Earn 3 CE credits
This course was written for dentists, dental hygienists, and assistants.

Achieving Successful Proximal Contacts with Direct Composite
A Peer-Reviewed Publication
Written by Ian Shuman DDS, MAGD, AFAAID

Abstract
When planning a direct composite restoration in a tooth where the contact must be restored, the practitioner must decide on the best method to achieve an excellent proximal contact with proper morphology. In these instances, the correct composite resin must be selected, along with an appropriate matrix system. This course will demonstrate various clinical scenarios and the steps needed to restore common cavity preparations using direct composite resin and different matrix systems.

Educational Objectives
The focus of this clinical study is to provide the dental professional with the steps needed to place direct composite resin restorations using a variety of matrix systems.
1. Identify the class type cavity preparations for composite restorations.
2. Identify the various matrix systems available for direct composite restorations.
3. Recognize the type of matrix needed to achieve the goal of a proper contact.
4. Know the steps required to complete the direct composite restoration.

Author Profile
Ian Shuman DDS, MAGD, AFAAID maintains a full-time general, reconstructive, and aesthetic dental practice in Pasadena, Maryland. Since 1995 Dr. Shuman has lectured and published on advanced, minimally invasive techniques. He has taught these procedures to thousands of dentists and developed many of the methods. Dr. Shuman has published numerous articles on topics including adhesive resin dentistry, minimally invasive restorative, cosmetic and implant dentistry. He is a Master of the Academy of General Dentistry, an Associate Fellow of the American Academy of Implant Dentistry, a Fellow of the Pierre Fauchard Academy. Dr. Shuman was named one of the Top Clinicians in Continuing Education since 2005, by Dentistry Today.

Author Disclosure
Dr. Shuman has no commercial ties with the sponsors or the providers of the unrestricted educational grant for this course.

INSTANT EXAM CODE 15148
Go Green, Go Online to take your course

Publication date: Nov. 2016
Expiration date: Oct. 2019

Supplement to PennWell Publications

PennWell is an ADA CERP recognized provider
ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP does not approve or endorse the listed courses or providers. AADA CERP does not accept or endorse individual courses or instruction. Instead ADA CERP assesses the credit earned for participating providers, which will be recorded in the ADA CERP online system. PennWell designates this activity for 3 continuing educational credits.

Dental Board of California: Provider #517, course registration number CCB 517-15148
This course meets the Dental Board of California requirements for 3 units of continuing education.

The PennWell Corporation is designated as an Approved PACE Provider by the Academy of General Dentistry. The formal continuing dental education programs of this program provider are accepted by the AGD for Fellowship, Mastership and membership maintenance credit. Approval does not imply acceptance by a state or provincial board of dentistry or AGD endorsement. The current terms of approval extends from (11/1/2015) to (10/31/2019) (Provider ID# 517).

Requirements for Successful Completion:
1. Complete all course material.
2. Complete course evaluation and obtain a score of at least 70%

Provider Disclosure:
Heather Hodges, CE Coordinator does not have a leadership or commercial interest with products or services discussed or shared in this educational activity nor with the commercial supporter. No manufacturer or third party has had any input into the development of course content.

Image Authenticity Statement:
The images in this educational activity have not been altered.

Scientific Integrity Statement:
The information presented in this educational activity is derived from the most current information available from evidence based dentistry.

Known Benefits and Limitations of the Data:
The information presented in this educational activity represents the most current information available from evidence based dentistry.

Registration:
The cost of this CE course is $59.00 for 3 CE credits.

Cancellation/Refund Policy:
Any participant who is not 100% satisfied with this course can request a full refund by contacting PennWell in writing.
Educational Objectives

The focus of this clinical study is to provide the dental professional with the steps needed to place direct composite resin restorations using a variety of matrix systems.

1. Identify the class type cavity preparations for composite restorations.
2. Identify the various matrix systems available for direct composite restorations.
3. Recognize the type of matrix needed to achieve the goal of a proper contact.
4. Know the steps required to complete the direct composite restoration.

