

2018 ANNUAL SEMINAR NASHVILLE, TENN.

# Special Care Advocates in Dentistry 2018 Lit. Review

(SAID's Search of Dental Literature  
Published in Calendar Year 2017\*)



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Recent journal articles related to oral health care  
for people with mental and physical disabilities.

Search Program = PubMed

Database = Medline

Journal Subset = Dental

Publication Timeframe = Calendar Year 2017\*

Language = English

SAID Search-Term Results = 1142

Initial Selection Result = 403 articles

Final Selection Result = 161 articles

### SAID Search-Terms Employed:

- |                                    |                                 |
|------------------------------------|---------------------------------|
| 1. Intellectual disability         | 21. Protective devices          |
| 2. Mental retardation              | 22. Moderate sedation           |
| 3. Mental deficiency               | 23. Conscious sedation          |
| 4. Mental disorders                | 24. Analgesia                   |
| 5. Mental health                   | 25. Anesthesia                  |
| 6. Mental illness                  | 26. Dental anxiety              |
| 7. Dental care for disabled        | 27. Nitrous oxide               |
| 8. Dental care for chronically ill | 28. Gingival hyperplasia        |
| 9. Special Needs Dentistry         | 29. Gingival hypertrophy        |
| 10. Disabled                       | 30. Autism                      |
| 11. Behavior management            | 31. Silver Diamine Fluoride     |
| 12. Behavior modification          | 32. Bruxism                     |
| 13. Behavior therapy               | 33. Deglutition disorders       |
| 14. Cognitive therapy              | 34. Community dentistry         |
| 15. Down syndrome                  | 35. Access to Dental Care       |
| 16. Cerebral palsy                 | 36. Gagging                     |
| 17. Epilepsy                       | 37. Substance abuse             |
| 18. Enteral nutrition              | 38. Syndromes                   |
| 19. Physical restraint             | 39. Tooth brushing              |
| 20. Immobilization                 | 40. Pharmaceutical preparations |

Program: EndNote X3 used to organize search and provide abstract. Copyright 2009 Thomson Reuters, Version X3 for Windows.

\*NOTE: The American Dental Association is responsible for entering journal articles into the National Library of Medicine database; however, some articles are not entered in a timely manner. Some articles are entered years after they were published and some are never entered

1. *Odontology*. 2017 Jan;105(1):96-102. doi: 10.1007/s10266-016-0238-5. Epub 2016 Mar 17.

Screening tests for predicting the prognosis of oral intake in elderly patients with acute pneumonia.

Oba S(1)(2), Tohara H(3), Nakane A(1), Tomita M(4), Minakuchi S(1), Uematsu H(1).

Many elderly patients with pneumonia have aspiration pneumonia. Therefore they must temporarily abstain from oral intake. However, it is difficult to predict whether or not they will be able to start oral intake. The reason is the standard method to evaluate deglutition about pneumonia patients has not been established. In this study we aimed to develop a simple and convenient method that predicts the prognosis of oral intake as nutrition among elderly patients with acute stage pneumonia. Participants were 77 inpatients fasting due to aspiration risk with acute pneumonia. (86.0 ± 7.7 years; range 68-105 years; men: n = 34, women: n = 43) during September 2011 and August 2013. Their consciousness levels were determined by Glasgow coma scale (GCS) and swallowing function and cough reflex were evaluated by repetitive saliva swallowing test (RSST), modified water swallow test, simple swallowing provocation test and cough test. Oral intake status at discharge was considered as the objective variable, and these tests were considered as explanatory variables. Then receiver operating characteristic (ROC) curve and the area under the curve (AUC) for each was done. From the ROC curve analysis, GCS ≥14 had the largest AUC (0.79) with a sensitivity and specificity of 0.71 and 0.80. That was followed by RSST ≥1, AUC (0.77) with a sensitivity and specificity of 0.81 and 0.67. These results suggest that GCS and RSST could be useful screening tests for prognostic prediction of oral intake capability in elderly patients with acute pneumonia.

2. J Dent Child (Chic). 2017 Jan 15;84(1):39-43.

Enamel Pit Defects and Taurodontism in a Patient with Ring Chromosome 14 and 47,XXX.

Townsend JA(1), Lacour L(2), Scheuerle AE(3).

The purpose of this paper is to describe the clinical findings and management of a case involving a patient with co-occurring ring chromosome 14 syndrome and 47,XXX presenting with enamel pit defects and taurodontism. Ring chromosome 14 syndrome is an unusual condition with uncontrolled seizure disorder as its most significant finding; 47,XXX (trisomy X; triple X) is a more common condition and has characteristic physical and behavioral findings. Neither condition has been associated with enamel pit defects.

3. Braz Oral Res. 2017 Sep 28;31:e79. doi: 10.1590/1807-3107BOR-2017.vol31.0079.

Caries experience and salivary aspects in individuals with fragile X syndrome.

Amaral COFD(1), Straioto FG(1), Napimoga MH(2), Martinez EF(3).

Fragile X syndrome (FXS) is the most common cause of hereditary mental retardation, but studies on the oral health condition of these patients are rare.

The aim of this study was to determine the experience of dental caries in individuals with FXS, by examining the saliva profile, oral hygiene, socioeconomic characteristics and use of controlled drugs in these patients.

Dental health was estimated using the decayed, missing and filled teeth index (DMF-T) and sialometry, and the pH value and buffering capacity of the saliva, colony forming units of *S. mutans* (CFU/mL), visible biofilm index, and socioeconomic status were all examined. The sample, comprising 23 individuals, had an average age of  $17.3 \pm 5.6$  years, a DMF-T index of 5.5, a diminished salivary flow (78.3%), and a low (73.9%) saliva buffering capacity. Most (52.2%)

individuals presented with a high abundance (CFU/mL) of *S. mutans*. The experience of caries was correlated with salivary parameters, poor oral hygiene, lower socioeconomic status and an increased count of *S. mutans* in saliva.

4. *Orthod Craniofac Res.* 2017 May;20(2):65-70. doi: 10.1111/ocr.12139. Epub 2017 Feb 16.

Dental development in Down syndrome and healthy children: a comparative study using the Demirjian method.

van der Linden MS(1), Vucic S(2), van Marrewijk DJF(1), Ongkosuwito EM(2).

**OBJECTIVE:** In children with Down syndrome, the timing of dental eruption is important for orthodontics treatment planning. Aim of this study was to determine whether tooth eruption and development of the dentition in children with Down syndrome are impaired.

**MATERIAL AND METHODS:** Dental development was scored on orthopantomograms (OPTs) of 95 children with Down syndrome. The dental age was determined at the left mandibular side according to the Demirjian method and by converting the assigned scores to the dental maturity score. Dental development scores of control children and DS children were compared with a mixed model linear regression analysis.

**RESULTS:** The model showed statistically significant changes relating to increasing age ( $P < 0.001$ ) and gender ( $P < 0.05$ ). In this comparison, the total DS group (with and without hypodontia) was not statistically significantly different from the control group. There was also no significant difference between the total sample of DS children and the control group after using the Nyström imputation (with and without hypodontia).

**CONCLUSION:** The findings showed that dental development in DS children is similar

to the development of control children and that a relationship exists between hypodontia and dental development. The clinically observed late eruption is probably not due to late dental development but due to the other processes that take place during eruption, such as the possible impaired processes at the apical side and the occlusal side of an erupting element.

5. J Oral Sci. 2017 Mar 31;59(1):39-46. doi: 10.2334/josnusd.16-0325. Epub 2016 Dec 28.

Five-year longitudinal study of dental caries risk associated with *Streptococcus mutans* and *Streptococcus sobrinus* in individuals with intellectual disabilities.

Oda Y(1), Hayashi F, Wakita A, Nagatani Y, Okada M.

*Streptococcus mutans* (*S. mutans*) and *Streptococcus sobrinus* (*S. sobrinus*) are important etiologic agents in human dental caries. Using quantitative real-time polymerase chain reaction assays for the presence of those strains, we examined 145 outpatients with intellectual disability (ID), calculated the proportion of each of these strains to total bacteria, and compared dental caries incidence over 5 years. Plaque samples were collected from all erupted tooth sites, and dental examinations were performed annually to determine numbers of decayed, missing, and filled teeth (DMFT score; World Health Organization caries diagnostic criteria). Elevated DMFT scores were calculated as  $\Delta$ DMFT, and sites of newly affected caries ( $\Delta$ SNAC) were identified. Sixty-six patients had both strains. The proportion of *S. mutans* to total bacteria was moderately correlated with DMFT in year 2,  $\Delta$ DMFT in years 2 and 5, and  $\Delta$ SNAC in years 2 and 5 (correlation coefficient = 0.470,  $P < 0.001$ ), while the proportion of *S. sobrinus* to total bacteria was moderately correlated with DMFT in years 2 and 5,  $\Delta$ DMFT in years 1, 2, and 5, and  $\Delta$ SNAC in years 2 and 5 (correlation coefficient = 0.695,  $P$

< 0.001). Individuals with ID who harbored both bacterial strains had a higher risk of dental caries and a significantly higher proportion of *S. sobrinus* to total bacteria.

6. Spec Care Dentist. 2017 Mar;37(2):107-110. doi: 10.1111/scd.12213. Epub 2016 Dec

Dental caries and associated factors in twins with Down syndrome: a case report.

Moreira MJ(1), Schwertner C(1), Dall'Onder AP(2), Klaus NM(2), Parolo CC(3), Hashizume LN(4).

Down syndrome (DS) is the most common genetic disorder in humans, but its incidence in monozygotic twins is extremely rare. The aim of this study was to determine the factors associated with dental caries in a pair of monozygotic twin girls with DS, where one had caries experience and the other did not. Clinical examination, salivary *Streptococcus mutans* (*S. mutans*) levels and their genotypic diversity, the biochemical composition of the dental biofilm, the frequency of sucrose consumption, and toothbrushing habits were assessed from the twin girls. Twin with caries experience showed higher levels of *S. mutans* in the saliva and lower concentrations of calcium, phosphate, and fluoride and higher concentrations of extracellular polysaccharides in the biofilm compared to her sister. Genotypic diversity of *S. mutans* was also higher in the twin with caries experience. Dental biofilm composition showed different patterns of cariogenicity between the two sisters, which may also by itself explain the difference in the dental caries between them.

7. Spec Care Dentist. 2017 Mar;37(2):93-98. doi: 10.1111/scd.12210. Epub 2016 Nov 2.

The feasibility of office-based propofol sedation for dental care in patients with intellectual disability by sedation practitioners.

Vaessen HH(1), Schouten AN(2), van der Hoeve H(3), Knape JT(4).

**BACKGROUND:** The quality of oral health care for intellectually disabled patients is a significant challenge due to behavioral issues. Intravenous propofol sedation may be useful to relieve the anxiety and fear, and make dental procedures more acceptable. The aim of this study was to evaluate the safety and effectiveness of propofol sedation, by trained nonmedical sedation practitioners, during dental treatments in an office-based setting.

**METHODS:** Intellectually disabled patients (124) were subjected to restorative dental procedures and moderately sedated using intravenous propofol. Vital signs, cooperation of the patient, and sedation depth were continuously assessed.

**RESULTS:** Propofol sedation was effective for dental treatment. All procedures resulted in a sufficient level of sedation without moderate or severe complications.

**CONCLUSION:** Propofol sedation can be safely and effectively performed in an office-based setting by sedation practitioners, who have experience in propofol sedation and are trained in the care of patients with disabilities.

8. Spec Care Dentist. 2017 Mar;37(2):102-106. doi: 10.1111/scd.12200. Epub 2016 Sep 19.

Dental treatment of a patient with Opitz G/BBB syndrome.

Giovani ÉM(1), Marinho KC(2), Andia-Merlin R(3).

Opitz G/BBB syndrome is a genetic condition characterized by several abnormalities along the midline of the body, such as hypertelorism, craniofacial deformities, and dysphagia. This study reports the clinical features of Opitz syndrome and its importance in the knowledge of patients who are developmentally challenged as a whole, in order to establish adequate dental treatment for a certain clinical case. A 19-year-old patient visited the Paulista University for

a dental treatment. The extraoral examination revealed ocular hypertelorism (wide-spaced eyes), oblique eyelids, epicanthus, low-set cart, and intellectual disability. During the intraoral examination, large caries lesions were observed surrounding the braces of the fixed orthodontic appliance and poor oral hygiene. Preventive and restorative treatments were carried out. It was concluded that the knowledge of patients with special needs as a whole is mandatory for an adequate dental treatment. This is a case report that highlights the importance of dentist and interdisciplinary care attendance for all patient systems, the examination and analyses should not be restricted to the oral cavity.

9. J Prosthodont Res. 2017 Jan;61(1):61-66. doi: 10.1016/j.jpor.2016.04.005. Epub 2016 May 8.

Why do edentulous adults with intellectual disabilities not wear dentures? Wave 2 of the IDS TILDA cohort study.

Mac Giolla Phadraig C(1), Nunn J(2), Carroll R(3), McCarron M(3), McCallion P(4).

PURPOSE: Older adults with intellectual disabilities (ID) are often edentulous.

When total tooth loss occurs, they are very unlikely to wear complete removable dentures (CRDs) to restore oral function in Ireland. The reasons for this are unclear, though opinion holds that this is because dentists do not offer prosthodontic treatment to this group. In this study we ask edentulous older adults with ID why they do not wear dentures.

METHODS: Cross-sectional survey data from Wave 2 of the Intellectual Disability Supplement to The Irish Longitudinal Study on Ageing (IDS-TILDA) was examined to study reported denture wear among edentulous older adults with ID.

RESULTS: Out of 692 participants, 186 were edentulous (26.9%), of whom 57 (30.6%) wore CRDs and 129 (69.3%) did not. Twelve of this 129 had dentures but did not

wear them. Of the 117 respondents who reported that they did not have dentures, 99 (valid %=92.5%) did not want dentures, while only 8 did. No respondents in this study reported that they were denied denture therapy. Rather, they simply did not want dentures. Clinicians should understand that extra steps may be needed to ensure that consent is truly informed when patients opt for, or decline, complete denture therapy.

**CONCLUSION:** While there is a high normative need for prosthodontic rehabilitation, expressed need is low. Extra steps may be necessary to ensure optimal outcomes for people with ID.

10. J Appl Oral Sci. 2017 May-Jun;25(3):250-257. doi: 10.1590/1678-7757-2016-0241.

Salivary density of *Streptococcus mutans* and *Streptococcus sobrinus* and dental caries in children and adolescents with Down syndrome.

Scalioni F(1), Carrada C(2), Machado F(3), Devito K(4), Ribeiro LC(5), Cesar D(6), Ribeiro R(1).

**Objective:** To assess and compare dental caries experience and salivary *S. mutans*, *S. sobrinus*, and streptococci counts between groups of Down syndrome and non-Down syndrome children and adolescents.

**Material and Methods:** This study included a sample of 30 Down syndrome children and adolescents (G-DS) and 30 age- and sex-matched non-Down syndrome subjects (G-ND). Dental caries experience was estimated by the number of decayed, missing, and filled teeth in the primary dentition and the permanent dentition.

Unstimulated whole saliva samples were collected from all participants. The fluorescence in situ hybridization technique was used to identify the presence and counts of the bacteria. The statistical analysis included chi-square, Student's t-test and Spearman's correlation.

