Clinical Applications of CAD/CAM and All Ceramic Restorations in 2014

Practicing Minimally Invasive Dentistry
In light of Current Technologies

Practicing Minimally Invasive Dentistry with Durability and Esthetic in Mind

Current status of ceramic restorations

Most commonly suggested all ceramic restorations in 2013

- Indications
- Contraindications
- Clinical parameters
- Clinical procedures
- Suggested products
- Laboratory communication

Commonly Suggested Dental Ceramics

A. Lightly filled, high silica, low crystal, so-called feldspathic.
B. Heavily filled, low silica, high crystals, i.e. e. max
1. Press
2. CAD
C. Polycrystalline, no glass
1. Monolithic
2. Layered
Commonly Suggested Dental Ceramics

A. Lightly filled, high silica, low crystal, so-called feldspathic.

Minimally Invasive with Etched Ceramic Bonded veneers

Commonly Suggested Dental Ceramics

B. Heavily filled, low silica, high crystals, i.e. e.max
   1. Press
   2. CAD

Commonly Suggested Dental Ceramics

C. Polycrystalline, no glass
   1. Monolithic
   2. Layered

The basic color on centrals is opacious, A less translucent polycrystalline ceramic creates the desire color
A high translucent clinical outcome is best achieved with a high silica ceramic.

Etched Ceramic restorations
Reminiscent of minimally invasive procedures.

An artistry

Norm vs Exception
All Ceramic Restorations in 2014

**Variables involved**

- Different conditions

All Ceramic Restorations in 2014

**Variables involved**

- Different ceramics

All Ceramic Restorations in 2014

**Variables involved**

- Different surface treatments

All Ceramic Restorations in 2014

**Variables involved**

- Different clinical outcomes

All Ceramic Materials

**Fracture Toughness (MPa m^{1/2})**

- OMEGA
- EMPRESS 2, e.max CAD
- DICOR MGC
- EMPRESS MK II
- INCERAM -Al
- INCERAM -Zr
- PROCERA

All Ceramic Materials

**Flexural strength (MPa)**

- CLASSIC PORCELAINS
- INFILTRATED CERAMIC
- GLASS CERAMIC
- ALUMINA
- ZIRCONIA
All Ceramic Materials

Digital Dentistry, CAD/CAM Technology
- Truth and myth
- Current status
- Digital or analog or both
- Minimal invasive procedure
- Polychromatic restorations
- Cementation / bonding
- Handling

Universal simplified adhesives

Bond or Cement

Scientific Information

All Ceramic Restorations in 2014
Variables involved
- Different luting and bonding Materials

- Sufficient enamel.
- Canine guided occlusion
- Surface texture and characterization
- Good harmonious color
- No parafunction
Layering technique and feldspathic is suggested when prerequisites are met.

- Monolithic zirconia
- Layered zirconia
- Monolithic e.max
- Layered e.max
- Layered feldspathic

It is technically difficult to fabricate single anterior monolithic lithium disilicate or zirconia restorations.

Patient desire
- Tooth color restorations
- Less open bite

Ideal restorations
- Layered feldspathic crowns
Ideal treatment option

Functional occlusion and selection of ceramic

Ideal occlusion, sufficient enamel, no flexural loading, excellent color

Minimal invasive, excellent prognosis, excellent outcome

Large composite build ups and long ferrule ext.
Extensive composite build ups
Long ferrule extension
Supragingival margins
Light occlusal contacts

Best Option: Layered e. max or feldspathic

Patient request: Bleached teeth

8 & 9 crowns, 7 & 10 Veneers
- Excessive tooth loss of 8 & 9
- Excessive loading
- Excessive thickness of porcelain

8 & 9 crowns, 7 & 10 Veneers
- Monolithic zirconia
- Layered zirconia
- Monolithic CAD/CAM e.max
- Layered presses e.max
- Layered feldspathic

Best Option: Layered pressed e. max

Important
Three of them are covered with a similar strength silica based porcelain
Important

Under the ideal condition, three of them provide similar clinical outcomes
Tight over-jet

Endodontically treated # 8, restored with DT Post

- Extensive build up with composite
- Short ferrule extension
- Sub-gingival margin
- Light occlusal contacts

Pre-op; Feldspathic  Post-op; Zirconia

Restored with facially layered Zr crown

All Ceramic Restorations

- Layered feldspatic

Excellent for anterior-arch porcelain bonded to enamel veneers (non-discolored teeth)
All Ceramic Restorations
- Layered feldspatic
- Lithium-disilicate (e.max)
  A. Pressed
  360-400 MPa

Excellent for anterior etched porcelain bonded to enamel veneers
(discolored teeth, excessive flexural loading and insufficient tooth structure)

IPS e.max Indications
- Single unit crowns (anterior & posterior)
- Veneering discolored teeth
- Anterior teeth with extensive build ups

All Ceramic Restorations
Lithium-disilicate (e.max)
A. Pressed
B. CAD/CAM
Both pressed and CAD/CAM e.max may be layered to enhance the esthetic of the restoration

Recommended for stress bearing posterior FPD
(single or multiple units)

IPS e.max Indication
- Short span anterior bridge?
- Short span posterior bridges
Not suggested

All Ceramic Restorations
- Layered feldspatic
- Monolithic Lithium-disilicate
- Monolithic zirconia
900-1000 Mpa
Recommended for stress bearing posterior FPD
(single or multiple units)
All Ceramic Restorations
- Layered feldspathic
- Monolytic Lithium-disilicate
- Layered Lithium-disilicate
- Monolytic zirconia
- Fully veneered zirconia
- Facially veneered zirconia

All Ceramic Restorations
- Layered feldspathic
- Monolytic Lithium-disilicate
- Layered Lithium-disilicate
- Monolytic zirconia
- Fully veneered zirconia
- Facially veneered zirconia

Suggested for all anterior and posterior zirconia Restorations located in esthetic zone

Anterior FPD bridges

There is no reason to veneer the lingual or occlusal surfaces of a strong and esthetically acceptable zirconia restorations

The veneer layer is a silica based ceramic and susceptible to fracture upon excessive loading

There is no reason to veneer the lingual or occlusal surfaces of a strong and esthetically acceptable zirconia restorations

In light of current clinical observation, bonded or cemented monolytic Zr crowns are suggested for all posterior teeth when full coverage is indicated

What we did

What we do
Thank you