

# Caries management and minimal intervention dentistry: A collaborative approach

## Second edition

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### Abstract

The incidence of dental caries is increasing globally. It is essential that the dental team work together with the patient to manage dental caries throughout the various stages of the patient's life. Several methods are used within the dental field for caries identification. The utilization of a risk assessment can assist the dental professional in addressing the disease process and recommended treatment with the patient. It is advantageous to utilize a completed risk assessment, along with various caries identification methods, to help guide the patient and dental team in management of early carious lesions. The use of minimal intervention dentistry to address early carious lesions is an integral part of the caries management process and should be considered when devising a caries management plan.

### Educational objectives

At the conclusion of this course, participants will be able to:

1. recognize visual and radiographic methods used for caries identification,
2. describe how CAMBRA can assist with caries management, and
3. identify six methods utilized in minimal intervention dentistry that may aid in caries management.



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## Introduction

Dental caries, the most prevalent disease in humans, can pose a significant physical, emotional, and financial burden through all stages of life.<sup>1</sup> While dental caries is the most common preventable chronic disease on the planet, it remains largely untreated. Caries rates are rapidly increasing on a global level.<sup>2</sup> Due to the continual rise in caries incidence, dental health professionals ought to be mindful of this disease process in their patients. The long-standing practice of “drill and fill”—drilling out pits and fissures or surgically removing decayed and diseased tissue and placing permanent restorations—does not address the full continuum of the caries disease process, which includes microbial activity and the balance between enamel remineralization and demineralization.

Minimal intervention dentistry requires a philosophy change in the dental team’s approach to managing dental caries. Caries is a bacterial disease, not the end product of that disease. Patients should be assessed for their caries risk so that the dental team can assist the patient in preventing caries or reversing it in its early stage by interrupting the disease process prior to cavitation. If the caries process cannot be reversed, minimal intervention dentistry should be utilized to conserve sound tooth structure while restoring the carious lesion.<sup>3</sup>

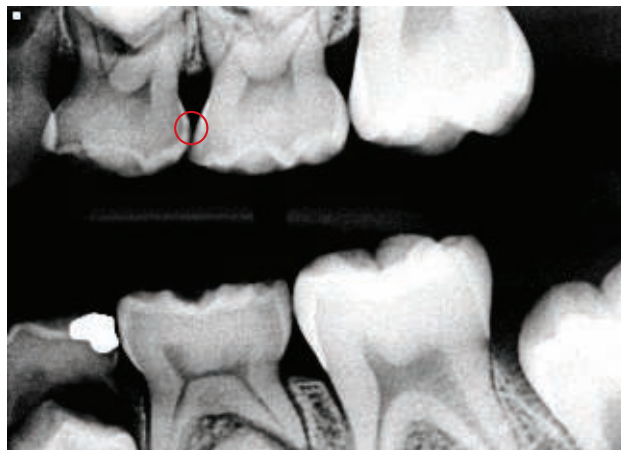
Control of the disease should be an essential part of the process of care for practicing dental hygienists.<sup>3</sup> Dental caries are best managed through a partnership between the patient and dental team throughout the stages of a patient’s life.<sup>4</sup> Using evidence-based research, the dental team should work together with the patient in planning appropriate actions for caries assessment and treatment to ensure successful outcomes with incipient carious lesions.<sup>5</sup> Systematic methods of caries detection, classification, and risk assessment, as well as prevention and risk management strategies, can help reduce patient risk of developing advanced disease and may even arrest the disease process. This approach may help the patient maintain his or her dentition for their lifetime.

## Methods for caries identification

Various methods are utilized within the dental field for identification of carious

lesions. One such method is visual inspection. Visual inspection—the act of looking at the tooth structure for signs of caries—is scientifically proven to be accurate for detecting carious lesions. Visual inspection, which can be paired with tactile methods, includes identification of halos and areas of distinct stain on the teeth. Visual inspection has proved most accurate when paired with detailed and validated indices. Assessments, such as the International Caries Detection Assessment System (ICDAS), are available to guide the clinician and provide universal interpretation, thus improving accuracy.<sup>6</sup> In addition, radiographs may be used as an integral aspect of caries identification. Advancements in digital imaging and technology-based assessment methods also show great promise.<sup>5-7</sup>

Visual inspection of the dentition is essential in the identification of carious lesions. The clinician should inspect the dentition for areas on the tooth surface that appear gray in color, often described as a shadow or halo on the tooth. The clinician can also visually inspect to assess for dark stain in deep pits and/or fissures



