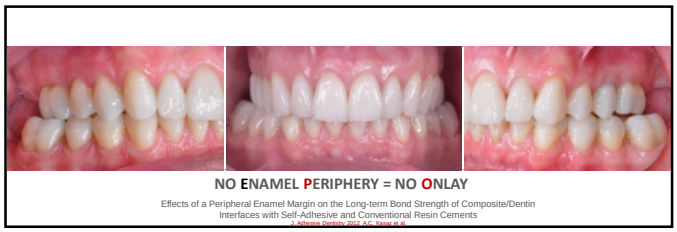
2. Anterior Three-Quarter Crown

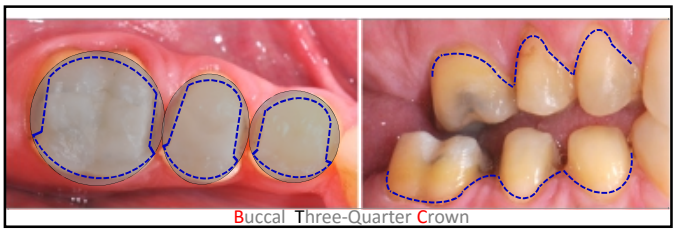
Indications
. Diastema Closure
. Proximal Composites
. Short Papilla & Black Hole
. Space Redistribution

Maintains Peripheral Enamel

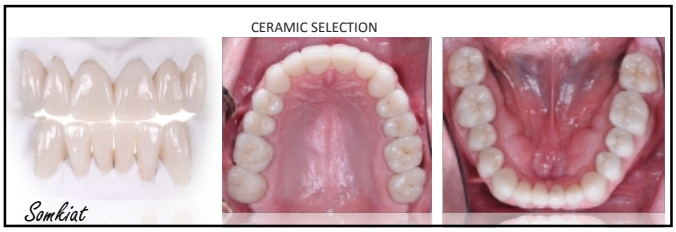



3. Posterior ¾ Crown


NO ENAMEL PERIPHERY = NO ONLAY
Effects of a Peripheral Enamel Margin on the Long-term Bond Strength of Composite/Dentin Interfaces with Self-Adhesive and Conventional Resin Cements


Buccal Three-Quarter Crown


V
FINAL THICKNESS
for
ALL-CERAMIC CROWNS


CERAMIC SELECTION
Somkiat

Erosion → Smooth Lingual Wear of Upper Anterior → Regurgitation

Cupping/Cratering → Lower 1st Molar Most Severe → Soda-Swishing

Cupping/Cratering → Even Posterior Wear Upper & lower → Fruit-Mulling

Less Frequent → Chewable Vit. C Asthma Spray → Chlorine

Abrahamsen TC, Inside Dent 2011;10:38-50

EMAX REQUIRED OCCLUSAL THICKNESS

1.0 mm. Sufficient if Adhesively **Bonded**

(Ivoclar – Vivadent 2016)

FACIAL MUSCULATURE

SCLEROTIC DENTIN

REQUIRED OCCLUSAL THICKNESS

1.5 mm. Minimum Adequate if **Cemented**

M. Kern et al. JADA 2012 143: 3: 234

Group 1: 2.0 mm. Group 2: 1.0 mm.

Group 3: 1.5 mm. Group 4: 0.5 mm.

. Specimens adhesively luted to die.

. Dynamic cyclic loading (380 to 390 N)

. In aqueous environment until failure.

"Reasonable to consider 1.5 mm or greater crown thickness for **milled** monolithic lith.disilicate crowns for posteriors"

