New Calcified Dental Tissue May Produce Increase in Root Wall Thickness, Root Length


Wang X, Thibodeau B, et al:
J Endod 2010; 36 (January): 56-63

We can grow hard tissues in the roots of immature necrotic teeth, but we still don't know if the tissue that is produced will provide us with the clinical result we want.

Background: Management of the necrotic immature permanent incisor has long been a difficult clinical problem. The Frank technique of multiple applications of calcium hydroxide, although often successful, required multiple appointments and could take years to complete. More recently, the single-appointment mineral trioxide aggregate (MTA) apical plug technique reduced the multiple appointments to 1 but did nothing to encourage additional root maturation. Multiple case reports and a pilot investigation have described an alternative to these techniques that seeks to encourage tissue growth into the canal space after pulp necrosis with the goal of continued root maturation. The technique has met with some clinical success, but the nature of the resultant calcified or canal space soft tissue has not been documented.

Objective: To characterize tissues that are produced in a revitalization/revascularization technique.

Methods: In this animal study, dog pulp spaces were opened and infected with calculus and sealed until signs of apical periodontitis were present. The teeth were treated with an intracanal medication consisting of 3 antibiotics. The canals were then re-accessed, and a stainless steel file was inserted into the apical tissues to induce bleeding with the intent of filling the canal space with blood. Collagen solution was introduced into the canal, and the tooth was sealed with white MTA and silver amalgam. The teeth were followed up for 3 months. The animals were then sacrificed, and the teeth were harvested for histologic analysis.

Results/Conclusions: Root growth was noted in the experimental teeth, but the newly calcified tissue was predominantly cementum. Some bone was seen in scattered deposits within the canal space in some samples. This new calcified dental tissue produced an apparent increase in root wall thickness and root length. Reviewer's Comments: It appears from this investigation that calcified tissue produced by revitalization/revascularization is not dentin but rather is predominantly cementum. The tissues appear to arise from apical ingrowth of vital tissues that produce new cementum, some bone, and periodontal ligament within the canal space. In a perfect world, the new laid-down calcific material would be normal dentin that would provide increased root strength and lead to apical maturation as occurs in normally developing vital teeth. As a consequence of finding that cementum is the tissue being deposited, the investigators pose 2 clinically relevant questions. (1) Does the thickened cementum provide the required structural root strength that would occur when roots mature normally? (2) How can a tooth treated by revitalization/revascularization technique be managed should it become infected a second time? This well-executed investigation can't answer these questions, but it provides the foundation for these questions to be investigated. (Reviewer-Michael J. Casas, DDS).

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Keywords: Revitalization, Revascularization, Cementum, Apical Periodontitis

Print Tag: Refer to original journal article
Background: Dental caries is a multifactorial disease that, if left untreated, can lead to serious consequences, including pain, difficulty in school, problems with eating, and other concerns. It is well known that multiple factors are causative agents in progression of dental caries. Plaque level, number of teeth, child's age, and socioeconomic status, as well as many other factors, including diet, hygiene, and lack of fluoride use, have all been implicated in caries initiation and progression.

Objective: To investigate the association between snacking and dental caries experience in a population with a high risk of manifesting dental caries.

Participants: Preschool children in the Boston area were recruited within the offices of pediatricians.

Methods: Various data points, including demographic characteristics, oral hygiene practices and habits, breast-feeding usage, use of a bottle, and snacking behavior were collected via a questionnaire. In addition, presence of plaque and number of teeth present in the mouth were documented. A total of 1200 children were equally distributed by gender, and half of parents or guardians had an education level lower than or equal to high school.

Results: A significantly higher proportion of children with visible plaque exhibited caries compared with plaque-free children. Children from homes with income below the median compared to those with income at or above the median level exhibited more caries experience. There was no difference between boys and girls in caries experience, nor was there a difference related to race, ethnicity, or parent education level. Nearly all children reported eating many snacks on most days, and 60% had 2 sweet snack items on most days. The proportion of children with caries lesion experience increased proportional to increasing number of sweet items reported.

Conclusions: Caries was significantly more prevalent among children who ate chips most days. Snacking on candies, cookies, and ice cream was also associated with a higher proportion of caries in children. Caries experience was more pronounced in children from poor families, in those from ethnic and racial minorities, in those with single mothers, and in those with families with less education.

Reviewer's Comments: The present study suggests, as has been shown previously, that proper hygiene promotion and healthy snacking are key factors in caries prevention in children. Many studies have demonstrated the relationship between the above mentioned factors and caries experience in children. The present study specifically elucidates the role of starchy chips in caries experience. Previous studies have described the role of sugary foods in caries progression but not starches. This study corroborates the role of significant sugar consumption and emphasizes the importance of the starchy substance chips. We must pay close attention to the frequency of sugar and starch exposures in thinking about caries risk. (Reviewer-Joel Berg, DDS).

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Keywords: Diet

Print Tag: Refer to original journal article
Casein phosphopeptide–amorphous calcium phosphate tooth mousse and fluoride toothpaste can reduce enamel demineralization.

**Background:** Orthodontic demineralization is an unwanted side effect of orthodontics. Demineralization/remineralization studies have utilized linear-polarized imagery, because use of polarization removes unwanted glare/reflections and lessens the chance of artifact error. Advent of automatic/autofocus digital cameras necessitated the development of circular-polarized filters, because linear-polarized filters negatively affect autofocus and may affect autoexposure. Casein phosphopeptide–amorphous calcium phosphate tooth mousse (CPP-ACP) and fluoride toothpaste have been advocated as agents to promote remineralization. Few studies, however, have used circular-polarized digital images to evaluate the effect of CPP-ACP and fluoride toothpaste on remineralization.

