Vital Pulp Therapy for the Primary Dentition

A Peer-Reviewed Publication
Written by N. Sue Seale, DDS, MSD

Publication date: March 2010
Expiry date: February 2013

This course has been made possible through an unrestricted educational grant. The cost of this CE course is $49.00 for 2 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.

Go Green, Go Online to take your course
Educational Objectives
The overall goal of this course is to provide the reader with information on pulpal therapy for primary teeth. Upon completion of this course the reader will be able to:
1. List and describe the clinical and radiographic assessment required to determine appropriate pulp therapy for primary teeth
2. List the indications for vital pulp therapy in primary teeth
3. List and describe the steps involved in pulpotomy of primary teeth and materials that can be used
4. List and describe the steps involved in indirect pulp treatment of primary teeth.

Abstract
Primary tooth pulp therapy can preserve primary teeth until normal exfoliation when clinical conditions permit. Therapeutic options include pulpotomy, indirect pulp treatment and pulpectomy. The appropriate therapeutic options depend on the health of the pulp. In order to determine which treatment option should be pursued, it is necessary to clinically and radiographically assess the tooth. Options for vital primary teeth include pulpotomy and indirect pulp treatment. Provided that careful attention is paid to detail during the clinical procedure and follow-up, as described in this article, both techniques have similar success rates and can save primary teeth.

Introduction
Primary tooth pulp therapy is aimed at preserving the primary teeth until normal exfoliation. Management of the cariously involved primary tooth where the carious lesion approximates the pulp requires a knowledgeable approach to pulp therapy, and a successful outcome depends on accurate diagnosis of the status of the pulp prior to therapy. Preliminary data gathering and interpretation must be focused on determining whether the primary tooth pulp is normal, reversibly inflamed, irreversibly inflamed or necrotic. If it is determined to be vital or reversibly inflamed, the vital pulp therapy techniques of pulpotomy or indirect pulp treatment (IPT) are indicated. If the pulp is determined to be irreversibly inflamed or necrotic, either a pulpectomy or extraction would be appropriate. This course is limited to a discussion of the vital pulp therapy procedures of pulpotomy and indirect pulp treatment (formerly known as indirect pulp capping) for primary teeth.

The process of determining that vital pulp therapy can be performed on a primary tooth starts with gathering clinical and radiographic diagnostic data aimed at determining the vitality status of the pulp.

Clinical Data
The clinical parameters that must be examined are soft tissue changes, pathologic mobility and history of pain. When performing a clinical examination of a tooth with a large carious lesion suspected of pulpal involvement (Fig. 1), evaluation of the buccal mucosa around the involved tooth should be made to rule out the presence of a sinus tract or parulis. (Fig. 2) Pulps of nonvital primary teeth often establish drainage through the thin buccal bone, and the presence of a sinus tract is indicative of a necrotic pulp and a direct contraindication to vital pulp therapy. In this situation, extraction or a pulpectomy would be the appropriate treatment. Mobility beyond that expected as a result of normal exfoliation is also a contraindication to vital pulp therapy, as it indicates that the inflammatory process in the pulp is involved and has begun to destroy supporting bone.

Figure 1. Large carious lesion in primary molar
Figure 2. Sinus tract associated with necrotic pulp in tooth S

The use of pulp testing such as cold and hot testing and electric pulp testing to determine pulp vitality is not indicated in young children. The only response one can elicit from a vital pulp is pain, and intentionally causing pain during these tests can scare the child and affect future cooperation. Obtaining a history of presence or absence of pain and type of pain is the major clinical tool for assessing pulp vitality in young children. However, since young children are not reliable historians one must rely on asking about pain history from the caretaker as well as the child. A history of spontaneous pain,
such as pain that awakens the child at night, is indicative of an irreversible pulpitis and a dying tooth. Vital pulp therapy is not indicated for such teeth. A history of elicited or provoked pain is more complicated to interpret. Pain on chewing may be the result of compression of the large carious lesion, rather than pericvasive pain, which is a more ominous sign. To rule out percusive pain, place a tongue blade on an uninvolved cusp of the tooth in question and have the child bite down, watching for signs of discomfort on the child’s face, which would be consistent with percusive pain. If percusive pain is identified, the tooth is contraindicated for vital pulp therapy. Pain elicited from sweets, heat or cold and that is of short duration is not a contraindication to vital pulp therapy but should be recorded in the data collection sheet.

