

## Minimally Invasive Dentistry Can Be Win-Win!

**Gordon and Paul's Clinical Bottom Line:** Minimally invasive concepts are *not* often considered to be exciting or income producing. With proper planning and delegation they can be both interesting and revenue producing! Patients appreciate conservative procedures and feel comfortable knowing that more aggressive procedures can always be done later if necessary. Delegation of appropriate procedures to staff is easy, relatively inexpensive, and they enjoy being the primary clinician. We have some great suggestions for you!

Do typical dental patients trust dentists? In recent years, our profession has dropped in public trust as reported by the Gallup poll. Over-promotion of esthetic dentistry procedures has blurred the division between needed dentistry and elective procedures. The move from *"need"* dentistry to *"want"* dentistry has confused patients and caused frequent *over treatment*. During treatment planning, patients should be advised of the alternatives for treatment *including the minimal ones*. After such discussion and patient agreement on the treatment, you have satisfied "informed consent" requirements. Don't be surprised at how many patients choose minimal procedures!

**This CR report identifies some of the most commonly accomplished "minimally invasive" techniques, provides research and evaluator observations about the techniques, and make suggestions about the financial implications of incorporating the procedures into your practice.**



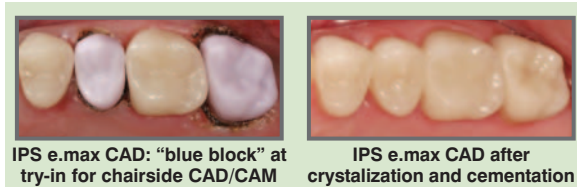
*Continued on page 2*

## IPS e.max CAD (Lithium Disilicate): A New All-Ceramic Alternative?

**Gordon and Paul's Clinical Bottom Line:** All-ceramic zirconia-based single and multiple-unit restorations have received emphasis in recent years. Monolithic (*one material*) lithium disilicate, although, not a new material, has continued to receive positive research reports for single crowns and is now competing for the all-ceramic market. Lithium disilicate has been reported to exhibit fewer failures than the current generation of zirconia supported layered restorations. Commercial emphasis from the parent company, Ivoclar Vivadent, and from laboratories continues to emphasize lithium disilicate.

IPS e.max is an all-ceramic system consisting of several types of materials for indirect restorative use. It contains materials for both the 1) press and 2) CAD/CAM processing techniques as well as a universal, fluoroapatite feldspathic porcelain for the layering technique. The entire IPS e.max system can be used for single restorations, including veneers, inlays, onlays, and zirconia-based bridges.

*The following information focuses on only one type of material of the IPS e.max system: lithium disilicate, either lab milled or milled chairside by the CEREC MCXL mill or the E4D mill.*



**This report discusses the advantages and limitations of lithium disilicate as a single-unit restoration; the effects on the overall strength of the material by the different mills, hand polishing, and glazing; comparison to IPS Empress CAD; CR Evaluator survey results; and clinical tips for use.**

*Continued on page 3*

## Performance Evaluation of Chairside CAD/CAM Milling Units

**Gordon and Paul's Clinical Bottom Line:** About ten percent of general dentists in North America (~11,000) have elected to incorporate digital impressions and in-office milling into their offices, with acceptance ranging from excellent to frustrated rejection of the concept. Research shows that in-office milling can work well, that restoration margins can be as good as restorations made manually, that the materials used may be superior to lab made restorations, and that the esthetic result can be acceptable with practice. There are two strong competitors in the market, the long present CEREC and the newcomer E4D. Both concepts are working well. How do their milling devices compare?