**Objective:** To evaluate the size of demineralized area (SDA) and mean grey level (MGL) of enamel treated with CPP-ACP and/or fluoride with computer-assisted image analysis of circularly polarized digital images.

**Design:** In vitro, controlled laboratory study.

**Methods:** 80 extracted bovine incisors were divided into 4 groups of 20: group A, remineralization therapy with 5-minute application of CPP-ACP; group B, remineralization therapy with a 5-minute application of a thin film of fluoride toothpaste; group C, remineralization therapy with a thin film of fluoride toothpaste for 5 minutes and then with CPP-ACP for 5 minutes; and group D, teeth were stored in artificial saliva of 37°C and not coated with any agent. Remineralization therapy occurred at 8:00 AM, 12:00 AM, and 5:00 PM. Afterward, samples were soaked in artificial saliva at 37°C. Duration of remineralization study was 12 weeks. At end of the 3rd, 6th, 9th, and 12th weeks, circularly polarized digital images were taken.

**Results:** SDA in all 4 groups decreased over time, and the rate of decline was lowest in the first 3 weeks. At 3 weeks, rates for group B and C were similar, while it appears that group A had the third lowest rate of decline, followed by the control group D. At the end of 12 weeks, the SDA of group C was the smallest, followed by groups A, B, and D, respectively. MGL in all 4 groups decreased with time; although the rate of decline in groups A, B, and C were similar, D was not. MGL of group C was lowest, followed by A, B, and D, respectively. No significant correlations, however, were detected between SDA and MGL.

**Conclusions:** CPP-ACP application can promote enamel remineralization by decreasing SDA and MGL. Combination of fluoride toothpaste and CPP-ACP improves the remineralization effect. Computer-assisted image analysis of circularly polarized images is an effective method of detecting enamel demineralization.

**Reviewer's Comments:** This is one independent study that substantiates claims of remineralization effects of CPP-ACP (also known in the United States at MI Paste™ [GC America]). (Reviewer-Jonathon Everette Lee, DDS).

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Keywords: Enamel, CPP-ACP, Remineralization, Circularly Polarized Images

Print Tag: Refer to original journal article
In a recent study by Carvalho et al, no association was found between age of the child at intrusion and injury to the permanent successor.

**Objective:** To determine the prevalence of intrusion of primary incisors and investigate the sequelae to both injured teeth and their permanent successors.

**Design:** Retrospective chart review.

**Methods:** Records of 307 children (169 boys, 138 girls) who presented with injuries to their primary incisors were reviewed. Type of injury was recorded according to WHO classifications for crown fractures and luxation injuries. Intrusion injuries were recorded as either total (crown of intruded incisor not clinically visible) or partial (some of the crown visible). Sequela of the intrusion injuries to the primary teeth themselves and to their permanent successors was also recorded.

**Results:** Study sample included 753 traumatized primary teeth, and intrusion was the most common injury (comprising almost 30% of the sample). Children aged 1 through 4 years were most likely to sustain injuries. Approximately 60% of intruded teeth were partially intruded, and 40% were totally intruded. Maxillary central incisors were the primary teeth most frequently intruded, and no difference in frequency was noted between boys and girls. Falls in the home were the most common cause of intrusions. A total of 187 teeth were followed up as part of an 8-year clinical and radiographic study. Approximately 90% of intruded teeth developed pathologic sequelae. Pulp necrosis and premature loss were the most frequent complications (80%). A total of 122 permanent successors were followed up until full eruption. Of this group, 54% succeeded the totally intruded teeth, and 46% succeeded those that were partially intruded. Overall, 35% of permanent successors to totally intruded teeth presented sequelae, and 53% of successors to partially intruded teeth were damaged. Enamel hypoplasia and eruption disturbances were the most frequent sequelae noted. No correlation was noted between age at time of injury and developmental disturbances to permanent teeth.

**Reviewer's Comments:** The authors advise close follow-up of these injuries, but they stop short of recommending specific treatment. Evidence is lacking to guide us to either extract or allow these intruded incisors to re-erupt, as damage to their successors appears to be similar in either case. It still seems prudent to try to clinically and radiographically determine the relationship between the intruded tooth root and its successor and to conservatively manage those that deviate away from the developing tooth. (Reviewer-Dennis J. McTigue, DDS, MS).

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Keywords: Intrusion Injuries, Damage to Developing Teeth

Print Tag: Refer to original journal article
Treating the child with dental disease may not be enough; the child's mother may also need to be treated.

**Objective:** To determine if a mother's untreated dental caries is associated with a likelihood of her child's untreated dental caries.

**Design:** Cross-sectional, population-based study.

**Participants:** Subjects came from Mendota, CA, a rural, low-income Hispanic community.

**Methods:** A random sample of 445 families was selected from 751 households that fit inclusion criteria. Bilingual interviewers met with families and invited them into the dental study, and incentives were offered. Demographic data was collected by questionnaire. Dental examinations without radiographs were completed, following accepted protocol. Decayed and filled surfaces were collected from both mother and child(ren).

**Results:** 179 mothers and 387 children were included in the study. A total of 46% of mothers and 27% of children had untreated caries. Mean age of the mothers was 36.0 years and the children was 8.6 years. Education and income levels of the mothers were low. Parents reported 56% of children started brushing by age 2 years, and 58% had received a topical fluoride or sealant. A total of 80% of mothers reported their dental health was poor or fair. Mean decayed surfaces in permanent teeth of the mother was 2.5; the children's decayed, filled surfaces in the primary teeth was 6.8, and the decayed, filled surfaces in the permanent teeth of the child was 4.3.