Abstract

When planning a direct composite restoration in a tooth where the contact must be restored, the practitioner must decide on the best method to achieve an excellent proximal contact with proper morphology. In these instances, the correct composite resin must be selected, along with an appropriate matrix system. This course will demonstrate various clinical scenarios and the steps needed to restore common cavity preparations using direct composite resin and different matrix systems.

Introduction

There are instances where the interproximal contact of a tooth is compromised. This can be due to caries, fracture, and/or loss of an existing restoration. In these cases, when desire and need merit the use of direct composite, a matrix system that will achieve the desired effect of creating the proper interproximal contact is required. There are many clinical circumstances where this might be necessary, but these vary only in the methods needed to correct the problem. Clinical situations include cavity preparations between anterior teeth, posterior teeth, and anterior-posterior contacts (canine to first premolar).

Discussion

By itself, composite resin is a passive material. During shaping and prior to curing, it cannot maintain complete rigidity. This is especially true when attempting to create a tight interproximal contact with an adjacent tooth or teeth. In addition to inherent material shrinkage during curing,1,2 failure has been linked to the use of amalgam matrix systems for direct composite and has led to poor gingivo-axial margin adaptation and open contacts. This may explain why in the past, direct composite, especially when used to restore Class 2 cavity preparations, might have exhibited a shorter lifespan and been seen as inferior to amalgam.3

Attempts to correct this problem have included the use of high viscosity composites (i.e., condensable composite),4 ceramic inserts,5 and proximal box-forming tools,6 among others. However, it was recognized that the type of matrix system used was most influential in achieving a proper interproximal contact. It is this method that primarily dictates the ultimate success or failure of the restoration. According to a study by Peumans et al.,7 the best proximal contact areas in Class 2 composite restorations were obtained using a sectional matrix system. The “packability” of the resin composite did not help to achieve better proximal contacts.

Definitions

Clinically, a matrix is defined as a thin strip adapted around the tooth to supply missing walls and contours, and against which restorative material can be placed and condensed.8 Prior to the advent and use of composite resin in posterior teeth, amalgam was the material of choice for direct restorations. Because amalgam behaved in an active manner by virtue of maintaining shape following compression, matrix systems such as the traditional Toffelmire and wood wedge were adequate. The plastic deformity of amalgam, the displacement of the tooth with wood wedges, and the ability of the Toffelmire matrix band to work in most traditional clinical situations achieved contact.

Matrix systems: A historical perspective

In 1900, the “Black Matrix,” also known as the “ligated matrix band,” was one of the early matrices and was made popular by Dr. G.V. Black.9 (Figure 1) In his book on operative dentistry, Dr. Black described his preference for a metal matrix drawn tightly around a tooth by multiple wraps of a ligature tied with a surgeon’s knot. He recommended that the selected matrix band be adjusted to a sufficient width to cover an area from the occlusal surface to the gingival margin, and be of sufficient length to encircle about half of the tooth. After the desired separation was achieved, the matrix would be contoured to the shape of the proximal surface and then finished with a burnisher.

Figure 1: Amalgam matrix systems

a. Ligated matrix band (G.V. Black, 1900)
b. Toffelmire (Benjamin Franklin Tofflemire, 1946)
c. Ivory matrix retainer

In 1937, Hollenback modified Black’s matrix by using low-fusing modeling compound to support the band prior to placement of amalgam.10 Even when heavy condensing forces were used, the matrix was securely held, and Hollenback stated that any matrix that would yield was unfit for use.11 In 1940, Sweeney explained the importance of rigid matrices that were immovable to prevent sliding of the matrix and restoration. In order to achieve these criteria, Sweeney used 0.002-inch
untempered steel matrix material, contoured according to the proximal surface and supported with a water-softened triangular wooden wedge made from an ordinary tongue blade. It was not until 1946 that Benjamin Franklin Tofflemire, a Navy dentist, invented the Tofflemire matrix retainer. He described using an “arcuate” (curved) metal matrix band with his matrix retainer, which spawned the Tofflemire bands in use today.

