Vital Topic

Issues in Islamic Biomedical Ethics: A Primer for Pediatric Dentists

There are three key medicolegal and three key social issues that dentists should be aware of when treating Muslim children

By Kamyar M. Hedayat, MD

Islam is the second-largest religion in the world, representing nearly 20% of the world’s population. While Islam originated amongst the Arabs of the Arabian Peninsula, the majority of Muslims is not Arab and includes people from every ethnic group around the world, from China to Nigeria to Canada. Like Judaism, Islam has a practical code for living that includes certain mores and rules, including dental health. There are three key medicolegal and three key social issues that dentists should be aware of when treating Muslim children. It should be kept in mind that Islam has no central authority or papacy to dictate what is right or wrong. Thus, there is a lot of individual variation in what Muslims believe and what they actually put into practice. Muslims who were born in North America and who have advanced degrees tend to be more strict on medicolegal matters but less strict on the social issues.

The other thing to keep in mind when approaching a Muslim patient is that there are two major sects in Islam, Shiite and Sunni, and they differ more on minor legal issues than on core beliefs. I do not advise the pediatric dentist to inquire into the patient’s specific confessional affiliation, that is to say, Shiite or Sunni, as this might be seen as threatening or discriminatory due to recent sectarian violence and the history of discrimination in various countries. The purpose in mentioning that there are two major sects is that sometimes there will be slight variations in how people approach things based on the sect to which they belong. In large and medium-sized cities in the United States, one is likely to find a local mosque, where a religious scholar or knowledgeable physician, or knowledgeable dentist, may be of service in clarifying particular issues related to treating the Muslim child. At the national level, there are two major Muslim medical associations that may be of assistance. The first is Imamia Medics International, and the second is the Islamic Medical Association of North America. Online you will find a link to both of their respective web sites.

Considerations for Treating the Muslim Child

Children are highly valued in Islam and were prescribed rights over their parents from the very beginning of Islam, going back to 1400 years. Children legally and ethically in Islam cannot be physically abused. Therefore, there is no religious justification for any nonaccidental traumatic injury, such as bruises or burns in suspicious areas such as the eyes, the cheeks, or the back of the neck, that the pediatric dentist might come across. If the pediatric dentist notices nonaccidental or suspicious traumatic injury to the child, they should be involved with the appropriate child protective services if the injury is noted on an oral, head, or neck examination.

The holy book of Islam, the Koran, is the only Scripture that explicitly discusses breastfeeding. Breastfeeding is highly encouraged in Islam for up to 24 months. The introduction of solid foods and the type of food to be introduced is not mandated or specified, but the prophetic tradition has strongly favored the use of fruits, vegetables, unpasteurized animal milk, whole grains, and the occasional use of meat.
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Use of Alcohol and Mouth Rinses

Mouth rinses have been shown to play an important role in reducing dental plaque formations as well as gingivitis. Since the time of lister, the majority of these products contain fermented grain alcohol. Islam forbids the consumption of fermented alcohol for pleasure, but allows it for medicinal purposes. Nevertheless, many Muslims feel uncomfortable using these types of products. Recent studies have suggested that alcohol-free mouth rinses using essential oils can be as effective as chlorhexidine products without irritation or risk of carcinogenesis, and they may be effective alternatives to recommend to Muslim patients in place of mouth rinses containing alcohol.

The Use of Xeno Material

While the consumption of certain meats such as pork are not allowed in Islam, the use of xeno material for human health is permitted if it is considered to be the best option, or even the most expedient one. If in the future there are tooth grafts or other types of material derived from porcine or bovine sources, they should be permissible for Muslims to use if it is the best option to replace damaged teeth or gums.

Honey and date syrups, both of which are low-glycemic, are the most emphasized sweeteners in Islam. Oral health is assigned a quasi-religious status for older children and adults, as the sweetness of the mouth is thought to carry prayers up to heaven in a more favorable way than a mouth that has a foul or pungent odor.

Islam places a great importance on oral health. The body, including the teeth and gums, is considered to be a divine trust that the person must take good care of. Good health is considered one of the main blessings from God, and seeking help for serious medical conditions is considered an obligation according to most scholars. The prophet Mohammed, the founder of Islam, is said to have brushed his teeth and used a toothpick after every meal and encouraged all Muslims to do the same. Unfortunately, the introduction of refined carbohydrates into traditional Muslim diets and the lack of religious literacy have resulted in poor dental health for many Muslim children around the world.
Relief of pain has been an important goal of Muslim physicians, who were the first physicians to use inhaled anesthesia for dental and surgical procedures, going back to the 10th century A.D. While there is no legal problem with the use of conscious sedation or general anesthesia, due to certain social considerations and sensitivities, a parent or other chaperone of the same sex as the patient should be in the room when a procedure is being done on a girl over the age of nine. We will explain the importance of this age shortly. A request to deny a child adequate sedation or analgesia for a painful procedure from the parents based on religious grounds is not justified from an Islamic perspective, and if the dentist comes to an impasse about the reasonable use of sedation, it should be addressed in a sensitive and appropriate manner.

When examining the Muslim child, there are four key sociological considerations to keep in mind. They are as follows: examination of the child, wearing of the headscarf, examination of a girl or a young lady wearing a headscarf, and communication of information.

It is preferred in Islam that children above the age of religious maturity and all adults be examined by same-sex health care practitioners whenever this is possible and reasonable. In the case where an opposite-sex practitioner is more experienced or knowledgeable, it is always preferred that the more knowledgeable practitioner take care of the patient. The various schools of thought in Islam disagree about the exact age of religious maturity, but they all agree that once a child reaches the age of religious maturity, a certain social decorum must be observed. In general, the range for girls can be as early as nine amongst Shiites and as late as 15 for the various Sunni sects, and for boys it can range from 13 to 18. Thus the most respectful practice would be to ask each family what they prefer with respect to the sex of the practitioner. Generally speaking, examination of the oral cavity alone does not pose a problem because of the use of gloves, which acts as a barrier between the skin-to-skin contact of the patient and the practitioner of the opposite sex. However, examination of the submandibular, mandibular, and cervical regions will be discussed momentarily because they require a little more decorum.

Girls who have reached this age of religious maturity, again between the ages of nine to 15, depending on the school of thought in Islam, are religiously required to dress modestly, which includes a headscarf, also known as hijab. Some sects may encourage the use of a face veil, though this is not considered to be absolutely required and is not common outside of the Arabian Peninsula and some African countries. Some families force their daughters to wear the headscarf and some do not. Some families might be religiously observant, but their daughters choose not to wear the headscarf. The observance of modest dress is not in and of itself an indication of a Muslim being educated or uneducated, repressed or liberated, forced or free in her decision, and should not be viewed as a political statement. It is simply a religious observation. In the United States, the vast majority of Muslim girls and Muslim women who wear a headscarf do so on their own as a deliberate and conscious choice, and they should be respected for that decision.