**Conclusions:** Mothers with untreated caries almost doubled the odds of their children having untreated caries and significantly increased the child's caries severity by about 3 surfaces. They pointed out the importance of the mother being treated if we expect to decrease the caries risk of their children. Fathers were not included in the analysis, because many did not show for the examination. For the 84 who did show, 45% had untreated decay with a DFS of 9.5.

**Reviewer's Comments:** Possibly in this population, father also played a role in the child's caries risk? My concern with the study was its title, which didn't focus on the population -- disadvantaged, rural, low-income Hispanic families. I feel they should have been identified early in the title. Results cannot be generalizable to other populations with other demographic characteristics. Nevertheless, the study further verifies the importance of mother's oral health and the child's oral health, and maybe mothers should be treated in the pediatric dental office to be sure the dental caries are treated? (Reviewer-Arthur J. Nowak, DMD).

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Keywords: Dental Caries, Family Health, Bacterial Transmission

Print Tag: Refer to original journal article
Antiplaque and antimicrobial agents should be considered to improve oral health.

Oral health or disease is not determined by the presence of bacteria as much as it is by the balance or imbalance of the oral ecology. Oral microflora is necessary for the health of the mouth. It prevents potentially harmful bacteria from becoming established in the mouth and regulates the inflammatory response of the host. If there is a disruption in this balance, diseases, such as caries, periodontal disease, or candidosis, can be the result. Effective oral health care products should be designed to manage levels of plaque without disrupting the balance and, therefore, retain the beneficial qualities of the microbes. Development of plaque biofilm occurs in a very ordered sequence, starting with colonization of bacteria on the tooth surface followed by development of a biofilm matrix and establishment of a diverse group of microbes in a stable homeostasis. Because of structure of biofilms, they are more resistant to antimicrobial agents and are difficult to manage. In dental caries, there is a shift in bacteria and in environmental conditions that leads to low pH, selection for acidogenic species (such as Streptococcus mutans and others), and inhibition of bacteria that prefer neutral pH. Effective control of dental biofilm requires regular, thorough oral hygiene. Regardless of ability to manage the biofilm, it will return relatively quickly. Oral care products are designed to assist in management of oral biofilm by incorporating agents to control plaque and oral microbes. Antiplaque agents interfere with formation of biofilm and/or aid in removal of biofilm. Antimicrobial agents either inhibit growth of specific bacteria or kill bacteria. In established biofilms, bacteriocidal ability of antimicrobial agents is inhibited by reduced ability of the agent to penetrate biofilm and slow the growth rate of bacteria within the biofilm. A variety of agents have been developed for use in oral care products. Desirable properties include substantivity, a broad spectrum of bacteriocidal activity, ability to interfere with the metabolism of oral bacteria, and ability to reduce inflammation. Agents available for use in oral health products include chlorhexidine, essential oils (such as menthol, thymol, and eucalyptol), metal ions (such as zinc and copper), plant extracts, phenols (such as triclosan), and surfactants (such as sodium lauryl sulphate).

**Reviewer’s Comments:** It is important when we counsel patients and parents about oral health that we remember the complex etiology of dental caries, gingivitis, and periodontal disease. For those at high risk, brushing, flossing, and eating a healthy diet may not be enough. Using plaque control or antimicrobial agents to return the oral environment to a healthy balance may also be required. (Reviewer-Rebecca L. Slayton, DDS, PhD).

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Keywords: Biofilm, Plaque Management

Print Tag: Refer to original journal article
Although rare, oral squamous cell carcinoma does occur in pediatric patients (most often the tongue) and should be included in the differential diagnosis of any inflammatory-like, rapidly growing lesions of the oral cavity.

**Background:** Squamous cell carcinoma (SCC) of the oral cavity is uncommon in young adults and rare in the pediatric age group.

**Objective:** To report the outcomes of a pediatric cohort of patients with SCC of the oral tongue treated at a comprehensive cancer center, and to compare those outcomes with that of a matched cohort of adult patients.

**Design:** Retrospective, matched-pair cohort study with pertinent patient, tumor, treatment-related, and outcome details obtained from hospital medical records.

**Participants:** Studied were 10 pediatric patients (ages 15 to 20 years) with SCC of the oral tongue who underwent treatment at Memorial Sloan-Kettering Cancer Center from 1983 to 2009. Forty adult patients with SCC of the oral tongue were matched to the pediatric patients for sex, history of tobacco exposure, tumor size status, nodal involvement status, distant metastasis status, surgical procedures, and administration of adjunctive radiotherapy.

**Methods:** Comparisons between groups included rates of overall survival (OS), disease-specific survival (DSS), and recurrence-free survival (RFS). Statistical analysis included continuous (t test) and categorical (Chi-square and Fischer exact) tests to compare demographic, tumor, and treatment characteristics. The OS, DSS, and RFS were calculated using the Kaplan-Meier method and compared with the 2-tailed long-rank test.

**Results:** 3 pediatric patients (30%) had recurrence after a median disease-free interval of 5.4 months. Of these patients, 1 developed cervical recurrence and died of progressive metastatic disease, and 2 others succumbed to lung metastases. Of the patients, 7 were alive at last follow-up. A total of 10 adult patients (25%) with a 9.2-month disease-free interval developed recurrences (5 local, 4 regional, 1 distant metastases). At last follow-up, 31 adult patients were alive and disease-free. Pediatric and adult-matched cohorts had equivalent survival outcomes. The 5-year OS was 70% in the pediatric group and 64% in the adult group. The 5-year DSS was also similar, with 80% in the pediatric group and 76% in the adult group. The 5-year RFS was 70% in the pediatric group and 78% in the adult group.

**Conclusions:** When pertinent differences in stage, grade, and treatment for SCC of the oral tongue are controlled for, outcomes for OS, DSS, and RFS are equivalent, suggesting that pediatric patients should receive the same therapy that is standard for adult patients.