In 1977, retainerless systems were being explored, and in 1982, Strasser and Porter reported using a retainerless system for a Class 2 amalgam restoration. These retainerless systems led to the creation of the sectional matrix system. Created in 1980 by Alvin Meyer, DDS, the Palodent system used a “BiTine” ring and sectional matrix. This provided dentists with a means to achieve more predictable contacts and improved tooth and filling longevity while adding comfort to Class 2 procedures for both the patient and doctor. Brackett and others described using the circumferential metal band and matrix retainer in conjunction with the BiTine ring for improved interproximal contour of Class 2 composites. After many generations of sectional matrix systems, wedge designs, and separation rings, several have come to the forefront of current clinical restorative treatment for the placement of direct composite resin. (Figures 02, 03, 04) These include the Contact Matrix System (Danville Materials, San Ramon, CA), CompoTight (Garrison, Spring Lake, MO), and Triodont V3 Sectional Matrix System (V3 Ring and V-Ring) (Ultradent, South Jordan, UT), among others.

In cases involving anterior teeth, contact is easier to achieve due to long, broad interproximal contact areas. Various separating matrices have been used, including stainless steel matrix bands, mylar strips (also known as a plastic or celluloid matrix), and Teflon tape, among others.

**Class 2 direct composite restorations**

**Interproximal contact:** Since the advent of composite, there have been many techniques, materials, and methods attempted to aid in the creation of strong, tight, and durable interproximal contacts. According to a recent study by de la Peña et al., the best way to achieve a strong contact point in Class 2 restorations with composite resin in the posterior dental sector is by using a sectional matrix. A study by Loomans et al. evaluated whether the matrix or the composite influenced a Class 2 contact when composite resin was used. A variety of matrix systems and different viscosities of composite resin were tested on 360 identical preparations on mannequin teeth. The results showed that when restoring a Class 2 composite resin restoration, the use of a
separation ring had a greater influence on the obtained proximal contact tightness compared to the influence of the consistency of the composite resin.

Other studies have substantiated these findings. Research by Saber et al. compared proximal contact tightness of MOD resin composite restorations placed with different matricing protocols. It was concluded that tighter contacts could be obtained when sectional matrices and separation rings are applied to both proximal surfaces prior to placement of the resin composite in MOD cavities.

Figure 5: A fully assembled sectional type matrix system.

Flash and excess material
A study by Loomans et al. demonstrated that the use of circumferential matrices or sectional flexible matrices resulted in the least marginal overhang only when combined with a contact matrix separation ring. However, in clinical situations that are less than ideal, numerous matrix systems designed specifically for composite resin can leave excess flash and/or material. This can be due to poor matrix adaptation, insufficient contacts, and uneven cavity preparations, among other reasons. The design of the Triodont® V-Ring and the Triodont® V3-Ring systems demonstrate adaptive capability in a wide variety of both simple and complex clinical situations.

A poor fitting matrix system will result in gross excess. The challenge here is the attempt to finish a tooth-colored restoration against natural tooth margins. Because of the difficulty in distinguishing tooth-colored resin from actual enamel, restorative margins and enamel might be damaged and require subsequent repair or a complete remake of the restoration. Research has substantiated this issue. A study by Loomans et al. sought to determine the proximal margin overhang of composite restorations in relation to the placement technique of separation rings. After matrix removal, overhang was measured on a standardized digital macroscopic image in millimeters squared. The Triodont® matrix system resulted in the least marginal overhang.

In a separate study by Cho et al., the Triodont® matrix system was found to allow a “minimal excess of resin at the buccal and lingual margins reducing the time required for finishing the restorations”.