If a woman is performing an examination of the head and neck of an older girl, and there are no men who will be entering the examination space, the patient can remove their head covering or face veil to facilitate the ease of the examination. In the case where a man will be examining the girl who is wearing a headscarf, a relative should be present throughout the examination. In Islamic law, the girl is permitted and should loosen her headscarf to the satisfaction of the practitioner in order to facilitate the most thorough examination. If a woman is examining the girl in an open examination setup where other men are present or may pass through, then the latter situation applies. Many Muslim women who do not wear headscarves will still prefer that a practitioner of the same sex offer care whenever available. So as a note of caution, the absence of a headscarf does not mean the absence of a certain degree of modesty with respect to interaction with the pediatric dentist or their staff.

Islam is a patrimonial religion, where the man is considered to be the head of the household. However, he is not considered to be the sole decision-maker. As in many other cultures, mothers are the primary guarantors of health and health care access, but for significant decisions, such as surgical intervention, orthodontic appliances, etc., the mother may wish to confer or defer to the father for a final decision. If the father is present during conversation, he should be addressed along with the mother. In some cultures where Islam is a common religion, it may be culturally appropriate to only address the father, as it would be considered inappropriate for a male dentist to make prolonged eye contact with a woman who is not a relative of his. The best policy is to be aware of the body language and the facial expressions of the family in order to gauge their level of comfort and their preferred communication style. Again, some Muslim families who have lived in the United States or have been born and raised in the United States might be very comfortable and may prefer to make direct eye contact with the pediatric dentist.

In conclusion, Muslims come from every country around the world, and most are not Arabs. There are particular considerations when treating the Muslim child. Dental care should be highly encouraged, as it is considered to be a religious duty in Islam. Some Muslims may object to the use of mouth rinses containing fermented alcohol, and mouth rinses containing essential oils or other nonalcoholic ingredients should be recommended if the dentist believes them to be equally effective. There are particular etiquettes of modesty that should be observed with Muslim patients, regardless of whether or not they are wearing a headscarf. In order to successfully treat Muslim patients with dignity and respect, it is best to ask them directly what their comfort level is with the issues mentioned in this lecture.
Critcal Discussion and Commentary

Genetic, Epidemiologic Research Provides Insight into Etiology of Cleft Lip & Palate

Understanding interactions between genetic and environmental factors provides hope for strategies to decrease the prevalence of cleft lip and palate.

By Rebecca L. Slayton, DDS, PhD

Non-syndromic cleft lip with or without cleft palate has a complex etiology with both genetic and environmental components. Advances made possible through the Human Genome Project have led to the discovery of specific genetic mutations that cause clefting, and candidate gene studies combined with epidemiologic studies have identified gene-environment interactions that increase the risk that a child will be born with cleft lip and or palate. Recently, the ability to screen the entire genome using a technique called a genome-wide association study, has identified additional genetic loci that are associated with clefting. A recent article provides an excellent review of our current understanding of the genetic and environmental influences that cause clefting.

Non-syndromic cleft lip and/or palate is an entity that occurs without other structural or cognitive abnormalities. It is estimated that seventy percent of the cases involving cleft lip and/or palate are of this variety. Prevalence ranges from one in 500 in Asian and Amerindian populations to one in 2,500 in populations of African heritage. Clefts of the lip only are more common in males with a 2:1 ratio, and clefts of the palate only are more common in females, again with a 2:1 ratio. Unilateral clefts of the lip and palate are more commonly left-sided.

Although there is variability in the expression pattern, studies to date have categorized patients as either being affected or unaffected for the purposes of identifying etiologic factors. Sub-clinical phenotypes such as lip prints, structural defects of the obicularis oris muscle, and dental anomalies, among others may provide additional insights into the genetic etiology of this disorder.

Genetic studies using the candidate-gene approach with parent/child trios or affected/unaffected subject pairs have been effective in identifying genes associated with cleft lip and/or palate. One gene, called interferon regulatory factor 6 was identified as the gene responsible for Van der Woude syndrome and has since been found to be consistently associated with some cases of non-syndromic cleft lip and/or palate as well. Using these techniques, a number of other genes have been identified as well. Genome-wide association studies screen over 500,000 polymorphisms for association with specific complex disorders. This technique has identified additional regions of multiple chromosomes that are associated with clefting and has confirmed association with previously identified genes.

Animal models, particularly the mouse, have made it possible to study facial development and to understand the function of specific genes in the developmental process. Expression studies showing that a gene of interest is expressed in the tissue of interest at the correct time of development, provides supporting evidence for that gene being an important component in the developmental process. Additionally, creation of a mouse model in which a gene of interest is mutated, allows researchers to evaluate the consequences of this mutation on the formation of the lip and palate.

Finally, environmental factors alone or in combination with the genetic background of an individual, have been found to contribute to the risk for clefting. Maternal smoking is associated with an increased risk for clefting and is thought to interact with genes involved in certain metabolic pathways. There are inconsistent findings on the effect of maternal alcohol consumption, folate supplementation and other nutrients on the increased or decreased risk for clefting and these still require confirmatory studies. Other environmental factors thought to be associated with increased risk for clefting are hyperthermia, maternal obesity, stress, ionizing radiation and infection. These also require additional investigation.

Significant progress has been made in the last 30 years to better understand the factors that contribute to cleft lip and/or palate. This article provides an excellent review of where we are today and what the future holds for understanding, preventing, and managing this disorder. It is impossible to do it justice in this summary, so I recommend you read it in full.

New Guidelines on Tonsillectomy Available

Tonsillectomy is performed more than 500,000 times annually in the United States; a tonsillectomy with an adenoidectomy is usually related to sleep-disordered breathing.

By Paul O. Walker, DDS, MS

When I was seven years old, my tonsils and I went our separate ways. I can still recall being anesthetized with ether, kicking and fighting all the way down, and recovering at home with a very sore throat. The only good thing that happened was that I was allowed to eat ice cream any time I wanted for a few weeks. Over the years I have noticed great variations in the recommendations to perform a tonsillectomy, some pediatricians delaying the procedure as long as possible and some recommending it quite early, some recommending a tonsillectomy only and others an adenotonsillectomy. I was never quite sure of whether there were specific pediatric guidelines for recommending a tonsillectomy. Perhaps that is why a recent article caught my eye.

The purpose of this article was to provide clinicians with evidence-based guidance in identifying children who are the best candidates for tonsillectomy. The panel developed 10...
Sound surfaces and carious lesions from 10 primary teeth and 140 permanent teeth were used in the study. The teeth had been extracted for various reasons and had been stored in thymol. After an extensive three-day calibration and training in both methods, the ICDAS method and the radiographic method of caries lesion scoring, the three examiners rated the lesions two times. The ICDAS classification system score had a range with a level of zero to six, where a level of zero was a sound surface and a level of six was when there was extensive visible cavitation within visible dentin. A level three, for example, in the ICDAS method referred to a localized enamel breakdown or cavitation with no visible notation of dentin involvement of the caries lesion. There were five levels for the radiographic scoring. Zero referred to a sound surface, and a four referred to a radiolucency in the outer third of the dentin. Results of the ICDAS and radiographic assessments were compared to histological assessments made subsequently after the teeth were sectioned and actual lesion depths and locations were measured. There were many results reported, including intraexaminer and interexaminer reliability, as well as the correlations between both the ICDAS scores and the radiographic scores and the ultimate histological findings. In compiling various pieces of data, regardless of whether in primary or in permanent teeth, the ICDAS scores were more reliable than radiographic scoring methods in predicting lesion depth or extent.

