

THE DENTAL ADVISORTM

"Improving Patient Care Through Research & Education"



Photography by George L. Poy, DDS, Hartland, Michigan

24 Years of All-ceramic Restorations

In the early 1980s, placement of all-ceramic restorations was not a common occurrence, and in most cases, it involved the cementation of one or two anterior units. They were often cemented with traditional cements such as zinc phosphate, carboxylate or glass ionomer. By the mid 1980s, dentin bonding agents became more reliable with bond strengths exceeding 15 MPa. Resin cements also became the medium of choice for cementing all-ceramic restorations.

Today, it is not unusual to restore six, eight, ten or more all-ceramic units in one appointment. THE DENTAL ADVISOR has documented the placement and monitored nearly 5,000 all-ceramic restorations over the past 24 years. This issue of THE DENTAL ADVISOR reports on the performance of many of these restorations over time and provides the clinician with insight as to what works and why. Of special interest is the fracture rate of nine all-ceramic materials.

2006

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December

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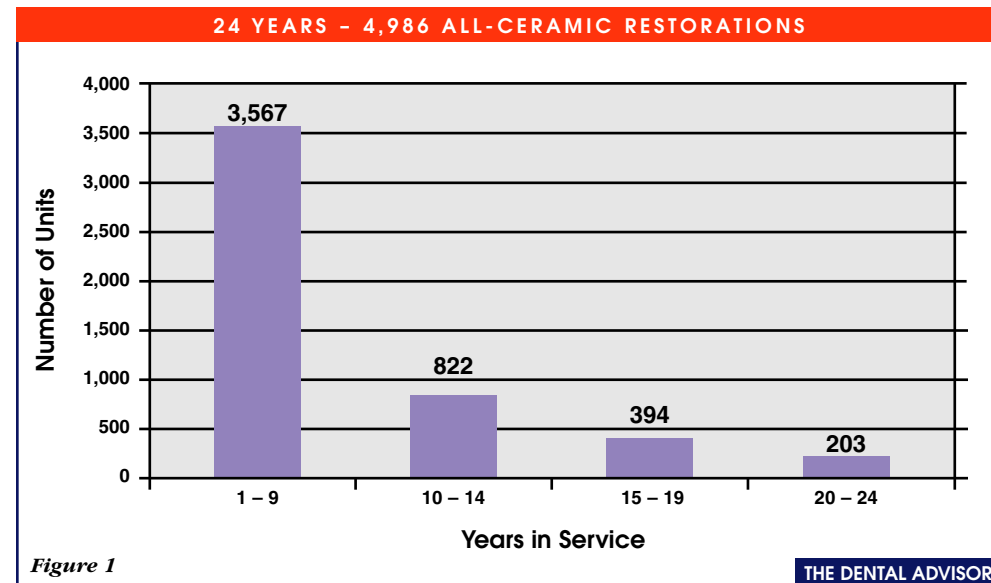
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24 Years of All-ceramic Restorations

Over the past 24 years, nearly 5,000 all-ceramic restorations have been placed and monitored by THE DENTAL ADVISOR. Dr. Farah placed restorations during the first 15 years, while during the most recent nine years, Drs. Farah, Brown, and Anderson have added more than 3,500 restorations. *Figure 1* shows the number of restorations placed over that period of time. *Figure 2* shows the distribution and type of restorations placed over the 24-year period.

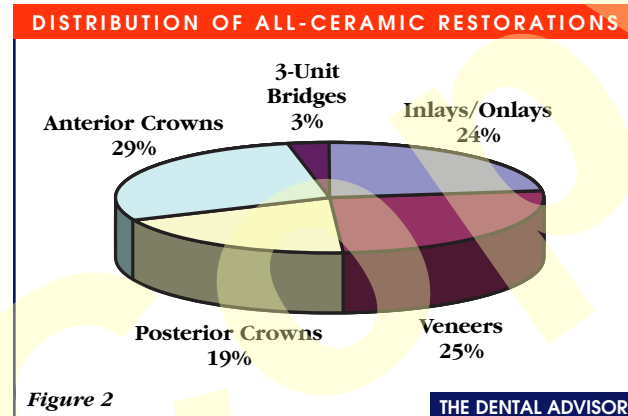


The restorations were evaluated at placement for

- Shade match
- Vitality
- Margin integrity
- Fit to the tooth

The same restorations were evaluated at recall for

- Fracture/chipping
- Microleakage
- Wear resistance
- Esthetics



Each category was rated on a 1 to 5 scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

The majority of the ceramic restorations fit into three groups (see Table 1): 1) Traditional, 2) Pressable, 3) Machineable – CAD/CAM. The pressable ceramics account for 90% of the total restorations evaluated, while the traditional ceramics account for 8% and the machineable ceramics account for 2%.

In the early years, traditional cements such as zinc phosphate, carboxylate, and glass ionomer were used to cement the crowns and inlays. Since the mid 1980s, resin cements with bonding agents became more prevalent.

Today, cements such as **3M ESPE RelyX Veneer Cement**/**3M ESPE, Nexus2**/**SDS/Kerr**, and **Variolink Veneer**/**Ivoclar Vivadent** are used. Recently self-adhesive resin cements (**3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement**) have become an excellent choice for some applications.

Table 2 shows the types and frequency with which resin cements were used. **Variolink** & **Variolink II** were used most often (39%), while **RelyX Unicem** was used in 37% of the cases. **RelyX Unicem** has been on the market for approximately four years and is currently the most popular self-adhesive resin cement.

3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement – 3-year Clinical Performance (*THE DENTAL ADVISOR* Vol. 23, No. 4, May 2006)

- Over 3,000 restorations (inlays, onlays, single crowns, bridges) were cemented with **RelyX Unicem**.
- 1,250 restorations were recalled at three years.
- Postoperative sensitivity was less than 1.6%.
- Microleakage at the margins was 2% – less than 1% required replacement.
- Low debonding rate of 0.6%.

3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement
(3M ESPE)

continued on page 4

Table 1 – Types of Ceramic Restorations Placed

Ceramics Evaluated	Type	Number of Units	Percentage of Use
Cerpress SL (Leach & Dillon)	Pressable	2,194	44%
OPC (Pentron Ceramics)	Pressable	947	19%
IPS Empress (Ivoclar Vivadent)	Pressable	548	11%
3G (Pentron Ceramics)	Pressable	449	9%
Optec HSP (Pentron Ceramics)	Traditional	298	6%
LUMINEERS by Cerinate (Den-Mat)	Pressable	200	4%
IPS e.max (Ivoclar Vivadent)	Pressable	150	3%
Cerinate Traditional (Den-Mat)	Traditional	102	2%
3M ESPE Lava Crowns and Bridges (3M ESPE)	CAD/CAM	98	2%

Table 2 – Types of Resin Cements Used

Cement	Number of Units	Percentage of Use
Variolink & Variolink II (Ivoclar Vivadent)	1,994	39%
3M ESPE RelyX Unicem Self-Adhesive Universal Resin Cement (3M ESPE)	1,845	37%
Panavia 21 & Panavia F 2.0 (Kuraray America)	299	6%
Lute-It Luting System (Pentron Clinical Technology)	249	5%
Calibra (DENTSPLY Caulk)	199	4%
Nexus (SDS/Kerr)	151	4%
Choice (Bisco)	100	2%
Ultra-Bond Plus (Den-Mat)	99	2%
Insure (Cosmedent)	50	1%



3M ESPE RelyX Veneer Cement
(3M ESPE)



Panavia 21
(Kuraray America)



Panavia F 2.0
(Kuraray America)



Variolink II
(Ivoclar Vivadent)

Fracture/Chipping

Fracture ranged from 1.0% at one year to 5.3% at 24 years.

Factors Contributing to Fracture

- Internal cracks (*see Notes on Internal Cracking*)
- Improper tooth reduction
- Improper bonding
- High occlusal forces/bruxism
- Accidental scenarios

Fracture rates for various types of restorations are summarized in *Figure 3*. No significant differences have been observed among fracture rates of onlays, crowns, and veneers at 10 years. Fracture rates are consistent with rates noted in *Figure 4*. The fracture rate of inlays (1%) was, however, significantly lower. *Figure 4* also illustrates the increase in fractures as a function of time. At 10 years, fracture rates of all-ceramic restorations (3.6%) are similar to fracture rates of PFM restorations (3-5%) as reported in the dental literature.

Traditional ceramics exhibit twice the fracture rate of pressable ceramics. Factors to be considered:

- Some of the early traditional ceramics were cemented with non-adhesive cements.
- Many of the traditional ceramics have been in service longer than pressable ceramics.
- The technique involving traditional ceramics is more operator-dependant than pressable ceramics.

