

We All Need to Be Aware of Cumulative Radiation Exposure in Our Patients

Exposure to Low-Dose Ionizing Radiation From Medical Imaging Procedures.

Fazel R, Krumholz HM, et al.:

N Engl J Med 2009; 361 (August 27): 849-857

Though results from this study focus on an adult population, the data hold informational importance for all pediatric medical specialists who may request separate, necessary imaging procedures for the same young patient.

Background: Use of imaging procedures is on the rise in the United States, elevating concerns about patient exposure to radiation. Development of solid cancers and leukemia has been linked to low-dose, ionizing radiation. Workers in the health care and nuclear industries are typically restricted to an annual maximum radiation exposure. For patients in the general population, there is no such standard for the monitoring of medical imaging procedures or exposure levels.

Objective: To estimate the cumulative effective doses of radiation from imaging procedures and to calculate population-based rates of exposure, with annual effective doses defined as low, moderate, high, and very high.

Methods: The study utilized claims data from UnitedHealthcare, a large U.S. health care organization, and focused on 5 health care markets: Arizona; Dallas; Orlando, Florida; South Florida; and Wisconsin. Within these markets, the study identified 952,420 non-elderly adults between ages 18 and 64 years and utilized imaging procedure records for each patient between January 1, 2005, and December 31, 2007 (3 years). Claims submitted from hospitals, outpatient facilities, and physicians' offices during the study were examined for Current Procedural Terminology (CPT) codes identifying procedures involving radiation exposure. All procedures involving high-dose radiation therapy (eg, for breast cancer) were excluded. For each claim, the subject's age, sex, zip code, and service location were noted. Procedures were categorized according to technique used: plain radiography, computed tomography (CT), fluoroscopy (including angiography), and nuclear imaging, and the anatomical area of focus was noted. The radiation exposure for each procedure was estimated by obtaining typical effective doses, assessed in millisieverts, a measure designed to represent the overall detrimental biologic effect of radiation exposure. Procedural frequencies and cumulative effective doses of radiation were then calculated for the study population over the 3-year period.

Results: The study notes, "Cumulative effective doses of radiation from imaging procedures increased with advancing age and were higher in women than in men. CT and nuclear imaging accounted for 75.4% of the cumulative effective dose, with 81.8% of the total administered in outpatient settings."

Conclusions: All health care providers need to be aware of cumulative radiation exposure to their patients.

Reviewer's Comments: Although this article did not specify issues with children, it will raise awareness among parents about total exposure, and pediatric dental practitioners need to be aware of its perception. It is presumed that this will eventually be studied in children as well.

Additional Keywords: None

Print Tag: Refer to original journal article

Portland Cement May Be Viable, Less Expensive Substitute for MTA

Pulpotomy of Human Primary Molars With MTA and Portland Cement: A Randomised Controlled Trial.

Sakai VT, Moretti AB, Oliveira TM::

Br Dent J 2009; 207 (August 8): E5

Portland cement offers a much less expensive material for vital primary molar pulpotomy with equivalent clinical outcomes to MTA.

Objective: To compare the clinical and radiographic outcomes of mineral trioxide aggregate (MTA) and Portland cement in human carious primary molars.

Design: Randomized controlled trial.

Methods: 30 primary molars were randomized into 2 groups at the time of treatment by a coin flip. Identical pulpotomies were performed except with the treatment variable of randomly selected MTA or Portland cement. All teeth were restored immediately with resin modified glass ionomer cement. Teeth were reassessed at 6, 12, 18, and 24 months post-treatment by clinical and radiographic examination. Two blinded raters with a high degree of inter-rater and intra-rater reliability rated the outcomes for each molar.

Results: All molars had acceptable clinical and radiographic outcomes at each of the reassessments. Many of the molars presented with greyish color change to the crowns.

Conclusions: Portland cement may be a viable and less expensive substitute for MTA in vital primary molar pulpotomy.

Reviewer's Comments: The wheels of health research grind slowly at the best of times and when the therapy being investigated is vital pulpotomy in children, current treatments that have demonstrated success when applied in a number of different modalities and a disease condition that can also be cured definitively with a pair of forceps, it is no wonder that it has taken as long as it has to finally see a randomized controlled trial comparing MTA and Portland cement published in a refereed journal. Although dentists may have waited for a human clinical trial, this paper was worth the wait. This is the first human clinical trial of Portland cement with an MTA control. Clinical and radiographic outcomes were excellent with both materials. The authors discussed the arsenic content of both MTA and Portland cement in this paper. Arsenic may be leachable from either material if arsenic was present in the limestone used for manufacture of either product. I have it on good authority that arsenic-free Portland cement does exist. This may obviate concerns about arsenic content in either material in the future. The authors concluded that Portland cement might serve as an effective and much less expensive MTA substitute. Although the authors suggested that longer follow-up and larger samples are indicated, among dental pulp investigations this is a comparatively well-designed investigation with random allocation, blinded raters, and 2-year follow-up.

Additional Keywords: None

Print Tag: Refer to original journal article

Orthodontic Providers Underestimate Patient Pain and Rx Use

Pain and Orthodontic Treatment: Patient Experiences and Provider Assessments.

Krukemeyer AM, Arruda AO, Inglehart MR::

Angle Orthod 2009; 79 (6): 1175-1181

Orthodontic providers should be aware of patient discomfort and pain during treatment and should be prepared to provide pain management.

Background: Research shows that 90% of orthodontic patients reported that their treatment was painful and that about one third considered stopping treatment early because of the discomfort.

Objective: To study whether patient pain experiences and graduate student orthodontic provider assessments of their patients' pain levels are consistent and whether orthodontic providers are aware of their patients' use of pain medication.

Design: Clinical study.

Participants: 116 adolescent patients (44 males, 72 females; average age, 14 years; age range, 11 to 21 years) and 14 graduate student doctors.

Methods: 2 surveys were given: (1) The patient survey assessed the patients' sociodemographic background, their experienced pain, and use of pain medication during and after the last and current appointment. The patients responded to these questions on a 5-point scale ranging from 1 = no pain at all to 5 = very much pain. (2) The student doctor survey assessed their patients' perceived pain levels and indicated whether they thought their patients used pain medication. The providers evaluated the patients' pain levels using an identical answer scale.

