



A cursory Review of Forensic Dentistry

A Peer-Reviewed Publication

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A cursory Review of Forensic Dentistry

EDUCATIONAL OBJECTIVES

At the conclusion of this course, the dental health professional will be able to:

1. Identify areas of forensic dentistry
2. Demonstrate the knowledge of the organization and mechanisms of a multiple fatality team.
3. Identify legal aspects and signs of human abuse.
4. Identify pathways to further knowledge and opportunities for involvement in Forensic Dentistry.

ABSTRACT

Forensic Dentistry/Odontology is not an official specialty as defined by the American Dental Association. It is an enhancement of the Dental Profession that uses knowledge, experience and judgement to collaborate with legal systems. Within this field, dental professionals, including, dentists, dental hygienists and dental assistants play vital roles in several areas of the field. They will often be affiliated with coroners, medical examiners and law enforcement agencies in the United States and worldwide. The roles Forensic Dental professionals play involve work in human identification, human abuse, expert witness testimony, bite mark analysis, age estimation and recently contributing to the creation of forensic dental standards.



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INTRODUCTION

The Science of Dentistry is applicable to several legal aspects. When facts, experience, and knowledge of dentistry is applied to legal matters, it evolves into the practice of Forensic Dentistry also referred to as Forensic Odontology. History credits Agrippina with the earliest dental identification in the first century A.D. Agrippina was married to Claudius, emperor of Rome. She sought to eliminate any rival for her husband and perceived Lollia Paulina as such. She ordered the murder of Lollia Paulina and that the head be brought back to her as proof. After seeing the unique and distinct teeth characteristics she knew to be Lollia Paulina's, she was satisfied that the murder was accomplished. Another notable dental identification in history was made by Paul Revere during the US Revolutionary War. He identified the body of Dr. Joseph Warren by the denture he had fabricated for him. It is also reported in the literature that Adolf Hitler's denture was responsible for his positive identification.¹

Today, the science of Forensic Dentistry has matured into using evidence-based methods and techniques to assure accuracy. There is formal education available for those in the dental field who wish to pursue the study of Forensic Odontology. Seminars, conferences and continuing education programs are available and presented by experienced professionals. There are organizations both local, state, national and international that offer memberships, education and avenues to garner expertise.

Forensic Dentistry has been cast into sections where the services are utilized and needed. They include abuse, expert witness, identification, bite mark analysis, and age assessment. As in any professional field, forensic dentistry commands the ethical treatment of persons and evidence without personal bias. Forensic professionals abide by oaths of practice and organizations whenever dealing with victims, the accused, and in their documentation and gathering of evidence.

DOMESTIC VIOLENCE

Domestic Violence encompasses child abuse and neglect, intimate partner abuse, elder abuse and neglect and abuse of the disabled. Any form of abuse can result in death. Dental professionals can help diagnose all forms of domestic violence through awareness and recognizing the overt and covert signs and symptoms. An intervention can begin on behalf of all victims as both a professional responsibility and as an ethical citizen. With a better understanding of the definitions, strategies can be implemented, for use by the dental team, to address and to reduce the incidence of both abuse and neglect.²

Child Abuse

We are tasked by law to report child abuse in every state. This is referred to as a mandated reporter. The reporter's identity is anonymous to the accused. When there is reason to suspect that there is evidence of non-accidental trauma or neglect, we must report. Some states clearly state dentists and dental hygienists. Some will state all healthcare providers and/or all citizens. With a better understanding, dental professionals can impact the incidence of child abuse and

neglect by increased reporting and increasing the education of the public.

Close to 680,000 children are involved in officially substantiated cases of abuse or neglect annually in the U.S. with neglect being the most common.³ Evidence from population studies show the real incidence is substantially higher^{4,5} This discrepancy arises for many reasons; most cases are not disclosed, not reported, or not investigated, or lack sufficient information to substantiate harm or to show the harm was caused by maltreatment.⁵ We lose an average of five children every day to abuse and neglect.⁶ The United States has one of the worst child abuse statistics among developed nations.⁷

Acts that result in physical or emotional harm to a child including pre-natal abuse, and exposing children to sexual activities can also be categorized as abuse or neglect. Neglect connotes that the child is unprotected from danger, is not afforded adequate supervision, does not receive food, clothing or shelter and can include failure to provide medical or dental care.