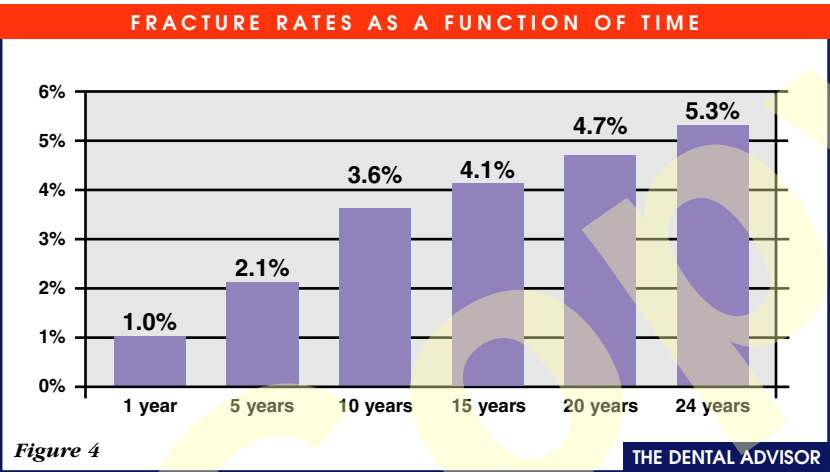
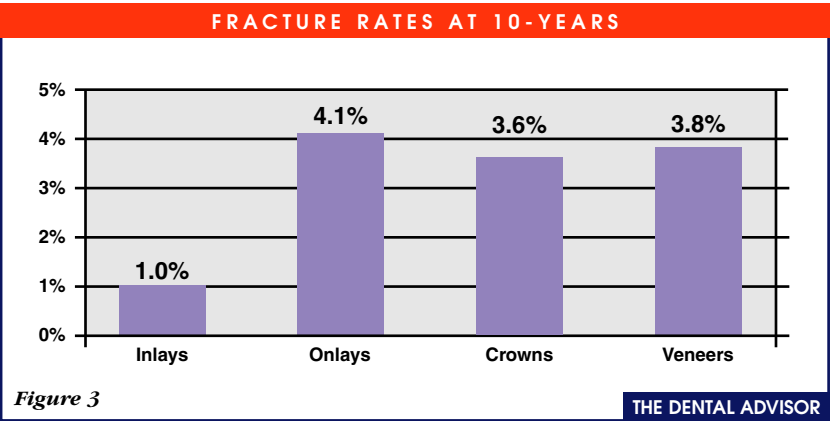
Notes on Internal Cracking

Internal stresses introduced during laboratory fabrication cause internal cracks, usually resulting in catastrophic failure of the restoration within the first year of clinical use. Carefully check each restoration received from the laboratory with a transilluminating light (*Microlux/AdDent*) before cementation. If any cracks are detected, return the restoration to the laboratory.



Microleakage

Microleakage is noted by graying at the margins of anterior and posterior crowns and veneers. No microleakage has been noted for inlays and onlays, but occurs in 3.1% of other ceramic restorations. Microleakage at the margins is the single most frustrating factor pertaining to cosmetic restorations and it often occurs within days of cementation.



Possible Reasons for Microleakage

- Improper etching/bonding of tooth and/or ceramic.
- Bruxism, resulting in high stress at the cervical margin, followed by debonding.
- Lack of proper isolation during cementation.
- Bleeding during cementation.
- 5th-generation bonding agents (single-bottle systems) might be associated with a higher rate of microleakage than 4th-generation bonding agents in which the primer is used separately and wets the prepared tooth better.
- Improper rinsing of ferric sulfate solutions used as an astringent.

Debonding

Debonding of all-ceramic restorations cemented with resin cement is low. The debonding rate of onlays, crowns, and veneers at 10 years of service is 3.5%. Failure of the bond could be the result of hydrolysis and subsequent weakening of the bond to the tooth over time. It is not always easy to determine if the bond failure was at the tooth/resin or resin/ceramic interface. Most often it seems to be related to both interfaces. Inlays had a much lower debonding rate, less than 1%.

Wear Resistance

The wear of the ceramic and opposing dentition has not been a major problem over the past 10 years. With the advent of low-fusing ceramics such as *Cerpress SL*, wear of the opposing dentition has decreased markedly, especially when compared to traditional feldspathic porcelains. The wear of certain materials is equal to enamel and results in reduced wear.

Esthetics

Shade and vitality are critical in the esthetic appearance of ceramic restorations. Factors such as tooth staining and dark posts/cores can influence the shade of the final restoration. Good shade match can be attained with all-ceramic restorations, assuming good tooth preparation, techniques, and proper communication with the laboratory. The ability of ceramic to fluoresce and look optically correct in different lighting conditions is a great plus over PFM restorations. Photos, stump or prep color guides, and digital shade taking devices are essential resources in achieving predictable esthetics.

Notes on 3M ESPE Lava Crowns and Bridges and LUMINEERS by Cerinate 3M ESPE Lava Crowns and Bridges is a zirconia-based, computer-designed and milled (CAD/CAM), all-ceramic system for crown and bridge frameworks. *Lava Crowns and Bridges* provides exceptional strength for three- and four-unit bridges with good esthetics. THE DENTAL ADVISOR is in the final stage of a three-year recall of 66 units of *Lava Crowns and Bridges*.

LUMINEERS by Cerinate are leucite-reinforced, pressed ceramic veneers and anterior crowns with minimal to no tooth preparation (THE DENTAL ADVISOR Vol. 22, No. 4, May 2005 and Vol. 23, No. 3, April 2006). Over the past 30 months, about 200 teeth have been restored with **LUMINEERS by Cerinate**, 25% of these with minimal to no tooth preparation. Restorations were cemented with *Ultra-Bond Plus*.



continued on page 6

Comparing Recent All-ceramic Restorations

Product	Company	Type	Placement Years	Number of Recalled Units	Fracture #	Fracture %
3G	Pentron Ceramics	Pressable	2000-2006	224	3	1.3%
3M ESPE Lava Crowns and Bridges	3M ESPE	CAD/CAM	2003-2006	60	0	0.0%
Cerinate Traditional	Den-Mat	Traditional	1995-2006	110	6	5.5%*
Cerpress SL	Leach & Dillon	Pressable	1996-2006	1,920	38	2.0%
IPS e.max	Ivoclar Vivadent	Pressable	2005-2006	115	0	0.0%
IPS Empress	Ivoclar Vivadent	Pressable	1993-2006	156	6	3.8%
LUMINEERS by Cerinate	Den-Mat	Pressable	2003-2006	200	2	1.0%
OPC	Pentron Ceramics	Pressable	1995-2006	410	16	3.9%
Optec HSP	Pentron Ceramics	Traditional	1990-1996	143	6	4.2%

**More than half of the Cerinate Traditional/Den-Mat units placed were posterior restorations which could explain the higher fracture rate. The manufacturer does not recommend this product for posterior restorations.*

24 Years of All-ceramic Restorations *continued*

Over the course of the **LUMINEERS by Cerinate** evaluation, three veneers fractured and were replaced. Only two anterior veneers exhibited darkening at the margins consistent with microleakage; these restorations were replaced. Clinicians and patients reported excellent esthetics. Case selection is important to obtain good results. Certain situations lend themselves to the placement of veneers with little or no removal of tooth structure. Patient response to **LUMINEERS by Cerinate** has been exceptional.

Summary of All-ceramic Restorations

Fracture/Chipping

- 1% at 1 Year
- 5.3% at 24 Years

Microleakage

- 3.1% at 1 Year
- 5.4% at 3 Years

Debonding

- 3.3% at 10 Years

Factors Contributing to the Success of All-ceramic Restorations

- Symmetrical and even reduction of tooth (1-2 mm), especially for posterior crowns – tapered walls
- Adequate reduction (1-2 mm)
- Rounded internal angles – avoid sharp line angles and sharp edges
- No bevels or retention grooves
- Use of circumferential chamfer preparations ■



Dialite
(Brasseler USA)



Ceramisté
(Shofu)

Survey of Clinical Consultants

Over 65 of our clinical consultants replied to a survey on ceramics. The results of that survey are shown below.

