

Restore Primary Tooth Decay to Improve Future Tooth Survival Rates

A Competing Risk Survival Analysis Model to Assess the Efficacy of Filling Carious Primary Teeth.

Stephenson J, Chadwick BL, et al:

Caries Res 2010; 44 (May 12): 285-293

Filling caries-affected primary teeth in young patients versus selective, symptom-based intervention shows tooth survival rates double those of untreated teeth.

Background: There is some debate in recent years among dentists regarding the best management strategy for caries-affected primary teeth. At odds is the argument that restorative treatment may not offer a significant benefit to symptomless caries-affected primary teeth in reducing the likelihood of the need for future extractions due to pain and/or sepsis before exfoliation. This assertion is derived from a study of retrospective case notes of 4056 caries-affected primary teeth of 677 children in northwest England. The analysis found that the majority of unrestored caries-affected primary teeth exfoliated naturally without pain. Other practice-based studies within the same time frame found similar results, reinforcing this philosophy. These findings were reviewed in letters to the British Dental Journal welcoming this non-interventive approach and citing its benefits on economic grounds. However, results from clinical trials, and the findings of this current study, challenge this philosophy.

Objective: To examine the viability of the practice-based assertion that selective, symptom-based intervention of caries-affected primary teeth does not present significant benefits above those associated with non-restorative care.

Design: Review using evidence gathered from clinical trials and prospective studies of primary molar restorations.

Methods: Data from the current investigation are based on a cohort study by Cardiff University School of Dentistry and augmented with treatment data from the British Dental Practice Board (DPB). For the cohort study, children were recruited at ages 4 to 5 years in Great Britain, followed for 4.5 years until 2003, and examined on up to 3 occasions during the study by 10 trained and calibrated examiners. From the original 2654 children examined at baseline, 2408 (90%) were seen at final exam. DPB treatment data was used to assess the effect of restorative treatment on the likelihood of caries-affected teeth subsequently progressing to either exfoliation or extraction.

Results: Time of occurrence of caries affected survival experience; teeth that developed caries lesions later in life were associated with higher survival rates to extraction. Among filled teeth, later fillings were also associated with higher survival rates to extraction. It was noted that demographic and tooth level variables had limited effect on survival experience.

Conclusions: Dental treatment was linked significantly to survival with respect to extraction with survival rates of >80% at 14 years, double those of untreated teeth.

Reviewer's Comments: These findings are key because of the inclusion of both cohort study and DPB treatment data sets, improving the inferential power of the analysis. Future such clinical trials, not restricted by time and cost, and involving more habit-based data and a greater number of participant examinations will further advance the argument in favor of early caries treatment. (Reviewer-Joel Berg, DDS).

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Keywords: Primary Caries, Competing Risks, Survival Analysis

Print Tag: Refer to original journal article

Stainless Steel Crowns Yield Superior Pulpotomy Outcomes

Success Rate of Calcium Hydroxide Pulpotomy in Primary Molars Restored With Amalgam and Stainless Steel Crowns.

Sonmez D, Duruturk L:

Br Dent J 2010; 208 (May 8): E18; discussion 408-9

Primary molars restored with stainless steel crowns had fewer restoration failures and superior overall pulpotomy outcomes than amalgam.

Background: Bacterial contamination via a leaking restoration has been implicated as a major factor in endodontic failures. In primary vital pulp therapy, achieving a reliable coronal seal has often been managed by a placement of a stainless steel crown (SSC) on pulpotomy-treated primary molars. There has been little investigation, however, into whether placement of a SSC actually improves pulpotomy outcomes.

Objective: To compare outcomes of pulpotomy-treated molars restored with amalgam or a SSC.

Design: Pseudo-randomized clinical trial.

Participants: 154 molars followed for 12 months.

Methods: Molars were classified by type of pulp exposure (mechanical, pinpoint carious, or large carious exposure) and then pseudo-randomized by a coin toss into amalgam or a SSC groups. Blinded examiners reviewed standardized radiographs taken at 1, 3, 6 and 12 months post-treatment. Inter- and intra-rater examiner reliability was assessed. Groups were assessed with the chi-square statistic.

Results: There were 70 amalgam restorations and 84 SSCs. Molars restored with a SSC had an aggregate success rate that was statistically significantly higher than molars restored with amalgam. Statistically significant differences were demonstrated between amalgam and a SSC restored molars with carious exposures but not for molars with mechanical exposures. The restoration failure rate was statistically higher for the amalgam group. A statistically significant relationship between restoration failure and pulpotomy failure could not be established.

Conclusions: For clinicians who wish to optimize their molar pulpotomy outcomes, this paper reconfirms the clinical wisdom of a SSC placement. SSCs have a significantly higher success rate (6 times higher) than amalgam restorations in primary molars.

Reviewer's Comments: The authors demonstrated that restoration failure, regardless of whether amalgam or a SSC, is associated with no difference in pulpotomy failure rates (ie, if the restoration fails, pulpotomy failure is predictable regardless of which type of restoration was used). Of greatest importance was the finding that molars treated with pulpotomy and a SSC have statistically better clinical and radiographic outcomes than molars treated by pulpotomy and an amalgam restoration. No difference was detected between groups for teeth with mechanical exposures. The authors speculated that in mechanical exposure, residual radicular pulp is healthy and therefore less susceptible to the effects of restoration leakage. In molars with carious exposures, the residual radicular pulp may be sufficiently compromised by preexisting bacterial infiltration that any restoration microbiological leakage exacerbates the existing inflammatory state of the pulp and the molar is less likely to heal and a negative pulpotomy outcome is more likely to occur. Placement of a SSC may prevent microbiological leakage and allow the compromised pulp a better chance of self-healing and therefore potentially more favorable pulpotomy outcomes. (Reviewer-Michael J. Casas, DDS).

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Keywords: Pulpotomy, Stainless Steel Crown, Amalgam

Print Tag: Refer to original journal article

Biocompatibility, Cytotoxic Effects of Orthodontic Composites Vary

Cytotoxic Effects of Orthodontic Composites.

Malkoc S, Corekci B, et al:

Angle Orthod 2010; 80 (July): 571-576

The majority of tested orthodontic bonding composites are suitable for clinical application, but further studies using different test methods are needed.