Documentation from statistics reveal that physical abuse occurs in the head and neck and mouth area at a rate of 75%. Yet, dentistry has not been a substantial contributor to reporting and all oral health care providers need to improve their reporting rate.⁸ The dental professional should identify signs such as: bruises, broken bones, burns, pattern injuries, injuries at various stages

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of healing, injuries inconsistent with history given, emotional and developmental problems

There is no profile or face of an abuser. Domestic violence and child abuse spans all socio-economic, racial and religious groups in both rural and urban areas. It is underreported and under recognized.⁵ There are some conflicts both in culture and religion wherein some groups expect that parents discipline their children with corporal punishment.

Emotional Abuse are acts that are committed or omitted that injure a child's self-esteem and can include humiliating criticism and social isolation. Emotional neglect manifests when a child's basic needs are denied for affection and comfort. Allowing a child to not attend school or encouraging a child to participate in illegal behaviors is a form of emotional neglect by denying the child to become involved in an appropriate educational environment.

The treatment record becomes both a medical and legal document. Screening for any maltreatment should become an integral part of all clinical examinations. The record should reflect subjectivity in what the patient or parent said and objectivity by recording all aspects of what was seen and measured and any other physical evidence such as radiographs, photographs and drawings.

Overlap of child and spouse abuse. Children who have been abused or witnessed abuse have higher rates of: tobacco use, alcoholism, drug abuse, physical inactivity and obesity, depression, suicide, sexual promiscuity and prostitution.⁹

Intimate Partner Abuse

Another form of domestic violence is the non-accidental trauma inflicted upon a family member or within an intimate relationship. The physical signs and symptoms mirror those of child and elder abuse.

Mandatory reporting laws differ from state to state. They generally fall into four categories: states that require reporting of injuries caused by weapons; states that mandate reporting for injuries caused in violation of criminal laws, as a result of violence, or through non-accidental means; states that specifically address reporting in domestic violence cases; and states that have no general mandatory reporting laws.¹⁰ With the increasing awareness about domestic violence as a health care issue, attention has turned to how health care providers can best assist their patients through routine documentation, intervention and referral. By helping to connect patients to community domestic violence advocates, safety can be enhanced especially in states where mandatory reporting is not in statute. Healthcare providers must be ever cognizant of privacy issues and a patient's right to autonomy in making critical decisions. Many local, state and national resources are available. Providers must understand the parameters of the legal definitions in their state's current statute and their state's reporting laws. Some mandatory statutes apply only to hospital personnel and may not apply to private practitioners or clinics.

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The argument against mandating all intimate partner violence include denying autonomy, revealing protected health information and fear of retribution by batterer. Suspicions or revelations of intimate partner violence should prompt the victim to seek help through coalitions of advocates via hotlines and organization offices. An excellent resource on intimate partner violence is Futures Without Violence: National Health Resource Center on Domestic Violence which also offers a toolkit for healthcare providers.¹¹

Every year, millions of women, men, and children in the United States are victimized by intimate partner violence. These forms of violence are serious public health problems that can be harmful to one's health, both physically and psychologically. Furthermore, evidence indicates that violence experienced early in life can put one at increased risk for subsequent victimization as an adult. CDC's National Center for Injury Prevention and Control launched the National Intimate Partner and Sexual Violence Survey (NISVS) which reveals data on incidence and consequences of intimate partner violence.¹²

Elder Abuse

The National Council on Aging reports that 1 in 14 elders in the US are victims of abuse.¹³ The US Senate Special Committee on aging reports more than two million adults over 60 are victims.¹⁴ This obviously connotes an enormous amount of unreported cases. Elder Abuse encompasses physical, emotional, sexual, financial, neglect and abandonment.

Signs and symptoms to watch for include: bruises, broken bones, bite marks, burns and other obvious lesions. Also, there may be unexplained changes in behavior, sudden changes in financial situation, and tense relationships including frequent arguments

Again, as in other domestic violence categories, mandated reporting is regulated by individual states. Some states do mandate health professionals to report and others mandate in certain situations as in nursing facilities. Become cognizant of the laws in the state you practice in. Domestic violence awareness, documenting, reporting and referring is that aspect of Forensic dentistry that each health professional plays a role in every day.

Abuse of the Disabled

Individuals with disabilities live on their own, with caregivers, within families and in public and privately-run housing facilities. They are usually dependent on additional help from others which can contribute their vulnerability to every kind of abuse. People with disabilities experience the same forms of physical, sexual and neglect as the general population. However, they experience these abuses at much higher rates.