Crowns and Bridges Most Often Placed

	Crowns	Bridges
PFM	62%	86%
All-ceramic	27%	9%
All-metal	11%	5%

All-ceramic Materials Most Often Used

Pressed	46%
Stacked	37%
CAD/CAM	17%

All-ceramic Restorations Most Often Placed

Anterior crowns	43%
Veneers	24%
Posterior crowns	18%
Inlays/Onlays	10%
Bridges	5%

All-ceramic Products Most Often Used Per Application

	Anterior Crowns	Inlays/Onlays	Posterior Crowns
IPS Empress	54%	47%	17%
Procera/Nobel Biocare	24%	7%	38%
CEREC 3/Sirona	4%	13%	9%
Other	18%	33%	36%

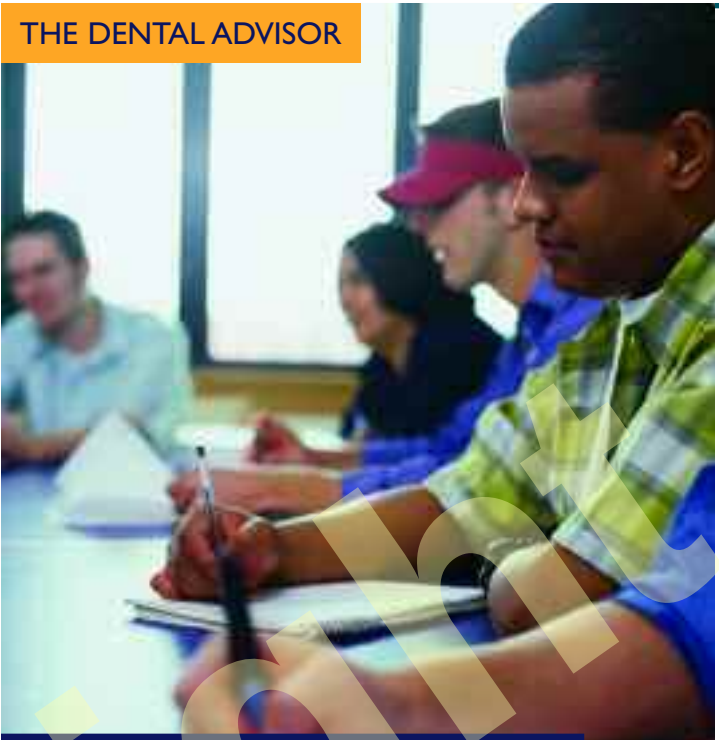
Favorite Ceramic Polishing Systems

Dialite/Brasseler USA	60%
Ceramisté/Shofu	19%
CeraGlaze/AXIS Dental	10%
Other	11%

Favorite CAD/CAM Ceramics

CEREC 3	35%
Procera	26%
3M ESPE Lava	22%
Crowns and Bridges	
IPS e.max	8%
ProCAD/Ivoclar Vivadent	8%

THE DENTAL ADVISOR



EDUCATION CENTER

For more information or to register, please contact the Education Manager, Cara Voss at 734.665.2020, ext. 102, email cara@dentaladvisor.com, or visit www.dentaladvisor.com.

Keith Felty, JD

The Anatomy of the Dental Malpractice Suit

Tues., Jan. 9, 2007, 5:30 p.m. – 8:30 p.m. (light dinner provided)

This program will provide an understanding of the legal process related to claims involving dental malpractice. Topics will include the role of the defense attorney, the judge and jury, and why the dentist prevails in nearly every case that actually goes to trial. (2 CE Credits)

Course Fee: \$150

Keith Felty, JD

The Dental Patient: Friend or Foe? (see page 9)

Fri., Jan. 19, 2007, 8:30 a.m. – 11:30 a.m. (light breakfast provided)

This program will delve into potential legal claims against dentists and how they may be avoided. Claims often arise from breakdowns in communication with the patient. Various communication methods will be discussed to reduce the risk of a malpractice suit. (2 CE Credits)

Course Fee: \$150



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John M. Powers, PhD

Master's Series

Dental Materials for the 21st Century: Bonding Agents

Wed., Feb. 7, 2007, 6 p.m. – 8 p.m. (light dinner provided)

Total-etch and self-etch bonding agents will be reviewed with an emphasis on 6th- and 7th-generation bonding systems. Variables that affect bonding clinically will be discussed. (1 CE Credit)

Course Fee: \$50 (Register for four Master's Series programs at \$40 each!)

Sponsored by: DENTSPLY Caulk and Kerr

Peter Yaman, DDS, MS

Master's Series

To Post or Not Post Endodontically Treated Teeth

Wed., Mar. 7, 2007, 6 p.m. – 8 p.m. (light dinner provided)

Endodontically treated teeth are compromised relative to the amount of remaining tooth structure and therefore require additional retentive features for successful restoration. The clinician needs to understand the philosophy and principles for post and core construction and recognize the options available for auxiliary retention. Selection of the most appropriate post and core materials for specific clinical situations – fiber, cast metal, amalgam, composite, or glass ionomer, will be reviewed and discussed. (1 CE Credit)

Course Fee: \$50 (Register for four Master's Series programs at \$40 each!)

Keith Felty, JD

The Dental Patient: Friend or Foe? (see page 9)

Tues., Mar. 13, 2007, 5:30 p.m. – 8:30 p.m. (light dinner provided)

This program will delve into potential legal claims against dentists and how they may be avoided. Claims often arise from breakdowns in communication with the patient. Various communication methods will be discussed to reduce the risk of a malpractice suit. (2 CE Credits)

Course Fee: \$150

Keith Felty, JD

The Anatomy of the Dental Malpractice Suit

Fri., Mar. 23, 2007, 8:30 a.m. – 11:30 a.m. (light breakfast provided)

This program will provide an understanding of the legal process related to claims involving dental malpractice. Topics will include the role of the defense attorney, the judge and jury, and why the dentist prevails in nearly every case that actually goes to trial. (2 CE Credits)

Course Fee: \$150

John M. Powers, PhD

Master's Series

Dental Materials for the 21st Century: Resin Cements

Wed., April 11, 2007, 6 p.m. – 8 p.m. (light dinner provided)

New resin cements will be reviewed with an emphasis on self-adhesive resin cements. Properties that affect clinical performance will be discussed. (1 CE Credit)

Course Fee: \$50 (Register for four Master's Series programs at \$40 each!)

Sponsored by: DENTSPLY Caulk and Kerr

Darren Marsh, DDS

Master's Series

Endodontic Systems for the General Dentist

Wed., May 9, 2007, 6 p.m. – 8 p.m. (light dinner provided)

Rotary instrumentation techniques and carrier based obturation systems will be reviewed with an emphasis on the properties that affect clinical performance. (1 CE Credit)

Course Fee: \$50 (Register for four Master's Series programs at \$40 each!)

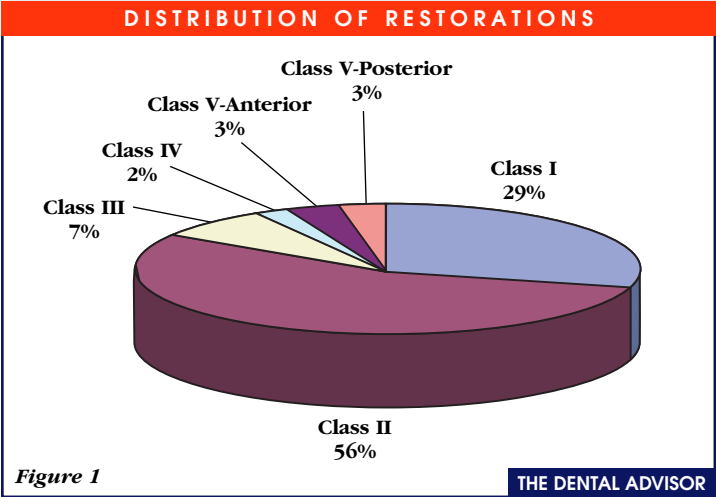
GC America
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Description

GRADIA DIRECT is a micro-hybrid resin composite system for anterior and posterior use. The system features 26 shades in both unitip capsules and syringes. Different formulations exist for anterior and posterior use. Anterior shades are radiolucent, have a creamy consistency, and emphasize esthetics and gloss. Posterior shades are radiopaque and have a heavier body for packing in interproximal areas. Standard shades alone are adequate for use in the majority of restorations. In cases of complex esthetic restorations, special “Inside” (opaque) and “Outside” (translucent) shades are provided. Shades available include: standard Vita shades, 11 anterior and four posterior; outside shades, six anterior and two posterior; inside shades, three anterior. The complete kit includes 26, 2.7-g syringes or 106, 0.16-ml unitips of composite with a shade guide. This product received a 96% clinical rating.

Suggested Retail Cost

- \$865.00/complete syringe kit
- \$387.00/complete unitip kit



Correction

The July/August 2006 issue of THE DENTAL ADVISOR, contains an error on page 6. The statement should have read: **RECALDENT™** (CPP-ACP) – encourages rapid remineralization.

2-YEAR CLINICAL PERFORMANCE

Consultants' Comments

- ▶ “Nice radiopacity of posterior shades.”
- ▶ “Restorations are undetectable.”
- ▶ “This has become my favorite composite.”
- ▶ “Some shades are too translucent when used alone.”

