

THE DENTAL ADVISORTM

Improving Patient Care Through Research & Education



Looking back over 30 years - Indirect Restorations

Dental professionals strive to provide patients with the best restorative solution available. As materials evolve and change, it is important to assess the strengths and weaknesses affecting long-term clinical success. Over the past 30 years, material choice has expanded from gold, to porcelain fused to metal, to varying types of all-ceramics. Our data from the past 30 years offers a sound basis for recommended restorative options.

December 2013

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www.dentaladvisor.com

RATINGS:

Excellent + + + + +

Very Good + + + +

Good + + +

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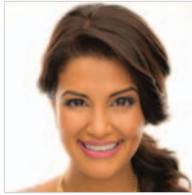
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From the Desk of Dr. Bunek, Editor-in-Chief

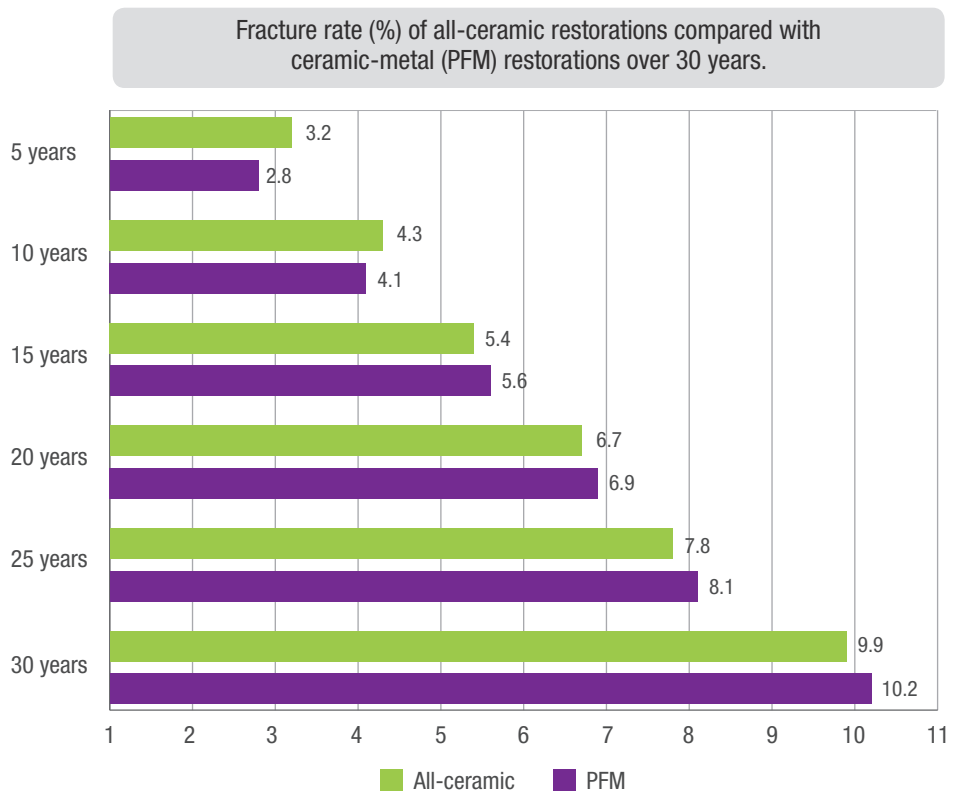


I have had the wonderful privilege of working with our founders, Drs. John Farah and John Powers over the past 12 years. I consider them leaders in the field and personal mentors. Their original mission in 1983 was to improve patient care through research and education. We have stuck to that goal by continuing to provide meaningful research and science, combined with practical tips on dental products and equipment. We continue to grow and change every day. In addition, our ability to report on the performance of products in the mouth over the last 30 years has become a cornerstone of our publication. We provide a unique perspective to dental professionals worldwide, providing a combination of clinical, laboratory and long-term reporting.

In this issue our co-authors, Dr. Santine Anderson, Dr. John Farah, and Dr. John Powers discuss our long-term data on indirect restorations, specifically cements and ceramics. Drs. Farah and Powers also share their experiences of the last 30 years. As always, I welcome your comments and suggestions: You can reach me at drbunek@dentaladvisor.com. Thank you for your continued support and reading!

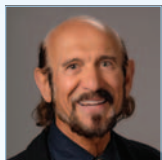
Ceramics vs PFM: The ongoing debate

The figure shows the fracture rate (%) of all-ceramic, monolithic restorations including crowns, inlays, onlays, and veneers monitored by THE DENTAL ADVISOR over 30 years. The first all-ceramic restorations were feldspathic porcelain (*Optec*), followed by leucite-reinforced ceramic (*IPS Empress*) and then lithium disilicate (*IPS e.max*). Eighty percent of the all-ceramic restorations were crowns. The figure shows that the fracture rate of all-ceramic restorations is similar to that of ceramic-metal (PFM) restorations over 30 years.



Ask Dr. Farah and Dr. Powers

Dr. John Farah and Dr. John Powers co-founded THE DENTAL ADVISOR in 1983. Both have unique perspectives on Dentistry; Dr. Farah has a dual Ph.D in Dental Materials and Aerospace Engineering and is also a practicing dentist. Dr. Powers has a Ph.D in Dental Materials and Mechanical Engineering, and has authored numerous papers and textbooks on the subject of dental materials. Below Drs. Farah and Powers were asked to comment on the trends seen since the inception of THE DENTAL ADVISOR in 1983.



What changes have occurred in indirect materials over the last 30 years?

By the mid 80's to the early 90's dentin bonding agents were becoming more reliable with bonds to dentin nearing bonds to enamel. This increased strength of bond to dentin helped to usher in a new era of adhesive and cosmetic dentistry. I placed my first porcelain inlays in 1982 and veneers in 1984, but I strictly bonded to etched enamel. I didn't fully consider the bond to dentin to be consistently reliable until 1990. After the improvement of dentin bond strength, inlays, onlays, and veneers in my practice remained stable over their first five years in function resulting in only one fractured inlay and no debonds. This data provided me with the confidence that porcelain restorations would last over the long term.