Background: Biocompatibility of orthodontic composites is important because these materials are located close to the periodontal tissues and may release substances that cause cellular tissue reactions. Little data are currently available in the orthodontic literature regarding the biocompatibility and toxicity of orthodontic composites.

Objective: To evaluate cytotoxic effects of 5 light-cured orthodontic bonding composites.

Design: Controlled laboratory study.

Methods: 5 light-cured orthodontic composites were evaluated: (1) Heliolit Orthodontic [Ivoclar]; (2) Transbond XT [3M Unitek]; (3) Bisco ORTHO [Bisco]; (4) Light Bond [Reliance]; and (5) Quick Cure [Reliance]. From each test specimen, 4 samples were aseptically prepared in accordance to the manufacturers' instructions in standardized Teflon molds (5 mm diameter and 2 mm depth). Samples were immersed in culture medium for 24 hours to extract residual monomer or cytotoxic substances and were sterile-filtered for use on the cell cultures. For cytotoxic tests, cultures of L929 fibroblast cells were used. Except for controls, these cultures were exposed to prepared test samples. Cellular morphology was also evaluated.

Results: Transbond XT significantly decreased cell survival rates compared to controls ($P < 0.05$), while all other orthodontic bracket adhesive materials did not reduce cell survival ($P > 0.05$) when compared with controls. L929 cells are normally elongated and spindle shaped in appearance and morphologic changes in test groups were noted and described.

Conclusions: The tested orthodontic bonding composites are suitable for clinical application. However, Transbond XT was cytotoxic, while the others showed no or only slight cellular alterations.

Reviewer's Comments: Knowledge of dental materials is important. The authors state "there is the necessity of informing people that dental materials may pose some risk to the patient and the dental team." In California, dental offices must give every patient a dental material fact-sheet and offices which employ >10 people must post a Prop 65 Warning about dental materials. However, the human body is complex and it is important to note that any single test method is applicable only for investigating 1 type of unwanted reaction out of a variety of possible reactions and that cell culture tests only detect the influence of a material on isolated cells. Composites consist of mainly 2 monomers: triethylene-glycol-dimethacrylate (TEGDMA) which lowers viscosity and allows increased filler content but has been shown to promote bacterial proliferation; and bisphenol-A-diglycidyl-dimethacrylate (bis-GMA). Recent studies have shown TEGDMA being released from materials and the authors state that orthodontic composite may release bis-phenol-A, a bis-GMA precursor that exhibits cytotoxic effects. Transbond XT contains bis-EMA which shows cytotoxic effects similar to TEGDMA which may explain Transbond XT's cytotoxicity. However, the results of the present in vitro study remain unclear, and further studies using different test methods are needed for Transbond XT. (Reviewer-Jonathon Everette Lee, DDS).

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Keywords: Biocompatibility, Light-Cured Orthodontic Composites, Cytotoxicity

Print Tag: Refer to original journal article

Even Short-Term Calcium Hydroxide Weakens Dentin

The Effects of Short-Term Calcium Hydroxide Application on the Strength of Dentine.

Sahebi S, Moazami F, Abbott P:

Dent Traumatol 2010; 26 (February): 43-46

A 30-day treatment of calcium hydroxide reduces the compressive strength of dentin by 15%.

Background: Calcium hydroxide (CaOH) is a widely used interim intracanal dressing and pulp capping agent that is effective because of its high pH and broad spectrum antibacterial activity. It has been used successfully in apexification procedures in immature teeth when used for up to 12 months, but long-term CaOH therapy has been shown to reduce the strength of dentin.

Objective: To measure the effect of short-term (30 day) CaOH exposure on the compressive strength of human dentin.

Design/Participants/Methods: 50 extracted human mandibular, single-rooted premolars were endodontically accessed and prepared to 0.5 mm short of the apex. These teeth were randomly assigned to either a control or experimental group with 25 teeth in each. Canals of the experimental group were filled with CaOH paste with Lentulo spirals and then sealed with a temporary filling material. Teeth in controls were left open and unfilled. Teeth in both groups were soaked in saline for 30 days. A root cylinder was then prepared from each tooth by slicing off the crown at the cemento-enamel junction and making another cut 5 mm apically. Each root cylinder was tested for compressive strength by placing it in an Instron universal testing machine with the force applied from the coronal end in a vertical direction. Point of application was centered in the root canal and the force continued until the cylinder fractured.

Results: Mean force required to fracture the dentin cylinders in the experimental group was significantly less than controls. Dentin strength was reduced by approximately 15%.

Conclusions: Short-term application of CaOH can significantly reduce dentin strength.

Reviewer's Comments: This paper is not directly clinically applicable because the forces were centered in the root canal and applied vertically. This does not duplicate the sudden impact that teeth absorb from varying angles in the clinical situation. Nevertheless, the finding that even 30 days exposure to CaOH significantly weakens dentin should drive clinicians to reconsider its use for anything but very short applications. The ideal interim dressing should not weaken tooth structure. (Reviewer-Dennis J. McTigue, DDS, MS).

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Keywords: Endodontics, Dental Trauma, Calcium Hydroxide

Print Tag: Refer to original journal article

Fearing the Tooth Worm -- Building Caries Risk Models

Building Caries Risk Assessment Models for Children.

Gao XL, Hsu CYS, et al:

J Dent Res 2010; 89 (June): 637-643

Most caries risk assessment models lack simplicity and accuracy.

Background: Caries risk assessment is essential for identifying patients who require preventive interventions and periodic monitoring. Present models lack simplicity and accuracy. Time and money are wasted in assuming that all kids are at risk until proven otherwise. The question remains as to when we will have a “test” that can be used easily and with accuracy to determine if a child is at risk or is headed towards developing decay, gingival disease, and malocclusion.

Objective: To develop and validate a biopsychosocial caries risk assessment for children.

Design: Population-based prospective study.

Participants: Children from 13 of 14 randomly selected kindergartens in Singapore.

Methods: A pre-tested questionnaire was administered to parents of children aged 3 to 6 years to collect information on demographics, socioeconomic, biological traits, children's oral health practices, and finally, parents' knowledge on oral health. Children's teeth were examined by a calibrated dentist using a dental explorer and World Health Organization diagnostic criteria. No radiographs were made. Plaque scores, saliva samples, pH, saliva flow rates, buffering capacity, and levels of *Streptococcus mutans* and *Lactobacilli* were assessed. After 12 months, examinations were repeated. Data were collected and statistical analysis identified risk factors, indicators, and protective factors for constructing risk models. A few of the 16 indicators were prolonged breast feeding, bedtime feedings, frequent snacks, past caries experiences, plaques indexes, and no dental examinations. Ultimately, 5 models were constructed and all were compared with the computerized program Cariogram.