REQUIRED OCCLUSAL THICKNESS

MUSCULATURE AFFECTS CHOICE & THICKNESS OF CERAMIC RESTORATION

FACIAL MUSCULATURE

SCLEROTIC DENTIN

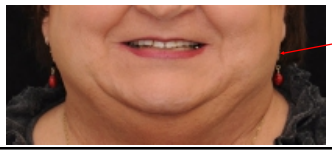
REQUIRED OCCLUSAL THICKNESS

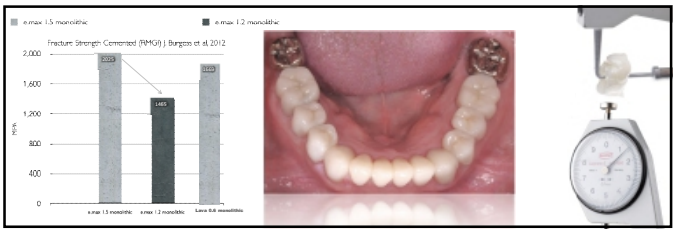
AT LEAST 1.0 MM. BONDED

CONSENSUS: LITHIUM DISILICATE for ANTERIORS ZIRCONIA for POSTERIORS

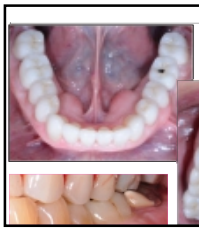
MAXIMUM BITE FORCE

- 500 N
- 700 N
- 1100 N





Monolithic Zirconia Crowns



Thickness for Safety **1.0 mm. and above**
Tooth Reduction **1.0 to 1.5 mm.**

Thickness			Fracture Strength
0.8 mm.	J Lee	2007	(N/A)
1.0 mm.	G Jang	2011	(3216 N)
1.0 mm.	S Jang	2013	(1780 N)
1.0 mm.	C Johanson	2013	(2795 N)
1.0 mm.	S Ting	2014	(2429 N)

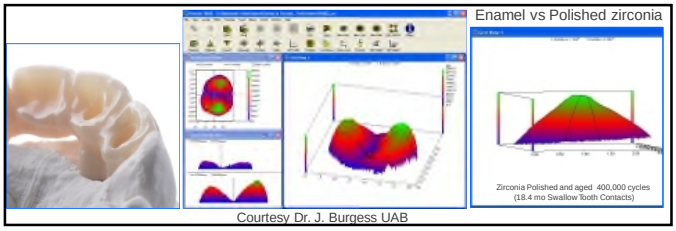
Zirconia Preparations

Specifications (D. Avery Drake Dental Laboratory)

1. Round Line Angles.
2. Final Thickness > 0.6 mm.
3. Occlusal Reduction.: 1mm -1.5 mm.
4. Rounded Shoulder – No Chamfer

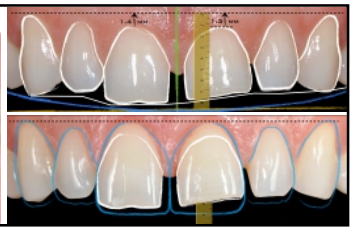
"Worst Scenario: Occlusal < 0.6 mm. Thick + Sharp Line Angles"

Enamel vs Polished zirconia



Courtesy Dr. J. Burgess UAB

INCREASED FLEXURE



BEST STRATEGY IF INCREASED RISK / FLEXURE

ALL-ENAMEL BONDING

INCREASED FLEXURE —ADDITIVE MATRIX

The Science and Art of Porcelain Laminate Veneers
G. Gurel Quintessence Pub. 2003

Limited Treatment – Level I

- Veneer Ceramics — Lithium Disilicate
- Bonding Substrate — Maintain Enamel
- Available Thickness — Augment Labial Volume

BASIC RISK MANAGEMENT

1. Veneer Preps in Enamel
2. Canine Guidance – not too Steep
3. High-Strength Ceramic
4. Occlusal Guard

Limited Treatment – Level I

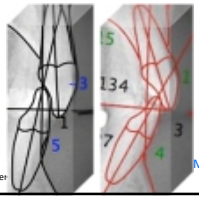
- Veneer Ceramics — Lithium Disilicate
- Bonding Substrate — Maintain Enamel
- Available Thickness — Augment Labial Volume
- Required Compliance — Occlusal Guard
- Difficult Cases — Test Drive w. Composites

Limited Treatment – Level II

CONTROL of ONE-ARCH

1. Adjust VDO
2. Gain Space
3. Increase Length
4. Improve Overbite
5. Reduce Anterior Force

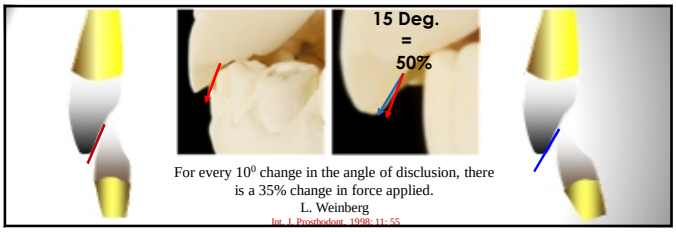
"Excessive Vertical Overlap"



SAFER

Open VDO
or
Move Teeth

Predictors of bruxism, other oral parafunction, and tooth wear over a 20-year follow-up per
Carlsson G. 2003



For every 10^0 change in the angle of disclusion, there is a 35% change in force applied.
L. Weinberg
Int. J. Prosthodont. 1998; 11: 55