Composite shrinkage and contact
Proximal contact tightness of Class 2 resin composite restorations is influenced by a myriad of factors, including the role composite shrinkage plays on proximal contacts. A study was conducted of volumetric shrinkage of resin and the intensity of curing lights as they relate to proximal contact tightness when restoring Class 2 cavity preparations in vitro. It was determined that low-shrinkage resin composite and low curing light intensity is associated with tighter proximal contact values.

Class 3 and 4 direct composite restorations
As previously mentioned, a variety of matrices are used in restorations where the proximal surface of an anterior tooth is missing. The matrix should be placed interproximally prior to etching and priming the tooth. This protects adjacent teeth from these materials, thereby avoiding unintentional bonding. After placement of composite material and prior to curing, the natural contour of the tooth can be created by either pulling the matrix tightly around the site, leaving it in place passively, or, following composite placement, pulling through without disturbing the uncured composite. Using a clear plastic matrix allows the curing light to penetrate the material and complete the curing process.

Despite the ability of the mylar matrix to provide a shiny surface layer, studies have shown that finishing and polishing the composite provides a superior long-term result. However, different polishing systems vary in their effect on reducing surface roughness and stain susceptibility of dental composite resin materials. This is especially true when mylar matrices are used. In a study evaluating Streptococcus mutans biofilm adhesion on composite resin surfaces following different finishing and polishing techniques, it was found that mylar matrix strips promoted the lowest bacterial adhesion on the surfaces of microhybrid and nanofilled composites in the absence of human saliva.

Case reports
1. Anterior tooth: existing restoration with caries
A 35-year-old female patient presented for routine examination. A carious lesion was detected in the upper right central incisor at the distofacial aspect. (Figure 6) The tooth was anesthetized and the existing restoration was removed. Following the complete removal of caries, a bevel was placed at the cavosurface margin. (Figure 7) Studies have shown that a bevel is necessary both for the long-term maintenance of the margin as well as for improved esthetics. The concave-beveled cavity preparation design has been shown to greatly reduce microleakage at the margins of these composite resin restorations. In addition, the bevel provides improved “optical integration” of the composite resin, allowing it to blend seamlessly with tooth structure.
Figure 6: A carious lesion in the upper right central incisor.

Figure 7: Following the complete removal of caries, a bevel was placed at the cavosurface margin.

Following cavity preparation, a clear mylar strip was placed at the interproximal. (Figure 8) The clear matrix allowed the curing light to reach the entire length of the restoration for a more rapid and complete cure. The site was treated with a one-step self-etching bonding system (Peak Universal Bond, Ultradent) and light cured. The cavity preparation was then restored with a light cured micro-hybrid composite with the fluorescent and opalescent qualities of natural tooth structure (Vit-l-escence, Ultradent).

Figure 8: A clear mylar strip placed at the interproximal.

To mimic the hypocalcifications present in these upper anterior teeth, a flowable dentin opaquer (PermaFlo®, Ultradent) was used. Following the removal of the mylar strip, an interproximal polishing strip was used, (Figure 9) followed by finishing and polishing of the restoration using silicone impregnated rubber cups, points, and discs (Jiffy® Composite Adjusters and Polishers, Ultradent). (Figure 10) In a study of four finishing systems, the surface roughness of different composite resins were evaluated after polishing. 20 specimens were made of each material (5 mm in diameter and 4 mm high) and analyzed with a profilometer (Perthometer S8P, Perthen, Mahr, Germany) to measure the mean surface roughness (Ra). The Jiffy® points produced the smoothest surfaces for the tested resin composites. As a result, these should be considered for clinical use as preferred polishing systems for these resin composites.

This was substantiated in a separate study by Roeder, Tate, and Powers. They examined the average surface roughness of three packable composites and one hybrid composite cured against mylar. Overall, the Jiffy® Composite polishing cups and discs produced some of the smoothest surfaces.

Figure 9: Interproximal polishing strip.

Figure 10: The completed restoration.