Results: 18% of patients experienced pain during their orthodontic appointments and 13% experienced pain from the braces that affected their daily lives. In total, 59% experienced post-appointment pain and 22% reported that pain due to the braces caused them to change their diet. On average, orthodontic providers underestimated the prevalence of patient pain during the last appointment and post-appointment (2.01 vs 2.28; $P=0.042$), immediately after the last appointment (1.93 vs 2.34; $P=0.005$), and 1 day (1.77 vs 2.53; $P<0.001$) and 2 days after the last appointment (1.57 vs 2.19; $P<0.001$). There was no difference in the average patient and provider responses concerning the pain during the current appointment. Although only 27% of patients used pain medication immediately following and day after the last appointment, the orthodontic providers also underestimated the amount of medication used.

Conclusions: Orthodontic providers underestimated the degree to which orthodontic treatment caused pain for their patients and their patients' use of pain medication.

Reviewer's Comments: This study emphasizes the importance of provider awareness of patient pain during orthodontics. Al-Omiri published the article that concludes, "pain during orthodontic treatment affects a patient's overall satisfaction with their orthodontic treatment outcomes." Yet, as the authors noted, there is no standard of care for analgesic use in the pain management of orthodontic patients. Keim, Ngan, and Dangott report a lack of emphasis on pain communication and management during orthodontic training. Pediatric dentists can help our orthodontic colleagues with pain management recommendations. For example, procedures such as placing separators, bands, and removal of appliances can be uncomfortable. For those procedures, analgesics such as acetaminophen, NSAIDs, and nitrous oxide help reduce the treatment pain.

Additional Keywords: None

Print Tag: Refer to original journal article

Many Options Available for Alveolar Crest Reconstruction Prior to Implants

Bone Replacement Following Dental Trauma Prior to Implant Surgery -- Present Status.

Hallman M, Mordenfeld A, Strandkvist T:

Dent Traumatol 2009; 25 (February): 2-11

Autogenous bone is the "gold standard" for grafting, but is associated with increased patient morbidity and possible bone resorption.

Background: Trauma to the dentoalveolar complex can lead to tooth loss and alveolar crest defects. A large variety of materials and techniques are available to reconstruct the alveolar crest prior to implant placement.

Objective: To review those materials and their function and indications for use. **Discussion:** Autogenous bone (AB) is still considered the "gold standard" for bone grafts because of its immediate osteogenic potential. It also promotes osteoconduction by serving as a 3-dimensional scaffold that allows in-growth of vessels and bone-building cells. Healing occurs in 4 to 9 months when the graft is replaced by new bone and an implant can then be placed. Disadvantages of AB are the associated patient morbidity of harvesting the graft and the potential for the graft to resorb. Guided bone regeneration (GBR) techniques use a semi-permeable membrane to act as a physical barrier to protect against in-growth of soft tissue and thus enabling bone healing of the defect. These membranes are either resorbable or non-resorbable and can be reinforced with filler material to improve the results. GBR has been used more for horizontal rather than vertical ridge augmentation. Bone substitutes are classified as allografts (from another individual of the same species); xenografts (from another species, eg, bovine or coral); and alloplasts (synthetic). Important criteria for their use include safety, biocompatibility, surface characteristics, and porosity. The ideal bone substitute has yet to be identified. Allografts most commonly used in reconstructive implant surgery are freeze-dried bone (FDBA). This is sometimes mixed with AB and various biomaterials. The most common xenograft material used in reconstructive implant surgery is an inorganic bovine bone mineral marketed as Bio-Oss®. It does not resorb and is most useful for widening the alveolar crest, with or without AB. Alloplastic bone substitutes include a large group of biomaterials with varying chemical compositions and biologic characteristics. Examples are calcium-based ceramics, polymers, calcium sulphate, and bioactive glasses. Synthetically manufactured hydroxyapatites include Calcitec® and Osteogen®. These are useful for grafting in esthetic areas, as they are osteoconductive and non-resorbable. The authors note that 3-D imaging is the standard of care for this reconstructive surgery. The mandibular ramus is reportedly the best choice of donor sites, but the iliac crest is better for larger amounts of bone. Small buccal plate defects can be repaired with a non-resorbable material and covered with a resorbable membrane. Larger defects involving vertical bone loss may need grafting with a bone block retained by miniscrews.

Reviewer's Comments: This is a good review of the materials and techniques currently used in reconstructive implant surgery. Data are limited as to the long-term success of many materials and well-controlled, prospective clinical trials are needed.

Additional Keywords: None

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Fluorosis But No Caries--Is This an Acceptable Trade-Off?

The Association Between Enamel Fluorosis and Dental Caries in U.S. Schoolchildren.

Iida H, Kumar JV::

J Am Dent Assoc 2009; 140 (July): 855-862

Teeth with fluorosis are more resistant to caries, and we should consider the caries preventive benefits associated with mild forms of fluorosis.

Background: Fluoride use has been advocated to reduce dental caries. But with increased amounts of fluoride coming from products other than water and toothpastes, increased prevalence of fluorosis has been reported. Only severe enamel fluorosis is considered an adverse health effect. Can fluorosis have a beneficial effect?

Objective: To evaluate at a tooth level the association between fluorosis and caries on first permanent molars.

Design: Secondary analysis of data from the National Institute of Dental Research survey of the oral health of U.S. children conducted in 1986 and 1987.

Methods: Data from 40,693 U.S. school children were searched for fluoride exposures, enamel fluorosis, and caries. Fourteen examiners assessed the caries and fluorosis levels of the children using artificial light, visual, and tactile methods, but without radiographs. Dean's fluorosis index was used to assess fluorosis. Parents completed a comprehensive written questionnaire and a 500 mL water sample from each school was represented in the study. Only children aged 7 to 17 years and who had a history of a single continuous residence were included; with this exclusion criteria, 16,873 children were available for further study. Decayed, missing, or filled surfaces (DMFS) were determined and the permanent maxillary right first molar was selected for the index tooth. Maxillary right centrals were also evaluated for fluorosis, but the prevalence of caries was <1 % and only 15 % had fluorosis.