Milling crowns and restorations is now routine in dental labs with the successful integration of the CEREC MCXL mill in over 1,000 labs in addition to other new and effective milling units. Many dentists may not even recognize that the "all-ceramic" crown they prescribed was actually milled instead of hand-layered or pressed. Using CAD/CAM to fabricate crowns is rapidly becoming the new model because of the decreased cost and simplicity for the lab.

and patients; both require a significant amount of time, effort, and resources to master. Many new and improved materials are being introduced (*i.e.* IPS e.max CAD) while the Vita Mark II block (*Vident*) has been a predictable and successful mainstay for CEREC users for over two decades. **The chairside CAD/CAM concept is now a reality and has opened the doors to a proven technology that will only excel in the years to come. Expect increased competition; more material choices; improvements in imaging, design, and milling; and, hopefully, a reduced expense.**

*Continued on page 4 (also see Special Edition)*

## Evaluators Reports and Clinical Tips

**Cervitec Plus:** Innovative varnish for immediate relief of cervical sensitivity (*Page 4*)

**AEU-7000E-70V Implant Surgical Motor:** Proven and accepted implant, oral surgery, and endo electric motor and handpiece (*Page 4*)

# Minimally Invasive Dentistry Can Be Win-Win! (Continued from page 1)

## Minimally Invasive Procedures Compared To More Aggressive Procedures

The following are representative examples of minimally invasive procedures.

### 1 Onlays and inlays vs. crowns

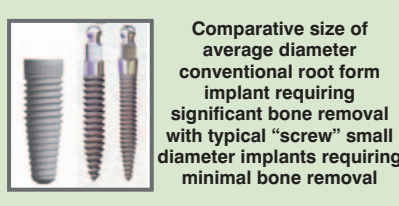
Many teeth requiring large, tooth-colored restorations can be treated with onlays instead of full-crowns. Usually, the facial and lingual walls of tooth structure are preserved, the tooth color is maintained through the service life of the restoration (*bleached or non-bleached*), the tooth still appears to be normal without a disagreeable margin showing when the gingiva recedes, research supports their service potential, third parties are now paying for onlays if one or more cusps are covered, and most patients prefer the more conservative procedure.

**Patients are served well with onlays vs. crowns, and the income to the practice is nearly identical.**



### 2 Small (mini) diameter implants vs. conventional diameter implants

Root form implants less than 3 mm in diameter are minimally invasive, easy to place, gaining strong research support when placed properly, and serve patients who could not have conventional implants for anatomic or health reasons or simply cannot afford bone grafting or other expensive surgical procedures. **Small diameter implants are a classic example of minimally invasive procedures that still bring in adequate revenue.**



### 3 Bleaching/whitening teeth vs. crowns or veneers

Many dentists agree that too many veneers are placed when conservative orthodontic therapy, bleaching, a few composite restorations, and/or incisal recontouring would have satisfied the desired change in esthetics. Bleaching teeth is a simple procedure, whether accomplished at home or in-office, and is a staff-oriented procedure.

**Revenue production is good and almost all patients appreciate the conservative approach.**

### 4 Conservative periodontal therapy vs. surgery

Conventional periodontal surgery procedures are often painful and esthetically compromising. Minor to moderate periodontal disease can be controlled by use of conservative therapy including frequent root planing (*2-3 month intervals*), sub-systemic antibiotics (*Periostat by Galderma Labs*), local antibiotics (*Arestin by Orapharma; Atridox by Tolmar; PerioChip by Dexel Pharma*), rinses (*Peridex by 3M ESPE, Crest Pro-Health by Procter & Gamble, Listerine by McNeil-PPC, Tooth and Gums Tonic by Dental Herb Company*), tongue cleaning (*Oolit by Oolit Advantage*) and other treatment options (*Perio Tray by PerioProtect*). **These relatively simple procedures can be delegated to staff persons, thus producing adequate revenue, stimulating practice activity, and exciting staff.**

### 5 Repairing defective crowns and fixed prostheses restorations vs. redoing crowns

Crown repairs can be made relatively simply using fluoride containing resin-modified glass ionomer such as Fuji Filling or Fuji II LC from GC or Ketac Nano from 3M ESPE. Usually crown repairs are not difficult in the posterior part of the mouth and in some anterior tooth situations. **Revenue production classifying the restorations as composites can be acceptable.**