The rate of violent victimization against persons with disabilities (31.7 victimizations per 1,000 persons age 12 or older) was 2.5 times higher than the rate for persons without disabilities (12.5 per 1,000) in 2014.¹⁵ Children with disabilities have a higher risk of being abused or neglected. In addition, the abuse tends to be more severe and reoc-

curing. Contributors to susceptibility can be that predators perceive a person with disabilities as weak and vulnerable and less likely to report. If they have limited communication abilities they may find it difficult to report. When the abuser is the caregiver, it is a difficult decision for the victim to report possibly jeopardizing their future and some predators believe people with disabilities are less human, less valuable and don't contribute to society.¹⁶

There are relevant state laws to address who is mandated and how to report suspicions. Dental Professionals should become aware of these regulations and guidelines to ensure safety and well-being of those with disabilities.

AGE ASSESSMENT

Forensic Odontology is having increased participation in the area of Age Assessment. Determining the age of a deceased individual is sometimes needed to help in the identification process but today, the world is seeing an unprecedented influx of refugees from many countries seeking asylum and crimes of human trafficking, thus, it is ever more applicable to the living. Legal entities are calling on forensic odontologists to add to the evidence to be considered. Even though all relevant information is considered, it is not likely that one form of assessment will give an exact determination on a person's age with 100% accuracy.

The United Nations has issued guidelines on policies and procedures in dealing with unaccompanied children and on the protective care of refugee children. Determining the age of majority is crucial in these instances. Emerging research on age assessment is giving this community new methods, technologies and issues to apply. An estimated chronological age is based on the primary means of eruption and emergence, crown and root formation and post development changes. Dental criteria recommendations to be applied to the skeleton of children include tooth mineralization and to adults amounts of aspartic acid, racemization of dentin and growth layers of cementum. Several methods should be used in combination to increase accuracy. The American Board of Forensic Odontology (ABFO) relates, that events can be divided into stages and compared with growth and development with similar people which forms the bases for many dental flow and chronological charts commonly used in dental literature. In addition, other tools for assessment are utilized. They include but are not limited to formation and growth techniques for children, and adolescents and post-formation in adults.¹⁷ These dental methods work well and provide good evidence but are only part of the overall picture.

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HUMAN BITEMARKS

A common definition of a human bitemark is an alteration in or on a medium that is caused by the contact of teeth. It represents a pattern left in an object or tissue by the dental structures.

Teeth are often used as weapons. This can occur when one person attacks another or when a victim tries to ward off an assailant. The forensic odontologist first must determine that it is a bitemark and whether or not it is a human bite based on the anatomical characteristics of teeth. Human bites are usually an elliptical or circular injury. The bite may have two u-shaped arches separated by an open space. Anthropological characteristics may assist in an evaluation because there exist commonalities in ethnicities. These commonalities serve as indicators that a more likely probability occurs. The cusp of Carabelli on the mesiolingual cusp of the maxillary first molar implies a European ancestry. Mucicuspis, multiple premolars and maxillary diastemas imply African ancestry and shovel shaped incisors, incisor rotations and buccal pits indicate Asian ancestry.¹⁷

Bitemarks may be found anywhere on the body. A bitemark with good forensic value will have distinctive traits. Incisors produce rectangular injuries, canines produce triangular ones and premolars display double triangles. Special characteristic that are visible also raise the forensic value, such as, missing teeth, fractures, rotations, attrition and congenital malformations.

A common procedure for bitemark analysis involves photographs of the injury that have a universal measurement scale for recoding measurements. It also includes taking impressions using dental impression material to make a model of the injury and one of the dentition of a perpetrator. Resection of tissue is an option on deceased victims. The most common technique for comparison has been making transparent overlays from the model and then compared to the bitemark photo. Presently, computer technology is also being utilized to more accurately trace the incisal edges for comparisons.

After bitemark analysis, the forensic odontologist has recommended conclusions for the injury and suspect from the ABFO:

- The dentition is excluded
- The dentition is not excluded
- Inconclusive – Insufficient evidence to relate the bitemark to the suspected biter.
- The comparisons done by bitemark analysis may be more useful to exclude someone than to implicate someone.¹⁸

EXPERT WITNESS

Courts of law frequently call on experts to testify in their expertise for either the prosecution or the defense. An expert witness testifies without prejudice and gives an opinion based on experience in the field. Forensic odontologists are called upon to relate knowledge on standards of care and in matters of practice and professional liability. They will also testify in matters of abuse, bitemark analysis and age assessment.