**Reviewer's Comments:** This very interesting article reemphasizes the need for routine and thorough oral soft tissue examination and screening of all pediatric patients. Early diagnosis and treatment are key prognostic factors regarding long-term survival. Weaknesses of the study include a small number of pediatric cases, which may limit statistical analyses, and this cohort may represent a selected population. (Reviewer-Erwin G. Turner, DMD).

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Keywords: Oral Squamous Cell Carcinoma

Print Tag: Refer to original journal article
Objective: To clarify current protocols in the diagnosis and treatment of head lice, and to serve as a guide for management of head lice in the school setting. Review: Head lice, or pediculosis capitis, have been human companions since antiquity, and approximately 6- to 12-million human infestations occur each year in the United States. In the past, these infestations have been treated by head shaving and use of poisons, such as dichlorodiphenyltrichloroethane. More recently, pharmaceutical agents such as lindane, pyrethrin, permethrin, and malathion have been used, but resistance to each of these has developed. Discovery of head lice manifestations by parents and other non-health care personnel coupled with easy availability of over-the-counter (OTC) pediculicides for self-treatment has resulted in removing the physician from the treatment process. Annual direct and indirect costs, including remedies, lost wages, and school system expense, has been estimated to be anywhere from $350 million to as much as $1 billion. The facts are these: head lice are neither a health hazard nor a sign of poor hygiene and, in contrast to body lice, are not responsible for transmission of any disease. Head lice can be found in all socioeconomic groups. Head lice cannot hop or fly; they crawl. The gold standard for diagnosing head lice is finding a live louse on the head; however, this can be difficult as lice are sensitive to light and can crawl away quickly. The eggs or empty casings, called nits, might be easier to spot. Prevention is equally as important as treatment. Children should be taught not to share combs, brushes, and hats, but no one should refuse to wear protective headgear out of a fear of catching head lice. Regarding treatments, a Cochrane review on pediculicides was published in 1999 and updated in 2001 but was subsequently withdrawn in 2007 while a substantial update was being conducted. Currently, OTC permethrin 1% or pyrethrins are recommended initial treatments. Malathion 0.5% can be used on individuals aged ≥24 months. Other OTC products include benzyl alcohol 5% and lindane 1%. 

Reviewer's Comments: One of the most troublesome problems in seeing pediatric patients is the discovery that one of your patients has head lice. What should you do? Treat the patient but insist on having him or her wear a head bonnet? Or dismiss the patient without treatment and insist that the caretaker see their physician and have the problem treated? (Reviewer-Paul O. Walker, DDS, MS).
This current clinical trial confirms that resin infiltration of interproximal caries lesions shows promise as a viable treatment method for reducing lesion progression.

**Background:** When nonoperative measures are effectively used to influence oral hygiene education (dietary control and local fluoridation), the progression of caries lesions is known to slow or stop. These preventive procedures are optimal, because they promote natural repair processes of teeth. At later stages, this approach can be less effective and caries lesions can progress. The best possible individual treatment threshold for intervening operatively is yet to be determined. This is especially the case for interproximal lesions that extend radiographically into inner enamel or the outer third of dentin. Caries infiltration is a novel treatment option for these lesions. This procedure can potentially bridge the gap between nonoperative and operative treatment choices, potentially postponing the first restoration placement. The purpose of caries infiltration is to soak up the porous lesion body with a low-viscosity resin (infiltrant) that is then hardened with blue light, which blocks pathways for cariogenic acids and seals the lesions. The difference in this caries sealing method is that the diffusion barrier is created inside the lesion and not on the tooth surface. This aids clinical application, especially in the interproximal space, because no temporary tooth separation is required. It should be noted that, to date, the efficacy of caries infiltration has been investigated only in vitro and in situ.

**Objective:** To assess whether resin infiltration of proximal lesions is more effective than nonoperative measures alone with regard to inhibition of caries lesion progression.

**Design:** Randomized, split-mouth, placebo-controlled clinical trial.

**Participants:** 22 young adults aged 18 to 35 years from the Charite-University Hospital in Berlin.

**Methods:** 29 pairs of interproximal lesions with radiological extension into the inner half of enamel, or outer third of dentin, were randomly allocated to 2 treatment groups. The study was executed for 18 months. In the test group, lesions were infiltrated (Icon, DMG). A placebo treatment was performed in the control group. All participants received instructions for diet, flossing, and fluoridation. Participant recruitment, treatment, and follow-up occurred from July 2007 to May 2009.

**Results:** Primary outcome after 18 months was radiographic lesion progression (assessed by digital subtraction radiography). No unwanted effects could be observed. Two of 27 lesions (7%) in the experimental group and 10 of 27 lesions (37%) in the control group showed progression ($P = 0.021$). Infiltration of interproximal caries lesions was demonstrated to be successful in reducing caries lesion progression.

**Reviewer’s Comments:** As dental practitioners, we are always looking for new and less-invasive methods to successfully treat caries lesions. This randomized clinical study is welcome news. The results validate 1 more effective method for the treatment of interproximal lesions without cutting into teeth. (Reviewer-Joel Berg, DDS)

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Keywords: Resin Infiltration, Infiltrant

Print Tag: Refer to original journal article
Parents of autistic children may be confused regarding the impact of certain dental treatments.

**Background:** Autism is a developmental, neuropsychiatric disorder first seen in early childhood and involves 3 behavioral domains: impairments in social interactions, impairments in communication, and repetitive or restrictive behaviors. Due to variability of ≥1 of these domains, the disorder is usually termed “autism spectrum disorder.” Autism spectrum disorder is further divided into autistic disorder, Asperger syndrome, and pervasive developmental disorder. In the 1900s, it was estimated that 1 in 1500 children had autism, but in the early 2000s, the incidence had increased to 1 in 150. It is not clear whether this has been a true increase in prevalence or more vigilant diagnostic procedures. There are no biologic tests for autism, and as a result, parents are often frustrated and have difficulty in separating science from pseudoscience.