### 6 Direct resin-based composite veneers vs. ceramic veneers

Resin veneers placed with Filtek Supreme Plus (*3M ESPE*), Durafill VS (*Heraeus Kulzer*), Renamel Microfill (*Cosmedent*), or Estelite Sigma (*Tokuyama*) produce beautiful direct resin veneers that remain smooth during service in the mouth. When the lab bill is considered and the time is compared, direct veneers are more conservative, provide adequate practice revenue, and can be redone several times without destroying the teeth. Many feel that too many veneers are being done and that many veneer tooth preparations cut away too much tooth structure. **Conservative veneer preps and occasionally no preps for ceramic veneers, incisal recontouring, bleaching, and gingival recontouring and shaping are excellent conservative procedures.**

### 7 Preventive procedures vs. restorative dentistry

It is estimated that about 10% of the patients in typical general practices need comprehensive caries preventive therapy. Some of the preventive procedures are 5000 ppm fluoride in custom trays, ACP application, remineralization techniques, varnishes, etc. Consider the following persons who need preventive therapy: geriatric patients; caries active young patients; bulimics; chemotherapy and radiation therapy patients; patients taking medications that cause dry mouth syndrome; and "meth" mouth patients. **This therapy can be a win-win financial situation for patients and dentists if qualified staff persons are used to provide the preventive services.**

### 8 Small tooth preparations, bonding, resin restorations, and sealants vs. conventional tooth preparations

The so-called G V Black preparations served very well for many years. Newer concepts such as acid etching of teeth and dentin and enamel bonding have allowed extremely small, conservative tooth preparation or no tooth preparation in some situations such as sealants. Air abrasion units or small burs such as the "Fissurotomy" burs from SS White can produce very small tooth preparations for small tooth defects. Third party payers reimburse as well for restorations placed in small tooth preparations as in larger preparations, and small restorations are easier to place, finish, and maintain. Practitioners should be looking for and restoring smaller carious lesions. **The procedures are relatively easy and the revenue is good.**



## Comparison of Minimally Invasive vs. Conventional Treatment\*

Procedure	Patient Acceptance	Time Compared to Conventional	Income per Minute†	Longevity
1. Onlay vs. Crown	Onlay better	Same	Same	Same
2. Small (mini) vs. Conventional Implants	Small (mini) better	Small (mini) less	Same (2 mini = 1 conventional)	Under investigation
3. Bleach vs. Crowns	Bleach better	Bleach—none (auxiliary time)	Bleach more (auxiliary)	Crowns may last longer
4. Conservative vs. Conventional Periodontal	Conservative better	Conservative—none (auxiliary time)	Conservative less	Same
5. Repair vs. New Crown	Repair better	Repair less	Variable	Variable
6. Direct Resin vs. Indirect Ceramic Veneer	Direct may be better	Direct less	Variable	Ceramic may be better
7. Preventive vs. Conventional Treatment	Preventive better	Preventive—none (auxiliary time)	Preventive more (auxiliary)	Preventive better
8. Small Prep vs. Conventional Prep	Small better	Small prep less	Small prep more because faster	Small prep better

\*As estimated by CR Staff and Evaluators †Estimates assume practice has full patient load

**CR Conclusions:** Minimally invasive procedures should be one of the options offered to patients when initial treatment plans are presented. Because the treatment result of aggressive procedures may be more esthetically pleasing, some patients still prefer to have conventional treatment. However, many prefer conservative procedures. When minimally invasive concepts are available versus more invasive ones, dentists should consider the conservative options seriously. The revenue potential of minimally invasive procedures is comparable to the more invasive procedures, and more invasive procedures can almost always be done later in the patient's life.