Results: 1782 children participated. Of those, 893 were female and mean age was 4.8 years. Of parents, 98% completed the questionnaire. After 12 months, 1576 (88%) children were available for follow-up. All children had high caries rates (mean decayed, missing, filled teeth in primary dentition of 1.57) with 44% having new decay after 12 months. Multiple caries risk indicators and protective factors were identified; the usual indicators were identified and the only new finding was what the authors called "healthy window for breast feeding" (this being the time up to age 12 months). Afterwards, the risk of decay was elevated 1.5 times.

Conclusions: For caries risk assessment to be used, it must be simple and accurate. Of models, 1 of 5 was a “community” model that, by using a 6-item questionnaire and a clinical exam, they were able to identify 25% of children requiring further assessment. All models were more sensitive and accurate than the computerized model.

Reviewer's Comments: To date, most models I have reviewed look at similar factors and indicators. How much better are they than what we have been doing for years? We trust our gut to tell us about the child and family. Although anecdotal and difficult to measure, we all develop a sixth sense when you first meet a child and the family and initiate your interview and assessment. Until I review a study, where infants are erupting teeth and their risk identifies for future disease, I will go with my “gut” feelings! (Reviewer-Arthur J. Nowak, DMD).

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Keywords: Caries, Risk Assessment, Pediatric Patients

Print Tag: Refer to original journal article

Genetics Play Greater Role in Caries Experience Than Once Thought

Genetic and Environmental Factors in Oral Health Among Twins.

Rintakoski K, Kaprio J, Murtomaa H:

J Dent Res 2010; 89 (July): 700-704

Caries has a greater genetic influence while gingival bleeding has a greater environmental influence.

Background: Twin studies are invaluable in the study of complex disorders, helping to determine contributions from both environmental and genetic components.

Objective: To study the hypothesis that major dental issues are significantly linked to genetics.

Design: Questionnaire data review.

Participants: >3000 twin pairs from the FinnTwin16 study.

Methods: In this particular study, self-reported number of filled teeth and gingival bleeding were used as measures of oral health. Numbers of filled teeth ranged from 0 to >10 and were subdivided into 5 categories. Answers regarding gingival bleeding were categorized by frequency of bleeding when brushing and ranged from nearly all the time to never. If a subject did not know, the answer was considered to be missing data. In the final analysis, there were 3 categories of gingival bleeding and 4 categories of filled teeth. Statistical methods were used to both describe data and to estimate the correlation of variables (gingival bleeding and filled teeth). Comparisons of variables from monozygotic and dizygotic twins were used to assess genetic and environmental effects and to estimate heritability. Quantitative genetic modeling was used to estimate variance by comparing different models. Evaluated models considered both genetic and environmental effects.

Results: Gingival bleeding was reported in the majority of subjects with 68% stating that they noticed this weekly; 26% reported no gingival bleeding. In terms of filled teeth, 16% reported no filled teeth, 49% reported 1 to 4 filled teeth, and 29% reported 5 to 10 filled teeth. Of respondents, 6% reported having >10 filled teeth. There was a higher correlation between dental variables for identical twins than for fraternal twins.

Conclusions: The best-fitting model for gingival bleeding included both additive genetic effects and environment, with a much greater emphasis on environmental effects. For filled teeth, models varied slightly for men and women. For men, the model included genetic effects and both shared and non-shared environmental effects while for women, the model included genetic and non-shared environmental effects. In both cases, genetic effects were greater than environmental, but these effects were significantly greater for women.

Reviewer's Comments: This study developed a complex model of 2 complex, multifactorial oral diseases. Using monozygotic and dizygotic twins as subjects allows one to evaluate genetic contributions where environmental influences are basically the same for both individuals. The authors demonstrated that there is a strong genetic component that contributes to caries experience in both men and women but with a stronger influence in women. They also demonstrate that for gingival bleeding, there is a stronger environmental component but that a genetic component also exists. These are significant findings and should cause clinicians and researchers to modify their belief that dental caries are 100% preventable. (Reviewer-Rebecca L. Slayton, DDS, MS, PhD).

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Keywords: Oral Health, Genetics, Twins

Print Tag: Refer to original journal article

Oral Mucosal Lesions Common In Children, Require Careful Evaluation

Oral Mucosal Lesions in Children From 0 to 12 Years Old: Ten Years' Experience.

Majorana A, Bardellini E, et al:

Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2010; 110 (July): e13-e18

The prevalence of oral mucosal lesions is significantly higher in children with systemic illness and these lesions may be a diagnostic or complicating factor of the disease.

Background: Dentists must be alert and able to detect any of the numerous oral mucosal lesions involving children, especially younger children, and provide the correct differential diagnosis and treatment in order to achieve the most positive outcomes.

Objective: To evaluate the prevalence of oral mucosal anomalies in children aged 0 to 12 years.

Design: Retrospective cross-sectional study using patient clinical charts from the Department of Pediatric Dentistry at the University of Brescia from January 1997 to December 2007.

Participants/Methods: Data included age, gender, site, and pathologic diagnosis. The sample consisted of 10,128 children with 58% being male and having a mean age of 6.5 years. The patients' guardians were interviewed regarding the symptoms and history of the illness, medical history, and dental history. Patients were divided into 2 groups: children with systemic disease (61%) and healthy children (39%). Clinical diagnosis followed criteria set forth by the World Health Organization and patients were examined using standardized conditions with clinical diagnosis confirmed by laboratory tests as needed. In this 10-year study, 6 calibrated examiners participated with only 2 involved throughout; recalibration occurred every 24 months. Data analysis included descriptive statistics and bivariate analysis which were performed using the chi-squared test and the Fisher test was used when applicable.