Radiographic Data
A bitewing and periapical radiograph are necessary to assess the pulpal status of a primary tooth with a large carious lesion. (Fig. 3) The bitewing is the best view to assess the proximity of the carious lesion to the pulp. It is also the best film to view the furcation of the primary tooth, which is where the first signs of necrotic pulp in primary teeth appear. Accessory canals in the floor of the primary tooth pulp chamber allow the toxins from the necrotic pulp in the chamber to travel into the furcation and affect that bone first. Loss of lamina dura and decreased radiopacity of the bone in the furcation are the first signs of dead or dying pulps, and teeth demonstrating these radiographic changes would not be candidates for vital pulp therapy. The superimposition of the furcation of the maxillary molars on the palatal root makes accurate reading for radiolucency in the earliest stages difficult in maxillary molars.

Figure 3. Bitewing and periapical radiograph of first primary molar with carious lesion approximating the pulp

The following is a summary of the indications for vital pulp therapy in primary teeth:
1. A large carious lesion approximating the pulp where pulp exposure is expected with complete caries removal.
2. The absence of soft tissue pathology such as sinus tract, pathological mobility and spontaneous pain.
3. The absence of radiographic changes of furcation radiolucency, internal or external root resorption or periapical pathology.
4. A restorable tooth.
5. At least one-third of the root remaining.

Once the decision has been made that the pulp is vital or only demonstrates signs of reversible pulpitis, the dentist must decide which pulp therapy technique to use, pulpotomy or indirect pulp treatment (IPT). The indications are exactly the same for both procedures, and the only disadvantage with IPT is the loss of the last diagnostic tool that is provided by the pulpotomy technique, the ability to actually view the pulp during pulp removal to confirm the accuracy of the diagnostic workup. Recent best evidence indicates that IPT has similar success rates to pulpotomy in primary teeth and is now considered a viable alternative. Both procedures will be discussed in the following sections. Prior to any invasive procedure with the potential to cause pain, adequate local anesthesia must be administered. A well-fitting rubber dam that controls for salivary contamination is required for both pulpotomy and IPT.

Pulpotomy Technique
The pulpotomy technique involves removal of the coronal pulp, leaving healthy pulp tissue in the canals. In order to minimize bacterial contamination, superficial caries must be removed before exposing the pulp and beginning the access opening. Following caries removal and exposure of the pulp, begin the access opening to remove the roof of the pulp chamber. A proper access opening to the pulp chamber is the most important step in ensuring complete removal of the coronal pulp. Tissue tags inadvertently left during pulp removal are the most common cause of inability to control hemorrhage. (Fig. 4) A wide, adequate access opening facilitates visualization of the chamber and removal of all tissues down to the orifices of the canals. The cusp tips are guides to the number and location of all pulp horns, and should be used to identify and expose all pulp horns to guide the outline of the opening and ensure that access to the pulp chamber is at the extent of the peripheral walls of the chamber. When the roof of the pulp chamber is removed, there should be no ledges and the walls of the access opening should be confluent with the walls of the chamber. (Fig. 5) The pulp should bleed when the roof is removed and the pulp chamber is accessed; bleeding is an indicator of a vital pulp. If the chamber is empty and dry or filled with purulent material, the pulpotomy procedure cannot be continued and the tooth must be treated with either a pulpectomy or an extraction. The access opening and removal of the roof of the chamber are best made with a high-speed handpiece and water coolant, but actual removal of the pulp tissue should be done with a spoon excavator or a large round bur in a slow-speed handpiece. (Fig. 6) Use of a high-speed hand-
piece in the chamber has the potential to perforate the floor of the chamber due to the small size and shallow depth of the chamber and the wiggly nature of children.