Results: 35% of the index molars had caries, with an average of 0.6 surfaces affected. Molars without fluorosis had a higher DMFS count. Presence of sealants was associated with decreased odds of having caries. Children in the SW region had consistently lower prevalence of caries. Although the data are old (from late 1980s), the authors feel that their findings remain valid even today when 90% of dentifrices sold contain fluoride.

Conclusions: Presence of enamel fluorosis can indicate that a meaningful fluoride exposure was present during the development of teeth. The authors conclude that teeth with fluorosis are more resistant to caries and we should consider the caries preventive benefits associated with mild forms of fluorosis.

Reviewer's Comments: I too have noticed that mildly fluorotic enamel was resistant to decay. If on the posterior teeth, no harm and a lot to gain. Nevertheless, we should discuss fluoride intake with parents and especially the minimal use of fluoridated toothpaste during the first 2 years of life. In addition, the paste should be placed on the brush by an adult and the brushing supervised. It only makes sense, knowing that toddlers do not have the dexterity or the understanding of minimal amounts of paste.

Additional Keywords: None

Print Tag: Refer to original journal article

Should Parents Have Predictive Genetic Testing Done on Their Children?

Parents' Interest in Predictive Genetic Testing for Their Children When a Disease Has No Treatment.

Tarini BA, Singer D, et al.:

Pediatrics 2009; 124 (August 24): e432-e438

Parents may choose to have genetic testing done in their children, even when medical societies do not recommend it.

Background: Online genetic testing has become available to anyone, without an order from a physician. A number of companies offer testing for both mild and severe genetic diseases.

Objective: To evaluate parents' attitudes regarding genetic testing for their children.

Methods: The survey was conducted over the internet using a representative national sample of parents. Background information about DNA and genetic testing was provided to all participants in written form at the 8th grade level. Parents were presented with 2 different disease scenarios for which genetic testing is available. The first was a disease with severe, life-limiting symptoms with an uncertain age of onset. The second had symptoms ranging from mild to moderate and with an uncertain age of onset. In both scenarios, there is no treatment for the disease. Parents were asked their opinions about genetic testing in general and then for each scenario, if they would seek genetic testing for their youngest child. Statistical analysis was performed to compare the demographics of parents who would definitely have their children tested to those parents who would not test their children. There was also an evaluation of the relationship between parents' opinion of genetic testing in general to their willingness to have their child tested.

Results: The response rate was 71% with 1342 parents participating. About one third of parents were interested in having their child tested for a disease with severe symptoms and uncertain onset. A similar percentage was unsure and less than one third were opposed to this testing. Results for the second scenario with uncertain severity and uncertain onset were very similar to the first scenario. Those parents who were interested in having their child tested were more likely to be of Hispanic ethnicity. Those parents who expressed a positive attitude about genetic testing in general were also more likely to respond positively to testing their child in the 2 scenarios presented.

Conclusions: Approximately one third of parents are interested in predictive genetic testing for their children, even for disorders with no treatment. Uncertainty about the severity of symptoms was not related to parents' testing preferences.

Reviewer's Comments: Professional medical societies, such as the American Society of Human Genetics and the American Academy of Pediatrics, recommend against genetic testing of children, especially for diseases with unknown onset and no current treatment. Because of the relatively easy access to genetic testing via internet-based companies, the decision to test oneself or one's children is now in the hands of each individual. How this information will be handled in the future and who will be responsible for the interpretation of results and counseling of individuals with positive results has yet to be determined.

Additional Keywords: None

Print Tag: Refer to original journal article

Delay in Diagnosing Foreign Body Ingestion, Aspiration Can Be Hard to Swallow

Foreign Body Ingestion and Aspiration.

Louie MC, Bradin S::

Pediatr Rev 2009; 30 (August): 295-301, quiz 301

Foreign body ingestion and aspiration may be asymptomatic initially and present later with varying symptoms that require thorough evaluation and timely treatment to prevent long-term complications.

Background: Foreign body ingestion and aspiration is a common problem involving toddlers who explore their surroundings with their mouths, and either condition can result in serious complications, and in some cases may be fatal.

Objective: To recognize the history, signs, and symptoms; to discuss long-term complications; to describe management strategies; and to identify risks associated with ingestion or aspiration of foreign bodies by children.

Results: Coins are the most commonly ingested items, followed by small toys and sharp metallic objects. The upper esophagus is the most common entrapment site, but once in the stomach, most objects pass without complications. Exceptions include sharp objects and children with esophageal and/or intestinal abnormalities. Ingestions may be asymptomatic or present with symptoms including drooling, respiratory distress, or gastrointestinal complications. Initial evaluation should include posterior-anterior and lateral radiographs of the neck and chest to determine the exact location, orientation, size, and number of objects present. Treatment is dictated by the type of object, its location, and presenting symptoms. Objects in the stomach may be observed, while those in the esophagus, where 70% remain entrapped, require removal. Button disc batteries, sharp pointed objects, and multiple magnets require immediate removal to prevent serious complications, with endoscopy being the treatment of choice. Foreign body aspiration is less common than ingestion and requires close scrutiny and examination to differentiate from other pulmonary problems. Small round foods such as peanuts and grapes are the most frequently aspirated objects as well as balloons, which are often fatal. Foreign bodies may remain in the airway without serious obstruction or may completely or partially occlude the airway or be expelled by coughing. Symptoms may vary and present days or months following the incident. A high degree of suspicion and thorough history and examination are required, and radiology may be helpful. Immediate first aid is required for complete airway obstruction. Those with partial airway obstruction should be emergently taken for airway management and a bronchoscopy, the treatment of choice. Patients with symptoms and positive radiographic findings after the initial event should be referred to a specialist. Caregiver education including attention to toy safety, aspiration risk labeling, and inappropriate food types for young children are key preventive measures.

Conclusions: Delay in the diagnosis of foreign body ingestion and aspiration increases the risk for serious complications. Although radiology is helpful, its sensitivity varies, and if clinical suspicion exists, additional evaluation must be undertaken.