Q: What do you think the next 30 years will bring in terms of indirect materials?

A: Zirconia has grown in leaps and bounds over the past 4 years. This trend will likely result in development of a translucent zirconia over the next few years. The option of a translucent zirconia will greatly increase the use of monolithic ceramic, lower the per unit cost of such materials, and decrease the fracture rate of restorations. I envision zirconia and possibly *IPS e.max* prevailing considerably in the esthetic market possibly eliminating the need to veneer porcelain.

Q: If you were to do an esthetic case 30 years ago, what would you be using? What would you use today and why?

A: Thirty years ago I relied on bonding composites to anterior teeth. Minimal preparation was required because the bond was to enamel. I completed my first six anterior maxillary cosmetic case using *Prisma APH* (DENTSPLY/Caulk) in 1982 on a young patient with mild tetracycline stain. The patient was extremely happy with the result. More than 20 years ago, porcelains began evolving into a viable alternative to anterior PFM restorations. Porcelain fused to metal in the anterior was less than ideal, and all porcelain restorations offered a much more esthetic result. As ceramic properties including strength improved, full ceramic crowns were used also to restore posterior teeth. Although many dentists have hesitated to restore posterior teeth with all porcelain crowns, our data from 30 years show that the fracture rate of all ceramic crowns is no different than the fracture rate of PFM crowns.



Dr. Powers, what changes in materials have you seen in the last 30 years?

Resin composites have become stronger, more wear resistant, more color stable and more lifelike. Bonding to both enamel and dentin is predictable with modern bonding agents. Alloys used for crowns and bridges are being replaced with strong and esthetic ceramics. Traditional water-based cements have been replaced by esthetic, adhesive and self-adhesive resin cements.

Q: Dr. Powers, do physical and mechanical properties predict clinical success?

A: No, measurements of physical and mechanical properties will not replace the value of long-term clinical studies to evaluate clinical success. Properties measured in vitro do provide a standardized way to evaluate important properties that could be affected by manipulation and clinical variables.

Q: What trends do you see for the future in materials?

A: Traditional Bis-GMA composites will be replaced by composites with new monomers and nanofillers. Restorative materials with antimicrobial properties will be developed. Bioceramic liners, bases and cements that encourage remineralization will be commonly used. Improvements in the translucency of zirconia will make all-ceramic restorations the indirect material of choice. Digital imaging and processing will replace many traditional dental laboratory procedures.



The team at THE DENTAL ADVISOR would like to thank our founders, **Dr. John Farah** and **Dr. John Powers**, for their tireless contribution to dentistry and to our organization. Our team, editors and consultants are the best in the business, and make it possible for us to move forward into the future with a strong reputation as leading advisors in the field.

Benchmarking Long-Term Data – CERAMICS

Evaluating in vivo restorations over the past 30 years has given us the ability to report on indirect materials performance over time in the following areas as related to indirect restorative materials:

ESTHETICS

WEAR RESISTANCE

RESISTANCE TO FRACTURE AND CHIPPING

Each of these criteria represent a clinical challenge over the long term. The ideal restoration will look natural, have high strength, and resist color shift and marginal discoloration over time from external factors.

Fracture and Chipping

There are many reasons why all ceramic restorations fail, including:

- Improper tooth preparation
- Improper bonding/cementation
- Pre-existing internal cracks due to processing high occlusal forces/bruxism
- Age of restoration

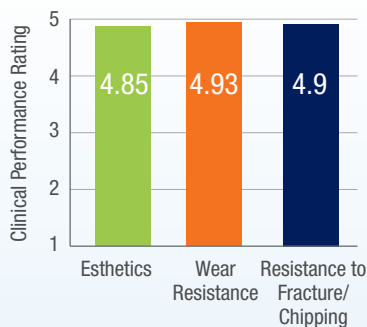
Wear Resistance

Although many will argue that wear of ceramic and opposing dentition is an issue, our recall data for both all-ceramic and zirconia show very little wear.

Esthetics

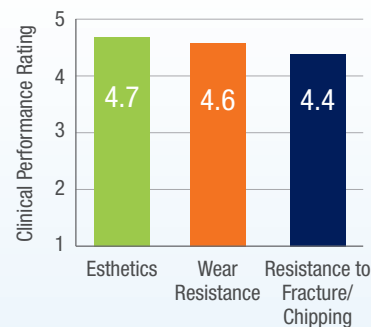
All-ceramic restorations are designed with extraordinary esthetics in mind. Our long-term data have shown very little esthetic concerns; restorations look vibrant and life-like, even after many years.

IPS e.max Press 5 years



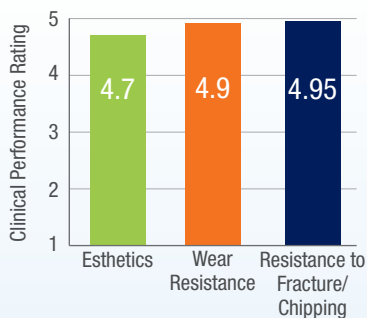
Tooth #5, IPS e.max Press at 5 years.

3M ESPE Lava Crowns and Bridges 10 years



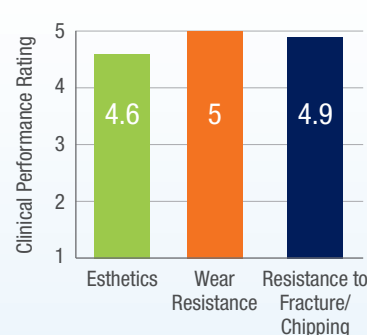
Tooth #15, Lava Crown at 8 years.

BruxZir 2 years



Tooth #15, BruxZir at 2 years.

NexxZr 1 year



Tooth #30-31, NexxZr at 1 year.