Once all tissue is removed, use small cotton pellets wet with water under gentle pressure to control hemorrhage and to clean the chamber. (Fig. 7) If hemorrhage control is not obtained within 5 minutes, the pulp should not be considered further for a pulpotomy. Inability to control hemorrhage is an indication that the inflammatory process has moved into the root canals and is a contraindication to vital pulp therapy. Once hemorrhage control has been obtained and the chamber is clean, the pulpotomy medicament may be applied. Formocresol is the most frequently used primary tooth pulpotomy medicament, but there are two other very well researched alternative medicaments for the pulp stumps, ferric sulfate and mineral trioxide aggregate (MTA). The decision about which medicament to use is up to the operator. Formocresol and ferric sulfate have similar success rates and MTA has the highest reported success rate of the three. However, MTA is very expensive and therefore used less frequently. These medicaments will be considered separately due to the differences in application technique.

Figure 4. Inadequate access opening results in leaving pulp tissue and tissue tags in pulp chamber.

Figure 5. Access opening with no ledges and walls confluent with walls of pulp chamber.

Figure 6. Coronal pulp tissue is removed to the level of the opening into the canals.

Figure 7. Hemorrhage control using a water-dampened cotton pellet.

Figure 8. Actual pulpotomy procedure

Formocresol
A 1:5 dilution of Buckley's formocresol (19% formaldehyde) is recommended for the pulp medicament. This is the concentration that has been used for the majority of recent investigations of formocresol pulpotomy, and the dilution is best performed by a pharmacist. It should be noted that Buckley's formocresol is not available for purchase in its diluted form. The formula for diluting formocresol is to mix 3 parts of glycerin with 1 part of distilled water to form a diluent, and add 4 parts of diluent to 1 part of Buckley's formula formocresol. Another concentration of formocresol is available
that has 45.8% formaldehyde; caution is recommended when purchasing formocresol to be sure that the correct concentration, Buckley’s formula, is being purchased. A great deal of attention has been paid recently to the undesirable features of formocresol, and current recommendations are to use the least amount possible, a 1:5 dilution of Buckley’s formocresol.

The steps involved using this technique are as follows: Soak a small cotton pellet (two pellets for second molars) in formocresol, and blot it/them very dry with a 2x2 inch gauze. Take care to use only a dampened, not soaking wet, pellet. The pellets are placed snugly over the pulp stumps and packed tightly into place with a dry cotton pellet to ensure that no excess formocresol oozes out of the tooth onto the gingiva. (Fig. 9) The pellets are left in place for five minutes and then gently teased away from the pulp stumps with an explorer, being careful not to initiate bleeding from the pulp stumps. If bleeding recurs, initiate hemorrhage control again and reapply the formocresol to the pulp stumps. The formocresol pellet MUST be removed and not left in the pulp chamber. A thick mix of zinc oxide and eugenol (ZOE), either plain or reinforced, is placed in the chamber and carefully packed tightly against the pulp stumps. It is important to be sure that the paste is well condensed onto the floor of the pulp chamber and against the orifices of the canals. The base formed by the ZOE covering the canals’ openings should be at least 3–4 millimeters thick and form a good seal for the orifices of the pulp canals. The tooth should be restored at the same appointment.

**Ferric Sulfate**

Ferric sulfate, a hemostatic agent, is available commercially as Astringedent (Ultradent Products, Inc., Salt Lake City, Utah) and comes with an applicator tip. Following hemorrhage control, the infuser or brush tip is gently applied to the pulp stumps for 10–15 seconds. The pulp chamber should then be gently rinsed with water and dried with cotton pellets. A thick mix of ZOE, either plain or reinforced, is placed in the chamber and carefully packed tightly against the pulp stumps. It is important to be sure that the paste is well condensed onto the floor of the pulp chamber and against the orifices of the canals. The base formed by the ZOE covering the canals’ openings should be at least 3–4 millimeters thick and form a good seal for the orifices of the pulp canals. The tooth should be restored at the same appointment.