Results: The G-DS exhibited a significantly higher caries-free rate ( $p < 0.001$ ) and a lower *S. mutans* salivary density ( $p < 0.001$ ). No significant differences were found in the salivary densities of *S. sobrinus* or streptococci between the groups ( $p = 0.09$  and  $p = 0.21$ , respectively). The salivary *S. mutans* or *S. sobrinus* densities were not associated with dental caries experience in neither group.

Conclusion: The reduced dental caries experience observed in this group of Down syndrome children and adolescents cannot be attributed to lower salivary *S. mutans* densities, as determined with the fluorescence in situ hybridization technique.

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11. J Dent Res. 2017 Nov;96(12):1361-1369. doi: 10.1177/0022034517716913. Epub 2017 Jun 29.

Oral and Craniofacial Anomalies of Bardet-Biedl Syndrome: Dental Management in the Context of a Rare Disease.

Panny A(1), Glurich I(1), Haws RM(2), Acharya A(1).

Standardized guidelines for the oral health management of patients with rare diseases exhibiting morphologic anomalies are currently lacking. This review considers Bardet-Biedl syndrome (BBS), a monogenic autosomal recessive nonmotile ciliopathy, as an archetypal condition. Dental anomalies are present in a majority of individuals affected by BBS due to abnormal embryonic orofacial and tooth development. Genetically encoded intrinsic oral structural anomalies and heterogeneous BBS clinical phenotypes and consequent oral comorbidities confound oral health management. Since the comorbid spectrum of BBS phenotypes spans diabetes, renal disease, obesity, sleep apnea, cardiovascular disease, and cognitive disorders, a broad spectrum of collateral oral disease may be encountered. The genetic impact of BBS on the anatomic development of oral components and oral pathology encountered in the context of various BBS phenotypes and their associated comorbidities are reviewed herein. Challenges encountered in managing patients with BBS are highlighted, emphasizing the spectrum of oral pathology associated with heterogeneous clinical phenotypic expression. Guidelines for provision of care across the spectrum of BBS clinical phenotypes are considered. Establishment of integrated medical-dental delivery models of oral care in the context of rare diseases is emphasized, including involvement of caregivers in the context of managing these patients with special needs.

12. Eur J Paediatr Dent. 2017 Mar;18(1):23-26. doi: 10.23804/ejpd.2017.18.01.05.

Dental trauma in Italian children and adolescents with special health care needs.

A cross-sectional retrospective study.

Bagattoni S(1), Sadotti A(1), D'Alessandro G(1), Piana G(1).

**AIM:** Dental trauma is a frequent finding in people with special health care needs. The aim of this study was to determine the prevalence of dental trauma in a sample of Italian children and adolescents with special health care needs.

**MATERIALS AND METHODS:** 556 medical and dental records of children and adolescents visited from January 2010 to March 2015 were examined. Information about medical diagnosis, gender, site and type of dental trauma (DT) were collected. According to age and reflecting the dentition stage, the sample was divided into 3 groups: subjects aged 0-5 years (group A, primary dentition), 6-11 years (group B, mixed dentition), 12-18 years (group C, permanent dentition).

**RESULTS:** 113 individuals experienced a DT (prevalence 20.3%), with no difference in relation to gender. Individuals with cerebral palsy and autism showed the highest frequency of DT: 39.6% and 30.4%, respectively. The highest frequency of DT occurred both in group A (21.8%) and B (21.5%), which differed significantly from group C (9%). Avulsion was the most frequent type of DT in the primary dentition (24%) and enamel-dentin fracture without pulp exposure in the permanent dentition (60%). Upper central incisors were the most affected teeth.

**CONCLUSION:** The prevalence of DT in a sample of Italian children and adolescents with special health care needs is high, especially in young individuals with cerebral palsy and autism. Preventive strategies for those patients should be developed in order to reduce the risk of DT.

13. Periodontol 2000. 2017 Jun;74(1):7-10. doi: 10.1111/prd.12187.

Interdisciplinary periodontics: the multidisciplinary approach to the planning and treatment of complex cases.

Lyons KM, Darby I.

Periodontics cannot be practiced in isolation as frequently many patients have multiple dental needs or medical health issues requiring management. In addition, pathology may manifest in the periodontal tissues, and the onset and progression of periodontitis can be affected by systemic conditions, such as diabetes, and vice versa. The focus of this volume of Periodontology 2000 is interdisciplinary periodontics, and the articles included discuss the interactions and the interrelationship between periodontal tissues/periodontal diseases and endodontics, fixed prosthodontics, implant dentistry, esthetics, gerodontology, radiology, orthodontics, pediatric dentistry, oral and maxillofacial surgery, oral pathology, special needs dentistry and general medicine. Previous volumes of Periodontology 2000 have covered some of the interactions between periodontal diseases and other dental disciplines, especially implant dentistry, 'and the interaction between periodontal disease and systemic disease', but there has not been a volume on interdisciplinary periodontics. The intention therefore is to show how and why periodontics should be interdisciplinary, as well as the

benefits of an interdisciplinary approach; in addition, the potential consequences of using a discipline in isolation are discussed.

14. *Periodontol 2000*. 2017 Jun;74(1):182-193. doi: 10.1111/prd.12198.

Periodontal disease and the special needs patient.

Brown LF, Ford PJ, Symons AL.

Individuals with special needs are at more risk of dental disease, including periodontal diseases, and have a greater prevalence and incidence of periodontal diseases than the rest of the population. Genetic or medical conditions, and/or the use of prescription medication or recreational substances, may further increase the risk for susceptibility to periodontal disease. The success of preventing or controlling periodontal diseases amongst this group of patients has not been established. Even those individuals who access regular and comprehensive dental care appear to develop periodontal diseases as they age, and this development occurs at a rate comparable to the natural history of the disease. The reasons behind the lack of success of interventions in reducing the incidence of periodontal diseases are complex and part of the lack of success may relate to the professional challenges in treating individuals with special needs.

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15. Eur Arch Paediatr Dent. 2017 Apr;18(2):127-133. doi: 10.1007/s40368-017-0274-z.

Epub 2017 Mar 1.

Frontonasal dysplasia: oral features, restorative and orthodontic dental treatment in a child.

Valério RA(1)(2), Scatena C(3), Santos FR(3), Romano FL(3), Queiroz AM(3), Paula-Silva FW(3).

**BACKGROUND:** Frontonasal dysplasia is a complex rare malformation, characterised by abnormalities involving the central portion of the face, especially the eyes, nose and forehead. It can manifest independently or associated with other abnormalities as part of some syndromes.

**CASE REPORT:** The purpose of this case report was to describe a 5-year-old patient, diagnosed with frontonasal dysplasia. Among the abnormalities characterised with this disorder were ocular hypertelorism, broad nose tip with median notch, median facial cleft, bifid anterior skull, low set hairline, Poland's syndactyly and ankyloglossia.

**TREATMENT:** Consisted of behavioural management, oral hygiene instruction, prophylaxis, topical fluoride application, extraction of primary teeth, composite resin restorations and sealants in pits and fissures. Preformed metal crowns were also applied to the right and left primary maxillary second molars.

**FOLLOW-UP:** Currently, the patient is 11 years-old in the permanent dentition and

therefore was referred for corrective orthodontic and periodontal treatments due to the persistence of gingival retraction of the permanent mandibular right central incisor.

**CONCLUSION:** The treatment in this case was directed to the promotion of oral health and orthodontic corrections, which are of fundamental importance due to medical, physical and social limitations of children affected by this syndrome, hindering healing and rehabilitative treatment. Paediatric dentists should be included in multidisciplinary teams providing care to patients with special needs, improving their quality of life.

16. Oral Health Prev Dent. 2017;15(1):23-32. doi: 10.3290/j.ohpd.a37710.

Fact or Fiction? Powered Toothbrushing is More Effective than Manual Toothbrushing.

Goh EX, Lim LP.

**PURPOSE:** To answer the question of whether powered toothbrushing is more effective than manual toothbrushing, this paper reviews various aspects of powered toothbrushes in terms of efficacy, safety, acceptability and special considerations for certain patient groups. Future research directions and gaps in the current knowledge are also discussed.

**MATERIALS AND METHODS:** The literature review was conducted using PubMed. A hand search of the references of the retrieved articles was also performed.

RESULTS: Powered toothbrushes have been found to be as effective as manual toothbrushes in removing plaque and reducing gingival inflammation. They are safe with no adverse effects on hard or soft tissues. Among the powered toothbrushes, there is evidence to suggest that rotation-oscillation toothbrushes may be more effective than others. The results seem to suggest that certain special-needs patient groups, such as the elderly and the disabled, may benefit from the use of powered toothbrushes.

CONCLUSION: Powered toothbrushes are as effective as manual toothbrushes in facilitating oral hygiene. They may be recommended for certain patient groups to improve the efficacy of oral hygiene measures. More data on the safety and acceptability of powered toothbrushes are necessary.

17. J Oral Rehabil. 2017 Apr;44(4):237-243. doi: 10.1111/joor.12490. Epub 2017 Feb 28.

Examination of factors affecting the intraoral perception of object size: a preliminary study.

Tomita K(1), Murakami K(1), Takahashi M(1), Ooka T(2), Hironaka S(1).

Oral sensory function is essential for the successful performance of a range of ingestion. Although the perception of object size is important in determining the degree of manipulation, evidence suggests that people does not always perceive the size of the object in oral cavity accurately. The purpose of this study was

to investigate the factors affecting the intraoral perception of object size.

Twenty-three healthy young volunteers detected the size of cylinders inserted into oral cavity blindly and identified it from the reference set. The diameter of cross section varied from 10 to 14 mm in a gap of 1 mm and had three different temperatures (5, 36, 50 °C) in each. The perceived size was recorded, and the difference with the actual size was assessed. The required time for identification was also measured and compared between gender and between temperatures. The results demonstrated that the direction of size illusion was significantly affected by the required time for identification. Long manipulation led to overestimation, and short manipulation led to underestimation of object size irrespective of temperature and size. Gender was the other factor affecting intraoral size perception. The rate of overestimation was low in female participants comparing with male participants in this experiment, although the number of participants was limited. We therefore concluded that in order to detect the other factors affecting intraoral size perception, regulating oral manipulation time is indispensable.

18. J Oral Rehabil. 2017 Feb;44(2):96-104. doi: 10.1111/joor.12458. Epub 2016 Nov 28.

Prognostic factors of single-visit endodontic and restorative treatment under general anaesthesia for special needs patients.

Chang J(1), Kim HY(2)(3).

The aim of this study was to evaluate the longevity of teeth with single-visit endodontic and restorative treatment under general anaesthesia (GA) for special needs patients and to investigate factors associated with survival and success. Data were collected from 381 teeth in 203 patients [mean (s.d.) age = 27·0 (14·1)]. All endodontic and restorative procedures were performed during a single GA session except for cementation of crowns in the cases requiring crown restoration (38%). A total of 267 teeth (70·6%) were followed-up for 6-81 months [mean (s.d.): 32·7 (20·0)]. Patients and teeth with and without follow-up were compared. Kaplan-Meier analysis with generalised Wilcoxon test was used to compare the mean survival and success period. Cox proportion hazard regression model was applied for multivariate analysis. At the end of the observation period, 10 teeth had a crown fracture (5-year survival rate = 89·8%), and an additional 10 teeth had primary or secondary caries (5-year success rate = 86·4%). Risk factors associated with survival were age (>40), non-parental caregiver, cooperation level and periodontal disease. A soft diet was an additional risk factor against the success of teeth. Single-visit endodontic and restorative treatment under GA showed favourable outcomes, suggesting a promising treatment option for special needs patients. Patient- and dental-specific circumstances need to be carefully considered to enhance the longevity of reconstructed teeth.

19. J Public Health Dent. 2017 Dec;77(1):78-85. doi: 10.1111/jphd.12184. Epub 2016 Nov 12.

Saskatchewan's school-based dental program staffed by dental therapists: a retrospective case study.

Mathu-Muju KR(1), Friedman JW(2), Nash DA(3).

**OBJECTIVES:** The poor oral health of Saskatchewan's children, in concert with a significant shortage of dentists, prompted the province in the early 1970s to seek an alternative method of addressing the oral health care needs of children. The result was the Saskatchewan Health Dental Plan (SHDP), which trained and employed dental therapists in school-based clinics to provide basic dental care to all children. The program was initiated over the opposition of Saskatchewan's dentists. The purpose of this research was to provide information and data previously not documented in the refereed dental literature regarding the only school-based program staffed by dental therapists to ever exist in North America.

**METHODS:** This case study reviews the program's planning, opposition, implementation, and achievements based on a comprehensive review of published articles as well as a search of the grey literature. Additionally, Saskatchewan Health provided annual reports for each year of the program's existence.

**RESULTS:** During its thirteen years of existence, the school-based program proved popular with parents and achieved significant success in providing necessary dental care for children. It was terminated in 1987 by the newly elected provincial Conservative government, which was not supportive of such social

programs.

CONCLUSIONS: The SHDP serves as a successful model of school-based dental care for children. However, the termination of the plan demonstrates the vulnerability of publicly funded dental health programs to conflicting political ideologies and special interest groups.

20. Dent Traumatol. 2017 Feb;33(1):51-56. doi: 10.1111/edt.12283. Epub 2016 May 20.

Effect of mouthguards on impact to the craniomandibular complex.

Tanaka Y(1), Tsugawa T(1), Maeda Y(1).

BACKGROUND: The aim of this study was to investigate the effect of wearing a mouthguard and teeth-clenching on impact to the head and temporomandibular joint (TMJ) during a blow to the jaw.

MATERIAL AND METHODS: A custom-made mouthguard was fabricated for five participants. A 4.1-N impact load was applied to the chin with a pendulum. Two acceleration sensors were attached to the forehead and left TMJ. The amplitudes and durations of the accelerations were obtained under five conditions: mouth-open without mouthguard; light teeth-clenching without mouthguard; maximum voluntary clenching (MVC) without mouthguard; mouth-open with mouthguard and MVC with mouthguard.

RESULTS: Wearing a mouthguard led to significant decreases in the amplitude (mouth-open with mouthguard vs mouth-open without mouthguard,  $P = 0.035$  at forehead,  $P = 0.022$  at TMJ) and duration (mouth-open with mouthguard vs

mouth-open without mouthguard,  $P = 0.043$  at forehead, not significant at TMJ).

Similarly, teeth-clenching caused significant decreases in the amplitude (mouth-open without mouthguard vs MVC without mouthguard,  $P = 0.024$  at forehead,  $P = 0.025$  at TMJ) and duration (mouth-open without mouthguard vs MVC without mouthguard,  $P = 0.033$  at forehead, not significant at TMJ). Furthermore, wearing a mouthguard in itself provided an impact reduction effect similar to the combination of teeth-clenching and wearing a mouthguard.

**CONCLUSIONS:** Wearing a mouthguard and/or teeth-clenching reduced the impact to the head and TMJ during a blow to the jaw. However, it should be noted that the findings are the results from a small impact load to the jaw.

21. Dent Traumatol. 2017 Feb;33(1):57-63. doi: 10.1111/edt.12284. Epub 2016 May 19.

The effect of antagonist tooth contact on the biomechanical response of custom-fitted mouthguards.