Benchmarking Long-Term Data – CEMENTS

At recall, the following parameters are assessed:

RESISTANCE TO MARGINAL DISCOLORATION

RETENTION

LACK OF SENSITIVITY

The ideal cement will not cause sensitivity in patients, retain the bond to tooth structure, and resist color shift.

Resistance to Marginal Discoloration

Microleakage of restorations has been implicated in:

- Dentin sensitivity
- Secondary caries formation
- Discoloration of dental materials

Retention

Debonds can be avoided by properly preparing tooth and the intaglio surface of the restoration. Keep in mind retention and resistance form when selecting a cement; less retentive preparations require a higher strength adhesive cement.

Lack of Sensitivity

Post-operative sensitivity is reported by patients at recall appointments. It has been reported that using the total etch technique increases sensitivity over time as opposed to using a self-etch technique.

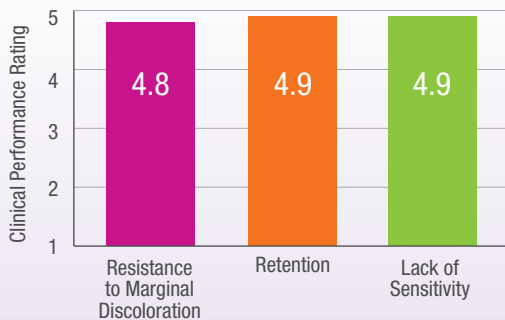
3M ESPE Rely X Unicem 10 years



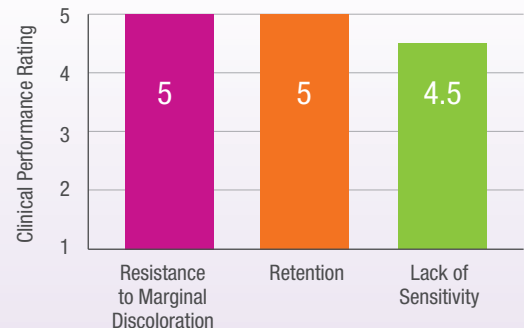
G-CEM Automix 2 years



Multilink Automix 3 years



MOJO Veneer Cement 2 year



3M ESPE Lava™ Crowns and Bridges

3M ESPE
(800) 634-2249 | www.3mespe.com

Description

3M ESPE Lava™ Crowns and Bridges are CAD/CAM processed, zirconia-based restorations overlaid with an appropriate zirconia veneering ceramic. The zirconia copings and frameworks provide the long-term strength while the veneering material is designed for optimal esthetics and shape. The zirconia substructure is colored with one of the seven available shades, to coordinate with the final restorations. The system is used for anterior and posterior crowns, implant crowns, bridges with a span of up to 48 mm in length and two-piece abutments.

Clinical Evaluation Protocol

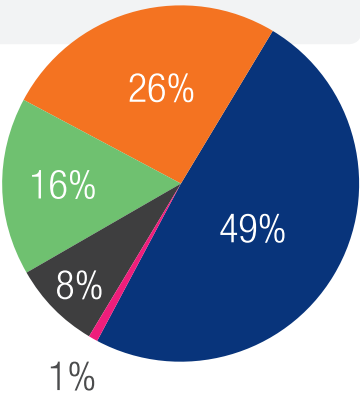
Over 1300 Lava restorations have been placed and documented since 2003. These restorations include anterior and posterior crowns, three- to six-unit bridges and implant crowns. Most restorations were cemented with 3M ESPE RehyX Unicem Self-Adhesive Universal Resin Cement.

- One thousand and eight restorations were recalled at year ten. The distribution of restorations evaluated is shown in Figure 1.
- Restorations were rated on a 1-5 scale, 1=poor, 2=fair, 3=good, 4=very good, 5=excellent.

FIGURE 1

Distribution of restorations evaluated at recall.

- Implants/Crowns
- Bridges
- Anterior
- Premolar
- Molars



Clinical Observations

Resistance to Fracture and Chipping

The fracture and chipping of Lava restorations at 1, 5, and 10 years of service are shown in Figure 2. The majority (89%) of Lava restorations showed no evidence of fracture or chipping at 10 years (Figure 3).

Of the recalled restorations, 61 fractured and therefore were replaced because they received a rating of 1 or 2 out of 5. In many cases the fractures resulted in the delamination of a large portion of the veneering ceramic, and the restorations could not be polished or repaired. Forty-seven restorations received a rating of 3 or 4.

These restorations were chipped restorations that either did not need any smoothing or polishing or were polished and smoothed satisfactorily. In most cases the patient was not aware that the restoration had chipped.

The causes of the fractures may be the result of:

- rapid heating or cooling of the veneering ceramic or
- the thickness of unsupported porcelain.

Rapid cooling of the restoration can result in the buildup of undesirable stresses within the restoration. Failure from rapid heating or cooling is normally experienced shortly after cementation of the restoration. The veneering porcelain disintegrated in these instances. This type of failure occurred in less than 10% of the failed restorations. None of the fractures involved a zirconia substructure or coping failure. The overlay fracture

10-year Clinical Performance

++++ 1/2



Tooth #15, Lava Crown at 8 years.

Consultants' Comments

- "I have been very pleased with the Lava restorations."
- "My patients love the life-like quality of Lava restorations and prefer them over the grayness of PFM crowns."
- "The esthetics and clinical longevity of anterior restorations over a ten year period have been exceptional."
- "Lava has been my restoration of choice for anterior and pre-molar crowns."

Laboratory Comments

- "As the owner of a dental laboratory, it is much more gratifying to work with zirconia as compared to metal, because the esthetic results are superior."

3M ESPE Lava™ Crowns and Bridges 10-year Clinical Performance (cont.)

FIGURE 2 Results of Fracture/Chipping of *Lava* Restorations over 10 Years.