2. Posterior tooth

A 64-year-old female patient presented for correction of a defective composite resin restoration of the upper left second premolar, tooth #13. Visual examination revealed an over-contouring of the disto-lingual aspect of coronal structure. This in turn was a chronic site for food impaction, and ultimately caused was caries at the disto-gingival margin. (Figure 11)
After administering a local anesthesia, the quadrant was isolated using a rubber dam. The existing restoration was removed. (Figure 12) Complete caries removal was determined by tactile exam with an explorer and light-assisted spectral analysis (Spectra, Air Techniques). The Triodont® V3 Sectional Matrix System™ was used to restore the Class 2 cavity preparation (Ultradent, South Jordan, UT). The matrix design incorporates accurate anatomic features, including a vertical contour that is gentle to the gingival margin, as well as a gingival apron. The gingival apron is properly shaped to common cavity designs while avoiding gaps in the gingivo-axial corner.

In addition, the 30μm width allows minimal spacing to adjacent teeth, and tabs lead to easy placement and removal when using specially designed Triodont® Pin-Tweezers. Manufactured from fully autoclavable nickel-titanium, and glass fiber–reinforced plastic tines the yellow and green Triodont® V3 Rings™ provide exceptional strength and resilience, which encourage tooth separation and produce perfect, tight contacts with minimal flash. One of the unique features of this system is that the ring itself, not the wedge, creates the interproximal separation. A fully tensioned Triodont® V3 Ring™ is capable of producing 60-80μm of interproximal space, making it easy to accommodate the wedge and form the matrix around the tooth.

There are occasions where a gap might still appear at the gingivo-axial. To obtain greater adaptation of the matrix, an additional wedge can be placed from the palatal aspect. This may be accomplished without the need to remove the rings as the Triodont® V3-shaped tines allow for this. The V-shaped tines of the V3 Ring™ and the underside of the wedge also allow for double wedging. In addition, waiting several minutes until the teeth no longer spread from the pressure of the ring might be required. Once in the correct position, the wedge can simply be pushed into the tines to readapt the matrix.
After completion of the restoration, (Figure 14) the ring and wedge were removed and the matrix wing holes gripped with Pin-Tweezers and wriggled using silicone impregnated rubber cups, points, and discs (Jiffy® Composite Adjusters and Polishers, Ultradent). (Figure 15)

Figure 15: The completed restoration.

Conclusion
It has been demonstrated that the use of the correct matrix system is essential when restoring areas that require interproximal contact. These materials and procedures offer the ability to provide teeth with excellent contacts in a variety of clinical situations. In addition, using resin-based bonding offers practitioners the ability to help patients by providing long-lasting and strong restorations, especially when combined with proper preparation guidelines.

Bibliography

Author Profile
Ian Shuman DDS, MAGD, AFAAID maintains a full-time general, reconstructive, and aesthetic dental practice in Pasadena, Maryland. Since 1995 Dr. Shuman has lectured and published on advanced, minimally invasive techniques. He has taught these procedures to thousands of dentists and developed many of the methods. Dr. Shuman has published numerous articles on topics including adhesive resin dentistry, minimally invasive restorative, cosmetic and implant dentistry. He is a Master of the Academy of General Dentistry, an Associate Fellow of the American Academy of Implant Dentistry, a Fellow of the Pierre Fauchard Academy. Dr. Shuman was named one of the Top Clinicians in Continuing Education since 2005, by Dentistry Today.