Results: Oral mucosal lesions were diagnosed in 29% of the children sampled. Of these lesions, 17 different types were confirmed; the most common were oral candidiasis (28%), traumatic lesions (18%), geographic tongue and other tongue lesions (19%), recurrent aphthous ulcerations (15%), primary and recurrent HSV-1 infections (12%), and erythema multiforme (1%). No differences were observed among oral mucosal lesions related to gender and age. Children with systemic disease had a significantly higher frequency of oral mucosal lesions compared to healthy children except for traumatic lesions which were more prevalent in the healthy group.

Conclusions: Oral mucosal anomalies are relatively common in children with several of these disorders associated with underlying systemic medical conditions and require thorough evaluation and diagnosis.

Reviewer's Comments: This was a good retrospective study with an excellent sample size and low mean age of the child participants. Overall prevalence and types of oral mucosal lesions, especially in younger children, were similar to previous studies from different countries and populations. There were, however, moderate variations regarding frequency of the common types of mucosal alterations in different populations and this may be related to several factors including sociodemographic characteristics, analysis methods, and diagnostic criteria. As acknowledged by investigators, weaknesses of this study included that detection of the lesions was dependent on the knowledge and recognition of multiple investigators and lesions were diagnosed after a single examination of each patient. (Reviewer-Erwin G. Turner, DMD).

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Keywords: Oral Mucosal Lesions, Children

Print Tag: Refer to original journal article

Behavioral Therapy a Viable Option for Tourette Disorder in Children

Behavior Therapy for Children With Tourette Disorder.

Piacentini J, Woods DW, et al:

JAMA 2010; 303 (May 19): 1929-1937

Comprehensive behavioral intervention results in significant improvement in symptom severity among children with Tourette and chronic tic disorder.

Background: Tourette disorder is a chronic neurological malady which manifests by motor and vocal tics. The prevalence of this disorder in school-age children has a range of 1 to 10 per 1000. Tics are usually blinking and grimacing and/or vocalizations.

Objective: To determine the usefulness of a comprehensive behavioral intervention to reduce tic severity.

Design: Randomized, observer-blind controlled clinical trial.

Participants: 126 children aged 9 to 17 years with Tourette or chronic tic disorder as a primary diagnosis.

Methods: Of children, 61 were randomly assigned to 8 sessions of behavior therapy over 10 weeks, and 65 were assigned to a control group and received supportive therapy and education.

Results: Behavioral intervention resulted in a significantly reduced score on the Yale Global Tic Severity Scale. Significantly more children in the behavior intervention group were rated as being very much improved or much improved.

Conclusions: When compared to supportive therapy and education, comprehensive behavioral intervention resulted in greater improvement in symptom severity among children with Tourette and chronic tic disorder.

Reviewer's Comments: During my professional career, I have been involved in providing care for less than a dozen children with Tourette disorder; however, these few patients left a lasting impression. It had been my mistaken belief that no treatments, other than antipsychotic medications, had any effect in mitigating the symptoms and the side effects accompanying these medications were often undesirable. This study clearly presented data showing that behavioral therapy can be of great benefit. (Reviewer-Paul O. Walker, DDS, MS).

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Keywords: Tourette Disorder, Behavioral Intervention, Clinical Trial

Print Tag: Refer to original journal article

A New, Simple Means to Decontaminate Dentin Is on the Way!

Killing of Adherent Oral Microbes by a Non-Thermal Atmospheric Plasma Jet.

Rupf S, Lehmann A, et al:

J Med Microbiol 2010; 59 (February): 206-212

The potential of cold plasma jet use for antimicrobial application in dentistry is now a wide-open prospect given recent positive investigative results.

Background: Today, methods for the decontamination and conditioning of intraoral surfaces are of great interest in the field of dentistry. Cold plasmas are of special interest to achieve this decontamination effect in order to prevent heat damage of the dental pulp. Only a few research papers have been published dealing with the application of plasma jets for biofilm and plaque removal intraorally. To date, no data on the effect of plasma jets on microbial-contaminated dentin are available. Plasma jets are ionized local gas flows, generated under normal pressure by means of microwaves, high frequency, or pulsed direct current in plasma-jet sources using noble gases.

Objective: To test a non-thermal atmospheric plasma jet for its antimicrobial efficacy against important oral micro-organisms grown on agar plates or adherent to dentin slices.

Methods: Experiments were performed with the caries-associated bacteria *Lactobacillus casei* and *Streptococcus mutans* as well as *Candida albicans*, which is frequently isolated from dentin caries lesions. *Escherichia coli* was included as a control in the study. Agar plates and dentin slices were inoculated with $6 \log_{10}$ c.f.u. cm⁻² of *L. casei*, *S. mutans*, and *C. albicans*. Areas of 1 cm² on the agar plates or the complete dentin slices were irradiated with a helium plasma jet for 0.3, 0.6, or 0.9 s mm⁻², respectively. The agar plates were incubated at 37°C, and dentin slices were vortexed in liquid media and suspensions were placed on agar plates. The killing efficacy of the plasma jet was assessed by counting the number of c.f.u. on the irradiated areas of the agar plates, as well as by determination of the number of c.f.u. recovered from dentin slices.

Results: A microbe-killing effect was found on the irradiated parts of the agar plates for *L. casei*, *S. mutans*, *C. albicans* and *E. coli*.

Conclusions: The plasma-jet treatment reduced the c.f.u. by 3 to 4 \log_{10} intervals on the dentin slices in comparison to recovery rates from untreated controls. The microbe-killing effect was correlated with increasing irradiation times. Non-thermal atmospheric plasma jets can be used for the disinfection of dental surfaces.

Reviewer's Comments: Plasma-jet applications are piquing interest in the dental community because the technology offers benefits that were expected from ozone treatment, but so far have not been proven. It may now be possible to consider cold plasma jet application for disinfecting dentin after caries removal or of shallow root caries lesions. Application of this laboratory testing into the clinical scenario should be done very soon, and hopeful testing in children in their primary dentition, particularly in relation to early childhood caries might be quite interesting. (Reviewer-Joel Berg, DDS).

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Keywords: Caries, Dentin, Oral Microbes, Atmospheric Plasma Jet

Print Tag: Refer to original journal article

Ankyloglossia, Breastfeeding, Failure to Thrive -- Can They Be Related?

Ankyloglossia, Exclusive Breastfeeding, and Failure to Thrive.

Forlenza GP, Paradise NM, et al:

Pediatrics 2010; 303 (May): 1500-1504

Ankyloglossia in a purely breast fed infant can result in failure to thrive.