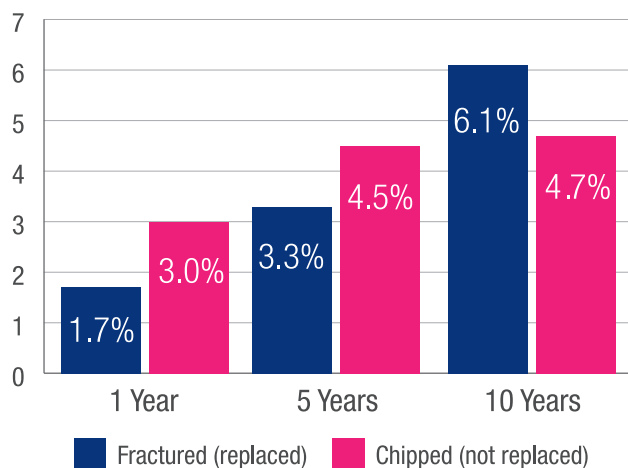


FIGURE 3 Ratings of *3M ESPE Lava Crowns and Bridges* at 10 years.

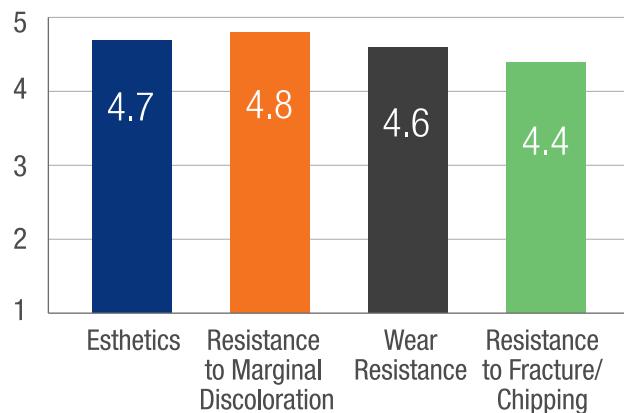


Table 1. Location of fracture/chipping of veneering ceramic of *Lava* restorations.

Teeth	# of Restorations	Fractures	% Failures
Molars	580	45	7.8%
Pre-molars	264	10	3.8%
Anterior	164	6	3.7%
TOTAL	1008	61	6.1%

rate (6.1%) at 10 years is higher by 1.8% than all-ceramic restorations documented by THE DENTAL ADVISOR over a 10-year period but in the same range of published PFM performance statistics. Molar crowns fractured twice as often as pre-molar crowns and anterior crowns (Table 1). Upper anterior crowns fractured more often than lower anterior crowns. Upper anterior crowns are especially prone to fracture in people who are bruxers.

Esthetics

The vast majority of *Lava* restorations received a 5 or excellent rating for esthetics (Figure 3). Only 50, or 4.8%, of 1008 restorations received a rating less than 5. *Lava* restorations definitely have superior esthetics when compared to PFM restorations, especially because the *Lava* coping can be shaded to closely simulate dentin, eliminating the graying caused by a metal substructure. Once the patient experiences the esthetics of a *Lava* zirconia-based restoration, they are elated with the outcome.

Resistance to Marginal Discoloration

Over 97% of *Lava* restorations received an excellent rating for resistance to marginal discoloration (Figure 3). One advantage of *Lava* crowns is that the margin of the opaque core is very close to the margin of the preparation. These thin opaque margins reduce or eliminate graying due to microleakage that can be visible in more translucent restorations. During the 10-year evaluation, only 2.4% of the restorations exhibited graying at the margins.

Wear Resistance

Over 97% of *Lava* restorations received an excellent rating for resistance to wear (Figure 3). A small number (2.8%) of the recalled restorations exhibited some wear of the overlaid ceramic at 10 years. Minimal to moderate wear was noted in about 15% of the teeth opposing *Lava* restorations; this wear was mostly visible in anterior teeth.

Summary

3M ESPE Lava Crowns and Bridges performed well over the 10-year evaluation period with very good resistance to fracture and marginal discoloration and minimal wear. *3M ESPE Lava Crowns and Bridges* received a 93% clinical performance rating at 10 years. ■

ZNano

Danville Materials
(800) 827-7940 | www.danvillematerials.com

Description

ZNano is a universal composite filled with zirconia-silica nanoparticles. It is indicated as a direct restorative for all cavity classes in anterior and posterior teeth. The zirconia fillers are 80 nm in size and are harder than traditional barium glass fillers. **ZNano** has a high radiopacity and is reported to provide long-term fluoride release. It can be used with any bonding agent system and light cures in 20 seconds. **ZNano** is available in 13 shades, including seven Vita shades plus A5, three opaque shades, Opalescent A2 and Bleach White. **ZNano** is available in 4 g syringes and 0.2 g unit-dose capsules. **ZNano** intro kit was evaluated by 35 consultants in over 1400 uses. This universal composite received a 96% clinical rating.

Suggested Retail Cost	
Trial kit (4 shades 1.5 gm syringes)	\$113.95
Trial kit (4 shades unit dose, 20 total)	\$89.95
Intro kit (7 shades)	\$513.95
4gm refill	\$78.95
20 unit dose refill	\$89.95

Product Features

ZNano composite is filled 73% (by weight) with spherical particles that enhance its handling and physical characteristics. The medium viscosity of the material is soft enough to adapt to the preparation yet firm enough to sculpt. Most restorations could be completed with a single shade and blended well with the tooth, although cured shades were a little darker than the shade guide. Restorations finished nicely and polished to a high shine. Thirty-four percent of consultants rated **ZNano** better than other universal composites they were using and 46% rated it equivalent. Sixty percent would switch to **ZNano** and 86% would recommend it to a colleague. ■

ADENNA Self-Sealing Sterilization Pouches

Adenna Inc.
(888) 323-3662 | www.adenna.com

Description

ADENNA Self-Sealing Sterilization Pouches are indicated for use in steam and ethylene oxide sterilizers. They are manufactured in an ISO certified facility under strict quality control. They feature internal and external indicators for sterilization confirmation, triple-sealed seams, and a thumb-notch for easy opening. **ADENNA Self-Sealing Sterilization Pouches** are constructed using durable, medical-grade paper with a blue-tinted transparent film for easy viewing of instruments and tears, should they occur. ADENNA Pouches are available in 12 sizes in 100 or 200-count boxes. **ADENNA Self-Sealing Sterilization Pouches** were evaluated by 27 consultants in over 5800 uses. This sterilization pouch received an 86% clinical rating.