The expert should prove a generally accepted method is scientifically valid. This is done by establishing the facts, interpreting the facts, and commenting on an opposing expert's testimony. They should describe the professional standards in the area and render an impartial opinion regardless of which side retained the services.

IDENTIFICATION

Forensic Odontologists are invaluable in the area of identification. They are involved with the everyday operations of a morgue and in instances of multiple fatalities. The importance of identification is adherent in consideration of families, for estate, insurance and legal settlements and in criminal investigations. Because of the survivability of teeth, dental identification is usually the fastest method.

Teeth have remarkable survivability. They can withstand some chemical, trauma and burning assaults. Unprotected natural teeth will turn to ash at 540 to 650 degrees C. Different dental restorative materials have varied melting points. Porcelain can resist temperatures in excess of 1100 degrees C. Amalgam composition of metals will change at different degrees and some metals will remain after mercury evaporates. The shape and size of composite materials would be unaltered exposed to temperatures of 101 degrees C for 2.5 hours. Most dental restorations will survive extreme fires even though the teeth may fragment or shrink. Other stable characteristics of teeth are invaluable in the dental identification process. They include bone trabeculation, root morphology, location and morphology of the mandibular canal and mental foramen among other anatomical sites.¹⁹

In many jurisdictions, a team is in place with sections that operate to accomplish this task. There can be a Go section comprised of experienced and contracted dentists who go to an incident site to ensure valuable dental forensic evidence is collected. The Antemortem (before death) section is composed of those members who request, receive and record prior dental records of victims. They can use software created for identification and enter information such as notes, charting and radiographs. The next section of the team is the Postmortem (after death) section. Here

the members do dental autopsy examinations. They may disarticulate the jaws, x-ray the remains, do dental charting and enter it into the software. Finally, the comparison section uses the records from both to make comparisons for the ultimate goal of identification. Positive identification traditionally involves comparing ante-mortem dental records with post-mortem data. The data compared is based on the written records and supporting radiographs. Additional information such as open mouth photographs, models and removable prostheses and other emerging technologies can be used as needed.

The United States has a Forensic Team called Disaster Mortuary Operational Response Team (D-MORT). These members are deployed wherever help is requested from the United States. There are formal trainings and practices that members must complete. The D-MORT Teams are organized in US regions and take applications through their websites. The national and local teams do welcome all members of the dental profession to participate.²⁰

FURTHER STUDY AND ORGANIZATIONS

Education in dental school, dental hygiene and dental assisting programs gives the professionals a sound basis for participation and progress in the field of Forensic Dentistry.

Forensic dental professionals present courses at seminars wherein one can gain additional knowledge. Conferences and symposiums are presented in hours or days and can include hands-on lab exercises. International, national and local organizations exist to educate and advance the work of Forensic Dentistry. The American Society of Forensic Odontology (ASFO) welcomes anyone interested in the science and promotes education and research. It publishes the Manual of Forensic Odontology. The American Academy of Forensic Sciences (AAFS) Odontology Section limits its members to dentists. State and local groups are present in many jurisdictions.

The government D-MORTs are composed of funeral directors, medical examiners, pathologists, forensic anthropologists, finger print specialists, forensic odontologists, dental hygienists, dental assistants, administrative specialists, and security specialists. They are deployed to supplement federal, state, local, tribal and territorial resources at the request of local authorities. They help families, friends and communities find closure so that they can move forward and begin to heal.

D-MORT members provide technical assistance and consultation on fatality management and mortuary affairs. They may be called on to provide a wide range of services, and may be activated internationally when the United States is asked for help in any disaster.²⁰

Dental Hygienists have participated in Forensic Dentistry activities presently and in the past. They serve on teams, as organization leaders, act as consultants, do forensic photography, are appointed to the government D-Mort regions, teach, present and do research alongside dentists and dental assistants with education, training and experience. The field is open to those interested but efforts should be made to be active in organizations and finding a mentor can be crucial to further involvement.