Reviewer's Comments: This is a very good article using a review of the current literature, case examples, and practical experience to describe the diagnosis, treatment, follow-up, as well as the risk assessment and preventive measures needed for foreign body ingestion and aspiration. Tables regarding symptoms and algorithms for evaluation and treatment are presented for both conditions as well as contacts for consumer groups that provide valuable information resources.

Additional Keywords: None

Print Tag: Refer to original journal article

Are Risk Factors for Asthma Associated With Childcare During Preschool Years?

Risk of Childhood Asthma in Relation to the Timing of Early Child Care Exposures.

Gurka MJ, Blackman JA, Heymann PW::

J Pediatr 2009; August 14 (epub ahead of print):

Exposure to other children at an early age may have a protective effect on a child's odds of developing asthma.

Background: Asthma is one of the most common childhood disorders in the United States and affects >9 million children (12%). Over the past 50 years, the prevalence of asthma has actually increased although there is no known reason. One theory is that there has been a decrease in childhood respiratory infections and that these illnesses may have had a protective effect on asthma. There are 3 general phenotypes of asthma that are recognized: (1) "transient early wheezing" associated with lower respiratory tract infections during the first 3 years of life; (2) "late-onset wheezing" after 3 years of age; and (3) "persistent wheezing" beginning before age 3 years and continuing throughout the childhood period.

Objective: To determine if early child care exposure has an effect on the development of asthma.

Design: An existing dataset provided usable information on 1364 families.

Participants: The asthma status of 939 children was determined.

Results: Of the children studied, 3% had persistent asthma and 16% had developed late-onset asthma by age 15 years. The number of children in a child care setting was significantly associated with the odds of asthma. That is to say, the fewer children a child was exposed to as a toddler, the higher the probability of persistent or late-onset asthma.

Conclusions: The study lends support to the theory that exposure to other children at an early age may have a protective effect on a child's odds of developing asthma.

Reviewer's Comments: Although this article begins with the statement that "asthma is the most prevalent of chronic childhood disorders," even if the prevalence of asthma was 16% to 19%, it is still far less than the prevalence of dental caries. The statement in the 1980 Surgeon General's Report on Oral Health in America "Dental caries (tooth decay) is the single most common chronic childhood disease -- 5 times more common than asthma and 7 times more common than hay fever" needs to be emphasized to our medical colleagues.

Additional Keywords: None

Print Tag: Refer to original journal article

38% Silver Diamine Fluoride Arrests Caries Lesions in Children

Efficacy of Silver Diamine Fluoride for Arresting Caries Treatment.

Yee R, Holmgren C, et al.:

J Dent Res 2009; 88 (July): 644-647

In nations with limited, affordable access to basic oral care, the option to administer single spot applications of SDF has proven to be an effective and economically viable method for arresting caries in the primary teeth of children.

Background: The global pandemic of untreated dental caries (Edelstein, 2006) continues to impact the health, well-being, and educational opportunities of children in low-income nations. Consistent and restorative dental treatment is difficult to access and is costly. A clinical trial based on the proposed Arresting Caries Treatment (ACT) program (Bedi and Sardo-Infirri, 1999) shows promise for children in resource-limited, disadvantaged communities.

Objective: To test the caries-arresting effectiveness of a single spot application of silver diamine fluoride (SDF) in the primary teeth of children.

Participants/Methods: This clinical trial was conducted on 976 Nepalese kindergarten and primary schoolchildren: 545 males and 431 females, ages ranging from 3 to 9 years. The study was conducted in Kathmandu, Nepal, a city with low-fluoride-content drinking water. The children received neither professionally applied fluorides nor fluoride supplements during the treatment between May and August 2005. The 976 children were allocated into 4 test groups: Group 1 received 1 application of 38% SDF for 2 minutes without a reducing agent; Group 2 received 1 application of 38% SDF for 2 minutes with tea as a reducing agent; Group 3 received 1 application of 12% SDF for 2 minutes without a reducing agent; and Group 4 received no treatment for caries-affected teeth (control group). The children were examined after 6 months, 1 year, and 2 years following the treatment. Primary health care workers and a supervising dentist conducted the treatments and a dental therapist carried out the follow-up examinations, blind to the children's treatment group assignment. Each surface of the tooth was classified according to specific caries-related criteria.

Results: Only the single application of 38% SDF with or without tannic acid was effective in arresting caries after 6 months, 1 year, and 2 years. Tannic acid created no additional benefit. The 12% SDF had no effect in arresting caries at any time period.

Conclusions: ACT with 38% SDF provides an option for arresting caries when restorative treatment for primary teeth is not an option.

Reviewer's Comments: The authors and reporters of this clinical trial make an excellent case for the effectiveness of single spot applications of 38% SDF in the primary teeth of children in nations or remote locations with severe dental resource limitations. Currently, there are areas of the world with such limited access to surgical restorative intervention, such that SDF may be the best available option for these children.

Additional Keywords: None

Print Tag: Refer to original journal article

You Swallowed What?

Medication Overdoses Leading to Emergency Department Visits Among Children.

Schillie SF, Shehab N, et al.:

Am J Prev Med 2009; 37 (September): 181-187

More than 70,000 children aged <18 years are treated annually in EDs for accidental medication overdoses.

Background: In the United States, 4 of 5 adults and more than half of all children take at least 1 medication each week. Multiple medication use is increasing. Because the number of medications found in American homes is increasing, the potential for accidental overdose in children is also increasing.

Objective: To describe the emergency department burden of accidental pediatric medication overdoses.

Methods: Using the U.S. Consumer Product Safety Commission's National Electronic Injury Surveillance System (NEISS) data from January 1, 2004, to December 31, 2005, an estimate was made of the number of ED episodes due to unintentional pediatric poisonings.

Results: The prevalence of unintentional poisonings from medications was twice that of non-pharmaceutical consumer products. Unsupervised ingestion of medications made up >80% of the incidents and 80% of the incidents involved children aged <5 years. The 4 medications most frequently overdosed were acetaminophen, cough and cold medications, antidepressants, and nonsteroidal anti-inflammatory agents. Over-the-counter medications were involved 33% of the time.