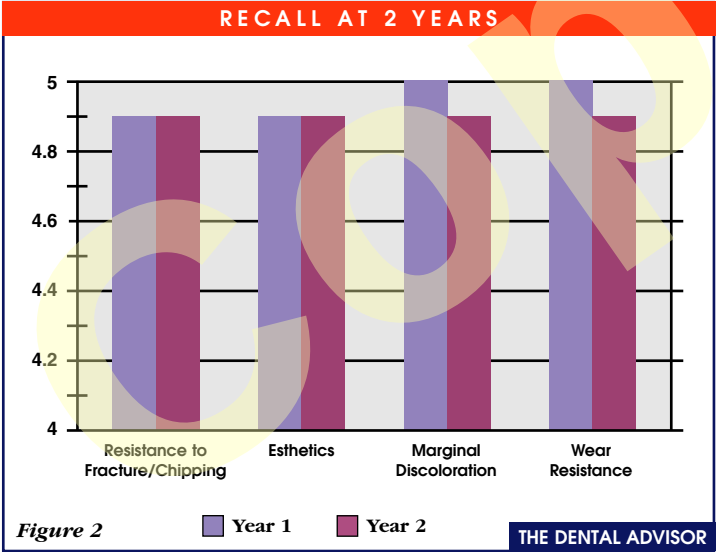
Clinical Evaluation Protocol

- 325 restorations in 181 patients were evaluated at two years.
- Restorations evaluated included 283 posterior and 42 anterior restorations (Figure 1).
- Categories were rated on a 1-5 scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent. (See Figures 2 and 3).

Clinical Observations

Resistance to Fracture/Chipping

Ninety-six percent of **GRADIA DIRECT** restorations were free of chips or fractures at two years. Of the 325 restorations recalled, two required replacement for fracture of the restoration. One restoration required repair, and 10 others exhibited very small chips that required refinishing.

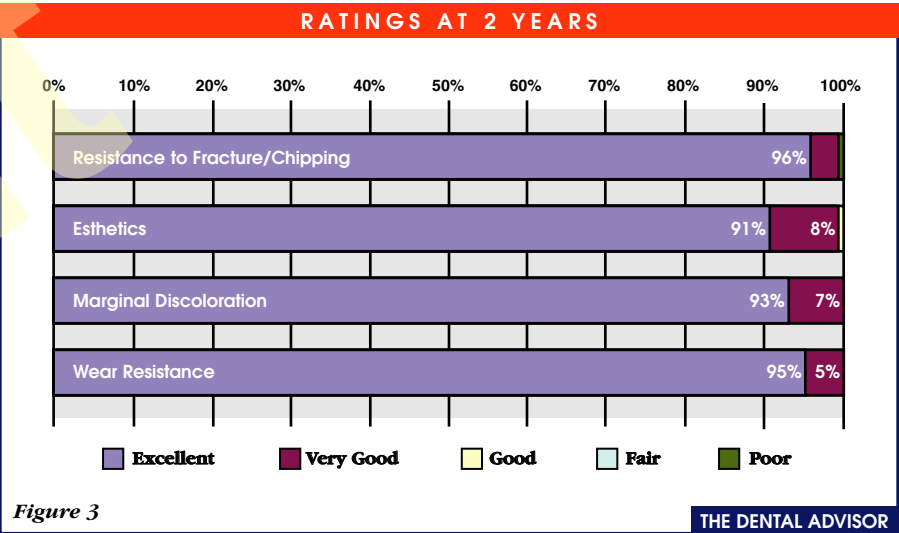


Esthetics

The esthetics of **GRADIA DIRECT** rated very good to excellent. Shades remained accurate and restorations blended very well with the teeth. The variety of available shades contributed to excellent esthetics in anterior restorations. While well over 90% of the posterior restorations were completed with a single shade, most anterior Class IV restorations utilized two to three shades. Similar restorations utilizing only the standard shade were rated too translucent. Consultants noted that the surface texture of the composite remained smooth with finishes ranging from glossy to matte. Two percent of restorations showed discoloration or staining.

Marginal Discoloration

Marginal discoloration, or microleakage, can be influenced by factors such as the restorative material, finishing procedures, bonding agent, and bonding technique. A variety of bonding agents were used during placement of **GRADIA DIRECT** restorations. At two-years, 93% of the restorations were free of marginal discoloration, compared to 99% at one year.



The Dental Patient: Friend or Foe?

by Keith P. Felty, JD

Q Even with the very best dental care, there will be cases in which an undesirable outcome occurs. No one relishes the idea of discussing failed treatment with a patient. Telling anyone that something has gone wrong often creates as much or more anxiety for the dentist as it does for the patient. Given these feelings, how does a dentist address this situation?

A Sincere and concise communication with the patient seems like an obvious approach to the issue at hand. However, through my years of practice, far too many cases have arisen where this communication was absent. Dozens of patients-turned-litigants have testified in cases that they never would have sued the dentist and the practice if the dentist had discussed the situation and apologized for the results.

Some years ago, there was a book that pondered the idea that all we needed to know, we learned in kindergarten. I have found that the elementary gesture of an apology may

Those restorations exhibited mild staining and only one anterior restoration required refinishing of the margins.

Wear Resistance

Ninety-five percent of restorations were rated excellent for wear resistance. The remaining 5% rated very good, showing mild wear. In some of those cases consultants noted wear on functional cusps or evidence of bruxism. ■

go a long way in preventing a lawsuit from ever being pursued. More importantly, I have found that it goes much further in preventing an adverse jury verdict. Juries are made up of people who are also dental patients. They are people who simply want to be treated with compassion and respect. There is no better method of demonstrating these qualities than with honest communication after something goes wrong. ■

For more information on upcoming courses on this and other risk management topics presented by Mr. Felty, please refer to THE DENTAL ADVISOR Education Center course listing on page 7, or visit online at www.dentaladvisor.com.

Keith Felty is a principle in Van Belkum & Felty, P.C. in Plymouth, MI. He regularly defends dental professionals in litigation and provides other legal services for the dental profession. Mr. Felty may be contacted at 502 Forest Ave., Plymouth, MI 48170, 734.459.0300 or via email at kfelty@feltypc.com.

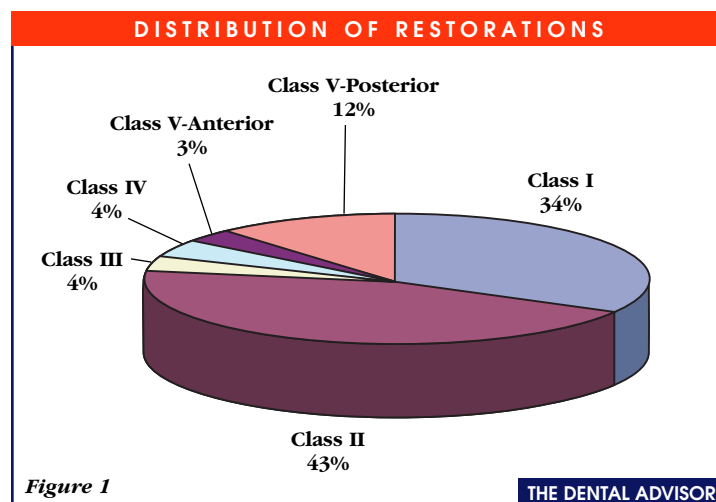
VOCO GmbH
888.658.2584
www.voco.com/usa

Description

GrandiO is a nano-hybrid resin composite for universal restorative use. This composite is filled 87% by weight (71.4% by volume) and is compatible with any bonding agent. Light-curing time for 2-mm increments is 20 seconds with a halogen or LED light. **GrandiO** is available in unit-dose capsules and syringes in 12 Vita shades plus bleach, incisal, and two opaque shades. This product received a 96% clinical rating.

Suggested Retail Cost:

- \$159.95/50 unit-dose capsule kit and shade guide
- \$239.00/five-syringe kit and shade guide



Clinical Evaluation Protocol

- Fifty-three patients with 101 restorations were evaluated for clinical performance at three years.
- Recalled restorations included 90 posterior and 11 anterior restorations (See Figure 1).
- Categories were rated on a 1-5 scale: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.

Clinical Observations

Resistance to Fracture/Chipping

No chips or fractures were noted for 94% of the **GrandiO** restorations during the third year of evaluation. The chips that occurred were minor, requiring only slight recontouring or refinishing. No bulk fractures were seen. This low fracture rate has been consistent over the three years of recall.

Shade Match/Esthetics

All restorations recalled were placed using a single shade rather than with a layering technique. **GrandiO** restorations blend very well with the surrounding tooth structure and have a good balance of translucency and opacity. The color stability of the shades has been very good. Only one posterior restoration was noted to be slightly yellow at three years. Five restorations were noted to have a rough or grainy surface texture. Overall, the appearance of the restorations was rated very good to excellent.