**Objective:** The author conducted a PubMed search of articles linking autism with mercury, fluoride, nitrous oxide, antibiotics, gluten, casein, acetaminophen, and dentistry.

**Design:** Literature review.

**Results:** There is debate as to whether autism is due to genetic defects, environmental factors, or a combination of both.

**Conclusions:** Dentists treating patients who have autism need to be sensitive to parents’ questioning of time-tested prevention and treatment modalities.

**Reviewer's Comments:** Quite frankly, this article was a huge disappointment. Although the author states that he conducted a literature review to investigate concerns that parents of a child with autism might have regarding oral health care, there was no ranking of each of the 60 articles cited using recognized and accepted hierarchies of evidence to rate the scientific merit or value of these articles. (Reviewer-Paul O. Walker, DDS, MS).

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Keywords: Autistic Disorder, Dental Care, Disabilities, Special Care Dentistry

Print Tag: Refer to original journal article
Physicians Have a Responsibility in Making Dental Referrals

Primary Health Care Providers' Advice for a Dental Checkup and Dental Use in Children.

Bell HA, Rozier GG:

Pediatrics 2010; 126 (August): e435-e441

Health care providers are ineffective in making dental referrals.

**Objective:** To estimate referral effectiveness by health care providers to dentists.

**Participants:** Studied were 2031 children ages 2 to 5 years and 3237 ages 6 to 11 years. Children with special health care needs and adolescents were not included.

**Methods:** Surveys and interviews were performed to collect epidemiological information and to determine whether the child was advised to see a dentist in the last year (2004) and whether they, in fact, had a dental visit of any type either by a dentist, hygienist, or any dental specialist.

**Results:** 5268 children participated. Of the subjects, 78% were white and 24% were Hispanic. Of the parents, 83% either finished high school or had a bachelor's degree or higher, 66% had regular dental care, 93% had regular medical care, 46% had private insurance with dental coverage, and 31% had public insurance. No measure of dental disease status was provided. A total of 47% of 2- to 5-year-olds and 37% of 6- to 11-year-olds had been advised to have a dental checkup within the previous year. Of these, 39% of 2- to 5-year-olds and 60% of 6- to 11-year-olds had an actual visit. If parents were routine users of dental care and if the child had a regular source of medical care, those children were more likely to be advised to see a dentist. Average cost of dental care for children ages 2 to 5 years who were advised to see a dentist was $187 compared to $204 for children not advised.

**Conclusions:** Children advised to see a dentist were almost 3 times more likely to have a dental visit. Children ages 6 to 11 years who were advised were no more likely to see a dentist than those who were not advised. Regular child medical care was the strongest predictor of whether a child was advised to see a dentist, followed by whether the parents were regular users of dental care.

**Reviewer's Comments:** Why were only 47% of 2- to 5-year-olds advised to see a dentist by a health provider? It verifies my experience that most health providers primarily look in the mouth to examine the pharynx and look past the teeth. Infrequently when presented with a young patient with dental disease have the parents reported they were advised to see a dentist by the child's health care provider. Of the original subjects, only 18% of the 2- to 5-year-old sample and 19% of the 6- to 11-year-old sample had a dental visit in the year in question. I also question the sample with 78% being white, 84% of parents with a high school or college education, and 90% of children with a regular source of medical care. This is not the demographics of our patient population. (Reviewer-Arthur J. Nowak, DMD).

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Keywords: Recommendations, First Visit, Referrals

Print Tag: Refer to original journal article
Can Poor Sleep Habits Be a Lasting Risk Factor for Unhealthy Weight Status?

Shortened Nighttime Sleep Duration in Early Life and Subsequent Childhood Obesity.

Bell JF, Zimmerman FJ:

Arch Pediatr Adolesc Med 2010; 164 (September): 840-845

Increased daytime sleep is associated with overweight/obese status in children ages 60 to 154 months.

**Background:** Over the last 30 years, there has been an alarming increase in the number of children and adolescents diagnosed as being overweight or obese. The rate of obese children (those with a body mass index above the 95th percentile) has doubled in the 2- to 5-year-old cohort and has tripled in the 6- to 11-year-old cohort. Obesity/overweight status has been described as the result of an energy/intake imbalance. A growing body of literature suggests there is a possible link in the energy imbalance and poor sleep habits in children. There has been interest in the theory that poor sleep affects hypothalamic pathways, which can alter hormonal levels and, ultimately, metabolism.

**Objective:** To measure the potential impact of poor sleep on obesity status, as well as the "type" of sleep (daytime vs nighttime), and to determine how this relationship may change between preadolescent and adolescent patients.

**Methods:** Data were collected from the Panel Survey of Income Dynamics, a longitudinal survey looking at the same children in 1997 and 2002. Aside from psychological data, a time-use diary was maintained by parents who documented the child's primary and secondary activities.

**Results:** Data were collected from 822 children ages 0 to 59 months and 1108 children ages 60 to 154 months (total children, n=1930). In both cohorts, over one third was diagnosed as overweight or obese. In the younger cohort, low nighttime sleep was significantly associated with an almost twofold increase in odds of obesity 5 years later. In the older cohort, increased daytime sleep was associated with an increased odds of being overweight or obese.

**Conclusions:** In children who are at risk for being overweight/obese, sleep duration and pattern are modifiable risk factors.