**FIGURE 1:** Bitewing radiograph showing incipient lesion

on the tooth surface. Use of an explorer during visual inspection is discouraged, as the explorer could penetrate the wall of an incipient lesion. An alternative to the explorer is to utilize radiographs to identify carious lesions. Bitewing radiographs, specifically, aid in the identification of carious lesions on the interproximal tooth surface (figure 1). In addition, the use of radiographs as an assessment tool provides value for

the dental team, as it allows them to see changes in the patient’s dentition over time and utilize past radiographs as a baseline for comparison of changes.<sup>7</sup> Additional technology-based assessment methods are available for identification of carious lesions, including lasers and fluorescence.<sup>5</sup> Research has demonstrated a high sensitivity for caries detection by using lasers.<sup>5,8</sup>

## Risk assessment

A proficient dental health professional must serve as an investigator to uncover the daily factors in a patient’s life that may allow for control of disease. Utilization of risk assessment for dental caries allows the dental professional to focus on the disease process instead of disease treatment.<sup>3</sup> There are various tools commonly used to identify caries risk. One such tool is the Caries Management by Risk Assessment (CAMBRA).<sup>3,9,10</sup> This tool guides the level of risk and aids the dental health professional in care-planning strategies.<sup>9,10</sup>

CAMBRA is an evidence-based approach to caries prevention and management.<sup>9</sup> This assessment tool places emphasis on the whole disease process, provides ways to identify problems early, and uses evidence-based strategies for moving forward to provide the best oral health outcomes for patients.<sup>2,9</sup> CAMBRA can guide early intervention for caries lesions instead of traditional restorative treatment.<sup>11</sup> It takes into account a patient’s health and lifestyle risk factors and weighs them against protective factors. Using this information, a patient’s risk for caries development is determined and a management strategy is established.<sup>12,13</sup> Understanding nutrition, products, and oral health educational goals is imperative once the risk is identified for patients as individuals. The dental hygienist should be actively involved in utilizing the evidence gathered through a risk assessment to determine an intervention plan, including treatment and products

unique to the patient's caries risk in order to delay, if not entirely avoid, invasive restorative treatments.<sup>9,12,13</sup>

Identification of patients at great risk for future caries helps clinicians work with patients and plan appropriate personalized care. A key benefit of CAMBRA is that it encourages the dental professional and the patient to consider all factors relevant to the patient's risk and disease state, shifting focus away from the traditional restorative approach to dental caries and toward the cause of the disease. This allows modification of cause, when possible, and greater communication and understanding between all individuals involved.<sup>12,13</sup> Studies show that patients who go through a caries management system protocol have fewer caries than those who do not. Patients benefit from a reduced risk of caries and, therefore, experience lower need for restorative treatment. Studies also show that a greater intervention effect carries through the combined action on multiple aspects of the caries process rather than through any single factor.<sup>12,13</sup>

### Minimal intervention dentistry

By utilizing evidence from a completed caries risk assessment, the dental health team can guide good management of diagnosed early lesions. The idea of managing early carious lesions with preventive measures—before they reach the cavitated stage—is utilized in modern dental practice.<sup>12</sup> Management strategies include products that help with saliva flow and pH balance, antimicrobials, sealants, xylitol, fluoride, and minimally invasive restorative work.<sup>9</sup>

#### SALIVA STIMULATING PRODUCTS AND PH BALANCE

Saliva stimulating products and those that help balance the pH of the oral cavity can be useful in the management of early carious lesions, as oral pH level depends heavily on saliva. Salivary pH increases upon stimulation, thus increasing the pH of the oral cavity, which aids in buffering acids, suppressing aciduric bacteria, and remineralizing enamel.

There are numerous topical products aimed at stimulating salivary flow, such as over-the-counter gums, mints, and rinses. It is important that the dental professional

work with the patient to find a product that the patient is willing to use, as patient acceptance varies among products. Patients must also be instructed to carefully read product labels for ingredients and instructions for use.