## IPS e.max CAD (Lithium Disilicate): A New All-Ceramic Alternative? (Continued from page 1)

### Lithium Disilicate—The Material

IPS e.max CAD is a lithium disilicate glass ceramic that is used in a monolithic form (*does not require any layering material unlike presently available zirconia-based restorations and PFMs*).

Lithium disilicate used as a dental ceramic is not a new ceramic as it has been available in previous formulations, i.e. IPS Empress 2 and others. It is available in various formulations and forms (*that may require layering*) from other companies.

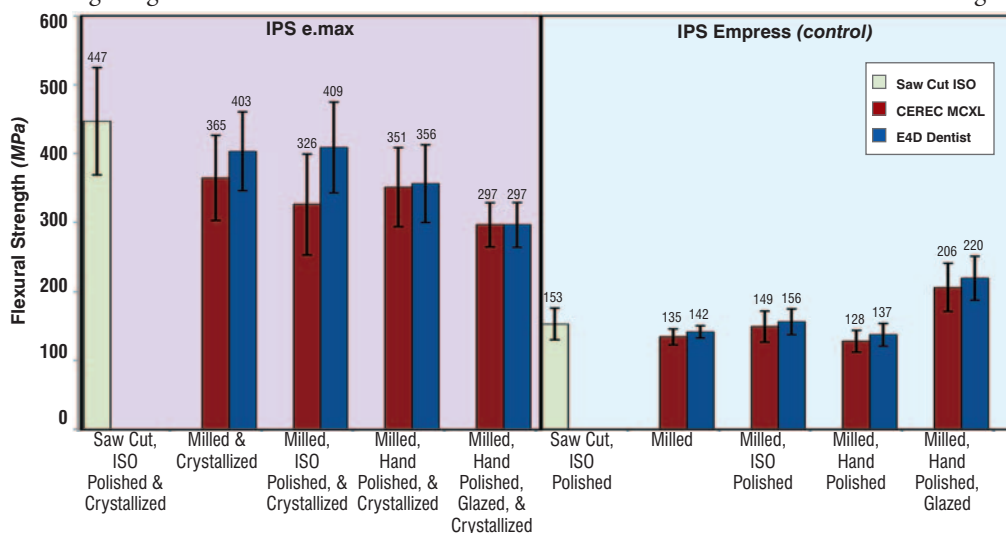
Lithium disilicate restorations fabricated via the CAD/CAM milling procedure (*in office or lab*) must be fully crystallized in a dental furnace (*20–25 minutes*). The processing of the material is technique sensitive and the manufacturers' recommendations must be followed. The blue color is indicative of its partially-crystallized form, lithium meta-silicate. Full crystallization of the material improves the strength by approximately 300% and changes from a blue color to the desired color of the restoration.

### Advantages of IPS e.max CAD

- Improved strength over any other ceramic
- Monolithic homogenous material
- Simple in-office or laboratory milling
- Easy staining or cut-back and layering for esthetics
- Highly esthetic with multiple levels of translucency
- Very little shrinkage after crystallization in furnace (*0.2%*)
- In-vitro studies demonstrating high durability

### Laboratory Evaluation

A total of 400 bars of IPS e.max CAD and IPS Empress CAD (*control*) were milled with the CEREC MCXL and the E4D mills. Three-point flexural strength was measured after the material was subjected to the ISO standard protocol as well as a variety of clinical conditions, i.e. hand polishing, and/or glazing. Manufacturers' recommendations were followed for all maintenance and bur changes.



### Clinical Tips

**Preparation guidelines:** Avoid sharp edges or angles; heavy or moderate chamfers; minimum thickness of 1.0–1.5mm for crowns and inlays/onlays, and 0.3–0.6mm for veneers.

**Milling** IPS e.max CAD faster than recommended may decrease the strength of the material or cause chipping.

**Finishing and Polishing** of the restoration in the pre-crystallized (*blue*) state should be kept to a *minimum* while the computer aided design portion of the restoration should be *optimized* to minimize post-milling adjustments and potential decreased strength.