Veríssimo C(1), Bicalho AA(1), Soares PB(1), Tantbirojn D(2), Versluis A(3), Soares CJ(1).

**BACKGROUND/AIM:** Custom-fitted mouthguards are devices used to prevent dental injuries. The aim of this study was to verify the influence of the antagonist contact on the stresses and strains of the anterior teeth, shock absorption and displacement of EVA custom-fitted mouthguards during a horizontal impact.

**MATERIALS AND METHODS:** Finite element models of human maxillary central incisors

with and without a mouthguard for different occlusion conditions (with and without antagonist contact) were created based on tomography. A nonlinear dynamic impact analysis using the single-step Houbolt method was performed in which a rigid object hit the model at  $1 \text{ m s}^{-1}$ . Strain and stress were evaluated by means of Von Mises and Critical modified Von Mises criterion and shock absorption during impact were calculated as well as the mouthguard displacement.

**RESULTS:** The model without mouthguard and without antagonist contact showed the highest stress and strain values at the enamel and dentin in the tooth crown on impact compared to the model without mouthguard and with antagonist contact. Mouthguard presence reduced the stress and strain values regardless of the occlusion condition. The mouthguard displacement decreased with the mandibular antagonist contact.

**CONCLUSIONS:** Mouthguards are efficient at decreasing the stress and strain values on the tooth in front of an impact reaching more than 90% of shock absorption. A mouthguard with balanced occlusion and maximum number of contacts with mandibular anterior teeth should be considered because it reduces mouthguard displacement.

22. Braz Dent J. 2017 Jan-Feb;28(1):9-15. doi: 10.1590/0103-6440201701380.

Evaluation of Eye Protection Filters Used with Broad-Spectrum and Conventional LED Curing Lights.

Soares CJ(1), Rodrigues MP(1), Vilela AB(1), Rizo ER(1), Ferreira LB(1), Giannini M(2), Price RB(3).

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The high irradiance and the different emission spectra from contemporary light curing units (LCU) may cause ocular damage. This study evaluated the ability of 15 eye protection filters: 2 glasses, 1 paddle design, and 12 dedicated filters to block out harmful light from a monowave (HP-3M ESPE) and a broad-spectrum (Valo, Ultradent) LED LCU. Using the anterior sensor in the MARC-Patient Simulator (BlueLight Analytics) the irradiance that was delivered through different eye protection filters was measured three times. The LCUs delivered a similar irradiance to the top of the filter. The mean values of the light that passed through the filters as percent of the original irradiance were analyzed using two-way ANOVA followed by Tukey test ( $\alpha = 0.05$ ). The emission spectra from the LCUs and through the filters were also obtained. Two-way ANOVA showed that the interaction between protective filters and LCUs significantly influenced the amount of light transmitted ( $p < 0.001$ ). Tukey test showed that the amount of light transmitted through the protective filters when using the HP-3M-ESPE was significantly greater compared to when using the Valo, irrespective of the protective filter tested. When using the HP-3M-ESPE, the Glasses filter allowed significantly more light through, followed by XL 3000, ORTUS, Google Professional, Gnatus filters. The Valo filter was the most effective at blocking out the harmful light. Some protective filters were less effective at blocking the lower wavelengths of light ( $< 420$  nm). However, even in the worst scenario, the filters were able to block at least 97% of the irradiance.

Effect of Erosion/Abrasion Challenge on the Dentin Tubule Occlusion Using Different Desensitizing Agents.

Canali GD(1), Rached RN(1), Mazur RF(1), Souza EM(1)(2).

The aim of the study was to evaluate dentinal tubule occlusion, measuring the dentin permeability (Lp) and using different desensitizing agents before and after abrasive/erosive challenge. Dentin discs from 42 healthy human third molars were obtained. Minimum Lp was measured after a smear layer simulation using #600 SiC paper and maximum Lp after an immersion in 0.5 M EDTA. The specimens were treated with different desensitizers: two varnishes (Clinpro XT Varnish-CV, Fluor Protector-FP), a paste (Desensibilize Nano P-NP) and a gel (Oxa Gel-OG). The Lp of each specimen was measured immediately after the desensitizers' application. The discs were subjected to erosion/abrasion cycles for 7 days, with 0.5% citric acid solution (6x/day) and tooth brushing (3x/day). Lp was measured after the first, fourth and seventh day of the challenge. The data were analyzed by 3-way ANOVA with repeated measurements and by a Games-Howell test ( $\alpha=5\%$ ). FP and CV did not show significant differences in Lp immediately after application until the 7th day ( $p<0.05$ ). OG showed a significant increase in Lp after the 4th and 7th days. NP resulted in a significantly higher permeability compared to the other materials immediately after the application and after the 1st day of challenge. All the desensitizers reduced the dentin permeability immediately after application. However, only the varnishes were able to maintain the occlusive effect after the erosion/abrasion challenge.

24. J Indian Soc Pedod Prev Dent. 2017 Apr-Jun;35(2):174-180. doi:

10.4103/JISPPD.JISPPD\_319\_16.

Comparison of efficacy of three chemotherapeutic agents on Streptococcus mutans count in plaque and saliva: A randomized controlled triple blind study.

Narayan A(1), Satyaprasad S(2), Anandraj S(3), Ananda SR(4), Kamath PA(5), Nandan S(6).

**BACKGROUND:** There is a need for exploration of the role of chemotherapeutic agents and its role in the prevention of early childhood caries (ECC) and its recurrence.

**AIM:** The aim of this study was two-fold: (1) To compare the antimicrobial efficacy of three commonly used chemotherapeutic agents in the prevention of ECC in comparison with a control and (2) To ascertain the role of chemotherapeutic agents in the prevention of ECC.

**MATERIALS AND METHODS:** Sixty children with ECC in the age group 3-6 years were randomly allocated into four groups. To each group of children after full oral rehabilitation either 10% povidone-iodine (PI), or chlorhexidine (CHX) varnish (Cervitec Plus), or fluoride varnish (Fluor Protector) were applied twice at an interval of 1 week, Group 4 served as control. Streptococcus mutans count in saliva and plaque were collected at baseline, 30, 60, and 90 days and the presence of S. mutans was evaluated using the Dentocult SM strip mutans kit. The

efficacy of 10% PI, CHX varnish (Cervitec Plus), and fluoride varnish (Fluor Protector) was compared with the control group at 30, 60, and 90 days. An intergroup comparison was also done during the same time intervals.

RESULTS: The reduction of *S. mutans* count in the plaque and saliva was greatest in the fluoride varnish treated groups at all time intervals (30, 60, and 90 days). Fluoride varnish, CHX varnish, and 10% PI showed significant improved efficacy when compared to the control group ( $P < 0.001$ ). Fluoride varnish showed significantly lower counts of *S. mutans* compared to CHX varnish at all time intervals (30, 60, and 90 days) and also significantly lower counts compared to 10% PI at 60 and 90 days interval ( $P < 0.001$ ).

25. Br Dent J. 2017 Apr 21;222(8):629-633. doi: 10.1038/sj.bdj.2017.365.

A review of mouthguards: effectiveness, types, characteristics and indications for use.

Parker K(1), Marlow B(1), Patel N(1), Gill DS(1).

Participation in sport carries an increased risk of sustaining dental trauma which can be reduced by the use of a mouthguard. Mouthguards work by dissipating the force of impact, thus reducing the force which is transferred to the dentition. There are different types of mouthguard available which vary in design, costs and the level of protection provided. This article aims to review the use of mouthguards in sport, the common barriers to their use and also the

different types of mouthguards and their characteristics.

26. J Appl Oral Sci. 2017 May-Jun;25(3):258-264. doi: 10.1590/1678-7757-2016-0304.

In situ effect of CPP-ACP chewing gum upon erosive enamel loss.

Alencar CRB(1), Oliveira GC(2), Magalhães AC(3), Buzalaf MAR(3), Machado MAAM(2), Honório HM(2), Rios D(2).

**Objective:** This in situ study investigated the ability of a CPP-ACP chewing gum in preventing erosive enamel loss. **Material and Methods:** During three experimental crossover phases (one phase per group) of seven days each, eight volunteers wore palatal devices with human enamel blocks. The groups were: GI - Sugar free chewing gum with CPP-ACP; GII - Conventional sugar free chewing gum; and GIII - No chewing gum (control). Erosive challenge was extraorally performed by immersion of the enamel blocks in cola drink (5 min, 4x/day). After each challenge, in groups CPP and No CPP, volunteers chewed one unit of the corresponding chewing gum for 30 minutes. Quantitative analysis of enamel loss was performed by profilometry ( $\mu\text{m}$ ). Data were analyzed by Repeated-Measures ANOVA and Tukey's test ( $p < 0.05$ ).

**Results:** The use of chewing gum (CPP and No CPP) resulted in lower erosive enamel loss compared with the control group ( $p < 0.05$ ). CPP-ACP chewing gum (CPP) did not

improve the protection against erosive enamel loss compared with conventional chewing gum (No CPP) ( $p > 0.05$ ).

Conclusion: The CPP-ACP chewing gum was not able to enhance the anti-erosive effect of conventional chewing gum against enamel loss.

27. Prim Dent J. 2017 May 1;6(2):27-34. doi: 10.1308/205016817821281738.

The Role of Mouthguards in Preventing and Reducing Sports-related Trauma.

Green JI.

a mouthguard, also known as a gumshield, mouth protector or sports guard is an appliance that covers the teeth and surrounding mucosa with the aim of preventing or reducing trauma to the teeth, gingival tissue, lips and jaws. The device is usually worn on the maxillary arch and works by separating the maxillary and mandibular dentition, protecting the teeth from the surrounding soft tissue, absorbing or redistributing shock and/or stabilising the mandible during traumatic jaw closure. They may also play a role in preventing and reducing concussion by absorbing impact forces that would otherwise be transmitted through the base of the skull to the brain, although the evidence for this is less conclusive. A mouthguard will usually fall into one of three categories: stock mouthguards (which are made ready to use and are believed to give the least protection), the mouth-formed or 'boil and bite' type (which are heated in hot water, placed in the mouth and moulded to the teeth) and custom-made mouthguards

(which are usually made on a stone model of the maxillary teeth and surrounding tissue and are thought to give the most protection). These devices can be made from various materials but ethylene-vinyl acetate is by far the most popular material, probably because of the ease with which it can be used for the production of custom-made mouthguards. This paper gives a review of the role of mouthguards in preventing and reducing sports-related trauma and examines the materials that are used to fabricate them.

28. J Oral Rehabil. 2017 Jan;44(1):43-50. doi: 10.1111/joor.12459. Epub 2016 Dec 2.

Effect of a new treatment protocol called Functional Chewing Training on chewing function in children with cerebral palsy: a double-blind randomised controlled trial.

Serel Arslan S(1), Demir N(1), Karaduman AA(1).

Cerebral palsy (CP) is a group of permanent sensorimotor impairments. Children with CP have various feeding difficulties including chewing disorder, which may affect their nutritional status. Functional Chewing Training (FuCT) was designed as a holistic approach to improve chewing function by providing postural alignment, sensory and motor training, and food and environmental adjustments. This study aimed to investigate the effect of FuCT on chewing function in children with CP. This study was designed as a double-blind, randomised

controlled trial. Eighty CP children with chewing disorder were randomised and split between the FuCT group (31 males, 19 females; mean age  $3.5 \pm 1.9$  years) and the control group (16 males, 14 females;  $3.4 \pm 2.3$  years) receiving traditional oral motor exercises. Each group received the training programme for 12 weeks with weekly follow-up and with two evaluations at baseline and end of 12 weeks. Chewing function was evaluated by analysing video recordings and scored with the Karaduman Chewing Performance Scale (KCPS). The Behavioral Pediatrics Feeding Assessment Scale (BPFAS) was used to evaluate feeding behaviours of children. A significant improvement was observed in KCPS scores at 12 weeks after training in the FuCT group ( $P < 0.001$ ), but no change was found in the control group ( $P = 0.07$ ). A significant improvement was detected in all parameters of BPFAS at 12 weeks after training in the FuCT group ( $P < 0.001$ ) and in four parameters of BPFAS in the control group ( $P = 0.02$ ,  $P = 0.02$ ). FuCT is an effective method to improve chewing function compared with traditional oral motor exercises.

29. Arch Oral Biol. 2017 Jan;73:16-20. doi: 10.1016/j.archoralbio.2016.08.035. Epub 2016 Sep 1.

Differences between the activity of the masticatory muscles of adults with cerebral palsy and healthy individuals while at rest and in function.

Matsui MY(1), Giannasi LC(2), Batista SR(2), Amorim JB(2), Oliveira CS(3), Oliveira LV(3), Gomes MF(2).

**OBJECTIVE:** The aim of the present study was to compare the electromyographic activity of masticatory muscles of adult patients with different degrees of oral motor impairment (cerebral palsy) with the electromyographic activity of healthy individuals in a control group. Electromyographic activity was compared when the masticatory muscles were at rest and in motion.

**DESIGN:** Thirty adult patients with cerebral palsy and 30 subjects without neuromotor disorders were enrolled in the present study. Oral motor function impairment was classified for each subject according to the Orofacial Motor Function Assessment Scale. Surface electromyography was bilaterally recorded in the masseter and anterior temporalis muscles at rest, during maximal voluntary clench and mouth opening. Comparisons between the groups were statistically assessed using Mann-Whitney test.

**RESULTS:** At rest and mouth opening, electromyographic values were higher among patients with cerebral palsy than control group. During maximal voluntary clench, the opposite occurred. The degree of oral motor impairment affected mouth opening.

**CONCLUSION:** There are significant differences in masticatory muscle activity between adult patients with CP and healthy individuals, and the degree of oral motor impairment is important.

**SIGNIFICANCE:** To improve the masticatory function of these patients, muscle therapy should approach rest, mouth opening and clenching differently.

30. J Oral Rehabil. 2017 Apr;44(4):251-260. doi: 10.1111/joor.12489.

Oro-facial functions in experimental models of cerebral palsy: a systematic

review.

Lacerda DC(1), Ferraz-Pereira KN(2), Bezerra de Morais AT(3), Costa-de-Santana BJ(4), Quevedo OG(5), Manhães-de-Castro R(6), Toscano AE(7).

Children who suffer from cerebral palsy (CP) often present comorbidities in the form of oro-facial dysfunctions. Studies in animals have contributed to elaborate potential therapies aimed at minimising the chronic disability of the syndrome. To systematically review the scientific literature regarding the possible effects that experimental models of CP can have on oro-facial functions. Two independent authors conducted a systematic review in the electronic databases Medline, Scopus, CINAHL, Web of Science and Lilacs, using Mesh and Decs terms in animal models. The motor and sensory parameters of sucking, chewing and swallowing were considered as primary outcomes; reactivity odour, controlled salivation, postural control, head mobility during feeding and the animal's ability to acquire food were secondary outcomes. Ten studies were included in the present review. Most studies used rabbits as experimental models of CP, which was induced by either hypoxia-ischemia, inflammation or intraventricular haemorrhage. Oro-facial functions were altered in all experimental models of CP. However, we found more modifications in hypoxia-ischemia models overall. On the other hand, the model of inflammation was more effective to reproduce higher damage for coordinating sucking and swallowing. All of the CP experimental models that were assessed modified the oral functions in different animal species. However, further studies should be conducted in order to clarify the mechanisms underlying oro-facial damage in order to optimise treatment strategies for children who suffer from CP.