Neutralizing products, such as antacid tablets, may raise a low intraoral pH to combat the progression of incipient caries. Antacids are a class of drugs used to treat conditions caused by acid produced by the stomach. They reduce acidity by neutralizing or counteracting acid and inhibiting the activity of pepsin. Antacids contain ingredients such as calcium or sodium bicarbonate, which act as a base to neutralize acid and increase pH.<sup>14</sup>

pH balancing products include certain desensitizing toothpastes that contain calcium phosphate, sodium bicarbonate rinses, and over-the-counter rinses aimed specifically at neutralizing pH.<sup>9</sup> Researchers have described dental caries as a pH-specific disease, with a low pH level being directly related to the demineralization of teeth.<sup>2</sup> Toothpaste containing calcium phosphate can contribute to the management of early carious lesions due to the ability for enamel surfaces to be remineralized by precipitation of calcium phosphate. Sodium bicarbonate, an active ingredient in some rinses, does not have direct antimicrobial effects but does play an active role as a cleansing agent because of its ability to dissolve mucus and loosen debris. These rinses help maintain moisture content of the oral epithelial barriers, thus contributing to caries management.<sup>9</sup>

Saliva stimulating products, such as sorbitol-containing gum, can also reduce the development of dental caries. Salivary flow increases in response to both taste and mechanical stimuli, both of which are provided when an individual chews sorbitol-containing gum. In addition to stimulating salivary flow, chewing sorbitol-containing gum raises salivary and plaque pH and promotes enamel remineralization.<sup>15</sup> An individual's flavor preference and gum selection can influence long-term compliance.

#### ANTIMICROBIALS

Prescription-based antimicrobial products may aid in caries management. Because

dental caries is an infectious disease of bacterial origin, the use of antimicrobial agents to reduce or eliminate bacteria associated with caries follows the approach used to combat other infectious diseases of humans. Antimicrobials, in the form of rinses, gels, pastes, or varnishes, are products that have the ability to potentially reduce the number of cariogenic microorganisms for a limited period.<sup>16,17</sup>

One type of antimicrobial often used in dentistry is chlorhexidine gluconate. This product has been proven effective against *Streptococcus mutans*. It is a second-generation product with considerable substantivity. It binds to the oral tissues, mucosa, and teeth, and is released over a prolonged period. This helps to reduce bacterial count and prevent plaque formation. Chlorhexidine has both bacteriostatic and bactericidal mechanisms of action, depending on its concentration.<sup>16,17</sup>

Another type of antimicrobial, essential oil mouth rinse, has also been shown to be effective in reducing bacterial plaque, thereby reducing the bacterial count in the mouth and aiding in the arrest of incipient lesions. Essential oils have been used historically for their powerful antibacterial properties. Today, they are made available through various products for use in caries prevention.<sup>16</sup>

#### SEALANTS

Effectively penetrating and sealing anatomical grooves or pits and fissures with a dental material can prevent lesions and is part of a comprehensive caries management approach. Research has shown that placing a glass ionomer sealant over an incipient carious lesion reduces the level of bacteria in the carious lesion.<sup>9,18</sup> Glass ionomer sealants have fluoride-releasing properties to aid in the remineralization of incipient lesions and have an antimicrobial effect. Fluoride ions are taken up by the enamel, which renders the tooth structure less susceptible to acid challenge through disruption of bacterial activity. The ability of glass ionomer to release other ions, notably calcium and aluminum, may also promote remineralization of the tooth.<sup>18</sup>

In addition, there is evidence that sealants can also inhibit the progression of

noncavitated caries lesions. Sealants can prevent caries progression by blocking fermentable substrates that cause carious lesions to advance. The bacterial level in a carious lesion may decrease when the bacteria are not nourished due to the placement of a sealant, thus inhibiting further growth of the lesion.<sup>18</sup>

#### XYLITOL

Xylitol, a sugar alcohol, is found in small amounts in many fruits and vegetables and is therefore considered natural. It is often used as a sugar substitute because of its sweetness, and is a common ingredient in many diabetes-friendly foods and oral care products. It may be found in sugar-free candies, such as mints and gummies, chewing gum, toothpaste, mouthwash, as well as various other products.<sup>19</sup>

Studies suggest xylitol reduces the incidence of caries and may have anticariogenic properties.<sup>17,19</sup> Xylitol is nonfermentable, so bacteria are not able to use it in their metabolic process. As a result, bacteria are not able to thrive or produce an acid by-product. Additionally, xylitol has an antiadhesive quality. This unique characteristic prohibits bacteria from adhering to cell tissue, which is required for bacteria to flourish. Because of these properties, xylitol reduces plaque formation and adherence of bacteria, inhibits enamel demineralization, and has a direct inhibitory effect on *Streptococcus mutans*—decay-causing bacteria—by keeping it from adhering to the tooth.<sup>16,19</sup> The American Academy of Pediatric Dentistry supports the use of xylitol as part of a strategy for long-term caries pathogen suppression.<sup>19</sup>