**Crystallization** in the furnace should not be altered by decreasing the time or altering the firing parameters.

**Glazing** of IPS Empress CAD is highly recommended due to the increased strength.

**Cementation:** HF acid-etch of internal aspect of restoration followed by silanation is recommended. Conventional or self-adhesive cementation should *only* be used with retentive crown preparations; use of a self-etching adhesive dual-cure resin cement results in higher bond strengths and should be used with all inlays, onlays, veneers, and non-retentive crowns.

**Pressing:** The pressed version of lithium disilicate IPS e.max is reportedly stronger by approximately 40 MPa, however many labs and most chairside CAD/CAM dentists are using the milled version due to its simpler and faster processing.

### IPS e.max CAD



**Ivoclar Vivadent**  
800-533-6825 • 716-691-0010  
www.ivoclarvivadent.com  
**\$25–\$28/Block**

### Limitations of IPS e.max CAD

- Not yet indicated for bridges
- Not indicated for bruxism or severely worn dentitions
- Long-term clinical use data is still needed
- Processing is very technique sensitive
- Requires a furnace with vacuum for crystallization
- Extra time is required for crystallization compared to other chairside milled ceramics

### CR Evaluator Survey

- 36% of CR Product Evaluators have placed an IPS e.max CAD/Press restoration
- 55% use a self-etch or total-etch resin cement, 39% use a self-adhesive resin cement, and 22% use a resin-modified glass ionomer cement
- 73% are increasing their use of this material at the expense of PFM or zirconia-based restorations
- 22% use this material on more than 50% of indirect restorations
- 94% would recommend it to a colleague
- 97% would purchase it again
- 99% rate it as good or excellent

### Summary of Results

**Milling:** The E4D mill produced higher or equal strength values compared to the CEREC MCXL with both IPS e.max CAD and IPS Empress CAD. **However, when hand polishing and/or glazing, the strength values between the mills were not statistically significant (95% confidence level).** The CEREC MCXL on average mills IPS e.max CAD 36% faster and IPS Empress CAD 41% faster than the E4D Dentist mill.

**Hand Polishing** of the IPS e.max CAD in the partially crystallized (*blue*) state with diamond impregnated pre-polishers, high-gloss polishers Dialite (*Brasseler*) followed by Diashine (*VH Technologies*) resulted in a slight decrease in strength. However, following this polishing protocol with the IPS Empress CAD did not result in a significant decrease in strength.

**Glazing** of IPS Empress CAD (*leucite reinforced glass ceramic*) resulted in a 50% increase in strength to an average of 213 MPa. Glazing of IPS e.max CAD may decrease the strength in-vitro.

**ISO Standards** resulted in the highest strength tested for IPS e.max CAD at 447 MPa. However, the more clinically relevant techniques of hand polishing and glazing demonstrated lower strengths but with *no* statistical difference between the mills.

**CR Conclusions:** IPS e.max CAD for single restorations demonstrates higher in-vitro strength values than any other conventional monolithic and polycrystalline ceramic materials (*i.e. IPS Empress CAD or zirconia-based*). Its ease of fabrication and increased strength provide promise for an alternative to other restorative materials; however, long-term clinical success needs to be established. When IPS e.max CAD was milled with the E4D Dentist mill, the strength values measured were higher by an average of 9%. When milled with the CEREC MCXL, IPS e.max CAD was milled an average of 36% faster.