**Reviewer's Comments:** Obesity truly represents a “constellation” syndrome in which so many systems exist in dysregulation. There is no reason to suspect that sleep would not also be significantly affected. It is interesting that as with many child-level variables, this is firmly within the control of parents, but often bad habits beget bad habits. (Reviewer-Sarat Thikkurissy, DDS, MS).

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Keywords: Obesity, Sleep

Print Tag: Refer to original journal article
In a study by vanGeelen et al, almost half of teenagers diagnosed with chronic fatigue syndrome used psychological support with positive results.

**Background:** It is estimated that as much as 4.4% of adolescents in the United States and United Kingdom suffer from chronic fatigue syndrome (CFS), with a reported female to male ratio of 4:1. Despite the incidence/prevalence of CFS in adolescents, there have been relatively few follow-up studies to examine this population.  

**Objective:** To examine long-term outcomes and risk factors of nonrecovery in adolescent CFS.  

**Methods:** Diagnosis of CFS was made according to 1994 Centers for Disease Control and Prevention recommendations. Fatigue was assessed using a subjective fatigue scale from the "Checklist Individual Strength" (CIS-20). Range of scores for each of 8 tested items was from 8 (no fatigue) to 56 (extreme fatigue). Functional impairment was tested using the Child Health Questionnaire-Child Form (CHQ), which measures limitations in daily activities, including school performance.  

**Results:** Complete data were collected for 54 subjects with a mean age of 16 years. Initially on CIS-20, the mean score was 49.4, suggesting very high fatigue levels. Half of patients reported gradual onset of symptoms, including a flulike illness. At follow-up, more than half of patients had scores of <40 on CIS-20 and an increase in physical functioning subscale on CHQ. Health care utilized by subjects during follow-up included physiotherapy (67%), psychological support (48%), and clinical rehabilitation treatment (39%).  

**Conclusions:** Although having a good follow-up prognosis, CFS still poses a significant hurdle for adolescent patients.  

**Reviewer's Comments:** For many dentists, CFS is a nebulous term, and yet literature suggests a true collection of symptoms that can impact daily functioning, academic performance, and overall quality of life. This paper is good in highlighting that therapy is often multimodal and requires active patient participation. (Reviewer-Sarat Thikkurissy, DDS, MS).
In some acute situations, intranasal opiates are as effective as intravenous forms for analgesia.

**Background:** In recent years, a distinct advantage to use of intranasal medications has been explored. Oral medication has variable bioavailability and, in some cases, slow onset. Although the rectal route may be effective for very young children, it poses an acceptability hurdle for older patients (adolescents). Traditional parenteral routes often require some degree of compliance from the patient, as well as challenges for the inexperienced provider. Intranasal delivery allows for a relatively high bioavailability with ease of administration and minimal need for patient cooperation.

**Objective:** To discuss existing literature on intranasal delivery of medications for analgesia, sedation, and seizures.

**Design/Methods:** This retrospective database analysis consisted of a keyword search on Medline and Google Scholar for nasal, intranasal, and matching medications. References from each article obtained through the search were then reviewed.

**Results:** Key points identified were that volumes exceeding 1 mL per nostril were not reliably absorbed due to mucosal saturation and resulting runoff. Atomizing medications are preferable to nasal drops to maximize surface of medication interaction with nasal mucosa. Intranasal opiates are noted to be as effective as intravenous in some acute situations, such as minor fractures, burns, etc. Intranasal midazolam, which has shown to be effective for anxiolysis and light procedural sedation, has limited practicality for longer procedures. The most common adverse effect associated with nasal medications is nasal burning and, although transient (often <30 seconds), can impact patient anxiolysis.

**Conclusions:** Intranasal medications do have an increasingly valuable place in managing pharmacologic needs of pediatric patients.

**Reviewer’s Comments:** I have had significant experience with intranasal midazolam for sedations and have been pleasantly surprised by the ease of administration, effectiveness of sedation, and quick recovery. This article does a good job of explaining the benefits and limitations of the intranasal route. (Reviewer-Sarat Thikkurissy, DDS, MS).

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Keywords: Sedation, Intranasal

Print Tag: Refer to original journal article
Autistic Diet Selectivity -- Nature or Nurture?

Feeding Symptoms, Dietary Patterns and Growth in Young Children With Autism Spectrum Disorders.


Pediatrics 2010; 126 (August): e337-e342

Children diagnosed later with an autism spectrum disorder may be more likely to have late acceptance of solid food as an infant/toddler.

Background: Classically, patients with autistic spectrum disorder (ASD) are characterized by their difficulties with social interaction, communication, and repetitive behaviors. Another facet of patients with ASD is often very particular and sensory-based diet choices. There has been debate as to whether the food selected is a result of intrinsic decisions due to ASD or extrinsically as a result of family preferences and cultural influences. Many previous studies have looked retrospectively at an ASD cohort.

Objective: To prospectively examine feeding practices, diet, and resulting growth in children with ASD.

Methods: Data were collected from the Avon Longitudinal Study of Parents and Children, a longitudinal cohort study examining subjects born between April 1991 and December 1992 in the Avon area of southwest England. Mothers enrolled during pregnancy. For purposes of this study, children were included if they were aged <11 years and had an ASD diagnosis confirmed by clinical records and the National Educational Database, a government-run program that identifies children in state schools who need special instruction due to an ASD.

Results: Data were collected from 79 ASD subjects and 12,901 controls. Children diagnosed with ASD were significantly more likely to have late acceptance of solid food and to be described by mothers as slow feeders. As children got older (15 to 54 months), those with ASD were significantly more likely to be difficult to feed and choosy. There was no difference in intake of energy, fat, carbohydrates, proteins, or minerals between children with ASD and controls. There was no difference in body mass index in the ASD patients versus the controls.

Conclusions: There were alterations in feeding practices of children with an ASD from infancy.