Conclusions: Unsupervised medication overdoses among children represent a substantial burden on EDs and increased hospital admissions. The morbidity from medication overdoses is preventable through injury prevention education and manufacturer engineering innovations.

Reviewer's Comments: Dentists involved with the treatment of children can help to educate parents on the perils of pediatric medication overdoses and encourage safer home practices.

Additional Keywords: None

Print Tag: Refer to original journal article

Use Non-Fluoridated Water When Mixing Infant Formula...Just in Case

Infant Formula and Enamel Fluorosis: A Systematic Review.

Hujoel PP, Zina LG et al.:

J Am Dent Assoc 2009; 140 (July): 841-854

There is weak evidence to support enamel fluorosis from infant formula.

Objective: To search the literature for evidence to support the association between fluorosis, infant formula, breast milk, and cow's milk; and to evaluate evidence that the fluoride in infant formula is the cause of fluorosis.

Design: Systematic review of the literature.

Methods: 8 databases were searched for randomized and observational studies with no language restrictions. The results were then synthesized by calculating a summary odds ratio at the 95% CI by using a random-effects model. Data were analyzed using SAS and Stata 10.

Results: A total of 969 articles were retrieved that fit the initial selection criteria. Exclusion criteria reduced the list to 27 articles. The 27 articles covered 19 original studies and included data from 17,429 subjects aged 2 to 17 years; all studies were in the English language. There were no randomized controlled studies. Of 19 studies, subjects were breast-fed in 7 studies and formula-fed in 12. Although frequency of feeding was reported, it was inconsistent; none of the studies reported quantity of formula consumed. In 16 studies, the authors reported on fluoride content of the infant formula; 3 studies provided historical estimates. Estimated severity of fluorosis was also inconsistent, with studies using a variety of indices. All studies reported on the level of fluoride in the drinking water in different ways, therefore more inconsistency. It was difficult to determine if fluorosis was due to fluoride in the drinking water or in the formula. Methods were further complicated by recall bias, whether examiners were blinded, a high no-response rate, lack of socioeconomic status, and whether fluoridated toothpastes were used.

Conclusions: Evidence suggests that consuming infant formula can be associated with a risk for fluorosis in the permanent dentition. The risk varies and is most likely due to unreported differences in amount, duration, and frequency of formula use. Of 19 studies, 18 were retrospective, making recall difficult and reliability questionable. Nevertheless, the authors state that consumption of infant formula can be associated with an increased risk of fluorosis, but evidence is weak.

Reviewer's Comments: The majority of toddlers that we see are mostly bottle-fed, although most started out on the breast. For convenience, most parents used liquid formula mixed with community or bottled waters; hardly any used powdered formula. Also, there seems to be a rush to wean infants off formula to cows milk; and the age seems to be getting younger and younger. In our anticipatory guidance sessions, we recommend exclusive breast-feeding and, when the time is right for that mother, use of formula mixed with non-fluoridated water, which is available in most communities.

Additional Keywords: None

Print Tag: Refer to original journal article

Treating Obesity -- It's Not as Easy as Taking a Pill

Pharmacotherapy in Pediatric Obesity: Current Agents and Future Directions.

Wald AB, Uli NK::

Rev Endocr Metab Disord 2009; August 18 (epub ahead of print):

All children being treated for obesity need to be involved in family-level interventions.

Current estimates define 17% of U.S. adolescents aged 6 to 19 years as obese (being >95th percentile for body mass index). An additional 34% are >85th percentile but <95th percentile and are considered "overweight." The major goal of intervention is to minimize metabolic comorbidities, such as diabetes and hypertension. Current recommendations advocate a staged approach to therapy: stage 1, prevention plus; stage 2, structured weight management; stage 3, comprehensive multidisciplinary intervention; and stage 4, tertiary care intervention. Patients who reach stage 4 are often treated with bariatric surgery and/or pharmacotherapy, as stages 1 through 3 have had poor success rates. Currently, there is only 1 FDA-approved medication for treatment of obesity in children aged 12 to 16 years (orlistat [Alli™]). Orlistat works by reducing absorption of nutrients through enzyme inhibition in the stomach and pancreas, which prevents absorption of ingested fat. While clinically effective, there are adverse effects such as oily stools, flatulence, incontinence, and possibly gallstones. The only other FDA-approved medication for treatment of obesity (for those aged ≥16 years) is sibutramine, which leads to a feeling of satiety through inhibition of norepinephrine, serotonin, and dopamine. However, this medication has been associated with xerostomia, tachycardia, constipation, and hypertension. Metformin is used to treat type 2 diabetes, with an off-label use for obesity. It reduces hepatic glucose production, which can indirectly treat some of the root causes of obesity. Diarrhea, nausea, and vomiting are reported side effects, and there are no pediatric case reports in treatment of obesity.

Conclusions: Irrespective of use of medications, intervention at the family level is a core treatment, which also presents the least physiologic comorbidities.

Reviewer's Comments: Pharmacotherapies associated with childhood obesity are limited and, as demonstrated, come with a significant price tag. All medications used have significant adverse effects that can potentially reduce patient compliance. This article makes the point that intervention at the family level is key. This often presents a significant challenge to the treating physician. Dentists need to be aware of potential side effects such as xerostomia when treatment planning for pediatric patients who are under treatment for obesity.

Additional Keywords: None

Print Tag: Refer to original journal article

Moving Beyond Meds in Treating Pediatric Epilepsy Syndromes

Managing Severe Epilepsy Syndromes of Early Childhood.

Wheless JW::

J Child Neurol 2009; 24 (August): 24S-32S

Epilepsy-related syndromes are often associated with cognitive and behavioral deficits.

Epilepsy-related syndromes of early childhood often present not only with varying seizure intensity and frequency, but also with associated cognitive and behavioral deficits as well. While all belonging to a similar family of disorders, these syndromes often present with specific findings. Dravet syndrome (DS) is also known as severe myoclonic epilepsy in infancy, often presenting initially at age <1 year. DS often progresses in intensity of seizures, and at approximately age 2 years, psychomotor delays are first noted. Treatment of DS often involves a cocktail of medications: valproic acid, clobazam, topiramate, and bromide as well as a ketogenic diet, which is a high-fat, low-carbohydrate diet that replaces glucose with ketone bodies as the primary energy source.