31. Med Oral Patol Oral Cir Bucal. 2017 Jan 1;22(1):e88-e94.

Use of the universal pain assessment tool for evaluating pain associated with TMD in youngsters with an intellectual disability.

Dugashvili G(1), Van den Berghe L, Menabde G, Janelidze M, Marks L.

**BACKGROUND:** The Universal Pain Assessment Tool (UPAT) was used to assess the level of pain in people with limited communication skills. The UPAT enables clinicians to consult a specialized pain management team more often and lead to earlier interventions. The purpose of this study was to determine, whether the UPAT could be used as an extra tool to collect data on functional TMJ pain and to assess orofacial pain levels related to temporomandibular disorder(s) (TMD) in people with intellectual disabilities (ID).

**MATERIAL AND METHODS:** Non-down syndrome ID Athletes were screened during the Special Olympics European games in 2014. The clinical scores of possible functional jaw pain were collected using the UPAT, to indicate pain severity on a visual scale during different jaw movements (opening, closing and lateral).

**RESULTS:** Two hundred and four youngsters were screened by calibrated dentists.

The majority (65%) of participants were male (133 male and 71 female athletes); age distribution ranged from 15 to 23 years (mean  $19.25 \pm 2.53$ ). The results of the UPAT have shown the existence of functional TMJ pain in 32% (n=65) of the athletes without significant prevalence ( $P > 0.05$ ) in this survey group.

CONCLUSIONS: According to the results of the present study, the UPAT demonstrated that it could be a useful tool to detect the existence of functional jaw pain possibly associated with TMD and also a valid instrument to score pain intensity associated with TMD in people with ID.

32. Spec Care Dentist. 2017 Jan;37(1):47-50. doi: 10.1111/scd.12198. Epub 2016 Aug 29.

Oral healthcare management in Bardet Biedl syndrome.

Hassona Y(1), Kasabreh N(2), Hammoudeh H(2), Scully C(3).

Bardet Biedl syndrome is a rare autosomal recessive disorder with variable clinical presentation and challenging diagnosis. Recognition of orofacial features might help in the diagnosis. Dental management of affected patients might be complicated by renal, cardiac, metabolic, neurosensory, and cognitive defects.

33. Int J Paediatr Dent. 2017 Mar;27(2):87-97. doi: 10.1111/ipd.12238. Epub 2016 Jul

4.

Children's experiences of dental anxiety.

Morgan AG(1), Rodd HD(1), Porritt JM(2), Baker SR(1), Creswell C(3), Newton T(4),  
Williams C(5), Marshman Z(1).

**BACKGROUND:** Dental anxiety is common among children. Although there is a wealth of research investigating childhood dental anxiety, little consideration has been given to the child's perspective.

**AIM:** This qualitative study sought to explore with children their own experiences of dental anxiety using a cognitive behavioural therapy assessment model.

**DESIGN:** Face-to-face, semi-structured interviews were conducted with dentally anxious children aged 11-16 years. The Five Areas model was used to inform the topic guide and analysis. Data were analysed using a framework approach.

**RESULTS:** In total, 13 children were interviewed. Participants described their experiences of dental anxiety across multiple dimensions (situational factors and altered thoughts, feelings, physical symptoms, and behaviours). Participants placed considerable value on communication by dental professionals, with poor communication having a negative influence on dental anxiety and the dentist-patient relationship.

**CONCLUSIONS:** This study confirms the Five Areas model as an applicable theoretical model for the assessment of childhood dental anxiety. Children provided insights about their own dental anxiety experiences that have not

previously been described.

34. J Prosthodont Res. 2017 Jan;61(1):9-19. doi: 10.1016/j.jpor.2016.04.004. Epub 2016 May 17.

Assessment of masticatory performance by means of a color-changeable chewing gum.

Tarkowska A(1), Katzer L(2), Ahlers MO(3).

**PURPOSE:** Previous research determined the relevance of masticatory performance with regard to nutritional status, cognitive functions, or stress management. In addition, the measurement of masticatory efficiency contributes to the evaluation of therapeutic successes within the stomatognathic system. However, the question remains unanswered as to what extent modern techniques are able to reproduce the subtle differences in masticatory efficiency within various patient groups. The purpose of this review is to provide an extensive summary of the evaluation of masticatory performance by means of a color-changeable chewing gum with regard to its clinical relevance and applicability.

**STUDY SELECTION:** A general overview describing the various methods available for this task has already been published. This review focuses in depth on the research findings available on the technique of measuring masticatory performance by means of color-changeable chewing gum. Described are the mechanism and the differentiability of the color change and methods to evaluate the color changes.

Subsequently, research on masticatory performance is conducted with regard to patient age groups, the impact of general diseases and the effect of prosthetic and surgical treatment.

RESULTS: The studies indicate that color-changeable chewing gum is a valid and reliable method for the evaluation of masticatory function.

CONCLUSION: Apart from other methods, in clinical practice this technique can enhance dental diagnostics as well as the assessment of therapy outcomes.

35. J Am Dent Assoc. 2017 Jun;148(6):e82. doi: 10.1016/j.adaj.2017.04.007.

Cognitive behavioral therapy was effective for reducing intraoral injection phobia in children and adolescents.

Brignardello-Petersen R.

Comment on

Acta Odontol Scand. 2017 May;75(4):294-301.

36. Acta Odontol Scand. 2017 May;75(4):294-301. doi: 10.1080/00016357.2017.1297849.

Epub 2017 Mar 7.

Treatment of intra-oral injection phobia: a randomized delayed intervention controlled trial among Norwegian 10- to 16-year-olds.

Berge KG(1)(2), Agdal ML(1)(2), Vika M(1)(2), Skeie MS(2).

Comment in

J Am Dent Assoc. 2017 Jun;148(6):e82.

**OBJECTIVE:** To evaluate the effect of five sessions of cognitive behavioural therapy (CBT) for 10- to 16-year-olds with intra-oral injection phobia.

**MATERIAL AND METHODS:** This was a randomized delayed intervention controlled trial in 67 patients, fulfilling the DSM-5 criteria for specific phobia. All patients received the same CBT performed by dentists specially trained in CBT. The patients were randomly assigned to either an immediate treatment group (ITG) (34 patients) or a waitlist-control group (WCG) (33 patients). The WCG was put on a waitlist for 5 weeks. After treatment, all patients were combined for post-treatment analyses. Assessments including the psychometric self-report

scales Intra-oral injection fear scale (IOIF-s), Children's Fear Survey Schedule-Dental Subscale (CFSS-DS), Injection Phobia Scale for children (IS-c) and Mutilation Questionnaire for children (MQ-c) and a behavioural avoidance test (BAT) followed by a questionnaire on cognitions during the BAT, occurred pre-, post-treatment/waitlist and at a 1-year follow-up.

RESULTS: CBT had a significant effect compared to no treatment (WCG). After treatment, the scores on the psychometric self-report scales were significantly reduced and higher levels in the BAT were achieved. The results were maintained at 1-year follow-up. Of the 67 patients, 70.1% received intra-oral injections during CBT treatment, whereas 69.4% of those completing the CBT, in need for further dental treatment, managed to receive the necessary intra-oral injections at their regular dentist.

CONCLUSIONS: The 10- to 16-year-olds diagnosed with intra-oral injection phobia benefitted positively on CBT performed by specially trained dentists.

37. Arch Oral Biol. 2017 Mar;75:37-47. doi: 10.1016/j.archoralbio.2016.12.008. Epub 2016 Dec 23.

Steinert syndrome and repercussions in dental medicine.

Baptista H(1), Lopes Cardoso I(2).

Steinert syndrome, also called myotonic dystrophy type 1, is a genetic disorder with autosomal dominant transmission characterized by myotonia and a

multisystemic clinical picture that affects several tissues of the human body. The most common systemic phenotypes are: muscular, cardiac, respiratory, CNS, ocular, gynecological, digestive, orthopedical, as well as cognitive and psychological symptoms (cognitive decline). Muscles involved in voluntary movement are highly affected by myotonia especially distal muscles of upper limbs. These patients also show changes in face, chewing and pharynx muscles that can lead to swallowing and speech problems, dysphagia and in most cases to food aspiration and suffocation. Poor oral hygiene resulting from reduced motor mobility and reduced saliva flux can lead to gingival inflammation and periodontal disease. Other oral manifestations include disturbances at the temporomandibular articulation, dental occlusion changes and reduction in teeth number as a result of caries. Main causes of death are pneumonia and cardiac arrhythmias. The etiopathogeny of this syndrome is still not clear, conditioning the existence of a specific treatment for this disease. Nowadays, treatments consist on the release of the existing symptoms, in an attempt to give a better life quality to patients. It is very important to implement actions that can prevent complications and consequently decrease death. Treatments should be applied in an early stage of the disease. Bronchoscopy and artificial respiration should be used to prevent pneumonia, and regular electrocardiographic monitoring should be done to evaluate defects in the conductive system. Several approaches have been applied to rehabilitate swallowing dysfunction and avoid aspiration like videofluoroscopy, postural techniques and adjustment of diet type. It is the aim of this paper to clarify the ethiology, diagnosis, systemic and oral characteristics of the syndrome, as well as to discuss treatments to be applied according to patients affected organs.

38. J Oral Facial Pain Headache. 2017 Summer;31(3):217-224. doi: 10.11607/ofph.1774.

Predictors of Clinically Significant Outcome for Adolescents with Temporomandibular Disorders.

Wahlund K, Larsson B.

**AIMS:** To evaluate and identify baseline characteristics of the adolescent patients included in two previous randomized controlled trials (RCTs) that may predict a clinically significant outcome after treatment of temporomandibular disorders (TMD) with an occlusal appliance (OA) or relaxation training (RT) in a clinical sample of adolescents.

**METHODS:** This study combined two patient samples from the earlier RCTs for a total of 167 adolescents with frequent TMD pain (once a week or more often), diagnosed according to the Research Diagnostic Criteria for TMD. They were treated with OA, RT, or received information only (control). Outcome (response to treatment vs nonresponse) was assessed using four measures: the Patient Global Impression of Change (PGIC), pain intensity rated on a numeric rating scale (NRS), pain frequency levels, and pain severity levels prospectively recorded in a pain diary. Predictors of outcome were evaluated posttreatment for the whole sample and at 6 months follow-up for participants from the first trial.

Associations and differences between groups obtained in the bivariate analyses were further examined in subsequent multivariate logistic regression analyses.

**RESULTS:** At posttreatment, treatment condition (OA being more effective than

RT/control), gender (boys being more responsive than girls), arthralgia (predicting lower response), lower levels of somatic complaints (predicting better response), and shorter TMD pain history (predicting better response) emerged as significant predictors of a clinical response. At 6-month follow-up, lower consumption of analgesics and shorter TMD pain history emerged as significant predictors of treatment outcome, while treatment condition approached significance after multivariate analysis.

**CONCLUSION:** This study revealed that treatment condition and gender were the most consistent predictors of a clinically significant outcome across outcome measures in a clinical sample of adolescents with TMD. Treatment with OA reduced TMD pain in the adolescents.

39. Braz Oral Res. 2017 Jul 3;31:e64. doi: 10.1590/1807-3107BOR-2017.vol31.0064.

Clinical performance and failure modes of pulpless teeth restored with posts: a systematic review.

Marchionatti AME(1), Wandscher VF(1), Rippe MP(1), Kaizer OB(1), Valandro LF(1).

The aim of this systematic review was to compare the clinical performance and failure modes of teeth restored with intra-radicular retainers. A search was performed on PubMed/Medline, Central and ClinicalTrials databases for randomized

clinical trials comparing clinical behavior and failures of at least two types of retainers. From 341 detected papers, 16 were selected for full-text analysis, of which 9 met the eligibility criteria. A manual search added 2 more studies, totalizing 11 studies that were included in this review. Evaluated retainers were fiber (prefabricated and customized) and metal (prefabricated and cast) posts, and follow-up ranged from 6 months to 10 years. Most studies showed good clinical behavior for evaluated intra-radicular retainers. Reported survival rates varied from 71 to 100% for fiber posts and 50 to 97.1% for metal posts. Studies found no difference in the survival among different metal posts and most studies found no difference between fiber and metal posts. Two studies also showed that remaining dentine height, number of walls and ferrule increased the longevity of the restored teeth. Failures of fiber posts were mainly due to post loss of retention, while metal post failures were mostly related to root fracture, post fracture and crown and/or post loss of retention. In conclusion, metal and fiber posts present similar clinical behavior at short to medium term follow-up. Remaining dental structure and ferrule increase the survival of restored pulpless teeth. Studies with longer follow-up are needed.

40. J Clin Pediatr Dent. 2017;41(4):308-311. doi: 10.17796/1053-4628-41.4.308.

Success of Dental Treatments under Behavior Management, Sedation and General Anesthesia.

Blumer S, Costa L, Peretz B.

**OBJECTIVE:** To present comparative study aims to assist the practitioner to choose between behavior modification (BM) techniques, pharmacologic sedation (N2O-O2 alone or combined with midazolam 0.5 mg/ kg) or routine general anesthesia (GA) for the most successful approach in enabling pediatric dental care.

**STUDY DESIGN:** Dental records of 56 children treated in a university dental clinic between 2006-2016 were reviewed, and data on age, gender, required treatment (amalgam restorations, composite restorations, pulpotomy, and stainless steel crowns [SSC]), treatment approaches and therapeutic success at final follow-up were retrieved.

**RESULTS:** Treatment under GA had the best success rates compared to both BM and pharmacologic sedation. N2O-O2 alone had a 6.1-fold greater risk of failure compared to N2O-O2+midazolam ( $p < 0.008$ ). Amalgam restorations had a 2.61-fold greater risk of failure than SSC ( $p < 0.008$ ).

**CONCLUSIONS:** The GA mode yielded significantly greater success than the N2O-O2 mode alone. There were no significant differences in success rates between GA and combined midazolam 0.5 mg/kg+N2O-O2. When choosing restoration material, it is important to remember the high success rate of SSC compared to amalgam restoration.

41. J Indian Soc Pedod Prev Dent. 2017 Apr-Jun;35(2):156-161. doi:  
10.4103/JISPPD.JISPPD\_82\_16.

Evaluation of nitrous oxide-oxygen and triclofos sodium as conscious sedative agents.

Subramaniam P(1), Girish Babu KL(2), Lakhotia D(1).

**BACKGROUND:** Conscious sedation is used in the pediatric dentistry to reduce fear and anxiety in children and promote favorable treatment outcomes. To achieve them, the primary clinical need is for a well-tolerated, effective, and expedient analgesic and sedative agent that is safe to use.

**AIM:** The aim of the present study was to evaluate the efficacy of nitrous oxide-oxygen and triclofos sodium as conscious sedative agents in 5-10-year-old children.

**METHODOLOGY:** Sixty children aged 5-10 years showing anxious, uncooperative, and apprehensive behavior were randomly divided and assigned into two groups (Groups A and B) such that Group A received 40% nitrous oxide-60% oxygen and Group B received triclofos sodium in the dose of 70 mg/kg body weight, given 30 min before the treatment procedure. During the whole course of sedation procedure, the response of the child was assessed using Houpt's behavior rating scale. The acceptance of route of drug administration by the patient and parent was also assessed. Data obtained were statistically evaluated using the Mann-Whitney U-test and Chi-square test.