**MTA**

MTA is available commercially as ProRoot MTA (Dentsply International, York, Pennsylvania) as a powder and liquid formulation (Fig. 10 A–B) that must be mixed to form a medium-thick paste. The powder is placed on the mixing pad and mixed with the sterile water from the manufacturer. For one pulpotomy, only about one-quarter of the powder is needed, and the packet can be folded over and paper-clipped closed. Place the packet in a sealable plastic bag and close tightly to create a moisture-free environment. The water supplied by the manufacturer comes in a premeasured plastic tube that cannot be saved after it has been opened. For the other mixes from the same packet, you can use either sterile saline (purchased from a pharmacy) or local anesthetic solution. The remaining powder should be used within a few weeks or discarded and a new packet opened.

The medium-thick mix of MTA is carried to the chamber on a spatula and condensed gently over the pulp stumps and the floor of the pulp chamber, being sure to have about a 2 millimeter thickness of paste over the stumps. (Fig. 11 A–D) A resin-modified glass ionomer (RMGI) is used as the base over the MTA, and care is taken not to disturb the MTA during placement and curing of the RMGI. The MTA takes 3–4 hours to completely set, and the resin-modified glass ionomer provides the protection needed during this setting time. The tooth should be restored at the same appointment.
The restoration of choice for primary teeth that have received a pulpotomy is a stainless steel crown (SSC). The pulpotomized tooth has been weakened by the caries and the amount of tooth structure removed during pulpotomy procedures. The full-coverage aspect of the SSC protects the weakened tooth structure and ensures the biological seal required for successful pulpotomy over time. The base used over the orifices for the root canals should be separate from the cement used to cement the SSC. If the SSC should come off, the separate base will ensure that the pulpotomy remains sealed until the child can return to the dental office for the SSC to be replaced.

**Indirect Pulp Therapy**

Another vital pulp therapy technique for the primary tooth with a large carious lesion closely approximating the pulp that would result in an exposure if all the caries were removed is indirect pulp treatment (IPT). The technique of IPT requires that some caries be left in the tooth to avoid an exposure. The IPT technique recommended for primary teeth is the one-appointment technique, and the tooth is not reentered to remove the residual caries. The first step is to remove the superficial and peripheral caries, and this can be performed with a high-speed bur with water coolant. All peripheral walls must be cleaned to sound dentin, leaving the caries over the pulp. The caries over the pulp is best removed with a large round bur (#6) on slow speed. Spoon excavators should be avoided, as they can remove large chunks of dentin and the pulp could be inadvertently exposed. The slow-speed round bur gives the operator more control over how much affected dentin to remove and when to stop. Using a slow-speed handpiece with a large round bur, carefully remove the softened, infected dentin over the pulp. A decision should be made at the beginning of the procedure to stop caries removal when the slow-speed bur is creating powder and the dentin appears leathery, though still softened, regardless of the color of the remaining dentin. This is “affected dentin,” and because affected dentin is not infected with large numbers of microorganisms and has the ability to remineralize if it has a biological seal, it is acceptable to leave 1–2 millimeters over the pulp (Fig. 12). Do not be overzealous in caries removal and risk pulp exposure. The remaining affected dentin must be covered with a base that ends on sound dentin and provides a biological seal over the affected dentin left behind. So long as the seal is maintained, any bacteria in the affected dentin will die or become inactive, and the dentin will remineralize and become harder. The two materials recommended for basing IPTs are reinforced ZOE products such as Caulk IRM Intermediate Restorative Material (Dentsply International) or RMGI. The tooth is restored with an SSC as described previously.
Figure 12. Removal of infected dentin, leaving discolored, affected dentin to avoid a pulp exposure.