Marginal Discoloration

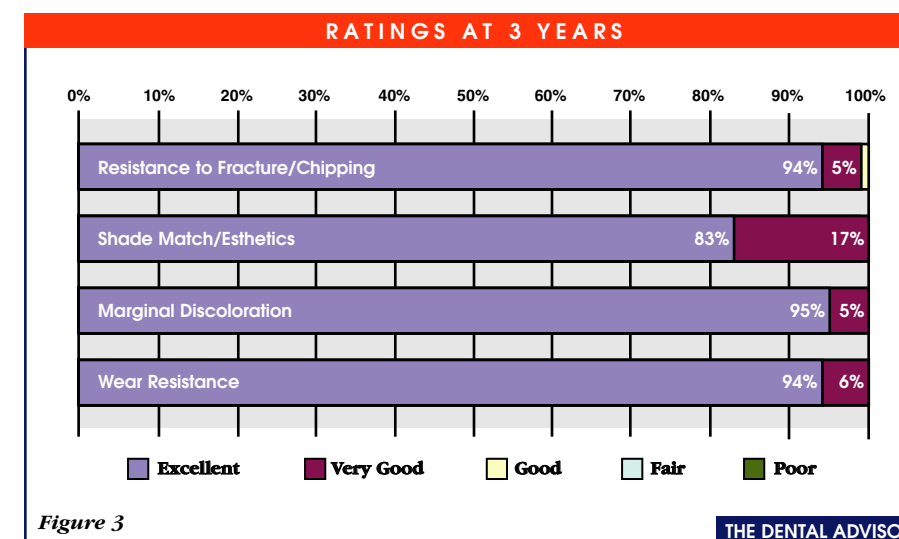
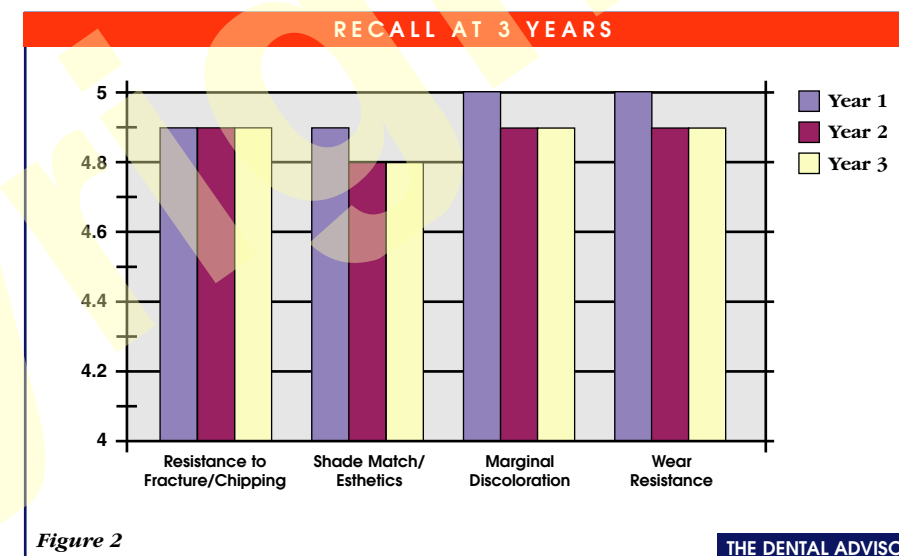
Marginal discoloration, or microleakage, can be influenced by factors such as the restorative material, finishing procedures, bonding agent, and bonding technique. A variety of bonding agents were used during placement of **GrandiO** restorations. Ninety-six percent of restorations showed no marginal staining at three years.

Wear Resistance

All of the restorations were rated very good to excellent for wear resistance. Ninety-four percent of restorations exhibited no visible signs of wear. The grainy texture of a few restorations may be due to surface wear.

Summary

GrandiO is a resin composite that handles very well, sculpts easily, and can be packed into proximal boxes. It is simple to use with a single shade rather than with layering of shades as some other systems require. The results over three years have been exceptional. Many of the restorations blend so well that they are hard to detect. The only negative that was noted over the three-year period was a rough surface in a small percentage of restorations. ■



Chicago Midwinter Meeting
February 23-25, 2007

THE DENTAL ADVISOR invites you to join us at The 142nd Chicago Dental Society Midwinter Meeting, February 23-25, 2007. Visit us at booth #1507 and take advantage of our show discount to renew your subscription at 30% off the regular price. Speak directly to our knowledgeable staff about our 2007 Preferred Product List; upcoming features; new products; and upcoming seminars, lectures and meetings. Also, learn about our state-of-the-art facility that includes THE DENTAL ADVISOR Biomaterials Research Center, led by John M. Powers, Ph.D.; THE DENTAL ADVISOR Education Center; and administrative offices. Our growth has increased our ability to combine results from clinical and laboratory research to better educate dental professionals. We are looking forward to seeing you!

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K. Hamlett, TX
G. Hart, OH
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C. Brown, LA
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3M ESPE Imprint 3 VPS Impression Material System

3M ESPE Imprint 3 VPS Impression Material is a system of addition silicone (VPS) impression materials. It is indicated for use in all impressions, including crowns, bridges, inlays, onlays, and implant abutments. The material is available in a variety of viscosities in both regular and fast setting times and is supplied in 50-ml *Garant* (auto-mix cartridge) and *Penta* (*Pentamix*) delivery systems. The manufacturer's instructions are presented in a color-illustrated, trifold guide containing tables outlining the different viscosities, colors, working and setting times, mixing devices, and combinations of the impression materials. **Imprint 3 Quick Step** and **Imprint 3 Penta Putty** were evaluated and are described separately in this report.

3M ESPE Imprint 3 Penta Putty + + + + ½

3M ESPE
800.634.2249
www.3MESPE.com

Description

Imprint 3 Penta Putty is a very high viscosity tray material that is noticeably warm when dispensed from the *Pentamix 2*.

The warmth hastens the setting of the regular- or light-body material while allowing its full working time. *Imprint 3 Penta Putty/Light Body Intro Kit* contains a 360-ml *Penta* cartridge of putty plus 50-ml *Garant* cartridges of both the regular- and light-body materials, mixing tips, intraoral tips, and tray adhesive. Ten consultants used **Imprint 3 Penta Putty** in 33 impressions. This product received a 91% clinical rating.

Suggested Retail Cost

- \$169.00 *Penta Putty/Light Body Intro Kit*

Product Features

The packaging of *Penta Putty/Light Body Intro Kit* is neat and compact with all necessary items for crown and bridge impressions. For clinicians who prefer a putty material, the auto-mix feature of **Imprint 3 Penta Putty** is a great advantage as it eliminates hand mixing and possible contamination of the material. The ease of dispensing from the *Pentamix* cartridge was rated excellent. The putty is mildly warm and has a very high viscosity that holds its form in the tray without running. **Imprint 3 Penta Putty** offers the working time of a regular-set material with a quick, intraoral setting time, making it ideal for multiple-unit impressions. **Imprint 3** regular-body material flows well, and consultants found it performed better than **Imprint 3** light-body material when used with **Imprint 3 Penta Putty**. The light-body material has an extra-low viscosity and is too easily



Consultants' Comments

- ▶ "True putty consistency from the *Pentamix*. It is easier than mixing putty by hand."
- ▶ "Lab was able to pour impressions multiple times without tearing."
- ▶ "Light-body material has good wettability but is runny."
- ▶ "The pink Quick Step regular-body material offers better color contrast than the yellow regular-setting material when used with the green putty."

displaced by the putty. While capturing good detail, the glossy yellow color of the light- and regular-body materials is difficult to read and offers little contrast to the green putty. **Imprint 3 Penta Putty** is easy to remove from the mouth and is resistant to tearing. Impressions were accurate with good adaptation of the putty and minimal voids or porosity. Fifty percent of consultants rated **Imprint 3 Penta Putty** equivalent to or better than their current impression material. Twenty percent would switch to this material and recommend it to a colleague.

Clinical Tips

- When dispensing the **Imprint 3 Penta Putty**, tilt the impression tray at an angle to the mixing tip. This will fill the tray evenly, avoiding a "rope" of material lying in the center of the tray. If needed, use fingertips or a spatula to further manipulate the putty in the impression tray to distribute it and smooth the surface.
- Use **Imprint 3 Penta Putty** with patients who gag easily or for cases when excessive flow of material is to be avoided.
- When using a one-step technique, select the regular-body rather than light-body material for use with the putty. The putty almost completely displaces the extra low-viscosity light-body material from the preparation. ■

Editors' Note:

3M ESPE is currently evaluating improvements in the instructions for use of the putty and how to optimize the viscosity match and color contrast with the syringed materials.