#### FLUORIDE

Fluoride use for the prevention and control of caries is proven to be both safe and highly effective when used as directed or within the context of community water fluoridation programs.<sup>20</sup> Fluoride has three main mechanisms of action: (1) promotes remineralization, (2) reduces demineralization, and (3) inhibits bacterial metabolism and acid production. The mechanisms of fluoride are both topical and systemic. Over the life span, topical fluoride has been proven most effective.<sup>20</sup>

The three most commonly used fluoride sources today are sodium fluoride, sodium monofluorophosphate, and stannous fluoride. In particular, stannous fluoride has proven to have antimicrobial properties in addition to anticaries properties, and may be an effective choice in certain cases.<sup>20</sup> Stannous fluoride kills bacteria in the oral cavity by interfering with the metabolic process of microbes. Fewer bacteria means decreased acid production, which contributes to caries prevention. Stannous fluoride is versatile, being the only fluoride source that provides protection against decay, tooth sensitivity, and plaque/gingivitis, making it a desirable option for many patients.<sup>20</sup>

The regular use of low-dose fluoride is a good home-care strategy for suppressing dental caries.<sup>21</sup> Forms of home fluoride delivery include fluoridated toothpaste and mouth rinses—both of which are available over the counter and in prescription strength—self-applied gels, drinking fluoridated water, and dietary fluoride supplements.<sup>20,22</sup> An additional option for fluoride application is to receive a high-dose treatment at the dental office. Professional fluoride delivery for patients includes higher strength fluoride rinse, gel, foam, and varnish (table 1).<sup>23</sup>

**TABLE 1: Types of Fluoride Treatments**

Home fluoride treatments	In-office fluoride treatments
Toothpaste	Rinse
Mouth rinse	Gel
Fluoridated drinking water	Foam
Dietary supplements	Varnish

#### MINIMALLY INVASIVE RESTORATIVE WORK

The primary objective of minimally invasive dentistry is to prevent or arrest active disease using nonoperative management techniques. The philosophy of minimally invasive restorative work centers on not preparing access cavities in the tooth, thus protecting and preserving the tissues surrounding the carious lesion. Advantages of this type of dentistry include minimizing unnecessary tooth tissue loss, preventing insult to the dentin-pulp complex, and

reducing the risk of damage to adjacent hard and soft tissues. Additionally, minimally invasive restorative work maximizes the strength of residual tooth structure by use of optimal adhesive restorative materials designed to restore function and esthetics with durable restorations that are easy for the patient to maintain. This technique is virtually painless and is gaining ground in dentistry.<sup>24</sup>

A range of innovative techniques are available for minimally invasive cavity preparation, including chemomechanical agents, sono-abrasion, laser systems, and fluorescence-aided caries excavation (FACE). One example of a minimally invasive procedure utilizes an etchant instead of a high-speed handpiece to access carious tissue. A glass ionomer is then placed on the lesion, which allows the slow release of fluoride into the carious surface, halting progression of the lesion.<sup>24</sup>

Various other types of minimally invasive restorative options also exist, which may be worth exploring to determine the optimal method for use on individual patients. Minimally invasive procedures have evolved significantly over the last three decades, particularly with innovative developments in adhesive dentistry and the use of certain restorative materials. This ongoing progress has promoted a more biologically focused approach to patient care delivery and resulted in significant advances in contemporary restorative dentistry.<sup>24</sup>

#### Conclusion

In conclusion, as the incidence of caries rises in the United States,<sup>22</sup> it is increasingly important that the dental team be knowledgeable of the best practices in treating incipient lesions.<sup>4</sup> The dental team should work together with the patient to devise an action plan for assessment, prevention, and treatment of dental caries. This action plan should include a thorough assessment of caries risk and current patient status, staying abreast of the most recent evidence-based recommendations for effective treatment of lesions, and continual assessment of a lesion over time.<sup>3</sup> Caries risk assessment can enhance patient care and is an integral part of a minimally invasive plan, allowing

the team to determine appropriate strategies and interventions.<sup>25</sup> Whether caries intervention includes assessment of the patient at regular intervals while providing oral health education, nonrestorative intervention (fluoride, saliva enhancers, antimicrobials, sealants, xylitol, etc.), or minimally invasive restorative procedures, the dental team and patient must work together to achieve optimal outcomes. Consideration of a patient's individual needs, as well as input from the patient, greatly affects compliance and success of a comprehensive caries management plan. The relationship between the patient and dental team should be considered a lifelong process, with continual reassessment and necessary adjustments to provide care that is optimal for the individual patient's oral health needs.