**RESULTS:** Children sedated with triclofos sodium were significantly more drowsy and disoriented compared to those sedated with nitrous oxide. The overall behavior of children in both the groups was similar. Good parental acceptance was observed for both the routes of administration. Patients accepted the oral route significantly better than inhalation route.

**CONCLUSION:** Both nitrous oxide-oxygen and triclofos sodium were observed to be

effective sedative agents, for successful and safe use in 5-10-year-old dental patients. Patients showed a good acceptance of the oral route compared to the inhalation route for sedation.

42. Evid Based Dent. 2017 Mar;18(1):17-18. doi: 10.1038/sj.ebd.6401220.

Preoperative analgesia for children and adolescents to reduce pain associated with dental treatment.

McCann C(1).

Data sourcesCochrane Oral Health Group's Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL), Medline, Embase, LILACS, ISI Web of Science, ClinicalTrials.gov and the WHO International Clinical Trials Registry Platform.Study selectionRandomised controlled clinical trials of analgesics given before dental treatment versus placebo or no analgesics in children and adolescents up to 17 years of age. Children and adolescents having dental treatment under sedation (including nitrous oxide/oxygen) or general anaesthesia were excluded.Data extraction and synthesisTwo reviewers independently selected studies, abstracted data and assessed risk of bias. Standard Cochrane methodological approaches were used.ResultsFive trials involving 190 patients were included. None of the studies were at low risk of bias. Three trials involved dental treatment and two involved orthodontic treatment. Three of the included trials compared paracetamol with placebo. Meta-analysis of the two

trials showed no evidence of a benefit in taking paracetamol preoperatively; (RR) for postoperative pain of 0.81 (95%CI; 0.53 to 1.22). Four trials compared ibuprofen with placebo. Pooled data from two studies showed a statistically significant mean difference in severity of postoperative pain of -13.44 (95%CI; -23.01 to -3.88) on a visual analogue scale (0 to 100), which indicated a probable benefit. Both trials were at high risk of bias and the quality of the evidence is low. Conclusions From the available evidence, we cannot determine whether or not preoperative analgesics are of benefit in paediatric dentistry for procedures under local anaesthetic. There is probably a benefit in using preoperative analgesics prior to orthodontic separator placement. The quality of the evidence is low. Further randomised clinical trials should be completed with appropriate sample sizes and well defined outcome measures.

43. J Clin Pediatr Dent. 2017;41(2):154-160. doi: 10.17796/1053-4628-41.2.154.

Detection of Respiratory Adverse Events in Pediatric Dental Patients Sedated With 0.75mg/Kg of Midazolam and Oxygen by Continuous Pretracheal Auscultation: A Prospective Randomized Controlled Trial.

Somri M, Matter I, Hadjittofi C, Hoash N, Moaddi B, Kharouba J, Parisinos CA, Peretz B.

PURPOSE: Sedation is becoming more commonplace for pediatric patients undergoing minor procedures. Fortunately, electronic monitors have contributed to a

reduction in the associated respiratory adverse events (RAEs). To test the hypothesis that adding the pretracheal stethoscope (PTS) to standard monitoring methods (SMMs) may improve RAE detection in sedated pediatric dental patients, the frequency of RAEs detected by SMMs (i.e. visual observation, capnography, and pulse oximetry) was compared to that detected by SMMs alongside continuous PTS auscultation.

**STUDY DESIGN:** A prospective, randomised, controlled trial was performed with 100 pediatric patient participants of ASA $\leq$ 2, who were scheduled to receive dental treatment under 0.75 mg/kg and oxygen. Patients were randomised into Groups A (n=50; SMMs) and B (n=50; SMMs+PTS). Inclusion criteria were behavioral management problems and intolerance to dental treatment despite behavioral management techniques or nitrous oxide administration. Exclusion criteria were high-risk conditions for RAEs, altered mental status, gastrointestinal disorders, parental refusal of conscious sedation and failure of previous conscious sedation. An anesthetist was present throughout the dental treatments.

**RESULTS:** RAEs were detected in 10 (20%) and 22(44%) Group A and B patients respectively (p=0.01). The majority of RAEs within Group B were detected by PTS auscultation (n=19). Capnography produced 13 and 15 false-positive results in Groups A and B respectively, whereas the PTS produced 4(8%) false-positive results in Group B (p=0.009).

**CONCLUSIONS:** PTS was found to be useful for detecting RAEs during pediatric dental sedation with 0.75mg/kg midazolam and oxygen, in the presence of an anesthetist.

44. Anesth Prog. 2017 Spring;64(1):17-21. doi: 10.2344/anpr-63-03-01.

Temperament as a Predictor of Nitrous Oxide Inhalation Sedation Success.

Nelson TM(1), Griffith TM(2), Lane KJ(3), Thikkurissy S(4), Scott JM(5).

Little is known about implications of temperament for children who receive nitrous oxide inhalation sedation (N<sub>2</sub>O/O<sub>2</sub>) for dental care. The aim of this study was to investigate whether child temperament is associated with success in N<sub>2</sub>O/O<sub>2</sub>. Child-caregiver dyads were enrolled from patients aged 36-95 months receiving dental care with N<sub>2</sub>O/O<sub>2</sub> at a university-based pediatric dental clinic. To assess child temperament, 48 caregivers completed the Children's Behavior Questionnaire Short Form. Patient behavior was abstracted from Frankl scores recorded in the patient's chart. The overall behavioral failure rate was 15% (n = 7/48). There was no significant difference in sedation outcome associated with sex, health, insurance status, or complexity of treatment provided. Sedation outcome was significantly associated with the broad temperament domain of Effortful Control and its subscales Attentional Focusing and Inhibitory Control. The Negative Affectivity subscales of Frustration, Sadness, and Soothability and the Extraversion/Surgency subscales Activity and Impulsivity were also significantly associated with sedation outcome. The results of this study suggest that Effortful Control is associated with behavior during dental treatment with N<sub>2</sub>O/O<sub>2</sub>. The subscales of Attention Focusing, Inhibitory Control, Frustration,

Fear, Sadness, Soothability, Activity, and Impulsivity may also be important determinants of child behavior during dental treatment.

45. J Clin Pediatr Dent. 2017;41(3):228-231. doi: 10.17796/1053-4628-41.3.228.

Localized Juvenile Spongiotic Gingival Hyperplasia: Report of Two Cases.

Kalogirou EM, Chatzidimitriou K, Tosios KI, Piperi EP, Sklavounou A.

**OBJECTIVE:** Localized juvenile spongiotic gingival hyperplasia (LJSGH) is a painless gingival swelling that histologically exhibits hyperplasia of the non-keratinized stratified squamous epithelium, intercellular edema and spongiosis of the spinus layer, and exocytosis of inflammatory cells. LJSGH pathogenesis remains to be elucidated, while a possible origin from the gingival sulcus epithelium is nowadays proposed.

**STUDY DESIGN:** We report two cases of LJSGH with immunohistochemical evaluation of cytokeratins (CKs) 18 and 19.

**RESULTS:** Both cases concerned 12-year-old boys, who presented with a well-circumscribed bright red pedunculated papillary swelling on the marginal gingiva of the left maxillary lateral incisor. With the provisional diagnosis of LJSGH, the lesions were excised under local anesthesia and histological examination supported the final diagnosis of LJSGH. In both cases, the lesional epithelium showed intense and mild positivity for CK19 and CK18, respectively, while the adjacent normal gingival epithelium expressed CK19, but not CK18, only in the basal cell layer. The postoperative course was uneventful in both patients

and no recurrence has been reported.

CONCLUSION: LJSGH is a recently introduced entity that is worth attention in the clinical pediatric dentistry. Clinical and histological examination is required for the final diagnosis, while immunohistochemistry has shed light to LJSGH pathogenesis.

46. J Dent Res. 2017 Apr;96(4):467-476. doi: 10.1177/0022034516681762. Epub 2017 Jan 12.

Role of Hyperplasia of Gingival Lymphatics in Periodontal Inflammation.

Papadakou P(1), Bletsas A(2), Yassin MA(2), Karlsen TV(1), Wiig H(1), Berggreen E(1).

Lymphatic vessels are important for maintenance of tissue fluid homeostasis and afferent antigen transport. In chronic inflammation, lymphangiogenesis takes place and is characterized by lymphatic endothelial cell proliferation and lymphatic hyperplasia. Vascular endothelial growth factor C (VEGFC) is the main known lymphangiogenic growth factor, and its expression is increased in periodontitis, a common chronic infectious disease that results in tissue destruction and alveolar bone loss. The role of lymphangiogenesis during development of periodontitis is unknown. Here, we test if transgenic overexpression of epithelial VEGFC in a murine model is followed by hyperplasia of lymphatic vessels in oral mucosa and if the lymphatic drainage capacity is

altered. We also test if lymphatic hyperplasia protects against periodontal disease development. Transgenic keratin 14 (K14)-VEGFC mice had significant hyperplasia of lymphatics in oral mucosa, including gingiva, without changes in blood vessel vasculature. The basal lymph flow was normal but slightly lower than in wild-type mice when oral mucosa was challenged with lipopolysaccharide from *Porphyromonas gingivalis*. Under normal conditions, K14-VEGFC mice exhibited an increased number of neutrophils in gingiva, demonstrated enhanced phagocyte recruitment in the cervical lymph nodes, and had more alveolar bone when compared with their wild-type littermates. After induction of periodontitis, no strain differences were observed in the periodontal tissues with respect to granulocyte recruitment, bone resorption, angiogenesis, cytokines, and bone-related protein expressions or in draining lymph node immune cell proportions and vascularization. We conclude that overexpression of VEGFC results in hyperplastic lymphatics, which do not enhance lymphatic drainage capacity but facilitate phagocyte transport to draining lymph nodes. Hyperplasia of lymphatics does not protect against development of ligature-induced periodontitis.

47. Evid Based Dent. 2017 Jun 23;18(2):41-42. doi: 10.1038/sj.ebd.6401234.

Remineralisation and arresting caries in children with topical fluorides.

Gugnani N(1), Gugnani S(2).

Comment on

BMC Oral Health. 2016 Feb 01;16:12.

Data sources The Cochrane Library, PubMed, Embase and the ISI Web of Science. Study selection English language clinical trials in children with outcome measures including the remineralisation or arresting effect of caries by professional fluoride treatment were considered. Data extraction and synthesis Two reviewers screened the studies and assessed risk of bias. Random effects meta-analysis was conducted. Results Seventeen studies were included, ten focused on remineralisation, seven on arresting carious lesions. Meta-analysis of four studies using 5% fluoride varnish found a 63.6% (95% CI; 36.0% - 91.2%) remineralisation of early enamel caries. For five studies using 38% silver diamine fluoride solution meta-analysis found 65.9% (95% CI; 41.2% - 90.7%) of caries arrested. Conclusions Professionally applied 5% sodium fluoride varnish shows the capability to remineralise early enamel caries in children. Silver diamine fluoride solution at 38% is effective in arresting active dentine caries. Because the number of clinical trials that studied the arresting effect of dental caries is limited, more clinical trials should be performed.

48. J Dent Res. 2017 Sep;96(10):1122-1128. doi: 10.1177/0022034517709738. Epub 2017 May 18.

Formation of Fluorohydroxyapatite with Silver Diamine Fluoride.

Mei ML(1), Nudelman F(2), Marzec B(2), Walker JM(2), Lo ECM(1), Walls AW(3), Chu CH(1).

Silver diamine fluoride (SDF) is found to promote remineralization and harden the carious lesion. Hydroxyapatite crystallization is a crucial process in remineralization; however, the role of SDF in crystal formation is unknown. We designed an in vitro experiment with calcium phosphate with different SDF concentrations (0.38, 1.52, 2.66, 3.80 mg/mL) to investigate the effect of this additive on the nucleation and growth of apatite crystals. Two control groups were also prepared-calcium phosphate ( $\text{CaCl}_2 \cdot 2\text{H}_2\text{O} + \text{K}_2\text{HPO}_4$  in buffer solution) and SDF ( $\text{Ag}[\text{NH}_3]_2\text{F}$  in buffer solution). After incubation at 37 °C for 24 h, the shape and organization of the crystals were examined by bright-field transmission electron microscopy and electron diffraction. Unit cell parameters of the obtained crystals were determined with powder X-ray diffraction. The vibrational and rotational modes of phosphate groups were analyzed with Raman microscopy. The transmission electron microscopy and selected-area electron diffraction confirmed that all solids precipitated within the SDF groups were crystalline and that there was a positive correlation between the increased percentage of crystal size and the concentration of SDF. The powder X-ray diffraction patterns indicated that fluorohydroxyapatite and silver chloride were formed in all the SDF groups. Compared with calcium phosphate control, a contraction of the unit cell in the a-direction but not the c-direction in SDF groups was revealed, which suggested that small localized fluoride anions substituted the hydroxyl anions in hydroxyapatite crystals. This was further evidenced by the Raman spectra, which displayed up-field shift of the phosphate band in all the SDF groups and confirmed that the chemical environment of the phosphate functionalities indeed changed. The results suggested that SDF reacted with calcium and phosphate ions

and produced fluorohydroxyapatite. This preferential precipitation of fluorohydroxyapatite with reduced solubility could be one of the main factors for arrest of caries lesions treated with SDF.

49. Prim Dent J. 2017 Dec 1;6(4):10-11. doi: 10.1308/205016817822230229.

Dementia-Friendly Dentistry: Why Dementia Guidelines?

Batchelor P.

FGDP(UK) recently launched its dementia-friendly dentistry: good practice guidelines publication, which members will have received free-of-charge. Vice Dean and editor of the guidelines, Paul Batchelor, explains why the publication is necessary and why all practitioners should make the effort to incorporate these recommendations into their practice.

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50. Dent Today. 2017 Jan;36(1):126-8.

Hypertension and the Dental Patient.

Hardeman JH.

51. Dent Today. 2017 May;36(5):111-4.

Diabetes and the Dental Patient.

Hardeman JH.

52. J Appl Oral Sci. 2017 Sep-Oct;25(5):506-514. doi: 10.1590/1678-7757-2016-0147.

Impact of inhalation therapy on the incidence of carious lesions in patients with asthma and COPD.

Bozejac BV(1)(2), Stojšin I(2)(3), Đuric M(2)(4), Zvezdin B(2)(4), Brkanić T(2)(3), Budišin E(2)(4), Vukoje K(2), Sečen N(2)(4).

OBJECTIVE: The aim of this study was to investigate the incidence of carious lesions, the amount of salivary flow rate and pH value in patients with asthma and chronic obstructive pulmonary diseases (COPD), using inhalation therapy. The obtained results were compared with the results of adult healthy subjects, forming a control group.

**MATERIAL AND METHODS:** The study included 80 participants aging between 18 and 65 years. The experimental group (EG) was comprised of 40 participants, previously diagnosed with asthma or COPD undergoing inhalation therapy for more than five years. The control group (CG), comprised of 40 participants, mirrored the same age and gender status of the EG. Dental status was determined by decayed, missing, and filled teeth (DMFT index). Quantity and pH value of saliva were determined in the laboratory.