Reviewer's Comments: A glaring weakness in this study is that the ASD cohort data are based off of 79 subjects compared to >12,000 controls. Although the duration of follow-up is phenomenal, it is still a relatively small group. Having said that, it is an interesting premise to attempt to see when the diet selectivity comes into play in ASD patients. (Reviewer-Sarat Thikkurissy, DDS, MS).

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Keywords: Autism, Diet

Print Tag: Refer to original journal article
Discolored primary teeth with a history of trauma are shown to be fivefold more likely to be necrotic.

**Background:** For many parents, the most significant immediate concern following a child's primary tooth trauma is discoloration. This is often understood as secondary to the paramount importance of the developing succedaneous tooth. The discoloration may be due to internal pulpal hemorrhaging, deeper hemosiderin penetration, and possibly pulpal necrosis. Authors have noted that gray primary teeth may maintain the discoloration while not demonstrating any other signs or symptoms of necrosis.

**Objective:** To examine whether there is an association between crown discoloration and pulp status in traumatized primary teeth.

**Design/Methods:** Retrospective study examining charts over a 10-year period at the Trauma Patient Care Program in Brazil. Details of traumatic injury were recorded.

**Results:** Data were collected from 55 teeth from 47 subjects. A total of 62% of teeth demonstrated discoloration, primarily grayish (62%). Thirteen teeth demonstrated a fistula, although only 1 had an accompanying fistula. An overwhelming majority of teeth (93%) demonstrated radiographic changes. The majority of changes were pathologic root resorption (45%). There was a significant association between discoloration and a necrotic pulp. In fact, discolored teeth were 5 times more likely to present as necrotic as traumatized teeth with normal coloration. Correspondingly, teeth described as having more severe trauma were more likely to demonstrate discoloration.

**Conclusions:** Discoloration in traumatized primary teeth was strongly associated with pulp necrosis.

**Reviewer's Comments:** Although I understand the rationale of this retrospective study, the truth remains that each traumatic injury is unique not only in etiology but local host factors and responses as well. This study does underscore the need for a radiographic survey of these traumatized incisors. (Reviewer-Sarat Thikkurissy, DDS, MS).

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**Keywords:** Primary Tooth Trauma, Discoloration

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Children with sickle cell disease are more likely to have some type of parasomnia.

**Background:** There has been literature describing increased parasomnias/abnormal sleep patterns in children with sickle cell disease (SCD). These have included sleep-disordered breathing, nocturnal hypoxemia, and disruption of sleep during crises/pain episodes. Children and adolescents with SCD have been described as more likely to exhibit nocturnal enuresis, which is often related to impaired renal function and increased nocturnal urine production.

**Objective:** To describe parasomnias/sleep problems in children with SCD and relate to extent of hematologic disease/symptoms.

**Methods:** Patients (ages 4 to 10 years) were recruited from an SCD clinic over a 12-month period. Patients were excluded if presenting with a history of stroke, hydroxyurea, or chronic transfusions. Control subjects were recruited from a well-child clinic. The Children's Sleep Habits Questionnaire was administered to parents.

**Results:** Data were collected from a total of 106 subjects (54 SCD, 52 controls). There were no significant differences in sleep parameters (total sleep time, length of waking, etc). Children with SCD were significantly more likely to resist going to bed, have a delay in falling asleep, or have some type of parasomnia. There was no overall sleep problem difference between the groups. There were associations between SCD severity and certain sleep disturbances, such as sleep anxiety and onset delay.

**Conclusions:** Children with SCD need to be screened for sleep disturbances and parasomnias.

**Reviewer's Comments:** Sleep is a facet of chronic illness that in many cases is underappreciated. Many medical clinics now include a sleep study in their assessment of a child's overall quality of life. The insidious nature of SCD can bring, as demonstrated here, increased anxiety in children regarding going to sleep, possibly for fear of waking in a crisis. (Reviewer-Sarat Thikkurissy, DDS, MS).

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Keywords: Sickle Cell Disease, Sleep

Print Tag: Refer to original journal article
Can Improved Oral Care Help Ameliorate Obstructive Sleep Apnea in Down Syndrome?

Effects of Oral Care in Down Syndrome Children With Obstructive Sleep Apnea.
Sato K, Shirakawa T, et al:


Down syndrome children with obstructive sleep apnea may have improved oral pH following oral care regimens.

**Background:** Sleep apnea is not an uncommon occurrence in patients with Down syndrome. Adenoid/palatine tonsil hypertrophy, growth impairment, and hypertension may all contribute to onset of obstructive sleep apnea (OSA) in these patients. Treatment is often accomplished by pharmacotherapy, adenoidectomy, continuous positive airway pressure (CPAP), and nasal reduction surgery. These therapies, as well as the OSA itself, can have effects on the oral complex. Likewise, oral inflammation can support tonsillar hypertrophy and the exacerbation of OSA.

**Objective:** To present the case reports of 3 Down syndrome children with OSA who underwent treatment of xerostomia and oral/pharyngeal inflammation to help reduce snoring and apnea.

**Participants/Methods:** 3 children, all between the ages of 5 and 10 years, with Down syndrome and OSA were studied. None of the children were being treated with CPAP. Oral symptoms for all cases included reddened oral mucosa (likely due to mouth breathing), coated tongue, and likely overall oral dryness. An oral care protocol, including repeated mouth rinses, tooth brushing, and mouth washing, was carried out in a standardized manner.

**Results:** Apnea, snoring, and mouth breathing improved in all 3 patients. Another oral health measure was an improvement in oral pH.