CONCLUSION

Forensic Dentistry has established itself as an important and indispensable service in legal and medical matters. Many dental professionals are interested and involved in Forensic Dentistry and the majority of them do so on a volunteer level. The work in this field can be considered an enormous, crucial and rewarding enhancement of a dental career. Even if one never gets an opportunity to partake on an identification team, conduct research, testify in court or do bitemark or age analysis, dental professionals can still contribute daily to Forensic Science:

**Always be aware and watchful for the signs and symptoms of human abuse*

**Keep thorough and up-to-date documentation and radiographs*

HOTLINE AND WEB INFORMATION CHART

Domestic Violence

National Domestic Violence Hotline 1-800-799-SAFE (7233) web site with online 24-hour chat www.thehotline.org

Child Abuse

National Child Abuse Hotline 800-422-4453 www.childhelp.org

State specific information:

<https://capsli.org/reporting-abuse/individual-state-hotlines>

Elder Abuse

National Center on Elder Abuse 800-677-1116

<https://ncea.acl.gov/resources/state.html>

Check your individual state Protective Services for more specific information and guides.

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AUTHOR PROFILE

Winnie Furnari, RDH, MS, FAADH has been recognized, published and speaks nationally and internationally for her work in Forensic Dentistry. She was trained by the Armed Forces Institute of Pathology and is a member of several Forensic Organizations. She has served her profession in numerous leadership positions and is the President-elect of the American Academy of Dental Hygiene. She holds a clinical professorship at New York University College of Dentistry.

AUTHOR DISCLOSURE

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QUESTIONS

1. **According to the American Dental Association which is not a recognized dental specialty?**
 - a. Oral and maxillofacial pathology
 - b. Prosthodontics
 - c. Dental Public Health
 - d. Forensic Dentistry
2. **Most dental forensic experts are gainfully employed**
 - a. In the field of Forensic Dentistry
 - b. In the field of Forensic Dental Hygiene
 - c. Not in the field of Forensic Dentistry
 - d. In the field of Forensic Pathology
3. **In cases of suspected child abuse, the following statement is true:**
 - a. Dental hygienists are mandated in all states to report child abuse
 - b. Two states exclude dental hygienists as mandated reporters
 - c. Mandated reporters must have proof that abuse occurred
 - d. Reporters must have radiographs and photographs on file
4. **In cases of Elder abuse, the following statement is true:**
 - a. Dental hygienists are mandated in all states to report elder abuse
 - b. Most states mandate dental hygienists to report
 - c. Only elders in housing facilities must be reported
 - d. Financial abuse is not considered when reporting
5. **In the US, dental professionals have been a significant source of reporting. Medical professionals and school personnel have the highest report rate.**
 - a. The first sentence is true and the second is false
 - b. Both statements are true
 - c. Both statements are false
 - d. The first statement is false and the second statement is true.
6. **The most common form of child abuse is:**
 - a. Neglect
 - b. Physical
 - c. Sexual
 - d. Financial
7. **Which of the following best lists what can be a result of child abuse?**
 - a. Obesity and tobacco use
 - b. Sexual promiscuity and obesity
 - c. Alcoholism and drug abuse
 - d. Obesity, sexual promiscuity, alcoholism, drug abuse, tobacco use
8. **When making a report, the reporter's identity is**
 - a. Revealed to the suspected abuser
 - b. Revealed to the suspected victim
 - c. Revealed to authorities but is kept anonymous to the suspected abuser
 - d. Revealed to State Boards of Dentistry
9. **Mandated reporters are required to report**
 - a. When certain that physical abuse has occurred
 - b. After photographs are taken of the evidence
 - c. When any abuse is suspected
 - d. After getting approval from employer
10. **Forms of Elder abuse include:**
 - a. Physical and sexual
 - b. Financial
 - c. Neglect
 - d. All of above
11. **What percentage of physical abuse occurs in the head and neck area?**
 - a. 50
 - b. 10
 - c. 35
 - d. 75
12. **Age Estimation is performed on both the living and deceased. Reasons for age estimation include:**
 - a. Refugee asylum
 - b. Identification
 - c. Criminal proceedings
 - d. All of the above
13. **When analyzing the skeleton of a child, the following are considered;**
 - a. Aspartic acid and racemization of dentin
 - b. Tooth mineralization status and eruption patterns
 - c. Aspartic acid and eruption patterns
 - d. Racemization of dentin and growth layers of cementum
14. **Dental age assessment is considered to have 100% accuracy. Several chart guidelines are available to assess dental age.**
 - a. The first statement is true and the second statement is false
 - b. Both statements are true
 - c. The first statement is false and the second statement is true
 - d. Both statements are false
15. **Which procedures usually succeed each other in bitemark analysis?**
 - a. Cutting the tissue around the bitemark to get accurate photographs
 - b. Impressions, tracing, overlays, photographs
 - c. Resection of tissue around the bite to get accurate impressions
 - d. Photographs, impressions, tracing, overlays
16. **The ABFO bitemark analysis verbiage suggests**
 - a. Clearly state the suspect is the biter without a doubt
 - b. Since all bitemarks are unique there can be no doubt of identity
 - c. The bitemark is excluded, not excluded or inconclusive
 - d. The bitemark is not useful to eliminate a suspect
17. **Which dental traits can be used to determine ethnicity?**
 - a. Cusp of Carabelli
 - b. Fractures and rotations
 - c. Crossbite
 - d. Fluorosis
18. **Expert witnesses**
 - a. Testify on behalf of the prosecution
 - b. Do not comment on other expert witness testimony
 - c. Testify on behalf of the defense
 - d. Gives opinion regardless of what side retained them
19. **Usually, the fastest method for identification is:**
 - a. DNA analysis
 - b. Fingerprints
 - c. Dental
 - d. Facial recognition