**RESULTS:** In the EG, the mean value of the salivary flow rate and pH value were statistically significantly lower than in the CG ( $p < 0.001$ ). Patients in the EG had a higher value of DMFT index when compared with the CG, although the difference was not statistically significant ( $p = 0.199$ ). Mean number of decayed teeth, as well as missing teeth, in the EG was statistically significantly higher than in the CG ( $p < 0.001$ ). Mean number of filled teeth in the EG was statistically significantly lower than in the CG ( $p < 0.001$ ).

**CONCLUSION:** It was found that patients undergoing inhalation therapy face increasing risk of dental caries due to the lower salivary flow rate and pH value along with the inhalation therapy. They should receive intensive preventive care, including oral hygiene instruction and dietary advice.

53. Braz Oral Res. 2017 Jul 3;31:e50. doi: 10.1590/1807-3107BOR-2017.vol31.0050.

The need for endodontic treatment and systemic characteristics of hematopoietic stem cell transplantation patients.

Braga-Diniz JM(1), Santa-Rosa CC(1), Martins RC(2), Silva MESE(1), Vieira LQ(3),  
Ribeiro Sobrinho AP(1).

The aim of this study is to investigate the relationship between the epidemiological and clinical profiles of patients before and after hematopoietic stem cell transplantation (HSCT) and the need for endodontic treatment. The subjects included 188 individuals enrolled in the dental care program for transplanted patients of the School of Dentistry, Federal University of Minas Gerais (Faculdade de Odontologia da Universidade Federal de Minas Gerais, FO-UFMG) from March 2011 through March 2016. The patients were subjected to an HSCT conditioning dental regimen based on a thorough clinical and radiographic evaluation. Intraoral periapical and bite-wing X-rays were obtained, and after evaluation, specific dental treatment was planned and performed. The following demographic and clinical data were collected from the patients' medical records: age, gender, transplantation stage, primary disease, transplant type, medication used, complete blood count at the time of visit, and need for endodontic treatment. The Kolmogorov-Smirnov and the chi-square tests were used. Leukemia (31.3%) and multiple myeloma (17.9%) were the most prevalent primary diseases. Most patients were subjected to allogeneic-related transplantation (83.6%). Most patients exhibited platelet counts and hemoglobin concentrations below the reference values in the pre-transplantation stage, while the neutrophil and platelet counts and the hemoglobin levels were within the reference ranges in the post-transplantation stage. The proportions of individuals requiring endodontic treatment were similar between the pre- and post-transplantation groups: 24.3%

and 24.7%, respectively. The systemic conditions of the patients referred for dental treatment were compromised.

54. *Periodontol* 2000. 2017 Jun;74(1):102-115. doi: 10.1111/prd.12192.

Dental geriatrics and periodontitis.

Persson GR.

The present literature review is focused on two main areas: (i) periodontal conditions in older individuals; and (ii) the scientific data available on periodontal treatment outcomes in individuals  $\geq 75$  years of age. The population of older people is increasing but the data on periodontal therapies and their efficacy in this population are limited and need to be carefully reviewed. Although life expectancy has increased, this does not mean that older people are medically healthy. Several chronic systemic diseases are associated with periodontitis, and the prevalence of most chronic diseases increases with age. Furthermore, older people are challenged by impaired immunity (immune senescence) with a decline in the numbers of naïve T-cells in peripheral blood and lymphoid tissues. The most frequent significant correlates with successful ageing include not smoking and the absence of disability, arthritis and diabetes mellitus. Periodontal diseases in older individuals may have specific features that are not consistent with periodontal diseases. In this respect, data suggest that gingival lesions in older individuals develop differently from gingival lesions in younger

adults. The progression of periodontitis may be slower in older individuals, and older individuals with periodontitis may benefit from more conservative treatment approaches. Diagnostic criteria used for the assessment and diagnosis of periodontitis in younger adults may not be fully applicable in older individuals. In summary, declining health, perception of treatment needs, dietary changes, comorbidity with other diseases and immune senescence are challenging factors to clinicians and researchers, in terms of therapies and in understanding periodontitis etiology in older individuals.

55. J Dent Res. 2017 Jun;96(6):618-625. doi: 10.1177/0022034517691720. Epub 2017 Feb 9.

Rapid Chair-Side Test for Detection of Porphyromonas gingivalis.

O'Brien-Simpson NM(1), Burgess K(1), Lenzo JC(1), Brammar GC(1), Darby IB(1), Reynolds EC(1).

Porphyromonas gingivalis is a keystone pathogen of chronic periodontitis, and its intraoral levels have been shown to predict disease progression (activity). An accurate and sensitive chair-side (point of care) test to determine disease activity is critical for early intervention and clinical management of disease.

This study aimed to develop a rapid, chair-side, saliva-based detection of *P. gingivalis*. Monoclonal antibodies (mAbs) to the A1-adhesin domain of the *P. gingivalis* RgpA-Kgp proteinase-adhesin complex were screened by enzyme-linked immunosorbent assay and microbial flow cytometry, with 2 mAbs shown to recognize all laboratory and clinical strains tested, without significantly cross-reacting with other oral bacteria tested. With these mAbs, an immunochromatographic device was produced and shown in preclinical studies to detect, in inoculated saliva, all *P. gingivalis* laboratory strains and clinical isolates tested. The device was able to detect  $\geq 1 \times 10^5$  *P. gingivalis* cells/mL. In a patient age- and sex-matched control clinical cohort, *P. gingivalis* levels in saliva-as measured by real-time polymerase chain reaction-positively correlated with *P. gingivalis* levels in subgingival plaque ( $r = 0.819$ ,  $P < 0.01$ ) and clinical parameters of disease ( $r = 0.633$ ,  $P < 0.01$ ). A positive device result strongly correlated with *P. gingivalis* levels  $> 1 \times 10^5$  cells/mL in saliva ( $r = 0.778$ ,  $P < 0.001$ ) and subgingival plaque ( $r = 0.715$ ,  $P < 0.001$ ) with sensitivity, specificity, positive/negative predictive values, and accuracy levels of 95.0%, 93.3%, 90.5%, 96.6%, and 94.0%, respectively. The device result also positively correlated ( $r = 0.695$ ,  $P < 0.01$ ) with disease severity as measured by probing depth. Detection of *P. gingivalis* in saliva was found to be rapid, taking 3 min from sample collection.

56. Spec Care Dentist. 2017 Mar;37(2):57-61. doi: 10.1111/scd.12211. Epub 2016 Dec

Protocols for treating patients with end-stage renal disease: a survey of nephrology fellowships.

Perry MM(1)(2), Howell S(3), Patel N(4).

**RATIONALE/BACKGROUND:** Approximately 14% of Americans are living with chronic kidney disease (CKD). The prevalence of end-stage renal disease (ESRD), the result of progressing CKD continues to rise by 21,000 per year. Currently, the only antibiotic prophylaxis guidelines for patients with ESRD undergoing dental treatment were published by the AHA in 2003. Presented in three parts, the first and second parts of this study found no consistent protocols amongst U.S. dental schools and U.S. GPRs and AEGDs, respectively. The goal of the third part of the project was to determine the current protocol being used to treat ESRD patients at U.S. nephrology fellowship programs.

**METHODS AND MATERIALS:** An 18 multiple-choice question survey was e-mailed to 130 directors of nephrology fellowships within the U.S. regarding renal treatment protocol details and antibiotic prophylaxis for patients with renal disease.

**RESULTS:** Note that, 34.6% of respondents reported having an established renal treatment protocol. For programs with a protocol, 69% of programs reported following AHA guidelines.

**CONCLUSION:** There is a lack of consistent, established protocols amongst U.S. nephrology fellowships. It is suggested that updated and evidence based guidelines for the safe treatment of patients be developed.

57. Spec Care Dentist. 2017 Mar;37(2):62-70. doi: 10.1111/scd.12207. Epub 2016 Oct 22.

A pharmacotherapy review of the novel, oral antithrombotics.

Walters KJ(1), Meador A(2), Galdo JA(3), Ciarrocca K(4).

Coagulation disorders account for a high incidence of death in the U.S. due to stroke, myocardial infarction, and venous thromboembolism. In the past few years, numerous agents have been brought to market for the treatment of thromboembolism or prevention of thromboembolism. Similar to warfarin, these agents can cause bleeding disorders, which may exacerbate dental care treatment plans. This literature review examines the newer agents for the treatment of thromboembolism disorders, common side effects and drug interactions, the specific medical conditions each agent treats, and the dental perspective on how to medically management patients prescribed these medications.

58. Clin Oral Investig. 2017 Jan;21(1):17-32. doi: 10.1007/s00784-016-1934-9. Epub 2016 Sep 8.

Oral health and orofacial pain in older people with dementia: a systematic review with focus on dental hard tissues.

Delwel S(1)(2), Binnekade TT(3), Perez RS(4), Hertogh CM(5), Scherder EJ(3),

Lobbezoo F(6).

**OBJECTIVE:** The aim of this review was to provide a systematic overview including a quality assessment of studies about oral health and orofacial pain in older people with dementia, compared to older people without dementia.

**METHODS:** A systematic literature search was performed in PubMed, CINAHL, and the Cochrane Library. The following search terms were used: dementia and oral health or stomatognathic disease. The quality assessment of the included articles was performed using the Newcastle-Ottawa Scale (NOS).

**RESULTS:** The search yielded 527 articles, of which 37 were included for the quality assessment and quantitative overview. The median NOS score of the included studies was 5, and the mean was 4.9 (SD 2.2). The heterogeneity between the studies was considered too large to perform a meta-analysis. An equivalent prevalence of orofacial pain, number of teeth present, decayed missing filled teeth index, edentulousness percentage, and denture use was found for both groups. However, the presence of caries and retained roots was higher in older people with dementia than in those without.

**CONCLUSIONS:** Older people with dementia have worse oral health, with more retained roots and coronal and root caries, when compared to older people without dementia. Little research focused on orofacial pain in older people with dementia.

**CLINICAL RELEVANCE:** The current state of oral health in older people with dementia could be improved with oral care education of caretakers and regular professional dental care.

59. Clin Oral Investig. 2017 Mar;21(2):701-708. doi: 10.1007/s00784-016-1937-6. Epub 2016 Sep 8.

Dental implants in medically complex patients-a retrospective study.

Manor Y(1)(2), Simon R(3), Haim D(4), Garfunkel A(4), Moses O(5).

**INTRODUCTION:** Dental implant insertion for oral rehabilitation is a worldwide procedure for healthy and medically compromised patients. The impact of systemic disease risks on the outcome of implant therapy is unclear, since there are few if any published randomized controlled trials (RCTs).

**OBJECTIVE:** The objective of this study is to investigate the rate of complications and failures following dental implantation in medically compromised patients in order to elucidate risk factors and prevent them.

**MATERIAL AND METHODS:** A retrospective cohort study was conducted from patient files treated with dental implantation between the years 2008-2014. The study group consisted of medically complex patients while the control group consisted of healthy patients. Preoperative, intraoperative, and post operative clinical details were retrieved from patients' files. The survival rate and the success rate of the dental implants were evaluated clinically and radiographically.

**RESULTS:** A total of 204 patients (1003 dental implants) were included in the research, in the study group, 93 patients with 528 dental implants and in the control group, 111 patients with 475 dental implants. No significant differences

were found between the groups regarding implant failures or complications. The failure rate of dental implants among the patients was 11.8 % in the study group and 16.2 % in the control group (P = 0.04). It was found that patients with a higher number of implants (mean 6.8) had failures compared with patients with a lower number of implants (mean 4.2) regardless of their health status (P < 0.01).

**CONCLUSIONS:** We found a similar rate of failure and complications of dental implantation in medically complex patients and in healthy patients.

**CLINICAL RELEVANCE:** Medically complex patients can undergo dental implantation.

There are similar rates of complications and failures of dental implants in medically complex patients and in healthy patients.

60. J Am Dent Assoc. 2017 Mar;148(3):138-142. doi: 10.1016/j.adaj.2016.12.030.

New sedation and general anesthesia guidelines: Why the changes?

Goodchild JH, Donaldson M.

Comment on

J Am Dent Assoc. 2017 Mar;148(3):133-137.

61. Spec Care Dentist. 2017 Mar;37(2):93-98. doi: 10.1111/scd.12210. Epub 2016 Nov 2.

The feasibility of office-based propofol sedation for dental care in patients

with intellectual disability by sedation practitioners.

Vaessen HH(1), Schouten AN(2), van der Hoeve H(3), Knappe JT(4).

**BACKGROUND:** The quality of oral health care for intellectually disabled patients is a significant challenge due to behavioral issues. Intravenous propofol sedation may be useful to relieve the anxiety and fear, and make dental procedures more acceptable. The aim of this study was to evaluate the safety and effectiveness of propofol sedation, by trained nonmedical sedation practitioners, during dental treatments in an office-based setting.

**METHODS:** Intellectually disabled patients (124) were subjected to restorative dental procedures and moderately sedated using intravenous propofol. Vital signs, cooperation of the patient, and sedation depth were continuously assessed.

**RESULTS:** Propofol sedation was effective for dental treatment. All procedures resulted in a sufficient level of sedation without moderate or severe complications.

**CONCLUSION:** Propofol sedation can be safely and effectively performed in an office-based setting by sedation practitioners, who have experience in propofol sedation and are trained in the care of patients with disabilities.

Gingival bleeding in a patient with autism spectrum disorder: A key finding leading to a diagnosis of scurvy.

Planerova A, Philip S, Elad S.

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder that can affect all aspects of life, including nutrition. This case reports a patient with ASD in which gingival bleeding was the key finding that led to a diagnosis of scurvy. The literature review discusses behavioral food aversions in patients with ASD that lead to significant nutritional deficiencies, such as scurvy. Through this case report, the objective is to raise clinical awareness to consider relatively rare diseases in patients with ASD who have atypical feeding patterns.

63. J Clin Pediatr Dent. 2017;41(2):147-149. doi: 10.17796/1053-4628-41.2.147.

Oral Health Assessment of a Group of Children with Autism Disorder.

Morales-Chávez MC.

**OBJECTIVE:** The aim of this research was to determine the oral status of a group of children with autism.

**STUDY DESIGN:** An observational transversal study was carried out in 96 pediatric patients between the ages of 2 and 16 years old with a diagnosis of autism. The

patients were assessed to determine the presence of caries with Index Caries (WHO criteria) and debris and calculus with the Simplified Oral Hygiene Index, as well as the type of diet they followed.

RESULTS: It was established that 41.7% of the patients had caries, with the result of an index of DMFT= 0.96 and dmft =2.41. In terms of the periodontal health 59.4% suffered from calculus. The OHI-S was 3.4.

CONCLUSIONS: Children with autism exhibited a higher caries prevalence in primary teeth than in permanent. They also presented poor hygiene and an extensive presence of calculus.

64. Eur Arch Paediatr Dent. 2017 Apr;18(2):91-96. doi: 10.1007/s40368-017-0275-y. Epub 2017 Feb 24.

Salivary biomarker levels and oral health status of children with autistic spectrum disorders: a comparative study.

Bhandary S(1), Hari N(2).

AIM: To evaluate the oral health status, salivary flow rate, pH and buffering capacity in children with autistic spectrum disorders (ASD) in comparison to their healthy siblings.