## Performance Evaluation of Chairside CAD/CAM Milling Units (Continued from page 1)

### Pricing Options for Chairside CAD/CAM

	CEREC AC	E4D
<b>Full System</b> (imaging, design, and mill)	AC + MC XL = \$119,995 • AC + Compact MC L = \$89,995	E4D Dentist and Mill = \$116,500
<b>Mills</b>	MC XL = \$66,000 • Compact MC L = \$36,000	E4D Dentist Mill = \$73,995
<b>Imaging Only</b>	AC = \$23,995 (optional purchase of mill or send to lab for design and milling)	E4D Cart = \$33,995 (must send to lab for design and milling)
<b>Imaging and Design Only</b>	AC = \$23,995 (optional purchase of mill or send to lab for design and milling)	E4D Cart and Design = \$44,995 (must send to lab for milling)
<b>Other Options</b>	<p><b>Pay As You Go:</b>* a system whereby the owner purchases the entry level acquisition unit (AC) and/or mill and either:</p> <ol style="list-style-type: none"> <li>1. AC CEREC Connect (unlimited impressions) = \$53,995 total</li> <li>2. Fee per impression =               <ol style="list-style-type: none"> <li>a. AC = \$23,995 + \$24.95/per impression</li> </ol> </li> <li>3. Fee per mill =               <ol style="list-style-type: none"> <li>a. AC + MC XL = \$89,995 + \$24.95/mill</li> <li>b. AC + Compact MC L = \$59,995 + \$24.95/mill</li> </ol> </li> </ol> <p><b>Lab Options:</b> inLAB MCXL mill, inEOS scanner, etc.</p>	<p><b>E4D Studio:</b> Remote design center (computer and software) for both labs and dentists to design restorations in another room or area of the office or lab = \$7,995</p> <p><b>E4D Labworks:</b> System designed for dental laboratories to scan casts or impressions, design restorations, and mill = \$89,995</p>
<b>Warranty, Training, and Support†</b>	<ul style="list-style-type: none"> <li>• 2-year parts and labor warranty; 2-day training course at one of 34 locations; \$500 merchandise credit for travel expenses towards training; 1-year free membership to ceredoctors.com; \$1,000 advanced training voucher; \$2,000 merchandise credit for CAD/CAM consumables; starter kit with 45 blocks; Patterson support</li> <li>• Cerec Club (optional \$219/month): free software updates and upgrades, annual preventative maintenance, discounted pricing on hardware upgrades, extended 3-year warranty</li> </ul>	<ul style="list-style-type: none"> <li>• 3-year parts and labor warranty with free software updates and upgrades; quarterly preventative maintenance; 2-day training course in Dallas, TX (includes all travel expenses for two); free membership to e4dcommunity.com; starter kit with 120 blocks; Henry Schein support</li> <li>• Optional 2-year extended warranty</li> </ul>

\*System comes with 50 unit Pay As You Go credits and additional units can be purchased in bulk

†See Clinicians Report June 2009 for more comparative information

**CR Conclusions:** New and more affordable options are available for clinicians to start using chairside CAD/CAM technology. Both CEREC and E4D are excellent options for clinicians and labs. Please see the enclosed Special Edition Clinicians Report for a detailed comparison of the two mills.

## Innovative Varnish for Immediate Relief of Cervical Sensitivity

Clear, thin, varnish protection for high caries risk patients, with exposed root surfaces and or sensitive teeth. One dose is enough to cover several teeth for most patients. Contains 1% chlorhexidine and 1% thymol. Not indicated for use prior to adhesives. Clinical tips: clean tooth surfaces before application for best adhesion and effect; wait one hour before eating or drinking.

### Advantages:

- Easy, painless application and dries quickly
- Immediate relief from sensitivity for most
- Nice packaging, applicator and holder
- Did not burn/irritate soft tissues
- No film after application

### Limitations:

- Unpleasant flavor for some and ethanol smell
- Long-term desensitizing varied by patient, but lasted several weeks to months

### Cervitec Plus



### Ivoclar Vivadent

175 Pineview Drive, Amherst, NY 14228  
800-533-6825 • 716-691-0010  
Fax: 716-691-2285 • www.ivoclarvivadent.com

**\$149.97/20 free-stand, single dose**  
**(\$7.50/dose)**

Also available in 7 gm multi-dose tube

**CR Conclusions:** 63% of 24 CR Evaluators stated they would purchase Cervitec Plus. 79% rated it excellent or good and worthy of trial by colleagues.