A Cursory Review of Forensic Dentistry

Name: _____ Title: _____ Specialty: _____
 Address: _____ E-mail: _____
 City: _____ State: _____ ZIP: _____ Country: _____
 Telephone: Home () _____ Office () _____
 Lic. Renewal Date: _____ AGD Member ID: _____

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**

EDUCATIONAL OBJECTIVES

- Identify areas of forensic dentistry
- Demonstrate the knowledge of the organization and mechanisms of a multiple fatality team.
- Identify legal aspects and signs of human abuse.
- Identify pathways to further knowledge and opportunities for involvement in Forensic Dentistry.

COURSE EVALUATION

1. Were the individual course objectives met?

Objective #1: Yes No Objective #2: Yes No

Objective #3: Yes No Objective #4: 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?

If not taking online, mail completed answer sheet to

PennWell Corp.

Attn: Dental Division,
 1421 S. Sheridan Rd., Tulsa, OK, 74112
 or fax to: 918-212-9037

For IMMEDIATE results,
 go to www.DentalAcademyOfCE.com to take tests online.

QUICK ACCESS CODE 15254

Answer sheets can be faxed with credit card payment to
 918-212-9037.

Payment of \$59.00 is enclosed.
(Checks and credit cards are accepted.)

If paying by credit card, please complete the following: MC Visa AmEx Discover

Acct. Number: _____

Exp. Date: _____

Charges on your statement will show up as PennWell

- | | |
|---|---|
| 1. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 16. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 2. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 17. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 3. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 18. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 4. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 19. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
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| 8. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 23. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 9. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 24. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 10. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 25. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 11. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 26. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 12. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 27. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 13. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 28. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 14. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 29. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 15. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 30. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |

AGD Code 145

PLEASE PHOTOCOPY ANSWER SHEET FOR ADDITIONAL PARTICIPANTS.

COURSE EVALUATION and PARTICIPANT FEEDBACK

We encourage participant feedback pertaining to all courses. Please be sure to complete the survey included with the course. Please e-mail all questions to: rhodges@pennwell.com.

INSTRUCTIONS

All questions should 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.

COURSE CREDITS/COST

All participants scoring at least 70% on the examination will receive a verification form verifying 3 CE credits. The formal continuing education program of this sponsor is accepted by the AGD for Fellowship/Mastership credit. Please contact PennWell for current term of acceptance. Participants are urged to contact their state dental boards for continuing education requirements. PennWell is a California Provider. The California Provider number is 4527. The cost for courses ranges from \$20.00 to \$110.00.

PROVIDER INFORMATION

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 individual courses or instructors, nor does it imply acceptance of credit hours by boards of dentistry.

Concerns or complaints about a CE Provider may be directed to the provider or to ADA CERP at www.ada.org/cotocerp/

The PennWell Corporation is designated as an Approved PACE Program 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 term of approval extends from (11/1/2015) to (10/31/2019) Provider ID# 320452

RECORD KEEPING

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.

Completing a single continuing education course does not provide enough information to give the participant the feeling that s/he is an expert in the field related to the course topic. It is a combination of many educational courses and clinical experience that allows the participant to develop skills and expertise.

CANCELLATION/REFUND POLICY

Any participant who is not 100% satisfied with this course can request a full refund by contacting PennWell in writing.

IMAGE AUTHENTICITY

The images provided and included in this course have not been altered.

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