Product Features

ADENNA Self-Sealing Sterilization Pouches come in a variety of sizes that are useful in the dental office. The presence of internal and external indicators confirms sterility of the contents. The triple-sealed seams are strong enough to contain heavy instruments without ripping during insertion. The strip is easy to peel from the adhesive band, and the paper

++ ++



Consultants' Comments

"A nice composite for most applications."

"Very good shade match with fewer shades needed."

"Convenient packaging of capsules."

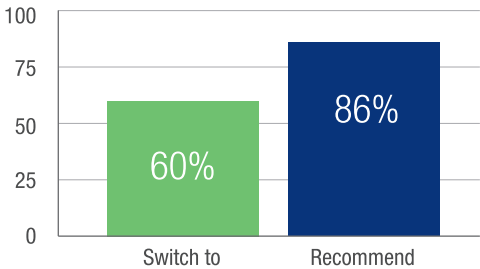
"On radiographs margins were defined and clearly visible."

"Finishes nicely; polishes to a high luster."

"A little sticky to instruments, especially the syringe material."

"Color code syringes and unit-dose capsules by shade."

Percentage of consultants who would:



++ ++

Consultants' Comments

"Bags are sturdy."

"The internal indicator is an important feature."

"Pouches are easy to seal and open."

"Color change is obvious."

flap folds neatly at the perforation. 22% of consultants rated **ADENNA Self-Sealing Sterilization Pouches** better than other pouches they were using and 41% rated them equivalent. 52% would switch to **ADENNA Self-Sealing Sterilization Pouches** and 63% would recommend them to a colleague.

Clinical Tips

- Instruments should be dry before placing them in the pouch.
- Place pouches paper-side up in traditional autoclaves and paper-side down in Class B sterilizers that feature vacuum drying. ■

TheraCal LC

Bisco Dental Products

(800) 247-3368, (847) 534-6000 | www.bisco.com

Purpose

The purpose of this clinical study was to determine the clinical performance of **TheraCal LC** (Bisco Dental Products).

Placement

One-hundred sixty-five restorations were evaluated at placement for:

- Type of tooth
- Level of caries risk
- Type of pulp cap
- Bonding agent and restorative material used
- Patient sensitivity before placement

The types of teeth and types of restorations are indicated in Figures 1 and 2. Eight restorations were noted as being very deep. There were no direct pulp caps. All placements were indirect pulp caps or simply liners under deep restorations or teeth with a history of significant sensitivity. Levels of caries risk are indicated in Figure 3. The teeth were restored using 16 resin composites, two ceramics and 11 self-etching bonding agents.

Results at One Year

Recalled restorations were evaluated in the following categories:

- Postoperative sensitivity as reported by the patient
- Necessity of endodontic treatment
- Percentage of direct and indirect pulp caps that required endodontic treatment
- Percentage of teeth classified by caries risk that required endodontic treatment

Of the 14 restorations eligible for six-month recall, nine were available for evaluation. No postoperative sensitivity was reported by patients. None of the teeth required endodontic treatment.

Of the 165 restorations placed, 113 have been in place for six months and 32 restorations are eligible for one-year recall. Eight restorations were noted as deep. Three of these later required a root canal treatment after six months. One tooth was extracted due to a large fracture.

Summary

TheraCal LC had excellent performance at six months and one year. No postoperative sensitivity was observed at six months or one-year after placement in 98% of the restorations. Of the three teeth (2%) requiring endodontic treatment, all were originally noted as being deep fillings. None of the restorations placed over **TheraCal LC** debonded or showed signs of marginal discoloration. **TheraCal LC** received a 98% clinical rating at the one-year recall. ■

1-year Clinical Performance

+++++



Consultants' Comments

"TheraCal LC has become part of my daily practice in the placement of direct restorations."

"TheraCal LC is truly effective in preventing the post-operative sensitivity often associated with deeper restorations."

"I am convinced that this liner actually helped prevent some root canal treatments."

FIGURE 1

Types of teeth included at placement.

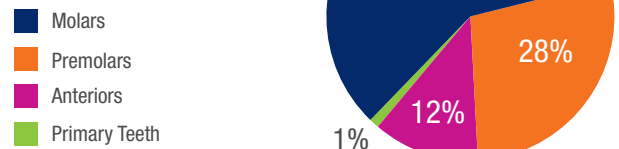


FIGURE 2

Types of restorations placed.

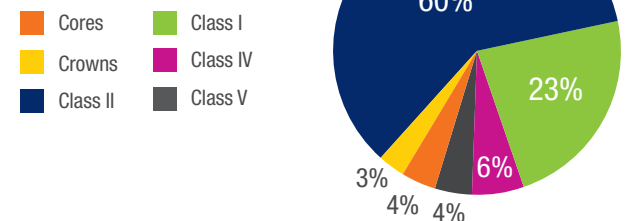
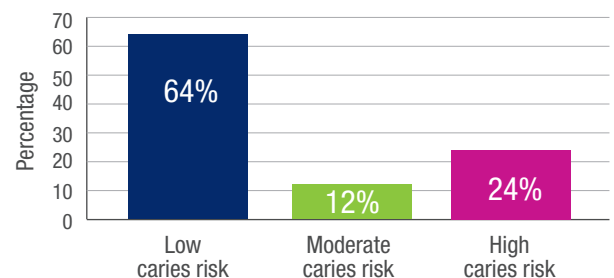


FIGURE 3

Levels of caries risk at placement.