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## Notes

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## QUESTIONS

- Which of the following statements regarding dental caries is true?
  - Dental caries can pose a significant burden through all life stages.
  - Caries rates continue to increase globally.
  - Responsibility for dental caries management lies with the entire dental team.
  - All of the above
- Which method of caries detection is *not* recommended?
  - Visual inspection
  - Use of an explorer
  - Assessments
  - Radiographs
- Which of the following is *not* true regarding CAMBRA?
  - Aids the dental health professional in care-planning strategies
  - Is an evidence-based approach to caries management
  - Can guide early intervention for caries lesions
  - Guides restorative treatment only
- Visual inspection for carious lesions includes looking for which of the following?
  - Halo on the tooth
  - Dark stain in deep pits/fissures
  - Both A and B
  - None of the above
- Which type of radiograph aids in the identification of carious lesions on interproximal tooth surfaces?
  - Bitewing
  - Periapical
  - Occlusal
  - Panoramic
- Which of the following is a type of assessment method available for use in the identification of carious lesions?
  - Lasers
  - Fluorescence
  - CAMBRA
  - All of the above
- What type of product may raise a low intraoral pH to combat incipient caries progression?
  - Antacid tablet
  - Prescription-based antimicrobial rinse
  - Xylitol gum
  - All of the above
- Risk assessment for dental caries allows the dental professional to:
  - Focus on disease treatment
  - Focus on the disease process
  - Place blame for disease development
  - None of the above
- What is the optimal use of lasers in caries detection?
  - As a sole diagnostic technique
  - In conjunction with visual and radiographic techniques
  - In conjunction with an explorer on the occlusal surface
  - There are currently no recommendations for laser use.
- What type of product has a fluoride-releasing property to aid in the remineralization of incipient lesions?
  - Glass ionomer sealant
  - Essential oil mouth rinse
  - Amalgam
  - Both A and C
- Home fluoride treatments, pH balancing agents, and xylitol are all examples of what?
  - Nonrestorative caries intervention
  - Minimally invasive restorations
  - Invasive restorations
  - Cariogenic agents
- What risk assessment tool places emphasis on the whole disease process, provides ways to identify problems early, and uses evidence-based strategies for moving forward to provide the best oral health outcomes for patients?
  - O'Leary's Plaque Index
  - Periodontal Risk Assessment
  - Caries Management by Risk Assessment
  - None of the above
- What type of product has proven effective against *Streptococcus mutans*?
  - Antacid tablet
  - Water
  - Prescription-based antimicrobial rinse
  - Chewing gum
- Which of the following individuals should participate in a partnership to manage dental caries?
  - Dentist
  - Dental hygienist
  - Patient
  - All of the above
- Which of the following is *not* a recommended best practice for treating an incipient lesion?
  - Thorough assessment of caries risk and current patient status
  - Utilization of current evidence-based recommendations for effective treatment of lesions
  - Continual assessment of a lesion over time
  - Telling the patient he or she must restore the lesion immediately
- Which product is supported by the American Academy of Pediatric Dentistry for use as part of a strategy for long-term caries pathogen suppression?
  - Xylitol
  - Resin compounds
  - Amalgam restorations
  - None of the above