Conclusions: New frontiers of epilepsy-related syndromes in children are corpus callosotomy, vagus nerve stimulation, and use of the ketogenic diet.

Reviewer's Comments: This exhaustive review of fairly obscure syndromes makes a critical point: Treatment of epilepsy-related syndromes is moving beyond the traditional polypharmacy that these patients have used for many years. New surgical options such as corpus callosotomy and dietary interventions may reduce adverse effects while improving quality of life. Indeed, vagus nerve stimulators have shown remarkable success in treatment of refractory seizures, giving hope to patients and parents who previously had limited options.

Additional Keywords: None

Print Tag: Refer to original journal article

The Next Generation in Pediatric Airway Management Tools

Pediatric Difficult Airway Management: Current Devices and Techniques.

Fiadjoe J, Stricker P::

Anesthesiol Clin 2009; 27 (June): 185-195

Laryngeal mask airways are useful in aiding ventilation of the pediatric airway.

Background: Unlike adults, children are poor candidates for traditional difficult airway management techniques. While adults may be able to cooperate for awake intubation, this is rarely the case in children. Furthermore, due to increased oxygen consumption by children, long periods of apnea are poorly tolerated.

Objective: To discuss some airway adjuncts used in children with difficult airways. **Discussion:** Optic stylets are a combination of lighted stylet and a flexible bronchoscope. Operators can directly visualize the passage of the endotracheal tube into the trachea. Video laryngoscopes, such as the GlideScope, combine the traditional laryngoscope blade with a video camera to allow for placement. However, video laryngoscopes are primarily designed for oral intubation and are rarely used for pediatric nasal intubation. While case reports have been favorable for video laryngoscopes, there are no clinical studies supporting their efficacy. Laryngeal masks have become a common adjunct for management of the difficult pediatric airway. Laryngeal masks, such as the LMA ProSeal, are particularly useful in aiding with ventilation and as "stents" for tracheal intubation. One drawback in using laryngeal masks is the inability to pass a cuffed endotracheal tube, commonly used in the pediatric airway. It can be "constructed" but involves several potentially time-consuming steps. The current gold standard for the difficult pediatric airway is the flexible fiberoptic scope.

Reviewer's Comments: For many practitioners who practice pharmacological behavior management, we only see or hear of these devices every 2 years when we re-certify for Pediatric Advanced Life Support. This review explains, in a very intuitive fashion, uses and limitations of some of these airway adjuncts. While it's something we hope we never have to use, sedating dentists always needs to keep a keen eye on the pediatric airway.

Additional Keywords: None

Print Tag: Refer to original journal article

Children With Otologic Surgery Often Have Disturbed Taste

Electrogustometric Assessment of Taste After Otologic Surgery in Children.

Leung RM, Ramsden J, et al::

Laryngoscope 2009; July 13 (epub ahead of print):

Nearly one third of all children who undergo tympanoplasty surgery have taste dysfunction afterward.

Background: Previous studies in adults have cited as many as 44% of patients with a history of otologic surgery having taste disturbances. This can be traced to the fact that the chorda tympani nerve traverses the surgical field for many otologic surgeries. The current FDA approval for cochlear implants is 12 months, and many children in early childhood are affected by otologic disease.

Objective: To use electrogustometry testing (ET) to assess dysgeusia (taste disturbances) in children with a history of otologic surgery.

Participants: Children aged 4 to 18 years with a history of otologic surgery (tympanoplasty, mastoidectomy, cochlear implantation) were compared to a control cohort.

Methods: The above cohorts were tested using the Rion TR-06 ET, which has been validated in previous adult studies. Researchers were blinded as to the surgical site. The ET works by passing a small current from a probe through the tongue to a grounded cervical electrode. The change in current translates into an altered pH that is detected by the subject as a sour or metallic taste. Previous thresholds were established in an adult population as requiring >16 dB on one side of the tongue, or having a side differential of 6 dB between the 2 sides of the tongue.

Results: Mean age of children was 11.5 years. Four children (aged 4 to 6 years) were excluded because they were not able to follow directions accurately. Patients who had a modified radical mastoidectomy had dysgeusia rates as high as 50%, with tympanoplasty patients demonstrating taste alterations 27% of the time. In the cochlear implant group, 15% of children exhibited alterations. All these were compared to a control group that demonstrated taste alteration 9% of the time. Of interest was that 50% of children who underwent radical mastoidectomy (by definition, the chorda tympani is sacrificed) had regained some taste, which suggests nerve regeneration or plasticity.

Conclusions: Otological surgery techniques are accompanied by some degree of taste dysfunction in children, but there is some evidence to suggest that taste abnormalities may be transient.

Reviewer's Comments: Otologic surgeries rank as some of the most common in childhood, and it's of note that approximately one third of all tympanoplasties were accompanied by taste dysfunction. The science of testing taste physiologically in children is new, and while this study needs to be replicated, its results are of interest. It is not that far a stretch to see how taste dysfunction accompanying an otologic procedure may also alter a child's diet preferences.

Additional Keywords: None

Print Tag: Refer to original journal article

Is a 'New' Permanent Tooth More Susceptible to Erosion Than an 'Old' Primary One?

Effect of Fluoride Varnish and Gel on Dental Erosion in Primary and Permanent Teeth.

Murakami C, Bönecker M, et al.:

Arch Oral Biol 2009; August 31 (epub ahead of print):

Post-eruptive age of a tooth can impact the efficacy of fluoride as a preventive agent against erosion.

Background: Dental erosion has been reported to be as high as 68% in some populations, particularly in children and adolescents. This has not only been attributed to the rise in consumption of acidic foods and beverages, but also to the theory that calcium fluoride (CaF) precipitates from topical fluoride applications dissolve in acidic conditions and do not impart any protection against erosion.

Objective: To evaluate erosion-preventing properties of 2.26% NaF varnish and 1.23% APF gel in human primary and permanent teeth.