Author Disclosure
Dr. Shuman has no commercial ties with the sponsors or the providers of the unrestricted educational grant for this course.
1. The interproximal contact of a tooth may be compromised due to:
   a. caries
   b. fracture
   c. loss of an existing restoration
   d. all of the above

2. Which of the following is considered a passive material?
   a. gold alloy
   b. amalgam
   c. composite resin
   d. none of the above

3. Using amalgam matrices for placing direct composite resin has led to which of the following failures?
   a. poor gingival margin adaptation
   b. open contacts
   c. voids in the pulpal floor
   d. a and b

4. Which of the following dictates the ultimate success or failure of the Class 2 composite restoration?
   a. matrix system
   b. spectral biosys
   c. ligation
   d. all of the above

5. According to a study by Peumans et al., the best proximal contact areas in Class II composite restorations were obtained using a:
   a. sectional matrix system
   b. tofflemire
   c. mylar matrix
   d. ligated band

6. In most traditional clinical situations, successful contact with amalgam is achieved by the:
   a. plastic deformation of amalgam
   b. non-displacement of the tooth with wood wedges
   c. Tofflemire matrix
   d. a and c

7. In 1900, the “Black Matrix” was also known as the:
   a. sectional matrix
   b. circumferential band
   c. ligated matrix band
   d. GV Ring

8. GV Black recommended that the selected matrix band should be adjusted to a sufficient width to cover an area from the occlusal surface to the gingival margin and must be of sufficient length to encircle about how much of the tooth?
   a. one quarter
   b. half
   c. three quarters
   d. one fifth

9. In 1937, Hollenback modified Black’s matrix by using:
   a. beeswax
   b. floss
   c. boxing wax
   d. low fusing modeling compound

10. In 1940, who explained the importance of matrices that are rigid and immovable?
    a. Sweeney
    b. Athos
    c. Porthos
    d. Aramis

11. Sweeney used 0.002-inch untempered steel matrix material, contoured according to the proximal surface, and supported with a water-softerned triangular wooden wedge made from:
    a. balsa
    b. modeling wood
    c. a tongue blade
    d. toothpicks

12. Dr. Benjamin Franklin Tofflemire, a Navy dentist, invented the Tofflemire matrix retainer in what year?
    a. 1926
    b. 1936
    c. 1946
    d. 1956

13. Retainerless systems led to the creation of the:
    a. sectional matrix system
    b. TriTine ring
    c. E-Ring
    d. mylar strip

14. Alvin Meyer, a dentist, created which matrix system in 1980?
    a. V-Ring
    b. Contact Matrix
    c. South Jordan
    d. Palodent

15. Brackett and others described using the circumferential metal band and matrix retainer in conjunction with a bitine ring for improved interproximal contour of:
    a. Class 3 composites
    b. Class 2 composites
    c. Class 2 amalgams
    d. Class 4 composites

16. In cases involving anterior teeth, contact is easier to achieve due to:
    a. broad interproximal contact areas
    b. point contacts
    c. varied interproximal contact areas
    d. none of the above

17. Pre-wedging is recommended to encourage a separation between teeth in order to avoid:
    a. bleeding
    b. ligament stretching
    c. matrix deformation
    d. mobility

18. According to Loomans et al., when restoring a Class II composite resin restoration, which of the following has a greater influence on the obtained proximal contact tightness?
    a. separation ring
    b. wedge
    c. matrix
    d. all of the above

19. Research by Saber et al. compared proximal contact tightness in what type of resin composite restorations?
    a. MO
    b. MOD
    c. DO
    d. OF

20. When combined with a contact matrix separation ring, use of circumferential matrices or sectional flexible matrices results in the:
    a. most marginal overhang
    b. least marginal overhang
    c. least occlusal flash
    d. most occlusal flash

21. In a study using a standardized digital microscopic image in millimeters squared, which of the following resulted in the least proximal contact tightness?
    a. V-Ring
    b. Tofflemire
    c. mylar
    d. Toriolut

22. A plastic matrix used for Class III and IV restorations is also referred to as a:
    a. celluloid matrix
    b. mylar strip
    c. cellular strip
    d. a and b
23. Studies have shown that a shiny composite surface layer is best achieved by:
   a. diamond strips
   b. finishing and polishing
   c. porcelain glaze
   d. none of the above

24. What microbial organism was studied when evaluating biofilm adhesion on composite resin surfaces after different finishing and polishing techniques?
   a. Actinomyces israelii
   b. Campylobacter rectus
   c. Tannerella forsythia
   d. Streptococcus mutans