METHODS: A total of 30 subjects with ASD and 30 normal healthy siblings between the ages of 6-12 years of both genders attending various special schools and hospitals of Mangalore, India were recruited. Estimation of salivary pH, flow

rate and buffering capacity were performed and oral health status was assessed using the WHO oral assessment form for children (World Health Organization in Oral health surveys: basic methods, World Health Organization, Geneva, 2013). The oral hygiene of the subjects was assessed using the oral hygiene index-simplified. Dental erosive lesions, presence of mucosal lesions and dental trauma were recorded for both the study and the control groups.

RESULTS: It was observed that salivary pH and buffering capacity were lower in children with ASD than their healthy siblings, the dental caries incidence was higher in ASD children when compared to their healthy siblings and oral hygiene was fair with gingival bleeding in children with ASD.

CONCLUSIONS: This study clearly indicates a need for better home care measures, parent, caregiver and institutional education on the importance of oral well-being among children with ASD.

65. J Appl Oral Sci. 2017 Sep-Oct;25(5):551-558. doi: 10.1590/1678-7757-2016-0407.

Comparison of two combinations of opioid and non-opioid analgesics for acute periradicular abscess: a randomized clinical trial.

Santini MF(1), Rosa RAD(1), Ferreira MBC(2), Fischer MI(3), Souza EM(4), S6 MVR(1).

**INTRODUCTION:** Acute periradicular abscess is a condition characterized by the formation and propagation of pus in the periapical tissues and generally associated with debilitating pain.

**OBJECTIVE:** The aim of this study was to compare the overall analgesic effectiveness of two combinations of opioid and non-opioid analgesics for acute periradicular abscess.

**MATERIAL AND METHODS:** This study included 26 patients who sought emergency care in a Brazilian dental school. The patients were randomly divided into two groups: Co/Ac - oral prescription of codeine (30 mg) plus acetaminophen (500 mg), every 4 h, for 3 days or Tr/Ac - oral prescription of tramadol hydrochloride (37.5 mg) plus acetaminophen (500 mg) on the same schedule. Two factors were evaluated: (1) pain scores recorded by the patients in a pain diary 6, 12, 24, 48, and 72 h after treatment, using the Visual Analogue Scale; and (2) the occurrence of adverse effects.

**RESULTS:** In both groups, there was a reduction in pain scores over time. For the Co/Ac group, there was a significant reduction in the scores 12, 24, 48, and 72 hours after treatment ( $P < 0.05$ ). In the Tr/Ac group, the scores significantly decreased over time from time point 6 h ( $P < 0.05$ ). Comparing the pain at each time point, the groups were not significantly different ( $P > 0.05$ ), i.e., both treatments were effective in controlling pain caused by APA; however, the combination of Tr/Ac caused more adverse reactions as two patients had to stop using the medication.

**CONCLUSION:** This study suggests that, considering both analgesic efficacy and safety, the combination of codeine and acetaminophen is more effective to control moderate to severe pain from acute periradicular abscesses.

66. J Oral Maxillofac Surg. 2017 Oct;75(10):2063-2069. doi:

10.1016/j.joms.2017.04.045. Epub 2017 May 15.

Efficacy of Codeine When Added to Paracetamol (Acetaminophen) and Ibuprofen for Relief of Postoperative Pain After Surgical Removal of Impacted Third Molars: A Double-Blinded Randomized Control Trial.

Best AD(1), De Silva RK(2), Thomson WM(3), Tong DC(4), Cameron CM(5), De Silva HL(6).

**PURPOSE:** The use of opioids in combination with nonopioids is common practice for acute pain management after third molar surgery. One such combination is paracetamol, ibuprofen, and codeine. The authors assessed the efficacy of codeine when added to a regimen of paracetamol and ibuprofen for pain relief after third molar surgery.

**MATERIALS AND METHODS:** This study was a randomized, double-blinded, placebo-controlled trial conducted in patients undergoing the surgical removal of at least 1 impacted mandibular third molar requiring bone removal. Participants were randomly allocated to a control group (paracetamol 1,000 mg and ibuprofen 400 mg) or an intervention group (paracetamol 1,000 mg, ibuprofen 400 mg, and

codeine 60 mg). All participants were treated under intravenous sedation and using identical surgical conditions and technique. Postoperative pain was assessed using the visual analog scale (VAS) every 3 hours (while awake) for the first 48 hours after surgery. Pain was globally assessed using a questionnaire on day 3 after surgery.

RESULTS: There were 131 participants (36% men; control group, n = 67; intervention group, n = 64). Baseline characteristics were similar for the 2 groups. Data were analyzed using a modified intention-to-treat analysis and, for this, a linear mixed model was used. The model showed that the baseline VAS score was associated with subsequent VAS scores and that, with each 3-hour period, the VAS score increased by an average of 0.08. The treatment effect was not statistically meaningful, indicating there was no difference in recorded pain levels between the 2 groups during the first 48 hours after mandibular third molar surgery. Similarly, the 2 groups did not differ in their global ratings of postoperative pain.

CONCLUSION: Codeine 60 mg added to a regimen of paracetamol 1,000 mg and ibuprofen 400 mg does not improve analgesia after third molar surgery.

67. J Oral Facial Pain Headache. 2017 Winter;31(1):7-18. doi: 10.11607/ofph.1753.

Topical Review: Potential Use of Botulinum Toxin in the Management of Painful Posttraumatic Trigeminal Neuropathy.

Moreau N, Dieb W, Descroix V, Svensson P, Ernberg M, Boucher Y.

Painful posttraumatic trigeminal neuropathy (PPTN) is a chronic condition that is difficult to endure and has a poorly understood pathophysiology. Treatment options are limited and often unsatisfactory due to insufficient efficacy and significant adverse effects. Botulinum toxin type A (BTX-A), initially used in the management of pathologically sustained or twisting muscular contractions, has recently been advocated for treatment of neuropathic pain. Its action is not limited to the blockage of acetylcholine release at the neuromuscular junction, but also includes inhibition of exocytosis of other neurotransmitters by interfering with the SNARE complexes of synaptic membranes. When injected into the painful location, the toxin can be taken up by peripheral terminals of nociceptive afferent nerve fibers, and this action suppresses peripheral and central release of algogenic neurotransmitters such as glutamate or substance P, thus promoting analgesia. Several randomized controlled trials in humans have provided emerging evidence for the therapeutic use of BTX-A in neuropathic pain states, including trigeminal neuralgia. This evidence, in addition to its good safety profile and long-lasting effect, suggests that BTX-A could be a potential novel treatment for PPTN.

68. Clin Oral Investig. 2017 Jan;21(1):43-52. doi: 10.1007/s00784-016-1974-1. Epub 2016 Nov 11.

Effect of preoperative oral analgesics on pulpal anesthesia in patients with irreversible pulpitis-a systematic review and meta-analysis.

Shirvani A(1), Shamszadeh S(2), Eghbal MJ(3), Marvasti LA(3), Asgary S(1).

Comment in

J Am Dent Assoc. 2017 May;148(5):e47.

**OBJECTIVES:** The objectives of this study were to assess the efficacy of preemptive oral administration of single dose of non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen on the local anesthetic success in adults with irreversible pulpitis and to find the possible covariates that could predict treatment effect.

**MATERIALS AND METHODS:** A systematic search using electronic databases up to March 2015 was conducted. Odds ratio (OR) and 95% confidence intervals (CIs) were estimated using random and fixed-effect inverse variance method. Subgroup and meta-regression analyses were conducted to assess the potential source of heterogeneity.

**RESULTS:** Results showed that preemptive analgesics are more effective than placebo in increasing anesthetic success (OR = 0.30, CI% 0.24-0.39,  $p = 0.000$ ) [ $Q = 55.860$  ( $p = 0.001$ )]. In the subgroup analysis, administration of NSAIDs as monotherapy, ibuprofen as mono- vs. combination therapy, oxicam type drugs as monotherapy, and acetaminophen as combination therapy were significantly more effective in increasing anesthetic success OR = 0.25, CI% 0.16-0.38,  $p = 0.00$ ,  $Q = 40.539$  ( $p = 0.003$ ); OR = 0.44, CI% 0.26-0.75,  $p = 0.00$ ,  $Q = 12.833$

( $p = 0.011$ ); OR = 0.48, CI% 0.30-0.74,  $p = 0.002$ ,  $Q = 15.898$  ( $p = 0.14$ );  
OR = 0.30, CI% 0.16-0.38,  $p = 0.001$ ,  $Q = 7.506$  ( $p = 0.02$ ); OR = 0.10, CI% 0.16  
0.38,  $p = 0.001$ ,  $Q = 5.075$  ( $p = 0.07$ ), respectively. However, there was no  
significant difference in increasing anesthetic success between treatment and  
placebo arms when acetaminophen was administered alone. In meta-regression  
analysis, an association between different types of NSAIDs (indomethacin,  
diclofenac potassium, and oxicam-type drugs) and articaine with treatment effect  
was observed.

**CONCLUSIONS:** The administration of preemptive analgesics can induce superior  
intraoperative analgesia for patients with irreversible pulpitis. However,  
strategies such as co-administration of certain types of analgesics and  
anesthetic solution might be predictors of treatment effect. Additionally, there  
was no association between different timing and dosage of analgesics and  
treatment effect.

**CLINICAL RELEVANCE:** When compared to placebo, preemptive oral analgesics are  
superior in achieving anesthetic success in inflamed pulp.

69. Aust Endod J. 2017 Apr;43(1):34-37. doi: 10.1111/aej.12169. Epub 2016 Aug 25.

Anaesthetic efficacy of intraligamentary injection techniques on mandibular  
molars diagnosed with asymptomatic irreversible pulpitis: A retrospective study.

Lin S(1)(2), Wigler R(1), Huber R(1), Kaufman AY(1).

The objective of this study was to evaluate the success rate of intraligamentary injections (ILI) using a two- or four-site injection technique. One hundred and fifty-one mandibular molars diagnosed with asymptomatic irreversible pulpitis received ILI at the mesiobuccal and distobuccal aspects of the roots. Patients who experienced pain when the access cavity was performed received additional supplemental ILI in the mesiolingual and distolingual aspects. Pulpal anaesthesia was considered successful when complete analgesia was achieved. The data were analysed by means of the Fisher's exact and Pearson's chi-square tests. IL anaesthesia was successful for 92.1% of the teeth. Forty-eight teeth (31.8%) were sufficiently anaesthetised using the two-site ILI and 91 teeth (60.3%) following supplemental IL anaesthesia in two more sites. The results of this study indicate that the use of four-site IL injections as a primary anaesthetic technique may be considered a favourable alternative to the common IANB.

70. Clin Oral Investig. 2017 Apr;21(3):779-785. doi: 10.1007/s00784-016-1831-2. Epub 2016 Apr 25.

Efficacy and safety of 1% ropivacaine for postoperative analgesia after lower third molar surgery: a prospective, randomized, double-blinded clinical study.

Brković B(1), Andrić M(2), Čalasan D(2), Milić M(2), Stepić J(2), Vučetić M(2), Brajković D(3), Todorović L(2).

**OBJECTIVES:** The purpose of this study was to investigate postoperative analgesic effect of ropivacaine administered as main or supplemental injection for the inferior alveolar nerve block (IANB) in patients undergoing lower third molar surgery.

**MATERIALS AND METHODS:** The double-blind randomized study comprised 72 healthy patients. All patients received two blocks, the IANB for surgical procedure + IANB after surgery for postoperative pain control, and were divided into three groups: (1) 2 % lidocaine/epinephrine + 1 % ropivacaine, (2) 2 % lidocaine/epinephrine + saline, and (3) 1 % ropivacaine + saline. The occurrence of postoperative pain, pain intensity and analgesic requirements were recorded. Data were statistically analyzed using chi-square, Fisher, and Kruskal-Wallis tests and analysis of variance (ANOVA) with Bonferroni and Tukey correction.

**RESULTS:** Ropivacaine was more successful than lidocaine/epinephrine in obtaining duration of postoperative analgesia, reduction of pain, and analgesic requirements whether ropivacaine was used for surgical block or administered as a supplemental injection after surgery.

**CONCLUSIONS:** Ropivacaine (1 %, 2 ml) resulted in effective postoperative analgesia after lower third molar surgery.

**CLINICAL RELEVANCE:** Since pain control related to third molar surgery requires the effective surgical anesthesia and postoperative analgesia, the use of 1 % ropivacaine could be clinically relevant in a selection of appropriate pain control regimen for both surgical procedure and early postsurgical treatment.

71. Cranio. 2017 May;35(3):175-179. doi: 10.1080/08869634.2016.1171479. Epub 2016 Apr 8.

Optimal duration of ultra low frequency-transcutaneous electrical nerve stimulation (ULF-TENS) therapy for muscular relaxation in neuromuscular occlusion: A preliminary clinical study.

Escassan R(1), Rumerio A(2), Monsarrat P(1)(2), Combadazou JC(1)(2), Champion J(1)(2), Destruhaut F(1)(2), Ghrenassia C(1)(2).

**OBJECTIVES:** The primary aim of this work was to determine the duration of ultra-low-frequency transcutaneous electrical nerve stimulation (ULF-TENS) application necessary to achieve sufficient relaxation of the masticatory muscles. A secondary aim was to analyze the influence of stimulation on muscle relaxation in pathological subjects and determine whether ULF-TENS has a noteworthy impact on muscle relaxation.

**METHODS:** Sixteen adult subjects with temporomandibular disorders (TMD) and muscle pain and a group of four control subjects were included in this study. ULF-TENS was applied, and muscular activities of the masseter, temporal, and sternocleidomastoid muscles (SCM) were recorded for 60 min.

**RESULTS:** Significant relaxation was achieved in the TMD group from 20, 40, and 60 min for the temporal, masseter, and SCM muscles ( $p < 0.05$ ), respectively. Maximum relaxation was achieved in 12.5% of the subjects after 20 min, in a further 12.5% after 40 min, and in the remaining 75% after 60 min. Significant relaxation was achieved in the control group from 20 to 40 min for the masseter and temporal

muscles, respectively ( $p < 0.05$ ).

DISCUSSION: Taken together, the results suggest that an ideal ULF-TENS application would last 40 min to obtain sufficient muscle relaxation both in patients with masticatory system disorders and healthy subjects, a time constraint that is consistent with everyday clinical practice.

72. Clin Oral Investig. 2017 Jan;21(1):275-280. doi: 10.1007/s00784-016-1787-2. Epub 2016 Mar 22.

The use of conventional transcutaneous electrical nerve stimulation in chronic facial myalgia patients.

De Giorgi I(1), Castroflorio T(2), Sartoris B(3), Deregibus A(4).

OBJECTIVES: The aim of this study was to evaluate the efficacy of conventional TENS in women affected by chronic facial myalgia.

MATERIALS AND METHODS: The study was performed on 49 women affected by chronic facial myalgia randomly allocated in the TENS group (34 women) and the control group (15 women). The subjective level of pain was assessed by the Visual Analogue Scale indicating the mean (VAS MEAN), the maximum (VAS MAX) and the current intensity of pain (VAS NOW). The level of pain at the muscular palpation sites was assessed by the Pericranial Muscle Tenderness Score (PTS) and the Cervical Muscle Tenderness Score (CTS). The TENS therapy lasted for 10 weeks, and

data were collected at baseline, after 5, 10, 15 and 25 weeks. The differences between groups before and after treatment were compared with the Mann-Whitney and the Kolmogorov-Smirnov tests. The intra-group differences were compared with the one-way ANOVA test.