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## QUESTIONS

17. Which of the following is *not* a mechanism of action for fluoride?
- Promotes remineralization
  - Reduces demineralization
  - Mechanically removes plaque
  - Inhibits bacterial metabolism and acid production
18. Which of the following is a form of home fluoride delivery?
- Fluoridated water
  - Dietary fluoride supplements
  - Fluoridated toothpaste
  - All of the above
19. The philosophy that centers on preserving and protecting tissues surrounding a carious lesion by not preparing access cavities in the tooth is called:
- Preventive dentistry
  - Minimally invasive restorative work
  - Amalgam cavity preparation
  - Invasive restorative work
20. Which of the following is a type of caries management strategy?
- Antimicrobial products
  - Fluoride
  - Minimally invasive restorative work
  - All of the above
21. Which of the following is *not* considered a pH balancing product?
- Desensitizing toothpaste containing calcium phosphate
  - Sodium bicarbonate rinse
  - Sealant
  - Over the counter mouth rinse
22. What type of preventive agent reduces plaque formation and adherence of *S. mutans* to the tooth?
- Xylitol
  - Minimally invasive restorations
  - Rinsing with water
  - All of the above
23. Demineralization of the tooth occurs with what type of pH?
- Neutral
  - High
  - Low
  - pH does not affect demineralization
24. What effect does the placement of a glass ionomer sealant have on an incipient carious lesion?
- Reduces bacteria level in the lesion
  - Increases bacteria level in the lesion
  - Has no effect on bacteria level in the lesion
  - Effect depends on the brand of sealant used
25. Patients with what type of caries risk can benefit from professional fluoride application?
- Low caries risk
  - Moderate caries risk
  - High caries risk
  - Both C and D
26. Xylitol is available in which of the following forms?
- Mints
  - Chewable tablets
  - Oral wipes
  - All of the above
27. Which of the following statements is true regarding minimally invasive restorative work?
- This technique has not been well received among dental professionals.
  - This technique includes making a smaller than normal access cavity in the tooth.
  - This technique is gaining popularity, particularly in pediatric dentistry.
  - This technique utilizes amalgam to cover carious lesions for prevention of further growth.
28. Which of the following is not a delivery method for receiving a high-dose fluoride treatment in a dental office?
- Fluoridated toothpaste
  - Gel/foam
  - Rinse
  - Varnish
29. Which of the following is a technique available for minimally invasive cavity preparation?
- Chemomechanical agents
  - Laser systems
  - Sono-abrasion
  - All of the above
30. Salivary flow increases in response to what stimuli?
- Taste
  - Mechanical
  - Both A and B
  - None of the above



# Caries management and minimal intervention dentistry: A collaborative approach

## Second edition

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_ SPECIALTY: \_\_\_\_\_

ADDRESS: \_\_\_\_\_ EMAIL: \_\_\_\_\_ AGD MEMBER ID (IF APPLIES): \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_ COUNTRY: \_\_\_\_\_

TELEPHONE: PRIMARY ( ) \_\_\_\_\_ OFFICE ( ) \_\_\_\_\_ LICENSE RENEWAL DATE: \_\_\_\_\_

**REQUIREMENTS FOR OBTAINING CE CREDITS BY MAIL/FAX:** 1) Read entire course. 2) Complete info above. 3) Complete test by marking one answer per question. 4) Complete course evaluation. 5) Complete credit card info or write check payable to Endeavor Business Media. 6) Mail/fax this page to DACE. A score of 70% is required for CE credit. **FOR QUESTIONS, CALL (800) 633-1681. COURSE MAY ALSO BE COMPLETED AT DENTALACADEMYOFCE.COM.**

**Educational Objectives**

1. Recognize visual and radiographic methods used for caries identification.
2. Describe how CAMBRA can assist with caries management.
3. Identify six methods utilized in minimal intervention dentistry that may aid in caries management.

**Course Evaluation**

1. Were the individual course objectives met?

Objective #1: Yes No                      Objective #2: Yes No                      Objective #3: 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 bibliography.                               | 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?

\_\_\_\_\_

\_\_\_\_\_

Mail/fax completed answer sheet to:

**Endeavor Business Media**

Attn: Dental Division  
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 Fax: (918) 831-9804

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| 5. (A) (B) (C) (D)  | 20. (A) (B) (C) (D) |
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| 7. (A) (B) (C) (D)  | 22. (A) (B) (C) (D) |
| 8. (A) (B) (C) (D)  | 23. (A) (B) (C) (D) |
| 9. (A) (B) (C) (D)  | 24. (A) (B) (C) (D) |
| 10. (A) (B) (C) (D) | 25. (A) (B) (C) (D) |
| 11. (A) (B) (C) (D) | 26. (A) (B) (C) (D) |
| 12. (A) (B) (C) (D) | 27. (A) (B) (C) (D) |
| 13. (A) (B) (C) (D) | 28. (A) (B) (C) (D) |
| 14. (A) (B) (C) (D) | 29. (A) (B) (C) (D) |
| 15. (A) (B) (C) (D) | 30. (A) (B) (C) (D) |

AGD Code 250

**PLEASE PHOTOCOPY ANSWER SHEET FOR ADDITIONAL PARTICIPANTS.**

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 All questions have only one answer. Grading of this examination is done manually. Participants will receive confirmation of passing by receipt of a verification form. Verification of Participation forms will be mailed within two weeks after taking an examination.

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 We encourage participant feedback. Complete the survey above and e-mail feedback to Aileen Gunter (agunter@endeavor2b.com) and Laura Winfield (lwinfield@endeavor2b.com).

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