**Reviewer’s Comments:** The results of this paper are based off an n=3, so the clinical results must be looked at with a grain of salt. Furthermore, the oral hygiene regimen was fairly intense, and the question is whether a caregiver would actually have the time or patience to follow such an intense oral hygiene regimen. Having said that, this might be more applicable for Down syndrome patients in whom there is a high risk of OSA coupled with poor gingival health. (Reviewer-Sarat Thikkurissy, DDS, MS).

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Keywords: Down Syndrome, Sleep Apnea

Print Tag: Refer to original journal article
Pulsed cone beam computed tomography beams provide less radiation than continuous beams.

Cone beam computer tomography (CBCT) represents the assimilation of hundreds of 2-dimensional images into a 3-dimensional image with volume. CBCT was first introduced in 1999 and has become not only commonplace but is highly regarded in many dental specialties. The acquisition of an image for a CBCT is done by directing the source of radiation through a cone-shaped field during a synchronous rotation. A key term with CBCT is “voxel,” which represents the cuboidal volume element that results from assimilation of multiple 2D images. Specificity for the images is defined by the field of view (FOV) or scan volume. Scan volumes range from large, which can capture the entire craniofacial complex, to limited (an area of ≤5 cm). A major concern for CBCT usage is dosing. Ambient radiation is 3000 µSv, and a digital cephalometric radiograph is in the range of 2.2 to 3.4 µSV. A key point is that the CBCT radiation is dependent on kVp and mAs, pulsed versus continuous beam, shape of beam filters, and degree of rotation. Finally, the smaller the FOV, the lower the radiation.

**Reviewer's Comments**: I have reviewed articles before about CBCTs and their use in pediatric dentistry. There is a wonderful table in the paper that demonstrates that, depending on the type of machine used, the doses can be highly variable. There is still scant literature on appropriate dosing for young, growing children. So it does come down to risk-benefit. Is the image being viewed unable to be detected using traditional low-radiation imaging? (Reviewer-Sarat Thikkurissy, DDS, MS).

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Keywords: Cone Beam

Print Tag: Refer to original journal article
Multiple myeloma patients with a history of chemotherapy and steroids are at particular risk for bisphosphonate-associated osteonecrosis of the jaw.

**Background:** Multiple myeloma is characterized by proliferation of plasma cells clones. These patients often also demonstrate anemia, renal failure, recurrent bacterial infections, and pathologic fractures. Due to associated comorbidities, bisphosphonate medications are often used to reduce osteoclastic activity. The net result is an increase in quality of life. Bisphosphonates, however, are not without risk. Upper airway issues, renal disturbances, and osteonecrosis of the jaw have all been associated with bisphosphonates use.

**Objective:** To evaluate the prevalence of bisphosphonate-associated osteonecrosis of the jaw (BONJ) in patients with multiple myeloma.

**Methods:** 1 population was examined retrospectively over a 6-year period and another through a cross-sectional design. In the prospective cross-sectional study, a dental exam accompanied the traditional multiple myeloma workup.

**Results:** Cumulative data were collected from 161 patients. Mean age at diagnosis was 63 years. Mean bisphosphonate treatment time was 48 months. In the retrospective group, all patients who exhibited BONJ had also been treated with cytotoxic drugs. In the prospective group, 13 of 16 patients with BONJ also had been treated with steroids and chemotherapy. For both groups, zoledronate was the medication used most often. In fact, all patients who developed BONJ had been on zoledronate at some point.

**Conclusions:** Multiple myeloma patients with a history of chemotherapy and steroids are at particular risk for BONJ.

**Reviewer’s Comments:** Increasingly, we are understanding that patients with malignancies who are treated with bisphosphonates are at significantly greater risk for osteonecrosis of the jaw. This paper also makes the point that, in fact, there may be very nuanced subclinical manifestations, which could represent an underreporting in the literature. (Reviewer-Sarat Thikkurissy, DDS, MS).
Does Laser Treatment Affect Dentin Permeability?

*Effect of an Er,Cr:YSGG Laser on Water Perfusion in Human Dentine.*

Adu-Arko AY, Sidhu SK, et al:


Alterations in postlaser-treated dentin may result in increased sensitivity.

**Background:** Dentinal sensitivity (DS) can be significantly associated with dentin composition and hydration. It has been theorized that DS is a result of fluid movements within dentinal tubules, specifically in response to hydrodynamic stimuli. As the fluid levels wax and wane, they depolarize nerve endings and result in pain. It has been noted that, as opposed to rotary instrumentation, laser treatment of dentin can result in different surface topography.

**Objective:** To examine the difference in hydroscopic perfusion across dentin surfaces treated with different methods, specifically laser, diamond bur, and sandpaper.

**Methods:** Third molars were used in this in vitro study. Dentinal surfaces were treated with Er,Cr:YSGG (Waterlase; Biolase Technology, San Clemente, CA) laser, round-end tapered diamond bur, or silicon carbide paper.

**Results:** Erbium laser-treated dentin was more permeable than diamond bur-treated dentin or dentin polished with 1000-grit silicone carbide (when measured under moist conditions). There was an increased smear layer (debris) in the bur/polish groups. It is possible that this may actually aid in reduced sensitivity compared to the patients’ tubules in the laser group. Laser-treated dentin also resulted in cracking of dentin, surface flaking, preferential loss of intertubular dentin, and fusion of collagen.

**Conclusions:** Possibly, the increased fluid flow through the laser-treated dentin may result in altered bond strengths.

**Reviewer’s Comments:** This is an in vitro study and was also done on third molars, so it does need to be taken with that in mind; however, the rationale and discussion are intuitive and do make sense. Laser-treated dentin resulted in less of a smear layer and increased chance for hydrodynamic movement and possible sensitivity. (Reviewer-Sarat Thikkurissy, DDS, MS).

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Keywords: Laser, Dentinal Hypersensitivity

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