VDO Decision – 4 Questions

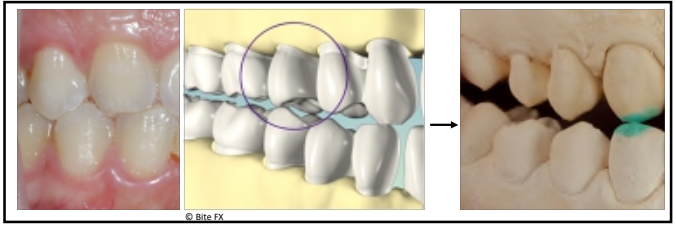
- 1 Restorative Space
- 2 Level Occlusal Plane
- 3 Esthetic Continuity
- 4 Reduce Vertical Overlap Generate Overjet

Comprehensive Treatment – Level III

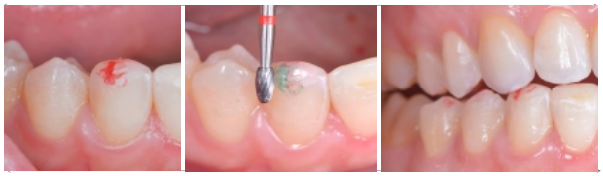
A. Control Vertical & Horizontal Overlaps

Dr. R. Elkattah & Mr. A. Torosian

Problem 2



Post-Delivery Apt. : Patient not comfortable



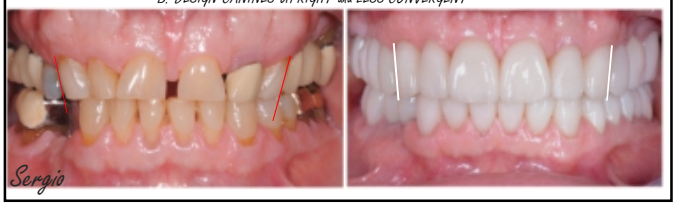
1. Shallow Guidance 2. Adjust Chewing pathway 3. Until Patient Comfortable…or

Amy & Jae-Sun

Group Function Indications

1. Weak or Mobile Canine
2. Canine Implant
3. Patient Does not tolerate Canine Guidance

B. DESIGN CANINES UPRIGHT and LESS CONVERGENT



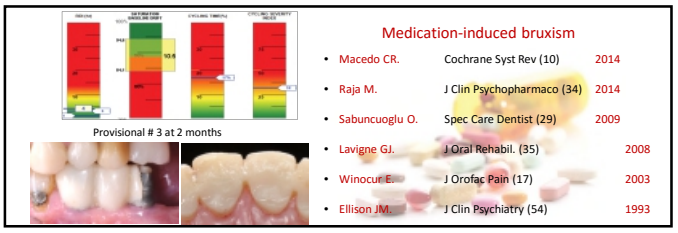
Sergio

C. Design Incisal Edge Support

Patient Management Level III

- A. Control Vert. & Horiz. Overlaps.
- B. Upright Canines.
- C. Provide Incisal Edge Support.
- D. Face Form & Masseters Thickness.
- E. Check for Breathing Disorders.


Problem 3
Broke 2 sets of Provisionals
Fractured Rehabilitation #1
Broke 2 sets of Provisionals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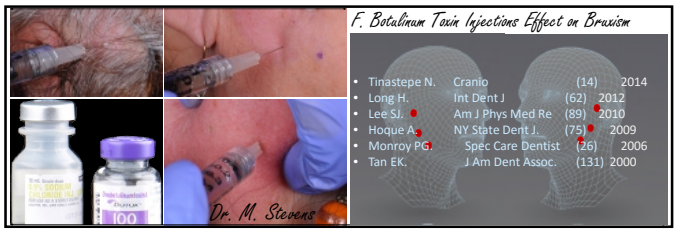
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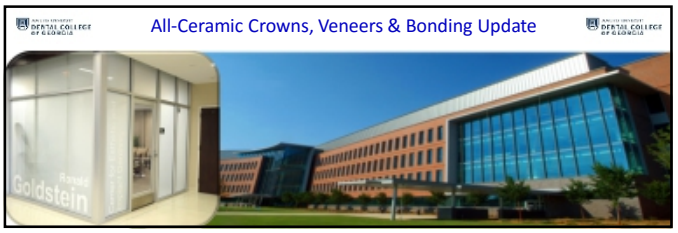
Dr. M. Stevens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Goldstein