Background: Ankyloglossia has a reported prevalence in newborn children of 1 to 10% and can be associated with feeding, swallowing, and speech problems.

Objective: To review a case report providing additional insight into the consequences of untreated ankyloglossia in an exclusively breast-fed infant. **Participant:** White male infant aged 6 months admitted to a hospital for failure to thrive following a report of suspected child neglect. **Discussion:** The child was the result of a term birth and weighed 4.28 kg, which put him at the 90th percentile. His discharge weight was 3.69 kg, about 14% less than his birth weight. At 5 days of age, a pediatrician documented a weight of 4.0 kg and a speech therapy evaluation for ankyloglossia was considered. At the 2-week visit, the mother complained of pain upon breastfeeding. Although a referral to an oral surgeon was considered, the parents reported that they were told that no one would surgically intervene until age 6 months. The family missed the 4-month visit. At age 6 months, there was a report to the abuse hotline of medical neglect involving the parent. The parents were instructed to take the child immediately to their local emergency department. The emergency department arranged for an inpatient assessment of failure to thrive. The breastfeeding medicine team recommended a frenotomy be performed.

Conclusions: Following the frenotomy, the child began to gain weight. Despite the unequivocal statements in the hospital records showing a purely anatomic cause for the failure to thrive, the investigation of child neglect remained open.

Reviewer's Comments: According to the authors, ankyloglossia is a relatively common newborn condition for which the diagnosis and treatments are controversial. The Academy of Breastfeeding Medicine states that ankyloglossia has been associated with feeding, swallowing and speech difficulties and is particularly important in breastfeeding infants, in whom it has been associated with poor latch, maternal nipple pain, poor milk transfer, and failure to thrive. The preferred treatment for clinically significant ankyloglossia is frenotomy. This case report demonstrates a breakdown in our medical system which resulted in infant morbidity and a false accusation of child neglect. (Reviewer-Paul O. Walker, DDS, MS).

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Keywords: Lingual Frenum, Failure To Thrive

Print Tag: Refer to original journal article

Old Habits Die Hard -- Changing the Preventative Recall Interval

A Systematic Review of Dental Recall Intervals and Incidence of Dental Caries.

Patel S, Bay RC, Glick M:

J Am Dent Assoc 2010; 141 (May): 527-539

Personalized preventative recall intervals need to be based on risk assessment along with the child's stage of growth and development.

Background: The 6-month recall has been “standard” for >50 years even though caries rates have dramatically changed during the same period. The question remains if evidence continues to embrace the 6-month recall interval or if other factors play a larger role.

Objective: To perform a systematic literature review on recall intervals and incidence of dental decay.

Design: Systematic review of PubMed databases.

Methods: Investigators performed a systematic review of the literature from 1966 through 2008; 27 different search terms were identified and entered into the PubMed database, requesting English language articles only.

Results: 10,755 unique and potentially relevant citations were identified. With further searching, 202 articles were selected. Upon further review, 196 were excluded. Finally, 7 articles met inclusion criteria, with only 1 being a randomized controlled study and the other 6 non-randomized, retrospective, or cross-sectional studies. Quality of studies was assessed and many problems were described, but methodology being the most common. The average “quality score” of the reports was 11.5 of a possible score of 27, prompting the authors to state that studies assessing the association between the recall and dental caries have been lacking in methodology design and inconsistency.

Conclusions: The authors concluded that on the basis of their review, they cannot support the concept of a “one recall interval fits all” protocol. A customized recall interval, taking in account the assessment of risk must be considered.

Reviewer's Comments: The study primarily concentrated on reports that only looked at caries prevention. In pediatric patients, although caries are important, other factors that we assess also need to be considered. So even if a child is without cavities, the need to assess growth and development of the developing jaws and teeth may take precedence at times over caries prevention. So a customized interval, taking in account the age, health status, dietary practices, family status, and compliance (just to name a few) must be considered. (Reviewer-Arthur J. Nowak, DMD).

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Keywords: Caries, Recall Intervals, Periodicity, Dental Disease, Systematic Review

Print Tag: Refer to original journal article

Does It Matter What Gets Mixed With Calcium Hydroxide?

In Vitro Sustained Release of Calcium Ions and Ph Maintenance From Different Vehicles Containing Calcium Hydroxide.

Ballal NV, Shavi GV, et al:

J Endod 2010; 36 (May): 862-866

When combining calcium hydroxide with various viscous vehicles, solutions result in an antibacterial, alkaline environment, but the best choice is still debated.

Background: Intracanal medicaments, such as calcium hydroxide (CaOH) serve as a barrier to bacterial invasion of the root canal system. Developed in the 1920's, CaOH is biocompatible while exhibiting antibacterial properties. The mechanism of action of CaOH is to increase local pH through increase in the amount of free calcium and phosphate. The released hydroxyl (OH) ions are antibacterial. The presence of hydroxyl ions is dependent upon the availability of ions in the CaOH solution. The 3 main vehicles in CaOH solution are: water-soluble substances (such as saline, local anesthetic, and water), viscous vehicles (glycerin and polyethylene glycol), and oil-based vehicles (eugenol). Classically, water-soluble vehicles promote the greatest CaOH solubility, while oil-based the least.

Objective: To evaluate the sustained release of calcium ions from viscous CaOH vehicles.

Methods: Viscous vehicles tested were: chitosan (Ch), polyethylene glycol (PG), propylene glycol (pg) and guar gum (GG), which were all formulated into control release capsules. For this study, 40 extracted anterior teeth were used. Following a standardized root canal preparation technique, teeth were prepared. Teeth were obturated with the viscous materials and suspended in a vial of distilled water so only the apical one third was submerged. Solutions of 3 mL were withdrawn at 30, 60, 120 minutes; 4, 6, 8, 12, 24 hours; and 7, 15, and 30 days. Calcium ion concentration and pH were measured at these intervals.

Results: PG demonstrated nearly 100% calcium hydroxide release at 15 days with Ch showing 86.8% release at 15 days, demonstrating better long-term release.

Conclusions: Clinically, all solutions ended up with bactericidal alkaline pH's, although there was no statistically significant difference.