Imprint 3	Delivery	Color	Working Time	Setting Time (Intraoral)
Regular Setting				
Penta Putty	Pentamix 2	Frog green	1:30	3:00
Penta Heavy Body	Pentamix or Pentamix 2	Burgandy	2:00	3:30
Heavy Body	Garant	Burgandy	2:00	4:00
Light Body	Garant	Yellow	2:00	3:30
Regular Body	Garant	Yellow	2:00	3:30
Quick Setting				
Penta Quick Step Heavy Body	Pentamix or Pentamix 2	Blue green	1:15	2:30
Quick Step Heavy Body	Garant	Blue green	1:15	2:30
Quick Step Light Body	Garant	Pink	1:30	2:30
Quick Step Regular Body	Garant	Pink	1:30	2:30

3M ESPE Imprint 3 Quick Step + + + + +

3M ESPE
800.634.2249
www.3MESPE.com

Description

The faster setting **Imprint 3 Quick Step** impression materials are ideal for one- or two-unit impressions. Consultants evaluated the *Quick Step Heavy Body/Light Body Intro Kit* that contained two, 50-ml *Garant* cartridges of heavy-body material; one, 50-ml *Garant* cartridge each of light- and regular-body materials; mixing tips; intraoral tips; and tray adhesive. Eight consultants used **Imprint 3 Quick Step** in 64 impressions. This product received a 96% clinical rating.

Suggested Retail Cost

- \$69.90/*Quick Step Heavy Body/Light Body Intro Kit*

Product Features

The color-illustrated, trifold guide is useful and informative. Packaging is neat with individual compartments for the components. The ease of dispensing from the *Garant* cartridges was rated excellent. The consensus among consultants was a preference for the regular-body material versus the light-body material. They found that **Imprint 3** light-body has a very low viscosity and handles like

an extra-light, while **Imprint 3** regular-body handles like a traditional light-body. Working time is adequate for one- or two-unit cases, and the 2.5-minute setting time was considered ideal. **Imprint 3 Quick Step** has a neutral taste and is easy to remove from the mouth. There were very few cases reported in which impressions needed to be retaken due to porosity or voids in the impression. The material is resistant to tearing and provides excellent reproduction of detail. Consultants reported that the blue-green and pink colors of the *Quick Step* materials contrasted well, which enhanced the readability of margins. Seventy-five percent of consultants rated **Imprint 3 Quick Step** equivalent to or better than their current impression material. Fifty percent would switch to this impression material, while 88% would recommend it to a colleague.

Clinical Tip

- Air can be used to improve adaptation of the light-body material to the margins of the preparation. ■



Consultants' Comments

- ▶ "Both viscosities were easy to dispense."
- ▶ "Material did not tear, even in thin areas."
- ▶ "Accurate impressions – crowns fit perfectly."

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R. Engle, IL
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R. Fay, TX
N. Fehmi, MI
M. Feinberg, NY
L. Feldman, NJ
J. Fine, NJ
K. Fischer, IN
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K. Goodman, MI
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A. Gray, MI
W. Gregory, MI
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J. Grover, MI
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E. Gutman, NY

KCP Hydro Jet + + + + ½

American Medical Technologies
800.359.1959 • 361.289.1145
www.americanmedicaltech.com

Description

KCP Hydro Jet is a *Hydroabrasion Cavity Preparation System* that combines kinetic cavity preparation (KCP) with water-streaming technology. **KCP Hydro Jet** is intended for removing hard tissue, caries, composite, and cutting cavity preparations. It is also indicated for modification of enamel and dentin for bonding procedures and cutting of ceramic restorations. **KCP Hydro Jet** combines a water stream with alumina particles propelled at high speed by compressed air. This combination reduces the overspray of abrasive particles and the associated mess common to most air-abrasion units. Air pressure is adjustable and ranges from 40-160 psi. Particle size of 27 µm (extra fine) or 50 µm (fine) may be selected. The console (unit) rests on casters for transport within the office. A wireless (infrared) footswitch and removable control pad allow flexibility in placement of the unit. The control pad can be taken off the unit and placed chairside for control of air pressure and water flow. Four presets can be reprogrammed, if desired. Each preset controls variables such as particle size, powder flow, air pressure, and water volume. Water in the unit is heated for patient comfort. The handpiece nozzle is set at a fixed angle for use in all areas of the mouth. The handpiece is fully autoclavable; additionally, the nozzle may be removed for replacement. **KCP Hydro Jet** includes two handpieces, fine and superfine alumina particles, a wireless footswitch and signal receiver, and a removable control pad. **KCP Hydro Jet** was used by consultants during a 12-week evaluation period. This equipment received a 91% clinical rating.

Suggested Retail Cost
• \$22,995.00

Equipment Features

Overall **KCP Hydro Jet** was rated as very good technology. The professional and high-tech look of the unit was greatly appreciated by both users and patients. In terms of cutting efficiency on hard tissue, **KCP Hydro Jet** received excellent scores. It was found to be especially useful in the removal of stain, opening grooves before sealant placement, and the removal of composite from previous restorations. Alumina particles are most efficient when used on hard surfaces; therefore, removal of soft decay could not be easily accomplished with air abrasion. The combination of water with air abrasion was highly rated and significantly reduced the overspray common with dry air-abrasion units.



Consultants' Comments

- ▶ "Less messy than other air-abrasion units."
- ▶ "Improvement on the original KCP."
- ▶ "Did not need to use anesthesia for shallow dentin preparations."
- ▶ "Great product for an office that does a lot of sealants and conservative dentistry."
- ▶ "A better set of instructions with better diagrams would be helpful."
- ▶ "Casters are hard to roll on carpeted floors – unit can become off balance and tip."

Patients were very receptive to **KCP Hydro Jet** and found preparation of small cavities to require anesthesia less often while still being comfortable. Users found the handpiece to be comfortable to hold. The head of the handpiece is larger than that of other KCP models, slightly impeding visibility of the tooth. Enamel preparation is significantly faster compared to dry air abrasion, and the preparations tend to be slightly wider. Due to pressure buildup during use, the handpiece can be difficult to remove for sterilization. Filling the particle compartments is easy. The wireless foot switch is occasionally sensitive in terms of placement, relative to the signal receiver. Sixty-six percent of consultants found **KCP Hydro Jet** to be equivalent to their current method for removing tooth and composite, and 100% of users would recommend **KCP Hydro Jet** to a colleague.

Clinical Tips

- If unable to isolate the area with a rubber dam, use damp gauze to cover soft tissue.
- Eye protection for patients is necessary.
- Use fine powder for etching and stain removal; use superfine for cutting.
- Leave the main power on overnight to prevent moisture from entering the unit.
- To ease removal of the handpiece, place the unit in 'sleep' mode.
- When using a waterline disinfection system, attach the water removal hose while in sleep mode and then turn on the unit to allow pressure to force the water/disinfection solution through the unit.
- If using CEREC technology, using **KCP Hydro Jet** on the preset etch setting is excellent for removing imaging powder residue.
- Contraindications include removal of amalgam and use for patients known to have severe asthma or chronic obstructive pulmonary disease. ■

Editors' Choice
PRODUCT

V-Ring + + + + ½

TrioDent Ltd.
800.811.3949
www.TrioDent.com

Description

V-Ring is a sectional matrix system to facilitate the contouring of posterior restorations that involve interproximal surfaces. **V-Ring** separator ring has a stainless steel inside ring and a nickel-titanium outer spring with V-shaped tines. The tines are placed over the wedge on the buccal and lingual surfaces to enhance tooth separation. Each sectional matrix band has a tab with a hole on the occlusal edge and holes on the wing ends for locking pin tweezers to grasp during placement and removal. The matrices are available in three heights: 4.5, 5.5 and 6.5 mm. The system also includes **V-Wedge** and **Double-Wedge**. **V-Wedge** has an inverted V-shape cross-section and is available in six different color-coded sizes. **Double-Wedge** is a clear, elastic wedge that is designed to be stretched and pulled between the teeth, rather than pushed like a traditional wedge. The kit evaluated contained three **V-Rings**, 50 **Tab-Matrices** in each of the three sizes, ring forceps, locking pin tweezers, and **Double-Wedges**. Fifteen consultants used the **V-Ring** system for 284 clinical restorations. This product received a 95% clinical rating.

Suggested Retail Cost
• \$345.00/kit

Product Features

The limited written instructions are supported by a CD/DVD that clearly shows application of the **V-Ring** system in numerous clinical situations. More thorough written instructions would be useful when it is not convenient to view the CD/DVD.



Editors' Note: The manufacturer is currently developing improved packaging and instructions. Look for the article in an upcoming issue of THE DENTAL ADVISOR.

The plastic packaging is adequate but could be improved by having separate compartments for the various system components. The pin holes in the matrix bands aid in grasping the bands during placement and removal. Bands adapt well to the teeth, and the sizes provided are adequate for all clinical cases. The **V-Wedges** adapt well to the interproximal surfaces with a good selection of sizes. The fit of **V-Ring** to the buccal and lingual surfaces and the resultant separation of the teeth were rated excellent. Since the tines of the ring rest on the wedge rather than directly on the soft tissue, patient comfort is enhanced. The quality of the proximal contours and contacts was rated as very good. Overall, 92% of consultants rated the **V-Ring** system equivalent to or better than the sectional matrix system they were currently using, and they would both switch to and recommend it.