Cinema ProMED System

Total 3D Solutions

(248) 494-4460, (248) 494-4431 (F) | www.total3Dsolutions.com

Description

The **Cinema ProMED System** is a patient entertainment and distraction system powered by **ZEISS Cinemizer OLED** multimedia viewing glasses. **Cinemizer OLED** multimedia video glasses simulate a 40-inch screen and Sony headphones provide sound. The glasses use binocular 3D and LED technology and have individual focus adjustments for each eye. **Cinemizer OLED** is designed to divert a patient's attention as they watch media (2D or 3D) or listen to music. The **Cinemizer OLED** is compatible with 4th-generation *iPods* and *iPhones* and HDMI-compatible devices such as gaming consoles, Blu-ray players or computers. Play time is approximately six hours per charge. Along with the video glasses and headphones, the kit provides instructions on a USB drive; downloadable videos, including some relaxation videos; appropriate cables; *iPod* dock; headphone ear covers; and lens wipes in a sturdy case. The glasses may be disinfected using disinfectant wipes and the headphone covers are for single-patient use. **Cinema ProMED System** was evaluated by 12 consultants in 117 uses. This patient entertainment system received a 90% clinical rating.

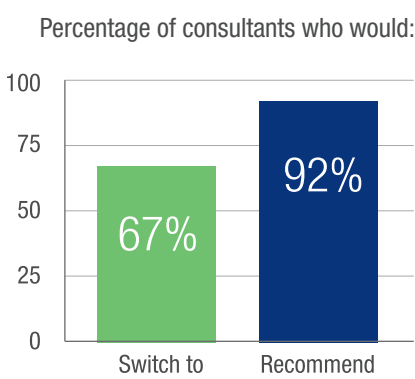
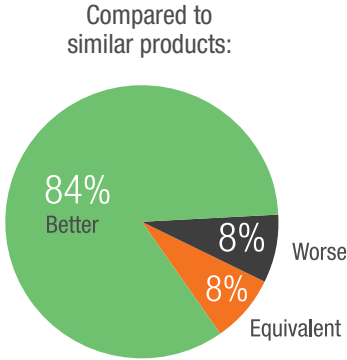
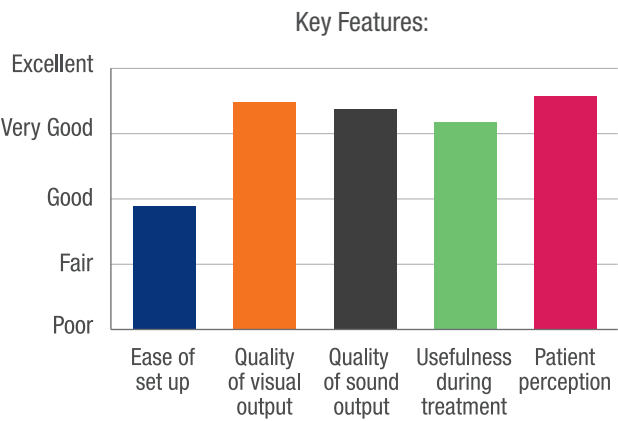
Suggested Retail Cost \$1239/system

Equipment Features

The majority of uses (83%) during the evaluation of **Cinema ProMED System** involved connection to an *iPod* to stream videos via Netflix or view downloaded videos suggested by the manufacturer. PCs, iPhones and the patients' own devices were also used. Initial set-up of *iPods* and downloading videos was challenging for many consultants, even with video instructions provided. After the initial set-up, the device is easy to use. Patients were comfortable with the glasses and headphones in place and often commented that they forgot they were at the dentist. Ninety-two percent of the time consultants found it easy to treat patients while using the **Cinema ProMED System**; it did not get in the way or impede access to the oral cavity. Ten of the 12 consultants reported that **Cinema ProMED System** reduced patient anxiety and helped keep the patient still by providing a distraction to their dental work. Controls are sensitive and patients would sometimes accidentally turn the movie off during use.

Clinical Tips

- The manufacturer suggests connection to *Netflix* with an *iPod* with a wi-fi connection.
- A list of 30- and 60-minute *Netflix* suggestions is provided to limit patient selection time.
- Charge the unit between patients. ■



Consultants' Comments

"Best new piece of technology that I've incorporated in years."

"Reduces my stress by aiding in patient relaxation."

"Patients were thrilled with this new technology."

"Sleek design - it didn't hinder my treatment at all."

"Patients wanted to stay to finish their movies after their treatment was done."

"Best suited for long procedures."

"Set-up is difficult for those who are not tech savvy."

"Most set-ups rely on a wi-fi connection, which was not always reliable in my case."

"Develop a longer battery life."

"Arm length on glasses should be adjustable."

"Put the volume control on the headphone cable to avoid shutting the unit off accidentally."

Editors' Note

Since the evaluation, the supplier has revamped their training videos, added the option to purchase a preloaded *iPod* and will be integrating an Android-based entertainment system to give the patient full control. The manufacturer now includes a light-blocking shield in the kit. This piece attaches to the glasses to reduce the ambient light and improve the viewing experience.

Tetric EvoCeram Bulk Fill

Ivoclar Vivadent, Inc.

(800) 533-6825 | www.ivoclarvivadent.com

Description

Tetric EvoCeram Bulk Fill is a nano-hybrid composite for direct restorations in posterior teeth. This radiopaque composite contains patented pre-polymers that reduce shrinkage stress, Ivocerin™ (a new photo-initiator) for a deeper depth of cure and light sensitivity filters for extended working time. The composite is filled 53- 54% by volume with particles in the 40 to 3000 nm range. **Tetric EvoCeram Bulk Fill** cures in 10 seconds and can be placed in layers up to 4 mm.

Clinical Evaluation Protocol

Over the past 18 months, well over 100 **Tetric EvoCeram Bulk Fill** restorations were placed. At one year 68 restorations that included one- to four-surface posterior restorations were recalled (Figure 1).