Follow-Up
Follow-up of teeth receiving vital pulp therapy is very important. Every six months, periapical radiographs of the treated teeth should be taken and read. These radiographs should be compared with the preoperative radiographs to observe for changes over time. No change between the preoperative and follow-up radiograph is the gold standard for success. However, many primary teeth receiving vital pulp therapy, especially pulpotomy, will show changes over time. A common finding is uniform narrowing of the canals which is called calcific metamorphosis and indicates an attempt on the part of the pulp to heal. (Fig. 13) Over time the entire pulp canal may be entirely obliterated. These teeth rarely progress to failure, and this finding is considered a success. Another change in the root canals seen less frequently than calcific metamorphosis is internal resorption. (Fig. 14) If it is minor and confined to the canal, it can be watched, as recent publications in the literature have reported that many teeth demonstrating this finding do not progress to failure over time.\textsuperscript{a,27} However, these teeth are vital and are demonstrating a potentially self-destructive change. If it continues, it will perforate the root and involve supporting bone. At this point, the tooth must be extracted as the pulpotomy has failed. (Fig. 15) Any osseous radiolucencies or evidence of external root resorption not associated with normal exfoliation are evidence of pulpal death and indicate that the treatment has failed. (Fig. 16) Teeth demonstrating these changes must be extracted and space management considered, depending on the child’s age and eruption patterns.

Figure 13. Follow-up radiograph of pulpotomized tooth (K) demonstrating calcific metamorphosis.

Figure 14. Follow-up radiograph of pulpotomized tooth (T) demonstrating contained internal resorption.

Figure 15. Follow-up radiograph of pulpotomized tooth (L) demonstrating perforating internal resorption.

Figure 16. Follow-up radiograph of pulpotomized tooth (K) demonstrating furcation radiolucency and external resorption.
In summary, many primary teeth with large carious lesions approximating the pulp can be saved until normal exfoliation through careful diagnostic assessment to determine the appropriateness of vital pulp therapy and attention to the details of technique and follow-up.

References

Author Profile
N. SUE SEALE, DDS, MSD
Dr. N. Sue Seale is Regents Professor, Department of Pediatric Dentistry, Baylor College of Dentistry, Texas A&M Health Science Center in Dallas, Texas. She received her DDS in 1970, her certificate in pediatric dentistry in 1972 and her MSD in 1979 from Baylor and has been a full-time faculty member since 1974. She was president of the Texas Academy of Pediatric Dentistry 1996-1997 and received the Distinguished Alumni Award from the Baylor College of Dentistry Alumni Association in 1997; she served on the Board of Trustees of the American Academy of Pediatric Dentistry from 1999-2002. In 2001, the American Academy of Pediatric Dentistry named her Pediatric Dentist of the Year and presented her with the Merle C. Hunter Leadership Award in 2003. She is a diplomat of the American Board of Pediatric Dentistry and received Fellowship in the American College of Dentists in 1984 and in the International College of Dentists in 2001. She was Chairman of the Department of Pediatric Dentistry at Baylor from 1986 until 2009.

Disclaimer
The author of this course has no commercial ties with the sponsors or the providers of the unrestricted educational grant for this course.

Reader Feedback
We encourage your comments on this or any PennWell course. For your convenience, an online feedback form is available at www.ineedce.com.
Questions