This paper used direct visualization as a means to identify and assess the level of a carious lesion, looking at direct observation in that sense in order to emulate the assessment of interproximal sites clinically. We know this is difficult clinically. In other studies by the same author, and in other authors’ study reports, separation of the teeth in advance of the ICDAS proximal assessment has allowed such clinical assessment to be performed in the same fashion. It is of value for the clinician to consider separation of teeth and using the ICDAS method as a subsequent method to assess proximal lesions. If this is done at a future visit, as noted, it might be possible to actually assess lesion depth without radiography.

Clinical ID of Caries Lesion Depth
May Be Better Than Radiographic ID

The International Caries Detection and Assessment System is more sensitive than bitewing radiographs when visible access is available

By Joel H. Berg, DDS

We struggle clinically in documenting the extent of carious lesions in a way that can be compared between examiners, between points in time, and in general to describe the depth or severity of the lesions. This paper compares the visual method of using the International Caries Detection and Assessment System (ICDAS) with the use of a radiograph for caries lesion detection in extracted teeth when examiners undergo extensive training in order to make such comparisons properly. Proximal lesions were chosen because, although they are not as accessible to vision clinically, if examiners are trained to look carefully at the interproximal site, it is proposed that it may be even more effective to look at them directly clinically than to image them and look at the lesions radiographically in order to assess the status of the carious lesion.
The purpose of this study was to evaluate the effectiveness of pulse oximetry (PO) in measuring blood flow in primary (SaO\textsubscript{2}) levels in their subjects’ fingers and teeth. First, to adapt its use to help us determine pulpal status in traumatized teeth would be welcomed.

The purpose of this study was to evaluate the effectiveness of pulse oximetry (PO) in measuring blood flow in primary and permanent teeth and to compare blood oxygen saturation (SaO\textsubscript{2}) levels in their subjects’ fingers and teeth. Eighty-four children aged four to 13 years comprised the study sample, and 123 teeth were tested. Fifty-one vital primary anterior teeth and 53 vital permanent anterior teeth were included. The negative control group was comprised of 19 root-filled permanent and primary incisors. The PO sensor bracket was placed on the buccal surfaces of the teeth, and three measurements were taken and averaged. SaO\textsubscript{2} levels were also recorded on each subject’s little finger using a separate sensor.

The authors found that the PO detected blood flow in all of the clinically normal teeth in the sample and showed no blood flow in all of the negative controls. The mean SaO\textsubscript{2} levels in teeth (85%) were significantly lower than those in fingers (93%), and there was no correlation between these readings. The mean time to achieve a SaO\textsubscript{2} level in primary teeth was approximately one minute, and it took longer in permanent teeth.

The most interesting and encouraging aspect of this study was its 100% accuracy in identifying both clinically normal and root-filled teeth. The authors reported that the children accepted the test willingly and the widespread availability of this equipment could help improve our diagnosis of injured teeth. The attachment of a PO sensor to accurately measure SaO\textsubscript{2} levels in teeth, however, is technically challenging, and the paper could have been strengthened had the authors removed and reattached the device between readings to verify the reliability of the measurements. The time necessary to register readings varied from 30 seconds to over 2.5 minutes, and this could pose some practical challenges to its use in the clinical setting. Nevertheless, the promising results reported here might encourage manufacturers to devise and market intraoral adapter devices to enable us to add this test to our diagnostic armamentarium.

**How to Identify Children at Risk for Palatally Ectopic Canines**

Extractions of both primary canines and first molars show significant improvements in the success rate and the intrabony position of ectopic maxillary permanent canines

By Jonathon Everett Lee, DDS


Ectopic maxillary canines occur with a frequency of one to four percent. Early diagnosis and preventive measures such as maxillary expansion and extraction of deciduous maxillary canines have been shown to reduce the severity of maxillary permanent canine impaction and the potential root resorption of adjacent permanent teeth. To compare the effectiveness of deciduous canine extraction versus deciduous canine and first molar extraction as a preventive treatment of ectopic maxillary permanent canines the authors designed and performed a prospective clinical study.

 Seventy-one non-orthodontic Caucasian subjects aged eight to 13 years with deciduous canines and first molars were enrolled into this study. However, the authors considered it unethical not to treat patients at risks for ectopically erupting canines or potentially resorptive situations. Thus canines were considered to be at risk if at least one of the following clinical and radiographic criteria was satisfied: (1) absence of palpation of the canine bulge, (2) canine bulge palpable palatally, (3) no abnormal inclination or rotation of the adjacent lateral incisor crown, (4) inclination of the canine to a vertical line passing through the midline exceeding 25 degrees, and (5) overlapping of the canine crown with the root of the permanent lateral incisor.

Among the 71 patients, 31 were judged to be at no risk. They served as the control group (CG) where no treatment was rendered. The remaining 40 subjects at risk for canine impaction or resorptive situations were then evenly and randomly assigned to the deciduous canine extraction (ECG) group or the deciduous canine molar extraction (ECMG) group. Panoramic radiographs were taken at the initial observation and after 18 months on average. Between-group statistical comparisons were carried out on the changes in canine inclination and sector location as measured on panoramic radiographs and on the percentages of successful permanent canine eruptions.

Three patients from the ECG group did not complete the trial resulting in a final sampling of 17 patients in the ECG group and 20 in the ECMG group. Favorable clinical outcomes occurred 78.6% in the single canine extraction ECG group and 97.3% for the canine molar extraction group. There was a significant difference between the favorable clinical outcomes between the two groups with the canine molar extractions ECMG group showing more significant improvements in the success rate and the intrabony position of the permanent canine, in
Obesity Is Not Just About a Big Gut

**Take Home Pearl**
Increased neck circumference is associated with an increased diagnosis of bronchial asthma.

**Background:** A common measure of obesity is the use of body mass index (BMI). The BMI measure, however, is not adequate at describing regional adiposity, such as central obesity, isolated to the upper body. Central obesity has been shown to be associated with other morbidities such as hypertension, diabetes, and obstructive sleep apnea (OSA). Central obesity is often measured by waist circumference and neck circumference (NC). While studies have associated neck circumference with OSA, fewer studies have examined the association of neck circumference with other conditions.

**Objective:** To determine if there is a relationship between increased NC and adverse airway events during elective noncardiac surgery.

**Methods:** Normal BMI was defined <85, high BMI was >85, and abdominal obesity was defined as a gender-adjusted waist circumference >90th percentile. Mallampati airway, desaturation events, and difficulty of mask ventilation were recorded.