The recalled restorations were evaluated in the following areas: Lack of sensitivity, esthetics, resistance to fracture/chipping, resistance to marginal staining, and wear resistance. Restorations were evaluated on a 1-5 rating scale: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent.

Results at One Year

Lack of Sensitivity

Tetric EvoCeram Bulk Fill restorations were bonded with self-etching bonding agents. None of the patients reported any postoperative sensitivity (Figure 2). The product's patented technology that reduces polymerization shrinkage may have contributed to the lack of postoperative sensitivity.

Esthetics

Although **Tetric EvoCeram Bulk Fill** restorations were slightly translucent, all of the recalled restorations exhibited excellent esthetics at one year (Figure 2).

Resistance to Fracture/Chipping

Only one of the 68 restorations fractured and had to be replaced. None of the restorations exhibited chipping (Figure 2).

Resistance to Marginal Staining

Two restorations exhibited slight staining at the cavosurface margin (Figure 2). These restorations were repolished.

Wear Resistance

No wear was observed on any of the restorations or opposing teeth (Figure 2).

Summary

Tetric EvoCeram Bulk Fill performed extremely well at one year. It received a 99% clinical performance rating. ■

1-year Clinical Performance

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Tetric EvoCeram Bulk Fill restoration, No. 3 at 1 year

Consultants' Comments

"An excellent composite."

"Good results without layering."

"This is now my 'go to' product for posterior composites."

"Great esthetics."

"Easy to place, not sticky and easy to finish and polish – very dentist friendly."

FIGURE 1

Distribution of Recalled Restorations.

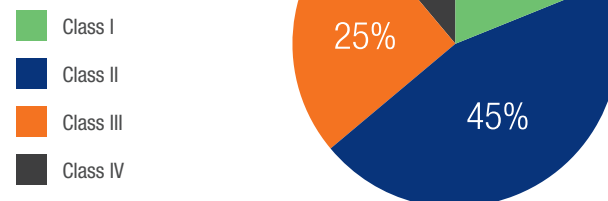
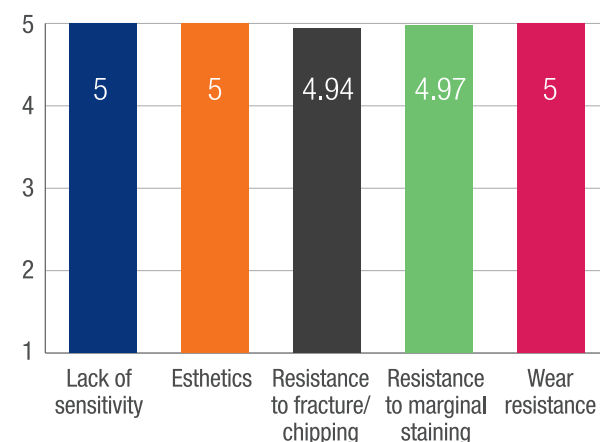


FIGURE 2 Results of **Tetric EvoCeram Bulk Fill** at One-year Recall.



CS 8100

Carestream Dental

(800) 944-6365 | www.carestreamdental.com

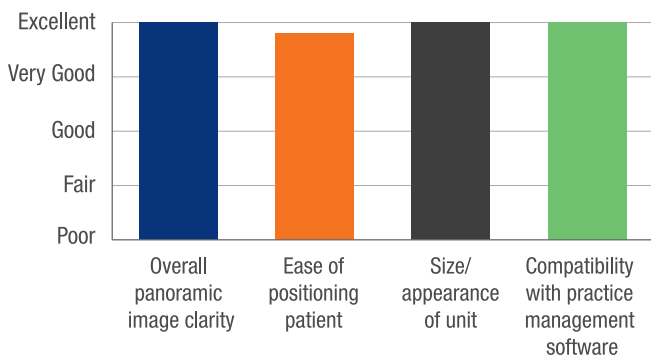
Description

The **CS 8100** digital panoramic system is a compact x-ray unit and dental imaging software. The system can be installed on a stand-alone computer or integrated with the existing practice management software on a network via an ethernet connection. The unit is designed with transparent patient supports and face-to-face positioning for ease of alignment. The **CS 8100** unit consists of a high frequency generator, the *Active Pixel* CMOS sensor, and vibration-free motion system with a 0.5 mm focal spot. The increased thickness of the focal trough offers greater tolerance for challenging anatomy or imperfect positioning in the anterior region. The dental imaging software offers a range of image options including standard panoramic images, segmented pans, TMJ, and maxillary sinus images. Additionally, the system is equipped with *Carestream's* exclusive 2D+ program allowing clinicians to view seven buccal-lingual slices along the jaw. The **CS 8100** was evaluated by 10 consultants in 207 uses. This digital panoramic system received a 99% clinical rating.

Equipment Features

The quality of panoramic images produced with the **CS 8100** is outstanding. Consultants were unanimous in rating the clarity of images as excellent. The software is easy to operate and integrates seamlessly with the practice management system. Image acquisition involves first selecting the image type and patient size on the computer. Pre-set programs minimize user input and the chance for errors in exposure. Since the patient faces outward, positioning is done through face-to-face alignment with fixed markings on the unit. Exposure takes just a few seconds and is immediately viewable on the computer monitor. After installation and a brief training presentation, consultants reported that they were able to use the **CS 8100** as part of their daily routine.