Clinical Tips

- The **V-Ring** should be expanded carefully to the required amount during placement. Do not open the rings excessively.
- The tab on the Tab-Matrix can be trapped against the neighboring tooth using a finger-tip and this prevents it from moving while placing the wedge.
- When it is necessary to wedge from both sides, the second wedge can be placed through the **V-Ring**'s V-shaped slot without having to start over. ■

Consultants' Comments

- ▶ "It works – an answer to an old problem."
- ▶ "Good for large, wide restorations."
- ▶ "The separation of the teeth resulted in good interproximal contacts."
- ▶ "Packaging and written instructions should be improved."
- ▶ "V-Rings are not easy to stack when restoring more than one contact area."

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Vista-Tec + + + + +

Polydentia SA
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www.polydentia.com

Description

Vista-Tec is a lightweight, full-face shield consisting of a removable clear plastic shield and a frame. The frame is available in white, clear and four translucent colors: yellow, blue, green, and pink. The height and angle of the frame can be adjusted for comfort and reduction of glare and fogging. When combined with an OSHA-compliant facemask, protection is provided for the eyes, nose, and mouth. Routine maintenance requires washing the shield in a mild soap and water solution or replacement of the shield. The kit contains one frame in any color, 10 shields and two *Clipons* (for attaching the shield to eyeglasses). Additional frames and shields are available separately. **Vista-Tec** was evaluated by 26 clinical consultants and their auxiliaries over a three-month period. This product received a 96% clinical rating.

Suggested Retail Cost
• \$50.00/ kit
• \$30.00/10 shields

Product Features

The manufacturer's instructions are clearly written, concise, and include an order form for replacement components. Assembly of the shield is explained in color illustrations. The frame is very flexible, making it comfortable to wear without excessive pressure on the head, ears and bridge of the nose. Height and angle of the frame are easily adjusted and remain in position. The slim frame of **Vista-Tec** is unobtrusive and does not impede visibility. Patient acceptance to the appearance of the shield was very good. Dental hygienists and assistants liked having a choice of frame colors,

and they especially liked the subtle, translucent colors. The **Vista-Tec** shield is clear; however, the curved surface can produce some glare. The shields are durable if cared for properly. Seventy-two percent of consultants would recommend **Vista-Tec** to a colleague and found it equivalent to or better than their current personal protective equipment. Fifty-nine percent would switch to **Vista-Tec**.

Clinical Tips

- Place **Vista-Tec** faceup when not in use to prevent scratching.
- Warm the shield before use to prevent fogging.
- If the shield is too long, it may be trimmed with scissors. ■



Consultants' Comments

- ▶ *"I like the stylish frames."*
- ▶ *"The shield stays clear – it does not turn yellow or cloudy."*
- ▶ *"It is lightweight."*
- ▶ *"The shield is easy to change and clips onto my glasses."*
- ▶ *"Gold screws used to hold the frame together are a nice touch."*
- ▶ *"Minimal fogging."*
- ▶ *"It fits over my loupes and keeps them free of splatter."*
- ▶ *"The shield sometimes comes off of the frame when it is set down."*

KwikCall + + +

KwikCall
877.336.5223 • 718.336.5227
www.kwikcall.com

Description

KwikCall is web-based appointment reminder service designed for use in dental and other healthcare-related offices. The service is designed to make these offices more efficient, saving time by calling and confirming patients as well as improving patient attendance at appointments. Setting up the system begins with a phone call placed by the doctor or staff into the **KwikCall** system to customize the voice messages to be received by patients. **KwikCall** offers multiple package options and can be customized to the needs of the practice. Reminders for patients to take medication can also be integrated into the protocol during the system setup. Once the voice messages are set up, the daily patient confirmation lists can be uploaded to the website as a CSV file. Arrangements can also be made to have the confirmation lists faxed or emailed to **KwikCall** daily for a nominal fee. For lists received by 5 p.m., **KwikCall** can begin making confirmation calls the

Consultants' Comments

- ▶ *"Fairly easy to set up."*
- ▶ *"Saves staff time on the phone confirming appointments."*
- ▶ *"Excellent customer service – they were very helpful."*
- ▶ *"Most patients easily accept the modern feel from the system."*
- ▶ *"Separate phone calls are needed for members of the same family."*
- ▶ *"Having some web experience is helpful."*

same day or as early as 9 a.m. EST the following day. When patients receive a confirmation from **KwikCall**, they are required to press a button to "hear a message from your dental office." This is needed in order to optimize answering machine detection and to ensure that a complete message is left after the beep. When a patient does not press the initial button to hear the message, the **KwikCall** system automatically assumes that an answering machine has picked up and pauses before continuing with the message. Patients who actually pick up the

phone to hear the message have three choices: (1) confirm the appointment, (2) cancel the appointment, (3) connect directly to the dental office by pressing a button. If they decide to cancel, they are given an opportunity to connect to the dental office to reschedule their appointment. Users are able to follow up with patients the next day if the patients decide to cancel using **KwikCall**. Once the calls have been placed, **KwikCall** generates a "call result" page online and an email is sent with the call results daily. Up to five calls per day are made to each person if no answer is received.

Consultants in three dental offices, including one specialty orthodontic practice, utilized **KwikCall** over a four-month evaluation period. This service received an 80% clinical rating.

Suggested Retail Cost

- \$175.00 up to 700 calls per month
- \$75.00 up to 250 calls per month
- Various customized plans are available

Service Features

Overall, consultants spent an average of one hour for the setup process. Integration of **KwikCall** with consultants' current dental office software was found to be acceptable. However, **KwikCall** was not able to accept appointment lists that were generated directly from dental office software such as *Dentrix*. In this case the dental office staff would have to rearrange the data to suit the import requirements of **KwikCall**. The dental office must provide accurate confirmation list files. The dental office should run test calls to ensure that the call process and confirmation files are optimal. There is also a concern that some elderly patients will have a hard time comprehending the automated call

and might not understand the purpose of the call. In addition, the call status for each patient was available online but did not integrate with existing office software to update the call status. Two offices found that their no-show rate did not decrease during the evaluation period using **KwikCall**. The **KwikCall** staff was eager to solve problems and improve the understanding and limitations of the system with the client. Fifty percent of consultants found **KwikCall** to be as effective as their current confirmation system. Half of the consultants would switch from their current confirmation system and recommend **KwikCall** for use by a colleague.

Clinical Tips

- Offices should inform patients of the change in the confirmation system before fully implementing **KwikCall** to avoid confusion with the new method.
- Multilingual calls are possible. You may enter language preferences for each patient if desired.
- The service can also be customized to make other calls such as welcome, provider cancellation, recall reminders, and others. ■

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LumaCool Whitening System + + + +

LumaLite, Inc.
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www.luma-lite.com

Description

LumaCool Whitening System is a high-speed, in-office teeth whitening system. Teeth stained from food, beverages, tobacco, age, or medicine can be lightened in less than one hour. **LumaCool** utilizes a white LED light that is operated by remote control or touch-sensor. The light is mounted on a wheeled base; an optional pole mount is available. The *LumaWhite Plus Single Patient Kit* is designed for three, eight-minute applications. The kit includes three *LumaLite* unit-dose 35% hydrogen peroxide ampoules, catalyst powder, mixing brushes, *LumaBlock* paint-on liquid dam material, Vitamin E moisturizer swabs, flour of pumice; 6" roll cotton, cheek retractor, consent form, and instructions for both the patient and the dentist. Also included is *StayBright Plus* take-home whitening enhancer, which is painted on the teeth for maintenance and touch-ups. This brush-on product contains hydrogen peroxide in a thickening gel, which adheres to the teeth. The complete system includes the light and materials for 12 whitening procedures.



Consultants' Comments

- ▶ **"I really like the short amount of time the procedure takes."**
- ▶ **"No need to make take-home trays."**
- ▶ **"Time display on light is easy for the patient to see."**
- ▶ **"Whitening results of up to 7 shades, but not on all patients."**
- ▶ **"Many patients commented about the pain they experienced hours after the procedure."**
- ▶ **"Add a desensitizer to the kit."**

On-site training is available from the manufacturer through dental dealers. Consultants evaluated **LumaCool** in 22 whitening procedures. This system received an 89% clinical rating.