**Results:** Data were collected from 1102 children with a mean age of 10.5 years. Males tended to have a larger NC. The majority of specified procedures were orthopedic. A strong association was noted between weight, BMI, systolic blood pressure, and increased NC. Increased NC was also associated with snoring, OSA, and a diagnosis of bronchial asthma. Upper airway obstruction, desaturation, and a need for more than one intubation attempt were all significantly associated with increased NC.

**Conclusions:** Increased NC is associated with adverse respiratory events in children.

**Reviewer’s Comments:** Obesity really is a touchstone issue these days, and it is interesting to note that much of the literature and established scales use adult norms simply because there is a paucity of good, well-designed studies on the pediatric population. This study is simple and has a profound outcome, which is particularly significant for practitioners who use in-office procedural sedation or general anesthesia.

**Reviewer:** S. Thikkurissy, DDS, MS


RSV Is a Common, Potentially Deadly Illness of Early Childhood

**Take Home Pearl**
Hispanics have a 50% increased risk for the respiratory syncytial virus in early childhood.

**Background:** Respiratory syncytial virus (RSV) is a common respiratory virus affecting young children. It was first isolated 40 years ago and is part of the paramyxovirus group. The pathologic action of RSV involves destruction of the bronchiar epithelial cells, resulting in terminal airway destruction. RSV “season” in the United States lasts from late October/mid-December through early spring. While often subclinical, its manifestations in young children often cause serious lower airway infections. Some studies have associated RSV with bronchiolitis in as many as 90% of cases. Mortality from RSV is approximately 2% and is seen primarily in infants. In children with cardiopulmonary problems, the mortality rate increases to 5%.

**Risk Factors:** Risk factors associated with RSV include cardiopulmonary problems, prematurity (which results in a 10-fold risk increase), and ethnicity. Hispanics have a reported 50% higher incidence rate of RSV than Caucasians and African Americans. Environmental factors associated with RSV include passive cigarette smoke, crowded living conditions, daycare attendance, and lack of breastfeeding.

**Prevention:** An RSV vaccine has not been an effective prevention tool. Prevention measures have primarily focused on education, such as handwashing practices and avoidance of potential passive smoke exposure. If an infant is deemed to be at high risk, it is recommended that the family consider Palivizumab immunoprophylaxis, which has been shown to reduce hospitalization by as much as 82% in some populations according to the American Academy of Pediatrics. Palivizumab is considered to be highly effective for children with cyanotic and acyanotic heart disease with hemodynamic compromise. The recommended dose of Palivizumab is 15 mg/kg by injection.
Take Home Pearl

Fevers are usually not indicative of major illness unless the fever is severe.

Background: Infection accounts for 20% of deaths in children aged 1 to 4 years. It is also a very common presenting chief complaint at a pediatrician’s office. A diagnostic challenge for physicians is recognizing a “serious illness” in children.

Objective/Methods: A recent systematic review examined >1900 studies in an attempt to establish criteria of severity. Examples of serious infections included sepsis, bacteremia, meningitis, pneumonia, osteomyelitis, and viral respiratory disease.

Results/Conclusions: The strongest red flags for serious illness included reduced consciousness, convulsions, cyanosis, and delayed capillary refill. When examining serious respiratory illness, the most predictive diagnostic signs/symptoms were cyanosis, shortness of breath, and poor peripheral circulation. The presence of poor peripheral perfusion/cyanosis alone raised the severity index from 1% to 25%. Dehydration was another sign that, when absent, resulted in a severity index of <1%; however, when present, it elevated the severity index to >10%. Fever was not diagnostically significant, unless the fever exceeded 104°F; even when exceeding 104°F, it raised the severity index to 5%. In fact, in many of the conditions that significantly raised the severity index, the children's temperatures were normal. Parental concern or “instinct” that something was wrong was a feature that, while not readily assessed, often accompanied more severe illness in children.

Take Home Pearl

If a mother has symptoms of depression, the child is 1.5 times more likely to exhibit symptoms of oppositional defiance disorder.

Background: Previous studies have demonstrated that children and adolescents with parents who have certain psychiatric conditions (depression and anxiety) are at risk for developing psychiatric issues in later life. When children of mothers who were experiencing major depressive disorders were studied, it was discovered that 34% of the children had depressive symptoms as well. When parents had both depression and anxiety, the percentage of children with symptoms increased to 45%. It has been shown that the treatment of maternal depression can minimize/cure child symptoms.

Objective: To identify rates of parental symptoms, to note associated symptoms in children, and to see if there is an association in the severity of symptoms.

Methods: Data were collected from the Child and Adolescent Psychiatric Evaluation Service survey. Children were 6 to 17 years of age. One parent completed the Brief Symptom Inventory 18 and the Child Behavior Checklist.

Results: Data were collected from 848 child-parent dyads. More than 50% had a diagnosis of attention-deficit hyperactivity disorder (ADHD), with another 33% having Oppositional Defiance Disorder (ODD). Children with mothers who had symptoms of depression or anxiety were 1.5 times more likely to have ODD and were more likely to have a diagnosis of ADHD.

Conclusions: Current parental symptoms may also affect their child’s mental/emotional state.

Reviewer’s Comments: This article does an excellent job of relating parental mental health to that of the child. I did have some objection that the age range for children was so wide and included children who were going through the already emotionally turbulent time of adolescence, but I believe this is a minor weakness. The article does a good job of raising the age-old question of “nature versus nurture” in terms of pediatric mental illness.

Reviewer: S. Thikkurissy, DDS, MS

Acute & Chronic Illnesses

Make Sure It’s Not Just a Simple Cough

Reviewer’s Comments: RSV is of particular significance in young children with a history of prematurity, and dentists need to consider its effects when considering sedation and/or in-office general anesthesia or deep sedation.

Reviewer: S. Thikkurissy, DDS, MS

Acute & Chronic Illnesses

Depression & Anxiety — the Apple Doesn’t Fall Far From the Tree

Objective: To identify rates of parental symptoms, to note associated symptoms in children, and to see if there is an association in the severity of symptoms.

Methods: Data were collected from the Child and Adolescent Psychiatric Evaluation Service survey. Children were 6 to 17 years of age. One parent completed the Brief Symptom Inventory 18 and the Child Behavior Checklist.

Results: Data were collected from 848 child-parent dyads. More than 50% had a diagnosis of attention-deficit hyperactivity disorder (ADHD), with another 33% having Oppositional Defiance Disorder (ODD). Children with mothers who had symptoms of depression or anxiety were 1.5 times more likely to have ODD and were more likely to have a diagnosis of ADHD.

Conclusions: Current parental symptoms may also affect their child’s mental/emotional state.

Reviewer’s Comments: This article does an excellent job of relating parental mental health to that of the child. I did have some objection that the age range for children was so wide and included children who were going through the already emotionally turbulent time of adolescence, but I believe this is a minor weakness. The article does a good job of raising the age-old question of “nature versus nurture” in terms of pediatric mental illness.

Reviewer: S. Thikkurissy, DDS, MS
How Do Kids Feel About Their Dentists?