Reviewer's Comments: While chitosan did, in fact, have a better long-term release, the authors point out that it is biodegradable and may actually impact the success of adhesive resins. A consistent body of traumatology literature has been moving away from repeated CaOH medicament changes, and so there may be some debate as to the clinical significance of this study. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Calcium Hydroxide, Chitosan, Intracanal Medicaments, Sustained Release, Viscous Vehicle

Print Tag: Refer to original journal article

Minimal Function Improvement With Cleft Lip Revision

Effects of Lip Revision Surgery in Cleft Lip/Palate Patients.

Trotman CA, Faraway JJ, et al:

J Dent Res 2010; 89 (July): 728-732

The decision to revise a cleft lip surgery may be based more on esthetic concerns than functional ones.

Background: Classically, cleft lip/palate revision surgeries are performed between ages of 5 and 8 years, or in some cases, during later teenage years. In many instances, the decision to proceed with a revision is based on cleft team's assessment of lip movements and rest positions.

Objective: To objectively measure circumoral function as a result of cleft lip revision surgery.

Design: Parallel, non-randomized, clinical trial.

Participants: 103 subjects (32 non-revision and 34 revision) as well as 37 controls.

Methods: 3 study groups were used: (1) patients with repaired cleft lip/palate who had lip revision, (2) patients with repaired cleft lip/palate who did NOT have lip revision, (3) control (non-cleft) subjects. Specific inclusion criteria included a previously repaired complete unilateral or bilateral cleft lip with or without cleft palate. Exclusion criteria were: history of orthognathic surgery, diabetes, collagen/vascular disease, an impairment that would impact comprehension (such as mental/hearing impairment), and a lip revision surgery within the preceding two years. A video-based tracking system (Motion Analysis™) was used to measure and track circumoral movements.

Results: There were significant changes within the cleft groups as compared to controls 12 months post surgery. Specific movements (grimace, lip purse, cheek puff, and maximum smile) were not significantly different between groups.

Conclusions: Lip revision did not significantly affect lip movements, and possibly the greater impetus for surgery is the esthetic concerns.

Reviewer's Comments: Results from this complex design are dependent on the effectiveness of the software at capturing and accurately portraying circumoral movements. It is of interest that the authors point out that the decision to revise a cleft lip may be based more on esthetics than improvement in function; for most of these patients, there is minimal improvement in circumoral movements. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Cleft Lip, Palate, Surgery

Print Tag: Refer to original journal article

Parents, Kids, and the Cycle of Dental Fear

Can Parents and Children Evaluate Each Other's Dental Fear?

Luoto A, Tolvanen M, et al:

Eur J Oral Sci 2010; 118 (June): 254-258

Parents and children are poor judges of the others dental fear.

Background: There are many theories as to the origin of a child's dental fear. Some suggest that family and environment influences can impart fear to a child. Previous literature has suggested that parental dental fear is positively associated with child dental fear. However, direction and nuances of this relationship are poorly understood.

Objective: To examine how well parents and children aged 11 to 16 years assess dental fear in each other.

Methods: Two Finnish cities were utilized: Pori was a study site, while Rauma served as the control site. Initial data were collected in 2001 with follow-up collections in 2003 and 2005. Fears were assessed using single 5-point Likert scale questionnaires.

Results/Conclusions: Data were collected initially from 1691 study subjects and 807 controls. Kappa values indicated that mothers and fathers had poor knowledge of their children's dental fears, although the ability to accurately assess the fear did increase with age. During the 3 periods, high dental fear was reported by 9%, 9%, and 13%, respectively. Parents and children were much better at recognizing an absence of fear in the other.

Reviewer's Comments: I thought this study was fascinating in that for many years, the argument has been that parents in the operatory convey their fear to children. Results of this study seem to suggest that children poorly recognize dental fears in parents. Possibly good "parental management" by the dentist, including setting boundaries and expectations may reduce the incidence of unwanted parental involvement. There is a strong suggestion in other literature that parental presence in the delivery of pediatric healthcare may soon be a standard expectation. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Dental Fear, Parents, Children, Environment

Print Tag: Refer to original journal article

Single-Parent Households More Likely to Have Childhood Caries

Incidence and Prevention of Early Childhood Caries in One- and Two-Parent Families.

Plutzer K, Keirse MJNC:

Child Care Health Dev 2010; June 1 (): epub ahead of print

Children in one-parent households in Australia were two times more likely to have severe early childhood caries than two-parent households.

Background: The percentage of one-parent families in Australia has increased 8% over the past 8 years, reflecting what has been demonstrated in other industrialized countries. The majority of single-parent households (88%) were headed by mothers in 2003. Single mothers with children aged <4 years had an employment rate of 34%. Concurrently, there has been an increase in the mean dmft (the sum of decayed teeth, teeth missing because of caries and filled teeth) of children as well (from 1.10 in 1997 to 1.70 in 2003), and 17% of children aged 2 to 3 years exhibited severe early-childhood caries.

Objective: To determine whether anticipatory guidance to single mothers expecting their first child reduced severe early childhood caries (S-ECC).

Methods: Mothers were either in a control or intervention group. The intervention group received 3 rounds of printed materials from enrollment to 12 years post-partum. Dental evaluation for S-ECC in children occurred at 20 months, blinded to mother's group assignment.

Results: Data were collected from 426 mother-child dyads (87 one-parent and 339 two-parent). Single-parent mothers were significantly more likely to report a household income of <\$20,000, as well as having an unplanned pregnancy.

Conclusions: Intervention prevented 1 case of S-ECC for every 9 single mothers who participated, compared to 1 in 15 for the 2-parent households. Children in 1-parent households were 2.3 times more likely to have S-ECC than 2-parent households.

Reviewer's Comments: It is interesting to focus so much on the single-parent household. I have observed that in some cultures, there is a greater influence from the community, family elders, and respected community members over home caregivers. It is important to also note that the single mothers in this study were also subject to greater incidences of poverty, which bring its own set of expectations and hurdles for healthcare access and prevention. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Early Childhood Caries, Parenthood, Prevention

Print Tag: Refer to original journal article

Just a Spoonful of Sugar Really Does Help the Medicine

Efficacy of Sweet Solutions for Analgesia in Infants Between 1 and 12 Months of Age: A Systematic Review.

Harrison D, Stevens B, et al:

Arch Dis Child 2010; 95 (June): 406-413

Sucrose/glucose reduced crying and composite pain in children up to age 12 months following painful procedures.