Suggested Retail Cost
\$2,995/complete system
\$49.95/*LumaWhite Plus Single Patient Kit*

Product Features

The consultants who evaluated **LumaCool Whitening System** were all experienced in performing in-office whitening procedures. They liked the complete *LumaWhite Plus Single Patient Kit*. Compared to other in-office whitening systems, **LumaCool** saves chair time with short applications and no need for fabrication of take-home trays. The **LumaCool** light is simple to set up and very easy to operate. The settings on the eight-minute pre-set timer can easily be increased or decreased. The timer display is conveniently located above the L.E.D. output and at a 15 degree angle, allowing both the patient and operator to view the time remaining. Because the light stays cool, there is no warm-up or cool-down time required. The slim profile of the light head is unobtrusive and easy to maneuver. Mounting the

light on the optional chair pole mount is beneficial for operatories with limited floor space. When the *LumaWhite* liquid and powder are mixed, they form a gel that is applied to the teeth with a brush or small disposable syringe. Consultants and patients appreciated the short procedure time. **LumaCool** whitening results varied greatly, with changes up to 7 shades on the Vita value-ordered shade guide and an average change of 2.5 shades. Although desensitizing agents are not included with the **LumaCool Whitening System**, consultants did apply various desensitizing agents to the teeth following the procedure. The majority of patients reported sensitivity during treatment or throbbing and pain to the teeth and gums for up to 24 hours after treatment. In all cases, discomfort was gone within 24 hours. Generally, patients were uncertain if

StayBright was effective in maintaining whiteness. In 50 percent of the cases, consultants rated **LumaCool Whitening System** equivalent to in-office whitening systems they had used previously.

Clinical Tips

- Refrigeration of the material is not necessary.
- On-site training is available by the manufacturer.
- Apply gel immediately after mixing for maximum effectiveness.
- Pre-op preparation is critical to the overall success: pumicing of the teeth and application of the paint-on rubber dam. ■



Patients' Comments

- ▶ **"It was easier than I thought it would be."**
- ▶ **"Relatively quick with mild discomfort."**
- ▶ **"Not as white as I would have liked."**
- ▶ **"Some tooth sensitivity that evening."**
- ▶ **"StayBright caused some stickiness on my teeth."**

Microlux/DL + + + ½

Addent, Inc.
203.778.0200
www.addent.com

Description

Microlux/DL is a battery-powered LED light intended to enhance visualization of oral lesions as an adjunct to conventional soft tissue examination. The pen-sized unit produces white light through a diffused glass light guide. When the mouth is rinsed with an acetic acid solution, the refractive properties of leukoplakic lesions are changed, making them more visible under the LED light. The manufacturer instructs the practitioner to do a conventional examination with incandescent light, and then follow that with a 60-second rinse of the acetic acid solution and another examination of the area with the **Microlux/DL**

Consultants' Comments

- ▶ **"The suspected lesions are certainly well-illuminated."**
- ▶ **"This product gives rapid results and is easy to use."**
- ▶ **"This product is a great motivator for patients to have a biopsy done."**
- ▶ **"Use of this technique shows the patient that I am thorough."**
- ▶ **"I'd like to read some comparative research studies of Microlux/DL."**
- ▶ **"The vinegar taste is a drawback."**

in a dimly lit room. Areas that show an "aceto-white" reaction should be closely monitored or considered for biopsy. The kit has a light with batteries; light guide; and six, 30-ml bottles of 1% acetic acid rinsing solution

in a sturdy case. Twelve consultants evaluated the **Microlux/DL** in 61 oral examinations. This product received an 84% clinical rating.

Suggested Retail Cost
• \$208.00/kit

Equipment Features

Consultants reported that the **Microlux/DL** is easy to use and readily incorporated into an office routine. The time necessary for the exam is minimal, approximately 3:00-4:00. Patients readily grasped the idea of the technique and appreciated it as a noninvasive screening procedure. It was well accepted by practitioners and patients, although patients found the 1% acetic

acid solution to be distasteful. Consultants noted that the best differentiation of "aceto-white" lesions occurred in a dimly lit room. **Microlux/DL** is not intended to provide a definitive diagnosis; rather, it is a screening tool for lesions that require further investigation. The unit is lightweight and comfortable to use, with very good output. Consultants did not notice appreciable heat generation while the unit was on. Sixty-nine percent of consultants rated **Microlux/DL** equal to or better than their current technique, 42% would switch, and 72% would recommend it to a colleague. ■

CLINICAL CONSULTANTS

- M. Shapiro, MI
- J. Shea, MO
- J. Sinkwitts, MI
- R. Smith, NY
- S. Smith, FL
- M. Sonne, MI
- J. Spingarn, FL
- S. Steedman, WA
- R. Stevenson, MI
- W. Stevenson, MI
- K. Stoffers, MI
- D. Stutman, NY
- K. Swearingen, OH
- M. Sylvester, CA
- P. Symeonides, NY
- J. Tabash, MO
- H. Tetelman, OH
- F. Tom, MA
- R. Tonelli, WI
- G. Trompeter, MI
- C. Trubschenck, CA
- P. Tu, CA
- S. Ura, NH
- J. Utess, MI
- H. Vann, MS
- J. Van Tiem, MI
- W. Walcott, MI
- L. Walsh, MI
- M. Waranowicz, MI
- M. Warshanna, MD
- R. Wilkie, MI
- S. Williams, MO
- R.G. Willis, SC
- K. Wilson, MI
- R. Wolf, IN
- F. Wood, PA
- P. Yaman, MI
- H. Yeung, CA
- D. Young, MI
- S. Young, NY
- M. Zahn, MI
- J. Zanetti, MI
- P. Zanetti, MI
- G. Zann, FL
- S. Zimmer, MI

LABORATORY CONSULTANTS

- Alpha Dental Studio, MI
- Nellmar Laboratory, LLC, MI

Ivoclar Vivadent
800.533.6825 • 716.691.0010
www.ivoclarvivadent.us.com

Description

bluephase 16i is a high-powered, rechargeable cordless LED curing light. This 10-watt LED generates a maximum light intensity of 1600 mW/cm² and is recommended for the polymerization of light-cured materials that are activated in the wavelength range of 430-490 nm. Depending upon the material selected, curing time may be reduced to as little as five seconds. The unit features three curing programs: High Power, Low Power, and Soft Start. Curing times of 5, 10, 15, 20, or 30 seconds are displayed on the unit. **bluephase 16i** features a back-up power system offering the option of a corded light. For corded operation, the lithium battery is removed and the power pack from the base is plugged directly into the handpiece. The recharging base features a continuous-recharge cradle for the handpiece and a built-in light meter. The battery offers 45-minute maximum curing time without any power loss and a short recharging time. The **bluephase 16i** is covered by a three year warranty. Twelve consultants evaluated **bluephase 16i** over a three-month period and experienced no failures. This product received a 96% clinical rating.

Suggested Retail Cost

- \$1,495/unit



Equipment Features

The **bluephase 16i** unit has a sleek, smooth surface, and the silver metallic finish gives it a contemporary appearance. The handpiece has an ergonomic design and consultants reported that it was well balanced, lightweight, and quiet. The selected curing time and power setting are easy to read on the display. The tapered 13>8-mm light probe and high power output reduced curing time, in some cases by half. Testing proper light output is convenient with the built-in radiometer. The continuous charge of the unit in the base was effective, and consultants did not need to use the corded power pack, although they were glad to have it as an option. Some consultants found the on/off switch was hard to activate and there was a few seconds delay for the light to turn on. One hundred percent of consultants found **bluephase 16i** to be equivalent to or better than their current LED curing light and all would recommend it to a colleague.

Clinical Tips

- Limit high power use to 10-second intervals to avoid overheating the tooth.
- Store handpiece in the base to keep it charged.
- Use the optional 2-mm pinpoint probe available from the manufacturer for tacking veneers. ■

Consultants' Comments

- ▶ "This unit will spoil you – very attractive unit that works well."
- ▶ "The first LED that has given me total confidence in the cure."
- ▶ "Cures fast, in as little as five seconds."
- ▶ "Easy to access posterior teeth."
- ▶ "The backup power supply includes a long cord – using the cord makes the unit lighter than using the battery."
- ▶ "I would like to see a 3-mm tip for tacking veneers."

What's New?

Ivoclar Vivadent (800.533.6825 • www.ivoclarvivadent.us.com) has introduced **OptraFine**, a diamond polishing system specifically developed for use on ceramic restorations. The **OptraFine** system can be used intra- or extra-orally and is ideal for CAD/CAM restorations. The system consists of three shapes of rubberized polishing instruments, polishing paste and polishing brushes. The polishing instruments and polishing paste contain a high concentration of diamond particles specifically designed for polishing ceramic surfaces. The polishers are mounted on latch-type mandrels and are designed to provide optimum polishing when used in sequential order between 10,000 and 15,000 rpm. **OptraFine** polishers are autoclavable and can be used up to 10 times. Look for the results of an in-depth clinical evaluation in an upcoming issue of THE DENTAL ADVISOR. ■