**Take Home Pearl**
The number one reason children cite for fear of going to the dentist is the injection.

**Background:** Results of the previous literature have reported the incidence of “fear of dentists” as approximately 5% of the general population and as high as 16% in preschool children. Establishment of trust is a key feature of the dentist-patient relationship. Previous studies have suggested that dental fear in adolescence and adulthood may actually have its origin in childhood.

**Objective:** To assess children’s feelings and attitudes toward their dentists.

**Participants/Methods:** Subjects were 9- to 12-year-old school children in Riyadh, Saudi Arabia, from 8 primary public schools. The survey instrument was devised by the authors. The instrument was piloted to 40 children to determine appropriateness of questions and issues of inference.

**Results:** Data were collected from 483 children with a roughly 50/50 gender split. More than three-fourths of the children had been to a dentist before; 11% responded they did not like their dental visit, and an additional 12% responded they were afraid when they visited the dentist, with 14% being unsure of their feelings. Significantly more of the children who did not like their dental visit had a physician in the family. Children who had a previous dental visit preferred their dentist to wear protective apparel.

**Conclusions:** The number one reason children cited for their fear of the dentist was the injection (74%), followed by extraction (31%) and teeth drilling (27%). Older children preferred their dental environments be decorated, while younger children did not have a preference.

**Reviewer’s Comments:** There is definitely a cultural aspect to this study, in which the majority of respondents preferred their dentist to be male. There was a distinct gender predilection between patients and dentists. The authors could have made an interesting commentary by determining which fear was associated with kids who had not been to a dentist to see if the fear may have been transmitted from within the family. This is an interesting study, but I would like to see it repeated in other cultural settings.

**Reviewer:** S. Thikkurissy, DDS, MS

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Who Is Committing Abusive Head Trauma Against Children?

**Take Home Pearl**
The common history presented in cases of abusive head trauma in children is a “short fall.”

**Background:** When discussing abusive head trauma (AHT) in children, traditionally, males have been more commonly identified as perpetrators; however, there have been concerns that female perpetrators are potentially underreported. Globally, as many as 42% of mothers have reported “shaking” their child as a form of discipline. In the United States, this figure can be as high as 5%.

**Objective:** To identify abuser profiles and characteristics based on gender.

**Methods:** Data were collected from 583 children with a roughly 50/50 gender split. More than three-fourths of the children had been to a dentist before; 11% responded they did not like their dental visit, and an additional 12% responded they were afraid when they visited the dentist, with 14% being unsure of their feelings. Significantly more of the children who did not like their dental visit had a physician in the family. Children who had a previous dental visit preferred their dentist to wear protective apparel.

**Results:** Data were collected from 48 cases of AHT, with 70% having “identified” perpetrators (IP). Of the 34 children in the IP group, >90% had intracranial hemorrhages and 17% had suspicious bruising. Six IP children died, and all deaths were consistent with shaken baby symptoms. Perpetrators ranged from 16 to 60 years of age with a median of 30 years. The most common perpetrators were biological parents followed by maternal boyfriends. The most common history presented was “short fall.” Children with a male perpetrator had significantly more severe injuries, as well as a resulting conviction. Of the 15 male perpetrators, 14 admitted to shaking the child. Males were significantly more likely to confess the abuse than were female perpetrators.

**Conclusions:** There were significant differences in AHT characteristics based on perpetrator gender.

**Reviewer’s Comments:** This is a fascinating study on child abuser profiles based on gender. There is a lot of good information to help mandatory reporters such as members of the dental team. It was interesting that the second most common “explanation” for injuries was a lack of one, after “short fall.” These are explanations that dentists come across all the time in cases of dentoalveolar trauma.

**Reviewer:** S. Thikkurissy, DDS, MS

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How Has Composite Chemistry Changed Over the Years?

**Take Home Pearl**
Clinical improvements in composite have been significant in spite of little chemical change.

**Background:** Resin composite materials are important in modern practice for children and adults. Over the past 40 years, numerous advances have been made that have dramatically improved the performance of composites, making them significantly more user friendly and, therefore, more utilized in clinical practice.

**Objective:** To review the many advances that have occurred over the years.
last few decades. The authors also want this paper to serve as a good refresher on the characteristics and nature of composites for clinicians.

**Review:** This paper reviews the types of monomers and the multifunctional nature of monomers. Multifunctional refers to the fact that the monomers serve to allow polymerization, while also having base chains that vary in size, length, and chemical composition to provide differing handling properties. The basic polymerization methods of resin composites today have not changed appreciably in the past few decades. Most resins use methacrylate polymerization, which causes significant shrinkage, still one of their major downsides. There is also significant shrinkage stress that occurs as a function of the stereological manner in which the resin composite polymerizes. This shrinkage stress pulls on the lateral walls of the cavity and, although not generally clinically perceptible, can cause ultimate failure of a restoration if the interface bonding procedure is not carried out effectively or if the composite is not cured properly. Various methods are discussed to reduce the effect of polymerization shrinkage stress, including stepped curing and layered curing of composite. Photoinitiator systems are described (including the more common camphorquinone), which require the use of an amine co-initiator. This amine co-initiator, in unstable form, has had reports of toxicity and lack of color stability, so some manufacturers have used phosphine oxide, a photoinitiator that does not require the co-initiator. The paper then discussed the role of acidification of monomers to allow the possibility of self-adhesive composites. Although such development has created a class of self-adhesive resin cements that serve that purpose well, these materials are not quite advanced enough to the point of allowing a self-adhesive restorative composite due to instability and inadequate physical properties. Also described are alternative methods of polymerization using something other than methacrylate chemistry to avoid the polymerization shrinkage problem. The problem with these systems currently is that, although they reduce the shrinkage problem, they are not as esthetically desirable and also require a unique proprietary adhesive system. Finally, the role of advance fillers is described, including nano fillers.

**Reviewer’s Comments:** Modern composites are outstanding but are technique sensitive. Look for continued development of the chemistries already known to create ultimately highly advanced and clinically much more useful composite resin systems, including the possibility of self-adhesion. This would be of particular advantage in restorative dentistry for children.

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**When There Isn’t Enough Food, Kids Find a Way to Survive**

**Take Home Pearl:** Children experience food insecurity on many levels and may eliminate snacking at school to help the family out.

**Background:** Household food insecurity (FI), in which a household cannot consistently provide sustenance for its members, is at the highest level since measurement began in the United States in 1995. It is estimated that >20% of U.S. households are defined as “food insecure.” In the past, the literature has focused on strategies that mothers use to manage FI. However, in recent years, a shift has occurred to detail the effects of FI from the vantage point of the child. A 2008 study noted that while 21% of households had FI, in only 1% was a child’s diet affected based on parental reports.

**Objective:** To examine hunger and FI from a child’s perspective.

**Methods:** Structured interviews were conducted with 26 families from South Carolina. Interviews examined household finances, food decision making, and eating norms.