Methods: This in vitro study took 60 (30 primary and 30 permanent) enamel samples from a total of 50 teeth (25 exfoliated primary molars, 25 extracted permanent third molars). Samples were assigned to 1 of 3 groups: 1.23% APF (DFL Industry), 2.26% fluoride varnish (Duraphat® Colgate), or control (no treatment). The APF group was exposed to the gel for 4 minutes, then rinsed with deionized water. In the fluoride group, varnish was applied with a microbrush, left on for 24 hours, and then immersed in deionized water. All samples were stored overnight in artificial saliva, after which they were immersed in Coca-Cola® for 5 minutes, then in artificial saliva for 30 minutes.

Results: Primary enamel samples demonstrated a continuous loss of hardness through the study, whereas permanent enamel samples actually regained some hardness after the second period. APF gel was able to diminish the enamel hardness loss compared to the varnish group among primary enamel samples. In the permanent enamel group, both varnish and APF inhibited erosion.

Conclusions: The findings are suggestive of a connection between post-eruptive age and rate of erosion progression, as well as fluoride-imparted protection, that needs to be further studied.

Reviewer's Comments: The discussion of this paper is immensely interesting in its theoretical handling of post-eruptive age, noting that an "older" tooth has been in contact with acids over many more cycles than has a "younger" tooth, suggesting it is more acid-resistant. Indeed, in this study, younger permanent teeth seemed more susceptible to demineralization than did older primary teeth. The concept of post-eruptive age is something to consider when devising a preventive treatment plan for pediatric patients. Potential confounding variables not addressed, however, are presence of caries and whether teeth came from a limited number of subjects.

Additional Keywords: None

Print Tag: Refer to original journal article

Does Prematurity Imply a Different Oral Microflora?

Oral Streptococcus Species in Pre-Term and Full-Term Children - A Longitudinal Study.

Seow WK, Lam JHC, et al.:

Int J Paediatr Dent 2009; September 1 (epub ahead of print):

There are no differences in targeted *Streptococcus* species between preterm and full-term children aged 3 to 24 months.

Background: The nature of bacterial colonization of the oral cavity in early childhood has been the subject of much study. Previous papers have focused on *Streptococcus mutans* and *S sobrinus* as primary bacteriological agents in early childhood caries. This conclusion, however, has been the focus of speculation. Previous studies have also demonstrated higher caries risks in preterm children when compared to full-term counterparts.

Objective: To longitudinally examine 5 streptococci species in caries-free healthy preterm children compared to healthy full-term children aged 3 to 24 months.

Methods: Microbiological samples were obtained through plaque and saliva collections at ages 3, 6, 9, 12, and 18 months. All samples were analyzed using a real-time polymerase chain reaction technique. Specific species targeted included *S mutans*, *S sobrinus*, *S mitis*, *S salivarius*, and *S sanguinis*.

Results: Data were collected from 15 preterm and 15 full-term children. There were no significant differences between preterm and full-term children in the numbers of targeted species. Both full-term and preterm groups had increases in all 5 species longitudinally. While relative concentration of *Streptococcus* species may be indicative of caries risk, there were no significant differences in the relative numbers of species between the 2 groups studied.

Conclusions: In full-term and preterm children aged 3 to 24 months, there was a fairly constant relationship among the targeted 5 species of *Streptococcus*.

Reviewer's Comments: The reality is that our understanding of the colonization of a child's oral cavity is in its nascency. Currently, researchers have identified approximately 50% of microflora, leaving gaping holes in our understanding of how bacterial colonization develops. This study is valuable in that it presents relatively complete longitudinal data from 2 distinct caries-free cohorts.

Additional Keywords: None

Print Tag: Refer to original journal article

Hidden Costs of the 'Golden Age' of Antibiotics

Antibiotic Stewardship--More Education and Regulation Not More Availability?

Dryden MS, Cooke J, Davey P::

J Antimicrob Chemother 2009; September 2 (epub ahead of print):

Many patients inappropriately self-medicate for colds and upper respiratory illnesses with leftover antibiotics.

Background: There is an erroneous belief that any inflammatory process in a patient should be treated with antibiotic therapy. This has proved to alter both provider and patient perception of the appropriate utilization of this class of medications. A major outcome has been the increase of antibiotic-resistant organisms, which not only reduced the efficacy of existing therapies, but also put some patients (such as the immunocompromised) at greater risk for aggressive infections.

Objective: To discuss the concept of "antibiotic stewardship," which quite plainly promotes "use of the right antibiotic, at the right dose, route, and duration for the right bacterial infection at the right time." **Discussion:** Antibiotic stewardship involves education of practitioners not only on appropriate antibacterial protocols, but also on health behaviors of patients. Estimates put ampicillin resistance in some European countries as high as 54% (Spain) and 47% (Portugal). Global health data demonstrate that countries with lower antibiotic utilization rates have correspondingly lower resistance rates (eg, Sweden 16%, Austria 18%). Another concern is the rise of self-medication. Previous studies have demonstrated that antibiotics left over from previous courses are often used inappropriately (through self-medication) for conditions such as colds or upper respiratory infections. It is currently estimated that 80% of antibiotic use in humans is in primary care outside of the hospital, and this has led to programs such as European Antibiotic Awareness Days, aimed at promoting education of patients and providers as to appropriate use of antibiotics.

Reviewer's Comments: I have reviewed articles on antibiotic awareness before, and it's something to think about. Global health data support that, while many developed countries have similar prevalences of bacterial illness, there are widely varying antibiotic utilization rates. One conclusion from this is that patients are being overprescribed antibiotics. Dental infections are often treated with chemotherapy, and this needs to be continually assessed on a case-by-case basis, particularly since data suggest that patient compliance with a course of prescription is often faulty. By casually prescribing an antibiotic today, we may be reducing the ability of future generations to treat bacterial illnesses.

Additional Keywords: None

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There's a Fungus Among Us -- *Candida* in Dental Appliances

The Effects of Orthodontic Appliances on Candida in the Human Mouth.