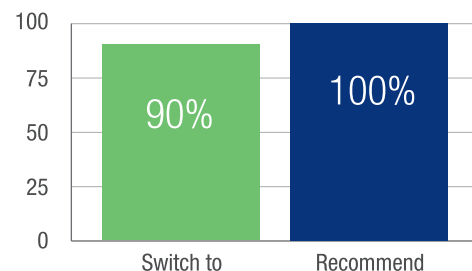
Key Features:



CS 8100 compared to other digital panoramic systems



Percentage of consultants who would:



SPECIAL THANKS TO:

Select Senior Clinical Consultants (Over 20 years):

J. Amara, CT · R. Fisher, OH · W. Gregory, MI · E. Katkow, MD · J. Lockwood, MI · J. Mayer, OH · W. Nagy, TX · G. Poy, MI · J. Shamraj, MI · R. Trushkowsky, NY · P. Yaman, MI

Senior Clinical Consultants (15-19 years):

S. Anderson, MI · R. Anthony, OH · K. Baker, TX · F. Berman, PA · L. Brimhall, MT · M. Briskin, NY · L. Brown, MI · R. Ciccone, MI · C. Colbert, MI · M. Conrad, PA · J. Dingman, WI · J. Doueck, NY · M. Dwoskin, MI · M. Eannaccone, NY · R. Engle, IL · K. Fairbanks, MI · K. Fischer, IN · G. Franco, NY · N. Garlisi, OH · K. Goodman, MI · S. Graber, IL · P. Grandsire, NY · E. Gutman, NY · K. Hamlett, TX · G. Hart, OH · R. Herwig, KS · J. Kaminski, MI · R. Kaprielian, NJ · M. Kastner, OH · C. Kehr, MI · M. LaMarche, WA · J. Leitner, MI · R. Lezell, MI · M. Livernois, NC · B. Manne, FL · N. Mansour, MI · N. Markarian, CA · J.W. Mikesell, IL · G. Mosso, PA · E. Mosso, PA · E. Odenweller, OH · J. Paris, TX · D. Parris, GA · D. Peterson, MD · T. Pieper, WY · D. Pitak, MI · V. Plaisted, NY · D. Qualliotine, NC · C. Reed, MI · K. Schwartz, FL · J. Shea, MO · B. Shumaker, NJ · B. Sims, NY · H. Tetelman, OH · C. Trubschenck, CA · P. Tu, CA · S. Ura, NH · W. Walcott, MI · L. Wee, MI · D. Wojtowicz, MI · R. Wilkie, MI · M. Zahn, MI

Clinical Consultants (14 years or less):

A. Albright, NY · N. Alexa, MI · B. Argersinger, NC · A. Bagchi, MI · B. Barricklow, OH · L. Bartoszewicz, MI · J. Bechtel, MI · C. Bhatti, MI · L. Bishop, MI · T. Bizga, OH · J. Bostic, OH · N. Brezden, MI · C. Brown, LA · W. Brownscombe, MI · S. Bunek, MI · J. Bunek, MI · J. Bush, PA · H. Cadorette, MI · P. Campo, NY · D. Chacko, TN · P. Chaiken, IL · W. Co, MI · P. Cracchiolo, MI · S. Dillingham, NY · R. Dost, VA · A. Dutko, MI · M. Eford, MI · O. Erdt, MI · F. Facchini, MI · M. Feinberg, NY · L. Feldman, NJ · M. Fluent, MI · L. Gee, OK · C. Goldin, MI · B. Greenwood, UT · P. Gronet, KY · H. Gulati, MA · D. Haas, Ontario · J. Haddad, MI · J. Hastings, CA · D. Hauck, CA · J. Hengehold, MI · B. Herrmann, CA · D. Hock, MI · C. Huang, CA · J. Ireland, MI · C. Jaghab, MI · J. Jaghab, MI · M. Kachi-George, MI · D. Kapp, NY · J. Karam, MI · S. Kazan, MI · E. Kelly, GA · J. Kelly, GA · L. Kemmet, MN · D. Keren, NY · M. Koczarski, WA · B. Kolb, MI · C. Latham, OH · R. Le, NC · S. Lever, MD · I. Levine, NY · E. Lowe, BC, CAN · J. Lusby, MI · M. Man, NY · C. Manduzzi, MI · K. Mantzikos, NY · F. Margolis, IL · M. Mason, NY · T. McDonald, GA · C. McLaren, MI · J. McLaren, MI · M. McMullin, MI · H. Menchel, FL · M. Migdal, MI · J. Minsky, CA · R. Mizrahi, NY · M. Moeller, MI · G. Molinari, MI · L. Montes, NY · M. Murphy, MI · J. Nash, MI · A. Nazarian, MI · N. Nealis, IL · M. Nemeth, MI · C. Noe, MD · J. Olitsky, FL · J. Olsen, MI · F. Orlando, NY · R. Oshrain, NY · A. Overall, MI · M. Paquette, MI · J. Parrott, MI · M. Patel, MI · T. Poirier, MI · G. Raichelson, Ontario · G. Ramos, NY · C. Ramsey, FL · T. Reeves, TN · N. Rego, CA · G. Reskakis, NY · J. Riggs, MI · J. Rowe, AR · F. Ruder, FL · A. Saddy, MI · L. Seluk, MI · R. Selvan, NJ · M. Shapiro, MI · J. Smith, MI · C. Stevens, OK · B. Stevenson, MI · P. Symeonides, NY · S. Tamber, MI · S. Tamber, MI · G. Tarantola, FL · T. Teel, IN · T. Trullard, MI · M. Vanderbeek, MI · H. Vann, MS · M. Waranowicz, MI · J. Wehr, MI · L. Williams, MI · K. Wilson, MI · D. Wolf, MA · W. Wright, CA · H. Yeung, CA · D. Young, MI · J. Zanetti, MI · S. Zimmer, MI

Laboratory Consultants:

Apex Dental Milling, MI · Bullinger Dental Lab, MI · Centric Dental Laboratory, TX · Cornerstone Dental Studio, Inc., MI · David's Dental Laboratory, NY · Expertec Dental Lab, MI · Heritage Dental Laboratory, IL · Technique Crown and Bridge, Inc., NC

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Consultants' Comments

"One of the easiest machines to use."

"Clear, crisp images."

"Small, compact unit."

"Software is intuitive."

"The 2D+ feature is useful in determining the buccal-lingual relationship of objects in the images."

Clinical Tip

- For best image quality, select the proper arch form and size based on the patient's anatomy. ■