**Results:** Of the families interviewed, 61% experienced FI. Responses included worrying about running out of food, reliance on cheap foods, and what were termed “problematic compromises” (canceling health insurance or not paying bills in order to pay for food). Only 38% of families were on food stamps. Children experienced FI in several ways: a cognitive understanding that food is scarce; an emotional worry or anger at the FI; and physical tiredness and exhaustion related to inadequate nutrition. Children used strategies such as eliminating snacking during school to save food for meals at home, as well as asking neighbors or relatives for food. Finally, children often worked part-time to supplement parental income.

**Conclusions:** FI is managed by children through strategies different from those of adults.

**Reviewer’s Comments:** This very sobering article demonstrates that poverty and FI often force children into their own coping strategies. A gambit of effects (mental, physical, and emotional) was noted. These children may be in our practices and are often unnoticed, as issues of poverty are difficult for a child to contend with and explain.

**Reviewer:** S. Thikkurissy, DDS, MS

Take Home Pearl
Beverage consumption can affect dentitions, but determining who is at greatest risk requires more study.

Background: Although many in vitro studies have looked at erosive tooth wear (ETW), there have been few, if any, large-scale studies in North American children. Okunseri (2009) reported that 46% of American children aged 13 to 19 years had at least one tooth with ETW, but it was not specific to the consumption of acidic beverages.

Objective: To examine the association between ETW and the consumption of a wide variety of beverages consumed by children.

Design/Methods: A secondary analysis of National Health and Nutrition Examinations Survey data from 2003 to 2004 was performed (the first time that data on ETW were collected). ETW was determined using the modified Tooth Wear Index by Smith and Knight (1984). ETW was evaluated and scored visually by trained examiners utilizing 8 teeth (6 anterior and 2 posterior). Beverage consumption data were collected using a food frequency questionnaire and processed by Diet*Calc software system that determined frequency (daily and seasonally).

Results: Of the 1314 children in the sample, 523 had evidence of ETW, completed the food frequency questionnaire, and had a dental examination. The sample was weighted to represent 13- to 19-year-old subjects in the United States. Overall, 45% had some evidence of ETW, and 53% of subjects were female. The rate of ETW was highest in whites, in subjects 18 to 19 years old, and in males. The highest rate of ETW was on incisal surfaces of centrals, laterals, canines, and occlusal surfaces of molars. As far as beverage consumption was concerned, there were no statistically significant differences in the beverages consumed. Children with ETW were observed to have a higher frequency of apple, orange/grape, and soft drink consumption than the overall mean consumption. When adjusting for age, gender, and race, more frequent consumption of apple juice was found to be associated with ETW.

Conclusions: Children with ETW have a somewhat higher mean frequency of consuming apple, orange/grape juice, and soft drinks, but the difference is not statistically significant. No association was found between ETW and soft drink consumption. Compared to whites, African-Americans had the lowest prevalence of ETW and the highest mean consumption of apple juice.

Reviewer’s Comments: Although the conclusions may be helpful for our adolescent patients, the effect on the primary dentition may be even greater. With infants and toddlers consuming non-milk beverages from bottles and cups, much of the disease we see now may have been initiated by acid dissolution of the thinner enamel on primary teeth that allowed for the rapid bacterial invasion.

Reviewer: Arthur J. Nowak, DMD


Take Home Pearl
A strong correlation has been found between secondary tooth eruption and gingival displacement.

Background: There is scant literature that soundly examines the development of the periodontal architecture between childhood and adulthood. Studies have demonstrated the concept of secondary tooth eruption, which is eruption of the permanent teeth after they have reached the occlusal/incisal level. Previous studies have noted that the incisal edge of maxillary incisors gets displaced almost 1 mm in relation to the cephalometric point nasion over 20 years.

Objective: To monitor the changes in maxillary gingival contour in adolescents into adulthood.

Methods: Cases were selected from patients who had completed orthodontic treatment between 1984 and 1996. Patients were excluded if they had restorations of the maxillary centrals or the presence of periodontal problems.

Results: Data were collected from an adolescent group (n=25) with a mean age of 16 years, and an adult group (n=10) with a mean age of 31 years. Gingival displacement of incisors and molars was more pronounced in adolescents. Eruption of maxillary incisors was more pronounced in adolescents. A strong correlation was noted between secondary eruption and gingival displacement in adolescent incisors.

Conclusions: Tooth positions and gingival margins are not stable on reaching adulthood.

Reviewer's Comments: This is something we are typically taught in dental school: that periodontal architecture stabilizes 3 years after eruption. This study demonstrates that, in fact, there are significant changes on the order of mm in gingival displacement and tooth eruption well into adulthood. This study had a small sample size, which does affect the validity, but the premise is interesting. These results can be significant when considering things such as veneers in adolescents who may have had traumatized incisors.

Reviewer: S. Thikkurissy, DDS, MS

Does Parental Depression Affect Spanking?

**Background:** In 2009, the Institute of Medicine estimated that >15 million children live with an adult caregiver affected by major depression. However, most studies have focused on mothers rather than fathers.

**Objective:** To determine if there is an association between depression in fathers of 1-year-old children and specific parenting behaviors (positive and negative) discussed by pediatric providers during well-child visits.

**Design:** This was a cross-sectional secondary analysis using interview data.

**Methods:** Interview data from 1746 fathers of 1-year-old children in the Fragile Families and Child Wellbeing Study were analyzed. Positive parenting behaviors included singing songs and reading stories. Negative parenting behaviors included a report of spanking during the previous month.

**Results:** Within the study sample, 7% of the fathers were depressed. Depressed fathers were more likely to report spanking their 1-year-old children during the previous month (41%) than were nondepressed fathers (13%).

**Conclusions:** Parental depression is known to be associated with parenting behaviors. Pediatric care providers should also screen fathers for depression, discuss specific parenting behaviors, and be prepared to refer these fathers for treatment when appropriate.

**Reviewer’s Comments:** This study was widely reported in the lay media, and I had never thought too much about parental depression as related to positive and negative parenting behaviors. This study certainly opened my eyes to the finding that depressed fathers were 3 times more likely to have spanked their 1-year-old children during the month previous to the well-child visit. As providers likely to see parents of 1-year-old children, pediatric dentists should be aware of these findings and be alert to the possibility of parental depression.

**Reviewer:** Paul O. Walker, DDS, MS


Sedation in Children — Keep Them Distracted

**Background:** In recent years, pediatric sedation has moved out of the realm of the hospital into community outpatient centers and ambulatory offices. Accordingly, many organizations have established clinical guidelines to ensure the safety and degree of standardization of practices.

**Guidelines:** While organizations such as the American Academy of Pediatrics and the American Society of Anesthesiologists (ASA) have largely focused on education standards and perioperative measurements, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and Centers for Medicare and Medicaid Services (CMS) have established physical guidelines for facilities that can support sedation and general anesthesia. CMS specifically identifies anesthesia as encompassing regional monitored anesthesia care, general anesthesia, and deep sedation. These patients cannot be easily aroused but can respond purposefully to repeated or painful stimulation. Alternatively, analgesia/sedation includes topical, local, minimal, and moderate sedation. This includes epidurals and spinal blocks where loss of consciousness is not required.