25. Studies have shown that a beveled margin is necessary for both the long-term maintenance of a Class 3 restoration as well as providing:
   a. optical migration
   b. improved esthetics
   c. refractory indices
   d. a and c

26. Which of the following preparation designs have been shown to greatly reduce microleakage at the margins of composite resin restorations?
   a. convex bevel
   b. concave butt joint
   c. concave-bevel
   d. convex butt joint

27. When a bevel provides a composite resin to blend seamlessly with tooth structure, it is known as:
   a. camouflage
   b. refractory migration
   c. optical integration
   d. a and b

28. In cases involving anterior teeth, various separating matrices have been used, including:
   a. stainless steel matrix bands
   b. mylar strips
   c. Teflon tape
   d. all of the above

29. In the clinical Class 3 case shown, hypocalcifications were created using:
   a. flowable dentin opaquer
   b. translucent hybrid
   c. packable resin
   d. none of the above

30. Bleeding during cavity preparation can be prevented by:
   a. placing a matrix band
   b. interproximal Teflon tape
   c. pre-wedging
   d. a and c
Achieving Successful Proximal Contacts with Direct Composite

Educational Objectives
1. Identify the class type cavity preparations for composite restorations.
2. Identify the various matrix systems available for direct composite restoration.
3. Recognize the type of matrix needed to achieve the goal of a proper contact.
4. Know the steps required to complete the direct composite restoration.

Course Evaluation
1. Were the individual course objectives met?
   Objective #1: Yes No Objective #2: Yes No
   Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.
   2. To what extent were the course objectives accomplished overall? 5 4 3 2 1 0
   3. Please rate your personal mastery of the course objectives. 5 4 3 2 1 0
   4. How would you rate the objectives and educational methods? 5 4 3 2 1 0
   5. How do you rate the author's grasp of the topic? 5 4 3 2 1 0
   6. Please rate the instructor's effectiveness. 5 4 3 2 1 0
   7. Was the overall administration of the course effective? 5 4 3 2 1 0
   8. Please rate the usefulness and clinical applicability of this course. 5 4 3 2 1 0
   9. Please rate the usefulness of the supplemental webliography. 5 4 3 2 1 0
   10. Do you feel that the references were adequate? Yes No
   11. Would you participate in a similar program on a different topic? Yes No
   12. If any of the continuing education questions were unclear or ambiguous, please list them.
   13. Was there any subject matter you found confusing? Please describe.
   14. How long did it take you to complete this course? ___________
   15. What additional continuing dental education topics would you like to see? ___________

Requirements for successful completion of the course and to obtain dental continuing education credits: 1) Read the entire course. 2) Complete all information above. 3) Complete answer sheets in either pen or pencil. 4) Mark only one answer for each question. 5) A score of 70% on this test will earn you 3 CE credits. 6) Complete the Course Evaluation below. 7) Make check payable to PennWell Corp. For Questions Call 800-633-1681

Customer Service 800-633-1681

PennWell maintains records of your successful completion of any exam for a minimum of six years. Please contact our offices for a copy of your continuing education credits report. This report, which will list all credits earned to date, will be generated and mailed to you within five business days of receipt.

The PennWell Corporation is designated as an Approved PACE Program Provider by the Academy of General Dentistry. The formal continuing education programs of this organization are acceptable by the AGD for Fellowship, Mastership and membership maintenance credit. Approval does not imply acceptance by each state or provincial board of dentistry or AGD endorsement. The current term of approval extends from (9/1/2015) to (10/31/2019) Provider ID# 320452

Any participant who is not 100% satisfied with this course can request a full refund by contacting PennWell in writing. Concerns or complaints about a CE Provider may be directed to the provider or to ADA CERP at www.ada.org/cerp.

Please photocopy this course material for your records. For IMMEDIATE results, go to www.DentalAcademyOffice.com to take tests online.