Hibino K, Wong RWK, et al.:

Int J Paediatr Dent 2009; 19 (September): 301-308

All orthodontic appliances (fixed and removable) will increase candidiasis density, although this will rarely progress to candidiasis in the healthy patient.

Background: Approximately 50% to 60% of the human population has *Candida* as part of their microflora. The organism is opportunistic and can cause candidiasis, which can be a significant problem, particularly for the immunocompromised patient. Orthodontic appliances (both fixed and removable) have been shown to alter normal oral microflora.

Objective: To examine whether orthodontic patients have any alteration in intraoral density and carrier status of *Candida*. **Discussion:** In this review of the literature, presence of *Candida* was increased with presence of any prosthesis or appliance. There was, however, no statistical difference in carrier status between groups that had fixed appliances, removable appliances, or no appliances. Arendorf and Addy (1985) demonstrated that, prior to orthodontic treatment, the *Candida* incidence was 39%, which increased to 79% during treatment and reduced to 14% posttreatment. Hägg et al (2004) demonstrated that insertion of a fixed appliance increased *Candida* carriage by 27%. The studies seem to suggest that both removable and fixed orthodontic appliances imparted a transient *Candida* carrier status, which changed with completion of therapy. The most frequent site for *Candida* in fixed appliance patients was the posterior tongue; for removable appliance patients, the anterior and posterior palate. Previous studies all agreed that presence of appliances (fixed or removable) will increase *Candida* density. Follow-up studies have suggested that, as long as patients remain healthy during treatment, *Candida* colonization rarely progresses to clinical candidiasis.

Reviewer's Comments: This paper imparts important knowledge. We know that all appliances we put in (including space maintainers) are plaque retentive, and this paper demonstrates that they will increase *Candida* density. However, rarely will this progress to candidiasis, but it can be of particular importance in immunosuppressed patients and should be considered when any appliance therapy is used for these patients. This is a wonderfully comprehensive paper with valuable information.

Additional Keywords: None

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Urbanization -- Destroying Our Children's Teeth?

Has Urbanization Become a Risk Factor for Dental Caries in Kerala, India: A Cross-Sectional Study of Children Aged 6 and 12 Years.

Christian B, Evans RW::

Int J Paediatr Dent 2009; 19 (September): 330-337

Children with increasing frequencies of exposure to sugar have increased caries experiences.

Background: Current estimates are that 70% of India's population reside in rural areas and have a daily income of \$2/day (U.S. dollars). A theory that has been supported in other developing regions has suggested a possible caries risk increase associated with "urbanization" habits, such as use of pre-sweetened carbonated beverages, etc.

Objective: To evaluate any caries risk changes associated with urbanization in the Kollam District in the state of Kerala, India.

Participants: Children aged 6 and 12 years from rural poor, urban middle class, and urban poor socioeconomic groups.

Methods: A clinical oral examination was conducted and a decayed, missing, and filled teeth (DMFT) score (primary dentition of 6-year-olds; permanent dentition of 12-year-olds) was recorded. The 12-year-old patients also answered a structured multiple-choice survey related to oral health and dietary habits in the previous 24 hours.

Results: Data were collected from 876 children. A total of 53% of 6-year-olds were caries free, along with 90% of 12-year-olds. Caries experience was significantly related to increasing frequency of exposure to sugar and pattern of dental visits. Children who had visited a dentist had a higher caries experience, which was an expected finding, as the caries experience more than likely led to the necessity to see a dentist.

Conclusions: There is no evidence of oral health changes due to urbanization in Kerala, India.

Reviewer's Comments: This article has a promising premise, but I was disappointed in that there was really no detailed explanation or establishment of criteria of how "urbanization" might affect oral health of children. The sample size was impressive, but variables recorded were not established in terms of the social impact of dental disease. DMFT scores, while commonly used, are weak surveillance methods for the premise put forth. It was impressive to see the oral health of these children, and the paper was straightforward in discussing its results (ie, those with visits to dentists had higher incidences of caries experience).

Additional Keywords: None

Print Tag: Refer to original journal article

Is Body Mass Index the Best Way to Predict Body Fatness?

Classification of Body Fatness by Body Mass Index-for-Age Categories Among Children.

Freedman DS, Wang J, et al::

Arch Pediatr Adolesc Med 2009; 163 (September): 805-811

Body mass index-for-age is an appropriate screening tool for children who are either obese or overweight.

Background: Elevated body mass index (BMI) has been correlated with overall mortality, hypertension, and diabetes in children. Suggestions have modified current Centers for Disease Control and Prevention recommendations to term children in the 85th to 94th percentile BMI-for-age as overweight, and those in the ≥ 95 th percentile as obese. It has been noted that the accuracy of BMI as an indicator of adiposity "increases with degree of body fat."

Objective: To examine the classification of body fatness categories with respect to BMI-for-age.

Participants/Methods: Children aged 5 to 18 years were recruited between 1995 and 2000 in New York City. Aside from ethnicity, patients were weighed, measured for height, and a BMI was calculated. A whole-body dual-energy x-ray absorptiometry was performed. Three categories of BMI were established (<85, 85 to 94, ≥ 95) as well as 3 body fatness types (normal, moderate, elevated).

Results: Data were collected from 1196 children; 17% were overweight (85 to 94) and 16% were obese (≥ 95). The mean level of body fat was 11% higher among overweight children and 21% higher in obese children. BMI was a fairly good indicator of body fatness for most children except normal-weight children, where the authors termed it "useless." In fact, there was considerable mistyping of body fatness for children who were in the <25th percentile BMI-for-age.

Conclusions: BMI-for-age is an appropriate screening tool for children who are either obese or overweight. Its use, however, is limited for the general range of children.

Reviewer's Comments: This article supports use of BMI as a "quick reference" tool for at-risk populations. However, when one reads the complex methodology, it becomes apparent that appropriate use of the BMI scale is anything but quick. Dentists often have cursory knowledge of these BMI scales but can often identify patients with at-risk habits or body morphotypes. As a side note, I did look up whole-body dual-energy x-ray absorptiometry, and the radiation dose is reported as negligible (less than that encountered during 1 cross-continental flight).

Additional Keywords: None

Print Tag: Refer to original journal article