**Providers:** In order to practice anesthesia, as defined by the CMS, providers must be an anesthesiologist, a physician with additional training, a certified nurse anesthetist, or an anesthesia assistant under the supervision of an anesthesiologist. When children lie on their backs, they tend to feel vulnerable, so establishing a comfortable position is important. Distractions such as toys, music, and light wands may help remove the procedure from their central cognition.

**Reviewer’s Comments:** I attend my residents in many sedation procedures (nearly 300 a year), and I believe this review on basic CMS/JCAHO/ASA definitions is a great one. While the idea of distraction and engaging children and parents is a great concept, it can be difficult because of the child’s anticipation of dental surgery/sedation.

**Reviewer:** S. Thikkurissy, DDS, MS


Being a Physician Doesn’t Make Your Sedations Safer

**Background:** Procedural sedation is a common technique used to elicit cooperation from young children for relatively unpleasant procedures. Due to differences in physiology and anatomy, children are often at greater risk for sedation-related complications than adults. Several organized groups have produced collaborative procedural sedation guidelines for the management of children. While much of the anesthesia guidelines and standards of care have been established by anesthesiologists, in recent years, they have been outpaced by other groups providing procedural sedation care.

**Objective:** To determine if there is an association between procedural sedation adverse events and operator specialty.
Survival of Root Canal-Treated Teeth Influenced by Distribution, Character of Functional Stresses

**Take Home Pearl**
This paper provides dentists with a good foundation of evidence to assist patients with decision making with regard to root canal therapy.

**Background:** As a clinician, it is not uncommon to be faced with the situation of trying to rank competing treatment options for parents and their children. Among the most difficult choices is whether to treat a tooth endodontically, extract the tooth in question and replace it with an osseointegrated implant, or, if the timing is favorable, orthodontically close the resultant space. In the population I treat, the decision-making process is often complicated by the necessity for general anesthesia as an adjunct to endodontic treatment and would likely be required for any subsequent treatment. In addition, the parents and child have a legitimate expectation that the complicated and expensive treatment result will function for a reasonable number of years. Information that would be most helpful to the dentist would be good outcome evidence for the expected outcomes and related prognostic factors of endodontic therapy.

**Objective:** To investigate root canal outcomes and the prognostic factors for tooth survival after root canal therapy.

**Design:** Systematic review.

**Methods:** 14 papers met the inclusion criteria for the systematic review.

**Results:** Overall, outcomes for root canal treatment plus restoration were similar to those expected for extraction and an osseointegrated implant. Root canal-treated teeth were expected to survive 86% to 93% of the time over an 8- to 10-year follow-up interval.

**Conclusions:** In descending order of influence, factors favorable for root canal-treated tooth survival were: (1) the tooth was restored with a crown; (2) the tooth had mesial and distal proximal contacts (ie, the tooth had sufficient structure remaining to be in contact with the adjacent teeth and was not standing alone or the terminal tooth in the arch; (3) the tooth did not function as the abutment for a fixed or removable prosthesis; and (4) the tooth was not a molar.

**Reviewer’s Comments:** This information provides clinicians with some of the evidence required to offer parents and children prognostic information that is specific to the situation they are facing. This systematic review is the best available distillation of current evidence for predicting outcomes for root canal therapy. Based on this evidence, dentist and patient can approach the question of whether to treat endodontically versus extract and treat prosthetically with greater confidence. With the retrospective character of the data and emerging evidence relating oral foci of infection to systemic health, comprehensive prospective investigations are indicated. However, this is a very positive first step.

**Reviewer:** Michael J. Casas, DDS, MSc


Special Needs — Health Needs Are Best Met When Child Has a Medical Home

**Take Home Pearl**
Early dental care for infants and toddlers can be improved if children have a medical home.

**Background:** The medical home was first described in 1992; the dental home was described in 2002. Both have similar characteristics: accessible, continuous, comprehensive, family centered, coordinated, compassionate, and culturally effective.

**Objective:** To evaluate the association between having a medical home for children with special needs and receiving other components of health care, such as dental care.

**Methods:** The 2007 National Survey of Children’s Health conducted by the Maternal and Child Health Bureau and the Centers for Disease Control and Prevention was used to gather data. More than 91,600 interviews were conducted by phone between April 2007 and July 2008 in homes that had children from birth to age 17 years. The most knowledgeable parent was asked questions concerning one child. Examples include: (1) the usual source of care; (2) if the child had a personal physician or nurse; (3) if referrals were
available; (4) if the parent was satisfied with communication; and (5) if there was assistance with coordinating care. Four additional variables were measured to determine the impact of the medical home: (1) unmet medical needs; (2) data received on preventive medical care visits; (3) unmet dental needs; and (4) no preventive dental care visit.

Results: Using data from >83,000 children, the authors reported the following findings: (1) 56.9% of the children had a medical home, with 1- to 5-year old children having the highest rate (63.2%); (2) non-Hispanic whites made up 67.3% of the subjects with a medical home versus 44% of non-Hispanic blacks and 38% of Hispanics; (3) the subjects were equally divided among urban and rural locations; (4) 30.8% of the subjects were perceived by the parents as having excellent or very good overall health; and (9) 63% of parents perceived that their children had excellent or very good oral health and 35% had fair or poor oral health. As far as a medical home and the impact on dental care were concerned, the children who had unmet medical needs (3.7%) and were without a medical home (6.4%) had almost 4 times the risk of having unmet health care needs. The rate of unmet dental needs was 2.9% for all children. However, if children were without a medical home, they were 3 times more likely to have unmet dental needs. Seventeen percent of children did not have a preventive dental visit in the past year.

Conclusions: Just over half of U.S. children receive care in a medical home, and, if in a medical home, the children have reduced problems accessing medical and dental care.

Reviewer’s Comments: Even though 35% of the parents perceived that their child had fair or poor oral health, only 2.9% reported that their child had an unmet dental need. It is important that we continue to collaborate with our medical colleagues on the importance of the first visit and annual preventive dental care appointments.

Reviewer: Arthur J. Nowak, DMD

How to Prevent HFMD & Herpangina

Take Home Pearl
Although the conditions are most often benign, hand, foot, and mouth disease and herpangina infections may cause serious outbreaks. Early diagnosis, personal hygiene, and isolation can prevent transmission.

Background: Control measures to prevent the person-to-person transmission of hand, foot, and mouth disease (HFMD) and herpangina include hygiene and social distancing; however, limited empirical evidence exists to support these recommendations.

Objective: To assess risk factors for HFMD and herpangina, and to recommend control and preventive measures.

Design: Retrospective case-control study.