## Proven and Accepted Implant, Oral Surgery, and Endo Electric Motor and Handpiece

Hybrid electric handpiece for implant, oral surgery (third molar removal, sectioning teeth, avoiding air embolism, etc.), and may also be used for endo. Device includes surgical water delivery, control box, and foot pedal/control. Unit tested with the AHP-85MB-C handpiece attachment.

### Advantages:

- Ideal for implants, surgery, and can be used for endo
- Pre-programmed settings and easily programmable custom settings
- Sleek, attractive design/excellent manufacturing. Footprint not too large
- Internal diagnostics to troubleshoot various parts
- DVD training is excellent, and technical support is available
- Easily calibrates speed and torque
- Quiet operation
- Accepts various handpieces

### Main Limitation:

- Cost

### AEU-7000E-70V Implant Surgical Motor



### Asepticco

8333-216th Street SE, Woodinville, WA 98072  
800-426-5913 • 425-487-3157  
Fax: 360-668-8722 • www.asepticco.com

**\$1495/AHP-85MB-C attachment**  
**\$3995 for motor/control box**

**CR Conclusions:** 100% of evaluators stated they would incorporate AEU-7000E-70V Implant Surgical Motor into their practice. 100% rated it excellent or good and worthy of trial by colleagues.



# CR "Dentistry 2009 update"

Join Gordon, Rella, and Paul\* for a fast-paced, information-packed course highlighting the best dental products and techniques for 2009.

Presented by:\*



Gordon J. Christensen,  
DDS, MSD, PhD



Rella Christensen,  
PhD



Paul L. Child Jr.,  
DMD, CDT

## Register Today!

### Upcoming Course Locations



#### Boston, Massachusetts

Friday, October 16, 2009  
Hilton Boston / Woburn



#### Las Vegas, Nevada

Friday, October 30, 2009  
The Venetian  
Resort-Hotel-Casino



#### Chicago, Illinois

Friday, November 6, 2009  
Donald E. Stephens  
Convention Center Rosemont



#### Kansas City, Kansas

Friday, December 4, 2009  
Overland Park Marriott

#### Course features at least 25 topics, including:

- The latest clinical findings on zirconia-based restorations
- The best resin cements and their most appropriate uses
- Conventional implants vs. small diameter implants
- The easiest and best implant abutments
- Comparing endodontic sealers
- Is "cone-beam" radiography here?
- Foolproof impressions for fixed and removable prosthodontics
- Comparing resin restorative techniques and materials
- New surgical and medical concepts
- How do fluoride varnishes compare to 5000ppm fluoride?
- Cutting off and through zirconia-based restorations
- Digital impressions
- High-tech—practical vs. hype
- Many other timely topics

#### After this course, participants will be able to:

- Identify and discuss the most important new concepts, materials, devices, and techniques in all areas of dentistry
- Compare the major resin-based composite techniques and materials
- Select the most appropriate preventive materials and techniques for your practice
- Describe the best impression procedures for fixed and removable prosthodontics
- Discuss the status of zirconia-based restorations
- Compare conventional diameter and small diameter implants for your practice
- Identify the most appropriate pediatric restorative materials and techniques
- Select which high-tech concepts you want in your practice
- Describe clinical protocol for patients on bisphosphonates
- Many other concepts important to dental practice *\*and other CR staff*

### These locations also offer the concurrent course for staff and spouses "What Every Office Manager Should Know"

#### Front office skills for business personnel at all levels—from beginners to veteran office managers

This fun and interactive concurrent course identifies the major roles of the front desk person. It features excellent handouts that can be shared with the entire dental team and activities to better prepare and motivate attendees for performing their daily responsibilities.

Presented by:\*



Kaesy Barker

For more information or to register for a course,  
call Camla at **1-888-334-3200** or visit **www.cliniciansreport.org**