Background: There is a growing body of literature that says oral sucrose and glucose, among other sweet substances, are effective analgesics in neonates. In many locations, the recommendation is that these sweet substances be administered before procedures such as vaccinations. Much of the research has been on neonates, while there are relatively sparse studies on infants beyond early neonate status.

Objective: To evaluate the efficacy of sweet solutions on children beyond neonate status, up to age 12 months.

Design: Systematic review.

Methods: Data were collected from randomized controlled trials (RCTs) in: Cochrane database, Medline, Embase, CINAHL, PsychINFO, EBM reviews. Search terms were: newborn, infant, neonate, sucrose, and pain. Ancillary terms used were: lactose, glucose, fructose, glycerine, dextrose, and aspartame among others.

Results: Of 695 citations initially identified, a final pool of 14 studies was included. Of these, 13 found that administration of either glucose or sucrose resulted in reduced crying and composite pain scores compared to placebo (water). More concentrated (50%) sucrose was generally more effective than 25% glucose, 40% glucose, and water in reducing crying.

Conclusions: Sucrose and glucose were successful in reducing incidence of crying, as well as duration and perceived pain scores during immunizations beyond the neonatal period up to age 12 months.

Reviewer's Comments: Increasingly, in premature infants and young children with special needs facing painful procedures, sucrose/glucose is being used effectively as palliative analgesics. This study demonstrates that the effects go beyond the neonatal period up to age 12 months. In children with special needs who might have numerous such procedures, the dental team needs to be aware whether parents are 'self-administering' this analgesic. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Sucrose, Analgesia

Print Tag: Refer to original journal article

Significant Dental Blood Loss May Indicate Bigger Problem

Diagnosis and Management of Bleeding Disorder in a Child.

Sarnaik A, Kamat D, Kannikeswaran N:

Clin Pediatr (Phila) 2010; 49 (May): 422-431

Abnormal mucosal bleeding involving the gingivae, nasal mucosa, or petechia may indicate deficiencies in von Willebrand factor or a platelet disorder.

Background: A thorough understanding of the physiology of coagulation is required when dealing with patients who have coagulopathies. This is particularly true with smaller children who have less volume of blood to lose. The dental practitioner needs to recognize red flags for hematology consultation.

Objective: To discuss the physiology of hemostasis and features of a physical/laboratory assessment that may require consultation to a hematologist. **Discussion:** Hemostasis serves to limit blood loss and retain vascular integrity. The initial hematological response is the formation of a physical plug mediated by platelets. The initial trigger for activation of the coagulation cascade is tissue factor release from injured endothelial tissues. This triggers not only the extrinsic pathway of coagulation, but indirectly also the intrinsic path. There are several coagulation factors (II, VII, V, XIII) which are known as "Vitamin K" dependant factors. Of note is the factor that in the postnatal and infancy period there is a relative deficiency of these factors (approximately half of the adult values). Exaggerated bleeding responses to common events (nosebleeds for >15 minutes, significant blood loss 24 hours following a dental procedure, or inappropriate bruising or menorrhagia [menstrual bleeding lasting for 7 days or loss of >80mL blood per cycle]) may be suggestive of underlying or undiagnosed bleeding disorders. Mucosal bleeding involving gums, nasal mucosa, or petechiae may indicate von Willebrand's deficiency (vWD) or a platelet disorder. Prothrombin time (PT) and activated partial thromboplastin time (aPTT) can provide information about the secondary phase of hemostasis. Platelet function assay (PFA-100) is a screening test often used to detect vWD and, therefore, a screening tool for the primary phase of hemostasis. A functional test that measures how platelets bind to the vasculature is the bleeding time. The bleeding time has been shown to have poor reliability, and therefore many providers prefer using the PFA test instead.

Conclusions: Practitioners need to be able to assess whether a child is suffering from a coagulopathy based on clinical and laboratory information.

Reviewer's Comments: This is an outstanding review article which outlines the coagulation cascade succinctly. The 'didactic' part of the paper is then followed by 6 clinical cases - all very applicable to a dentist. Dentists are in a particularly good vantage point to assess 'occult' episodes of bleeding and provide appropriate referrals. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Bleeding Disorders, Pediatric

Print Tag: Refer to original journal article

Like Parent, Like Child -- Passing on Obesity

Changing Influences on Childhood Obesity: A Study of 2 Generations of the 1958 British Birth Cohort.

Pinot de Moira A, Power C, Li L:

Am J Epidemiol 2010; 171 (June): 1289-1298

Maternal body mass index and employment have significant positive relationships to offspring body mass index.

Background: Within the United Kingdom, as in other parts of the world, there has been an increase in the prevalence of childhood obesity. There is sufficient data to suggest that this trend, while potentially slowing, will lead to significant health issues associated with adult obesity in the near future. One, if not the prime, reason behind the increase in childhood obesity are a series of fundamental lifestyle changes that have occurred fairly rapidly (within the last 30 years).

Objective: To assess influences on childhood obesity from a 1958 cohort and their offspring.

Design: Cohort study.

Participants: 17,000 people born in the United Kingdom during one week in March 1958 and their offspring.

Methods: Participants were followed from birth through age 45 years. Offspring assessed were aged 4 to 9 years. From the original sample, 11,407 members and offspring were assessed through survey questions and body mass index (BMI) measurements. Survey questions specifically addressed: childhood BMI, parental BMI, prenatal and postnatal factors.

Results: When pre- and postnatal factors were considered, the only significant factors were maternal BMI and employment. Maternal age, breastfeeding, and gestational age had no relationship to BMI. Birth weight was positively associated with an elevated BMI. In this cohort, the less crowded a household, the higher the BMI, whereas in the offspring cohort, the more crowded a household the higher the BMI.

Conclusions: Offspring had higher BMIs than their parents, and the direction of social inequalities (housing, employment, family size) are associated with these physical changes.

Reviewer's Comments: This article is a great example of how a child's environment impacts their physical development. Of interest is the section on family crowding and housing, which had opposite effects between the generations studied. Of further interest, is it seems that girls were more significantly impacted by these changes than boys. Furthermore, the notion that high parental BMI is associated with higher offspring BMI is fairly intuitive. (Reviewer-S. Thikkurissy, DDS).