1. Primary pulp therapy is aimed at preserving the primary teeth until
   a. pain ensues
   b. extraction is scheduled
   c. normal exfoliation
   d. none of the above
2. Vital pulp therapy techniques for primary teeth are indicated for
   a. primary teeth that are reversibly inflamed
   b. primary teeth that are irreversibly inflamed
   c. nonvital teeth
   d. none of the above
3. The process of determining that vital pulp therapy can be performed on a primary tooth starts with gathering
   a. clinical diagnostic data but not from a pulpotest
   b. clinical diagnostic data including from a pulpotest
   c. radiographic diagnostic data
   d. a and c
4. When performing a clinical examination of a tooth with a large carious lesion suspected of pulpal involvement, evaluation of the buccal mucosa around the involved tooth should be made to
   a. check for buccal gingivitis
   b. check for mucosal sloughing
   c. rule out the presence of a sinus tract or parulis
   d. none of the above
5. __________ is a contraindication to vital pulp therapy.
   a. The presence of a sinus tract
   b. Mobility beyond that expected as a result of normal exfoliation
   c. A large carious lesion
   d. a and b
6. __________ is the major clinical tool for assessing pulp vitality in young children.
   a. Obtaining a history of presence or absence of pain and type of pain
   b. Pulp testing
   c. Palpation
   d. all of the above
7. A history of spontaneous pain, such as pain that awakens the child at night, is indicative of
   a. reversible pulpitis
   b. irreversible pulpitis
   c. a dying tooth
   d. b and c
8. The first signs of necrotic pulp in primary molar teeth
   a. appear in the furcation of the tooth
   b. are in variable locations
   c. are when the tooth becomes mobile
   d. none of the above
9. Indications for vital pulp therapy in primary teeth include
   a. a large carious lesion approximating the pulp where pulp exposure is expected with complete caries removal
   b. a restorable tooth and with at least one-third of the root remaining
   c. the absence of soft tissue pathology such as sinus tract, pathological mobility and spontaneous pain
   d. all of the above
10. An absence of __________ is necessary for vital pulp therapy to be indicated in primary teeth
    a. radiographic changes of furcation radiolucency
    b. internal or external root resorption
    c. periapical pathology
    d. all of the above

11. The __________ is the best view to assess the proximity of the carious lesion to the pulp.
    a. bitewing
    b. pericalcic
    c. panoramic
    d. none of the above
12. Vital pulp therapy techniques for primary teeth are
    a. pulpotomy and indirect pulp treatment
    b. pulpotomy and indirect pulp treatment
    c. root resection
    d. none of the above
13. A well-fitting rubber dam that controls for salivary contamination is required for vital pulp therapy.
    a. vital pulp therapy
    b. IPT
    c. extraction
    d. a and b
14. __________ is the most important step in ensuring complete removal of the coronal pulp.
    a. A proper access opening to the pulp chamber
    b. The provision of local anesthesia
    c. The use of a sharp excavator to remove the pulpal tissue
    d. all of the above
15. During a pulpotomy procedure, superficial caries must be removed before __________ in order to minimize bacterial contamination.
    a. exposing the pulp
    b. beginning the access opening
    c. giving anesthesia
    d. a and b
16. The inability to control hemorrhage is most commonly due to __________.
    a. medication use
    b. tissue tags inadvertently left during pulp removal
    c. application of inadequate pressure to the pulp stumps
    d. none of the above
17. If __________ a pulpotomy procedure cannot be continued.
    a. the pulp chamber is empty and dry
    b. the pulp chamber is filled with purulent material
    c. hemorrhage control is not obtained within 5 minutes
    d. all of the above
18. Small cotton pellets wet with water under gentle pressure should be used __________.
    a. once all pulp tissue is removed from the pulp chamber
    b. to control hemorrhage
    c. to clean the pulp chamber
    d. all of the above
19. __________ can be used as a medicament for a pulpotomy.
    a. Formocresol
    b. Ferric sulfates
    c. Mineral trioxide aggregate (MTA)
    d. any of the above
20. A __________ dilution of Buckley’s formocresol is recommended for the pulpotomy medicament.
    a. 1:2
    b. 1:3
    c. 1:4
    d. 1:5
21. A small cotton pellet dampened, not soaking, with formocresol is packed against the pulp stumps __________.