Participants/Methods: After an outbreak of HFMD and herpangina caused by human enterovirus 71 (HEV 71), 176 HFMD and herpangina diagnosed case-children (aged ≤6 years) were enrolled and compared to a stratified random sample of 201 asymptomatic control children. Children were frequency matched according to age and permanent or migratory resident status. A questionnaire was administered by trained public health doctors who conducted in-person interviews. All analyses were stratified by residency using the Mantel-Haentzel method and logistic regression analysis to calculate the odds ratios. To assess the effectiveness of hand-washing, 4 questions were asked and scored in order to evaluate the frequency of hand washing for 3 situations (after play, before eating, and by the caregiver before preparing food for the child) and 1 question regarded the daily frequency of all hand washing of the child. Logistic regression analysis was used to assess the relationship between hand washing and risk of contracting HFMD and herpangina.

Results: Infection rates were highest in children between 1 and 2 years of age and were lowest in infants (aged <1 year) and children aged 5 to 6 years. Migrant children had a significantly higher infection rate than permanent residents. Important risk factors for HFMD and herpangina included playing with neighborhood children, visiting an outpatient clinic for another illness, and community exposures involving crowded places. All 4 questions on hand washing showed a protective effect from 80% to 98% for the highest frequency of hand washing. A total of 50% of the case-children and 2.5% of the control group demonstrated poor overall hand washing scores compared to 12% of the case-children and 78% of the controls with good hand-washing scores.

Conclusions: Hand washing by preschool-aged children and their caregivers had a significant mitigating effect and was highly protective at the individual level against community-acquired HFMD and herpangina caused by HEV 71. A risk reduction of >95% was supported by a consistently increasing dose-response effect after controlling for other exposures.

Reviewer’s Comments: This retrospective case-control study had a very good sample size for both test and control patients. Although parental questionnaires were used, trained public health doctors conducted in-person interviews to improve information collection. As the authors indicated, the major limitation to the study included the retrospective self-reporting of exposures and preventive activities by the parents or caregivers, as well as their ability to recall an isolated or single exposure. The findings were consistent with those of other similar studies.

Reviewer: Erwin G. Turner, DMD
To receive credit for this activity, answer the practice quiz questions below, read the content, and complete the online post activity quiz at www.practicalreviews.com. Log in using your email address and password, click on take a quiz and enter the e-quiz code located below.

**E-quiz code: 31387N**

1. It was reported in a recent study that <25% of 1- to 5-year-old children have a medical home.
   Practice: T F  **Answer Submitted: T F**

2. Depressed fathers are no more likely than nondepressed fathers to spank their 1-year-old children.
   Practice: T F  **Answer Submitted: T F**

3. According to a recent study of hand, foot, and mouth disease and herpangina, a protective effect of 80% to 98% was found for subjects displaying the highest frequency of hand washing.
   Practice: T F  **Answer Submitted: T F**

4. A high correlation has been found between oxygen saturation levels in the teeth and fingers.
   Practice: T F  **Answer Submitted: T F**

5. Although the findings are not statistically significant, children with erosive tooth wear have a somewhat higher mean frequency of consuming apple, orange/grape juice, and soft drinks.
   Practice: T F  **Answer Submitted: T F**

6. The use of prenatal vitamin supplements and avoidance of maternal smoking would prevent the majority of cases of cleft lip and/or palate.
   Practice: T F  **Answer Submitted: T F**

7. Deciduous canine and first molar extraction is not as effective as a preventive measure for spontaneous eruption of ectopic permanent canines as deciduous canine extraction alone.
   Practice: T F  **Answer Submitted: T F**

8. Molars and incisors have similar outcomes for root canal therapy.
   Practice: T F  **Answer Submitted: T F**

9. There is still much opportunity to improve the clinical properties of composites.
   Practice: T F  **Answer Submitted: T F**

10. Caries lesions can be detected earlier with bitewing radiographs than with direct vision.
    Practice: T F  **Answer Submitted: T F**

11. More than 500,000 tonsillectomies are performed annually in the United States.
    Practice: T F  **Answer Submitted: T F**

12. Children with attention-deficit hyperactivity disorder (ADHD) are more likely to have mothers with depression or anxiety than are children without ADHD.
    Practice: T F  **Answer Submitted: T F**

13. Anesthesiologists have the lowest complication rate in sedations.
    Practice: T F  **Answer Submitted: T F**

14. Children with a physician in the family are more likely to be afraid of the dentist than those without a physician in the family.
    Practice: T F  **Answer Submitted: T F**

15. Female perpetrators of abusive head trauma in children have been underreported in the literature.
    Practice: T F  **Answer Submitted: T F**

16. Food insecurity is managed by children through strategies different from those of adults.
    Practice: T F  **Answer Submitted: T F**

17. Fevers in children are not significant even if they are >104°F.
    Practice: T F  **Answer Submitted: T F**

18. Palivizumab immunization may reduce respiratory syncytial virus-associated hospitalization by as much as 80% in high-risk populations.
    Practice: T F  **Answer Submitted: T F**

19. A spinal block is an example of the Centers for Medicare and Medicaid Services defined anesthesia.
    Practice: T F  **Answer Submitted: T F**

20. Males tend to have greater neck circumference than females.
    Practice: T F  **Answer Submitted: T F**
1. T  A recent study by Cheng et al, involving pediatric and adolescent patients undergoing cancer treatment, found that 41% of the sample developed oral mucositis after receiving chemotherapy.

2. F  Following a mandibular fracture, temporomandibular joint dysfunction is seen equally in boys and girls.

3. F  Sublingual ulcers in neonates are always due solely to traumatic irritation from a neonatal tooth.

4. T  The U.S. Supreme Court Chief Justice ruled that residents are the kind of workers that Congress intended to both contribute to and benefit from the Social Security System.

5. T  In the article by Marsh and Devine on oral biofilm formation, they suggest that host genetics may influence the establishment of periodontal microbiota.

6. T  A recent study found that rapid treatment of facial cellulitis in children had a significant positive impact on length of stay and total cost of treatment compared to published studies and nationally reflective data.

7. T  The results of a recent study demonstrated that the incorporation of DMAE-CB could provide the sealant with antibacterial activity without compromising the properties of the parent material.

8. F  There is a strong resemblance between a mother's dietary practices and her children's.

9. T  A recent study found that the use of an endotracheal tube with modulated cuff pressures resulted in less laryngotracheal mucosa damage.

10. T  Biofilms secrete alkali, but not enough to deter bacteria.

11. T  Children whose mothers have untreated decay or have lost teeth are at high risk for dental disease.

12. F  Other than body mass index, female sex has been associated with increased left ventricular mass.

13. T  A recent study has shown that the combined use of lidocaine spray and atomised intranasal midazolam appears to be a safe and effective method to achieve short-term sedation in children to facilitate medical care and procedures.

14. F  A recent study found that toothache rates were significantly lower in minority populations compared to Caucasians.

15. T  Neuronal death in non-human primates exposed to anesthetic agents has not been noted in exposures of $\leq 3$ hours.

16. T  Overcrowded housing and low family income are associated with oral disease in children.

17. T  Drooling is the most common symptom reported with teething.

18. T  Over half of children with a motor problem have $\geq 2$ developmental delays.

19. F  A recent study found that extended liver disease associated with acetaminophen is a common feature in children.

20. T  The most common cause of unavoidable cancellation is change in patients' medical status.