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Keywords: obesity, pediatric, body mass index

Print Tag: Refer to original journal article

Delayed Puberty Has Various Causes

Delayed Puberty.

Kaplowitx PB:

Pediatr Rev 2010; 31 (May): 189-198

Delayed onset of puberty in males and females may be indicative of systemic endocrinological issues.

Background: Puberty (defined as age 10 to 13 years in boys and age 9 to 12 years in girls) is associated with pulsatile secretions of pituitary gonadotropins (GnH): luteinizing hormone (LH) and follicle stimulating hormone (FSH). LH increases sex steroid production while FSH stimulates either sperm production or oocyte production.

Objective: To discuss clinical situations in which the onset of puberty may be delayed. **Discussion:** In males, the most common diagnosis is constitutional delayed puberty (CDP). According to the literature, this can affect as many as 63% of boys. Boys with CDP are often overweight and not short. Review of growth charts of boys with CDP often reveals growth at or below the third percentile, and this growth deficiency may become exaggerated with age. The penis is often small and may be suggestive of GnH deficiency. Primary gonadal failure is an uncommon cause for delayed puberty, affecting 7% of children in cohort studies. CDP occurs less frequently (30%) in females. GnH deficiency, which may be implicated, may be brought on by eating disorders, such as anorexia nervosa, or excessive exercise. Primary ovarian failure was found to occur in 26% of CDP cases in females. If females present with CDP and are very short, a key differential to consider is Turner Syndrome. Vital tests for either males or females are LH and FSH assessment. There are distinct psychological issues associated with delayed puberty. The concern tends to be highest among males participating in team sports.

Conclusions: Delayed onset of puberty may be indicative of systemic endocrinological issues.

Reviewer's Comments: Dental practitioners are very often in a good position to assess growth and development of adolescents and direct appropriate referrals. This review is interesting in that it also addresses psychological issues that may often accompany delayed puberty, particularly in males, and even more specifically those involved in team sports. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Puberty, Endocrinology

Print Tag: Refer to original journal article

When a Wheeze Is More Than a Wheeze

Children With Nocturnal Asthma Wheeze Intermittently During Sleep.

Boner AL, Piancentiti GL, et al:

J Asthma 2010; 47 (April): 290-294

Some asthmatic children have significant wheezing at night.

Background: A hallmark of asthma is the nocturnal wheeze. Correspondingly, children with significant nocturnal wheeze may also exhibit daytime reduced pulmonary function, which is known as “morning dipping” and this may be reflective of asthma severity.

Objective: To evaluate the relationships of clinical asthma status, nocturnal wheezing, and chief complaint according to subject.

Design: Prospective case-control series.

Participants: 9 children aged 9 to 16 years with a confirmed asthma diagnosis.

Methods: During the week prior to the nocturnal study period, children kept an asthma diary outlining day and nighttime symptoms and limitations on activity on a 0 to 3 scale. Peak expiratory flow measurements were taken twice daily (each evening and each morning). Lung function was measured the night before and the morning of the study.

Results: In 2 children, there was no objective wheeze, and no nocturnal symptoms along with normal function testing. Of children, 3 had what was termed “considerable” overnight wheeze for up to 87 minutes. There was a significant relationship between diary score and nocturnal wheezing, and with nocturnal wheeze and pulmonary expiratory measurements. All children who had nocturnal wheezing had so in episodic periods, with none having continuous wheeze.

Conclusions: Nocturnal wheeze is a significant issue with asthmatic children and is poorly associated with estimates of control.

Reviewer's Comments: Asthma is a challenging illness which has a very disparate phenotype. This study's major shortcoming was the very small number. The methodology seemed appropriate, although one can call into question the recall bias/reliability of the asthma diary kept by a 13-year old. Finally, an analytical difficulty with this study is the fact that using a mean for a small number is subject to the influence of outliers. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Asthma, Wheezing

Print Tag: Refer to original journal article

Confusion Behind Pediatric Food Allergies

Diagnosing and Managing Common Food Allergies: A Systematic Review.

Chafen JJ, Newberry SJ, et al:

JAMA 2010; 303 (May 12): 1848-1856

While there is a significant volume of literature on food allergies, it is disparate in diagnosis techniques and clinical recommendations.

Background: Despite the significant impact food allergies may have on families, currently the only licensed treatments address symptoms and outcomes of anaphylaxis, not the allergies themselves. Food allergies may be immunoglobulin E (IgE) and non-IgE mediated and the literature on them is largely case-based with poor consensus on the most effective diagnostic and therapeutic measures to address them.

Objective: To examine the prevalence, diagnosis, management, and prevention of allergies to: cow's milk, hen's egg, peanut, tree nut, fish, and shellfish.

Design: Literature review.

Methods: The review consisted of material from 4 databases including: PubMed, Cochrane, and Cochrane Central Register of Controlled Trials. Searches were restricted to English language articles between 1988 and 2009. Medical Subject Heading terms included: food hypersensitivity, food allergy, cow milk, peanut, oral allergy syndrome, and anaphylaxis.

Results: The search returned 12,378 titles from which 1,216 went full review and 182 met full inclusion criteria. Because the searches were restricted to specific food allergies, the final result was 72 studies. There is no universally-accepted definition for food allergy, although 87% of responses did include the phrase "immune response." Only 45% addressed specific food items, and 49% distinguished them from food intolerance or toxin-mediated reactions. Pooled estimates for allergies were: cow's milk (3.50%), egg (1.30%), shellfish (1.10%), peanut (0.75%), and fish (0.60%). Although there was no one, uniform "best way" to diagnose food allergies, the most common were atrophy patch testing and serum food-specific IgE determinations. Primary therapy was elimination diets.

Conclusions: While there is a significant volume of literature on food allergies, it is disparate in diagnosis techniques and clinical recommendations.

Reviewer's Comments: Food allergy affects a relatively small (<10%) number of children, but can have significant clinical impacts. An example is that peanut allergies, which affect approximately 1% of children, has had a monumental impact on the school cafeteria and lunch programs. This review demonstrated that evidence for therapies and diagnosis techniques is inconsistent and depends largely on who you choose to read. (Reviewer-S. Thikkurissy, DDS).

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Keywords: Food Allergy, Anaphylaxis

Print Tag: Refer to original journal article