22. Formocresol-dampened cotton pellet __________ following use during the pulpotomy procedure.
    a. must remain in place
    b. must be removed during
    c. can be optionally left or removed
    d. none of the above
23. The tooth should be restored at __________ the pulpotomy.
    a. the same appointment as
    b. a second appointment following
    c. any subsequent appointment following
    d. any of the above
24. Following use of mineral trioxide aggregate as a pulpotomy medicament, the tooth should receive __________.
    a. composite
    b. sealant
    c. resin-modified glass ionomer
    d. a and c
25. A thick mix of __________, either plain or reinforced, is placed in the pulp chamber and carefully packed tightly against the pulp stumps following pulpotomy with either ferric sulfate or Buckley’s formocresol.
    a. zinc phosphate
    b. zinc oxide and eugenol
    c. calcium phosphate
    d. none of the above
26. The restoration of choice for primary teeth that have received a pulpotomy is __________.
    a. composite filling
    b. glass ionomer cement filling
    c. stainless steel crown
    d. any of the above
27. The indirect pulp treatment technique recommended for primary teeth is the __________.
    a. one-appointment technique
    b. two-appointment technique
    c. three-appointment technique
    d. any of the above
28. During the removal of soft, carious dentin for an indirect pulp cap technique, the caries over the pulp is best removed with __________.
    a. an excavator
    b. a round diamond in a high-speed handpiece
    c. a large round bur (#6) on slow speed
    d. all of the above
29. A change that may be observed radiographically in a primary tooth that has received vital pulp therapy is __________.
    a. calcific metamorphosis
    b. internal resorption
    c. resorption of zinc oxide eugenol
    d. a and b
30. A decision should be made at the beginning of the indirect pulp treatment procedure to stop caries removal when __________, though still softened, regardless of the color of the remaining dentin.
    a. the slow-speed bur is creating powder
    b. the dentin appears leathery
    c. the dentin appears translucent
    d. a and b
Vital Pulp Therapy for the Primary Dentition

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 2 CE credits. 6) Complete the Course Evaluation below. 7) Make check payable to PennWell Corp. For Questions Call 216.398.7822.

EDUCATIONAL DISCLOSURE

The opinions of efficacy or perceived value of any products or companies mentioned in this course and expressed herein are those of the author(s) of the course and do not necessarily reflect those of PennWell.

COURSE EVALUATION and PARTICIPANT FEEDBACK

We encourage open and honest feedback from all courses. Please use this sheet to completely the survey included with the course. Please e-mail all questions to: macheleg@pennwell.com.

Educational Objectives

1. List and describe the clinical and radiographic assessment required to determine appropriate pulp therapy for primary teeth.
2. List the indications for vital pulp therapy in primary teeth.
3. List and describe the steps involved in pulpotomy of primary teeth and materials that can be used.
4. List and describe the steps involved in indirect pulp treatment of primary teeth.

Course Evaluation

Please evaluate this course by responding to the following statements, using a scale of Excellent = 5 to Poor = 0.

1. Were the individual course objectives met?
   Objective #1: Yes No
   Objective #3: Yes No
   Objective #2: Yes No
   Objective #4: Yes No

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. Do you feel that the references were adequate?
   Yes No

9. Would you participate in a similar program on a different topic?
   Yes No

10. If any of the continuing education questions were unclear or ambiguous, please list them.

11. Was there any subject matter you found confusing? Please describe.

12. What additional continuing dental education topics would you like to see?

For IMMEDIATE results, go to www.ineedce.com and click on the button “Take Tests Online.” Answer sheets can be faxed with credit card payment to (440) 845-3447, (216) 398-7922, or (216) 255-6619.

Payment of $49.00 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.

PLEASE PHOTOCOPY ANSWER SHEET FOR ADDITIONAL PARTICIPANTS.

If not taking online, mail completed answer sheet to

Academy of Dental Therapeutics and Stomatolgy,
A Division of PennWell Corp.
P.O. Box 116, Chesterland, OH 44026
or fax to: (440) 845-3447.

AGD Code 430, 074, 734