RESULTS: The results showed that the VAS MEAN, VAS MAX, PTS and CTS were significantly reduced in the TENS group compared to the control group after 10 weeks of TENS ( $p < 0.05$ ). The intra-group analysis revealed a decreasing tendency of VAS MEAN, VAS MAX, VAS NOW, PTS and CTS in the TENS group in a 25-week period ( $p < 0.05$ ).

CONCLUSIONS: The study demonstrated the efficacy of conventional TENS in patients with chronic facial myalgia and the decrease in both subjective and objective pain.

CLINICAL RELEVANCE: Conventional TENS is a safe, non-invasive, easy-to-administer therapy for chronic facial myalgia.

73. Evid Based Dent. 2017 Dec 22;18(4):111-112. doi: 10.1038/sj.ebd.6401271.

Topical intra-pocket anaesthetic gel reduces the risk and intensity of pain during periodontal scaling and root planing and probing.

Kumar S(1), Madurantakam P(2).

Comment on

J Clin Periodontol. 2016 Sep;43(9):754-66.

Data sources Medline, Scopus, Web of Science, LILACS, BBO, Cochrane Library,

SIGLE, ProQuest Dissertations and Theses, Periódicos Capes Theses, Current Controlled Trials, International Clinical Trials Registry Platform, the ClinicalTrials.gov, Rebec (www.rebec.gov.br), EU Clinical Trials Register (www.clinicaltrialsregister.eu), abstracts of the annual conference of the International Association for Dental Research (IADR) and its regional divisions.

Reference lists of primary studies and related articles from PubMed.

Study selection Randomised controlled trials, parallel, crossover or split-mouth designs comparing intra-pocket anaesthesia with an anaesthetic gel with placebo in patients requiring periodontal probing or SRP were considered.

Data extraction and synthesis Two authors shortlisted 11 final articles based on the inclusion criteria. Data extraction was performed by three authors using customised forms after calibration. The risk of bias in the included studies was evaluated using the Cochrane collaboration tool for assessing risk of bias in randomised controlled trials.

1 Results The authors used VAS and Heft-Parker scale to measure pain intensity and reported Hedge's g standardised difference in the means. The mean reduction in VAS and Heft-Parker scale were - 0.576 (CI = - 0.94 to - 0.22; p = 0.002) and - 1.814 (CI = - 3.38 to - 0.245; p = 0.023) respectively. This indicates a positive effect of anaesthetic gel in pain intensity reduction. For risk of pain, the authors reported the odds ratio of 0.025 (CI 0.003-0.25; p = 0.002). As far as the need for rescue anaesthesia using the same anaesthetic gel and/or injected anaesthetics, the odds ratio was 0.358 (95% CI 0.174-0.736; p = 0.005). Both these findings show the efficacy of anaesthetic gel in controlling the risk of pain during SRP and probing.

Conclusions The risk and intensity of pain during probing and SRP as well as the need for additional rescue anaesthesia using the same anaesthetic gel and/or injected anaesthetics is reduced with the

application of topical intra-pocket anaesthetic gel.

74. Prim Dent J. 2017 Aug 31;6(3 Suppl):38-43. doi: 10.1308/205016817821930881.

Current and Anticipated Developments in the Diagnosis and Management of Dental and Related Pain.

Renton T.

75. Braz Oral Res. 2017 Jul 3;31:e43. doi: 10.1590/1807-3107BOR-2017.vol31.0043.

Calcium hydroxide associated with a new vehicle: *Psidium cattleianum* leaf extracts. Tissue response evaluation.

Valentim D(1), Bueno CRE(2), Marques VAS(2), Vasques AMV(2), Cury MTS(2), Cintra LTA(2), Dezan E Junior(2).

The aim of this study was to evaluate edemogenic activity and subcutaneous inflammatory reaction induced by *Psidium cattleianum* leaf extracts associated with Ca(OH)<sub>2</sub>. Thirty male Wistar rats, split equally into three groups [aqueous extract + Ca(OH)<sub>2</sub>; ethanolic extract + Ca(OH)<sub>2</sub>; and propylene glycol + Ca(OH)<sub>2</sub>],

were assessed every 3 h or 6 h (five animals in each period). Under general anesthesia, 0.2 mL of 1% Evans blue per 100 g of body weight was injected into the penile vein and each combination to be evaluated was subcutaneously injected into the dorsal region 30 min thereafter. Edemogenic activity was analyzed by spectrophotometry ( $\lambda=630$  nm). For inflammatory reaction analysis, 50 rats received four polyethylene tubes (three experimental groups) and an empty tube (control group). The assessments were made at 7, 15, 30, 60, and 90 days, followed by hematoxylin-eosin staining and by the assignment of scores for evaluation of tissue response intensity. Ethanolic extract + Ca(OH)<sub>2</sub> yielded the largest edemogenic activity at 3 h. Intergroup differences at 6 h were not significant. The histological analysis showed progressive repair over time ( $p<0.05$ ) and aqueous and ethanolic extracts produced similar responses to those of the control and Ca(OH)<sub>2</sub> + propylene glycol groups. Psidium cattleianum leaf extracts used as Ca(OH)<sub>2</sub> vehicles evoked similar tissue response when compared to Ca(OH)<sub>2</sub> associated with propylene glycol.

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76. J Am Dent Assoc. 2017 May;148(5):e50. doi: 10.1016/j.adaj.2017.02.034.

Insufficient evidence for preferring 2% articaine over 4% articaine in patients undergoing mandibular premolar or molar extractions.

Brignardello-Petersen R.

Comment on

Clin Oral Investig. 2017 Jan;21(1):397-403.

77. J Am Dent Assoc. 2017 May;148(5):e47. doi: 10.1016/j.adaj.2017.02.020.

Preoperative oral ibuprofen and oxycam analgesics increase the rate of successful anesthesia of mandibular molars with irreversible pulpitis.

Brignardello-Petersen R.

Comment on

Clin Oral Investig. 2017 Jan;21(1):43-52.

78. J Oral Facial Pain Headache. 2017 Spring;31(2):124-128. doi: 10.11607/ofph.1642.

Comparative Evaluation of Anesthetic Efficacy of 2% Lidocaine, 4% Articaine, and 0.5% Bupivacaine on Inferior Alveolar Nerve Block in Patients with Symptomatic Irreversible Pulpitis: A Prospective, Randomized, Double-blind Clinical Trial.

Aggarwal V, Singla M, Miglani S.

AIMS: To compare the anesthetic efficacy of 1.8 mL of 2% lidocaine with 1:200,000 epinephrine, 4% articaine with 1:100,000 epinephrine, and 0.5% bupivacaine with 1:200,000 epinephrine on producing inferior alveolar nerve block (IANB) in patients with symptomatic irreversible pulpitis.

**METHODS:** A total of 91 adult patients who were actively experiencing mandibular molar pain were involved in this study. The patients were randomly divided into three groups on the basis of the anesthetic solution used. The first group received IANB with 1.8 mL of 2% lidocaine with 1:200,000 epinephrine, the second group received IANB with 4% articaine with 1:100,000 epinephrine, and the third group received IANB with 0.5% bupivacaine with 1:200,000 epinephrine. After 15 minutes of IANB, conventional endodontic access preparation was started. The pain during the treatment was noted on a Heft-Parker visual analog scale (HP VAS). The primary outcome measure was anesthetic success, and anesthesia was considered successful if the patient reported no pain or weak/mild pain (HP VAS score < 55 mm) during endodontic treatment (pulp access and canal preparation procedures). The data were analyzed with one-way analysis of variance and chi-square test.

**RESULTS:** The anesthetic success rates of 2% lidocaine, 4% articaine, and 0.5% bupivacaine were 23%, 33%, and 17%, respectively. The differences were statistically insignificant ( $P > .05$ ).

**CONCLUSION:** The 2% lidocaine solution used for IANB had similar success rates when compared with 4% articaine and 0.5% bupivacaine.

79. J Oral Maxillofac Surg. 2017 Oct;75(10):2071-2075. doi:

10.1016/j.joms.2017.03.032. Epub 2017 Mar 25.

Buffered 1% Lidocaine With Epinephrine Can Be as Effective as Nonbuffered 2% Lidocaine With Epinephrine for Maxillary Field Block.

Phero JA(1), Warren VT(2), Fisher AG(2), Rivera EM(3), Saha PT(4), Reside G(5),  
Phillips C(6), White RP Jr(7).

**PURPOSE:** Buffering local anesthetics with epinephrine (Epi) offers clinicians options not often considered. This study assessed outcomes for pulpal anesthesia, pain on injection, and time to midface numbness for buffered 1% lidocaine with 1:100,000 Epi versus nonbuffered 2% lidocaine with 1:100,000 Epi.

**MATERIALS AND METHODS:** In this trial with a randomized, crossover design, buffered 1% lidocaine was compared with nonbuffered 2% lidocaine. Subjects were adult volunteers who served as their own controls. The predictor variables were alternate drug formulations. The outcome variables were subjects' responses to cold and electric pulp testing (EPT) stimulation of the maxillary first molar and canine, pain levels during the injection, and time to midface numbness. After maxillary field blocks with 40 mg of buffered lidocaine or 80 mg of nonbuffered lidocaine, subjects reported pain on injection and responses of the maxillary first molar and canine after cold and EPT stimulation. Teeth were tested before field block and at 30-minute intervals until a positive response was detected. Two weeks later, subjects were tested with the alternate drug combinations. For all outcome variables, assessment of treatment difference, calculated as 1% buffered minus 2% nonbuffered, was performed with the Wilcoxon rank sum test with significance at  $P < .05$ .

**RESULTS:** More of the 24 subjects were women and Caucasian. The median age was 23.5 years (interquartile range, 21, 25 years), and the median body weight was 155 lb (interquartile range, 128.5, 176.5 lb). Pain levels during the injection

were significantly lower for 1% buffered lidocaine, with  $P = .04$ . Times to response after injection were not significantly different between the 2 drug formulations for the cold test on a molar, with  $P = .08$ , or the cold test on a canine, with  $P = .22$ . However, times to response were significantly longer for nonbuffered drugs for EPT on the molar and canine, both with  $P = .01$ .

CONCLUSIONS: Buffering 1% lidocaine with 1:100,000 Epi reduces the pain on injection with a maxillary field block and results in similar lengths of pulpal anesthesia tested with a cold stimulus as compared with nonbuffered 2% lidocaine with 1:100,000 Epi.

80. J Dent Child (Chic). 2017 Jan 15;84(1):35-38.

Deep Sedation Technique for Dental Rehabilitation of a Patient with Klippel-Feil Syndrome.

Abukabbos H(1), Mahla M(2), Adewumi AO(3).

Klippel-Feil syndrome (KFS) is a congenital anomaly characterized by a defect in the formation or segmentation of the cervical vertebrae, resulting in their fusion. The clinical triad of the syndrome consists of short neck, low posterior hairline, and limited neck movement, although fewer than 50 percent of patients demonstrate all three clinical features. The short neck and its immobility and instability present a significant challenge for endotracheal intubation. The purpose of this paper is to describe the management of a 13-year-old patient with KFS, extensive dental caries, and restricted mouth opening using a deep sedation

technique in the operating room, which allowed successful completion of dental treatment.

81. J Clin Pediatr Dent. 2017;41(2):95-101. doi: 10.17796/1053-4628-41.2.95.

Plasma Level Formaldehyde in Children Receiving Pulpotomy Treatment under General Anesthesia.

Bagrizan M, Pourgolshani P, Hosseinpour S, Jalalpour G, Shahrestani MZ.

**OBJECTIVES:** Formocresol has long been used by dentists for pulpotomy of primary teeth. Due to some concerns regarding its possible carcinogenicity, formocresol has been the topic of numerous studies. This study sought to assess the changes in plasma level of formaldehyde of children after receiving pulpotomy under general anesthesia.

**STUDY DESIGN:** Twenty-five children between 2-6 years requiring dental treatments under general anesthesia were studied. Blood samples were taken of children before and after the procedure. Plasma level of formaldehyde was measured using high performance liquid chromatography (HPLC).

**RESULTS:** A total of 106 pulpotomy treatments were performed in 25 children using 126 cotton pellets dipped in formocresol. An increase and a decrease in plasma level of formaldehyde were noted in 5 (20%) and 20 (80%) children, respectively post-operatively compared to baseline. The t-test showed no significant difference in plasma level of formaldehyde pre- and postoperatively ( $P=0.12$ ). the plasma level of formaldehyde in children who had higher levels of formaldehyde

prior to the operation was also higher than that of others after the operation and this association was statistically significant ( $P=0.001$ ,  $r=0.64$ ).

CONCLUSIONS: The results showed no significant change in the mean plasma level of formaldehyde in children who received pulpotomy under general anesthesia compared to its baseline value.

82. J Oral Maxillofac Surg. 2017 Jul;75(7):1376.e1-1376.e5. doi: 10.1016/j.joms.2017.01.034. Epub 2017 Feb 4.

Palatal Injection for the Removal of Maxillary Teeth: Current Practice Among Oral and Maxillofacial Surgeons.

Badenoch-Jones EK(1), David M(2), Lincoln T(3).

PURPOSE: Conventional teaching regarding palatal injection for the removal of maxillary teeth dictates the administration of buccal and palatal injections. Recently, some investigators have questioned the necessity of the palatal injection, suggesting that contemporary local anesthetics might diffuse sufficiently across the buccopalatal cortical bone distance. It has been suggested that because the buccopalatal cortical bone distance increases anteriorly to posteriorly in the maxilla, the success of maxillary extractions with buccal injection only might be related to the anteroposterior position of the tooth. Evidence from clinical trials has only recently become available. Since 2006, 15 clinical trials that examined outcomes of maxillary tooth

extractions performed with buccal injection of local anesthetic only have been published. However, there are limited data available on the clinical practice of surgeons.

**MATERIALS AND METHODS:** An online survey was sent to 276 full members of the Canadian Association of Oral and Maxillofacial Surgeons. Respondents were asked about their use of palatal injection for the removal of maxillary teeth under local anesthesia, including how often they administer a palatal injection for maxillary extractions in each region of the maxilla.

**RESULTS:** Ninety-two responses were received (33%). Most practitioners deliver a palatal injection for every maxillary tooth extraction under local anesthesia. However, there is a substantial number who do not always administer a palatal injection (ie, they give it "most of the time," "occasionally," or "never"). This number decreased in a linear fashion anteriorly to posteriorly in the maxilla (incisors, 17 of 89; canines, 16 of 88; premolars, 13 of 88; first and second molars, 10 of 89; third molars, 10 of 88).

**CONCLUSION:** Some surgeons who do not always administer a palatal injection for extraction of maxillary teeth under local anesthesia. The number is larger for anterior compared with posterior teeth.

83. J Oral Maxillofac Surg. 2017 Jun;75(6):1118-1123. doi:  
10.1016/j.joms.2017.01.005. Epub 2017 Jan 18.

The Use of a Chitosan-Derived Hemostatic Agent for Postextraction Bleeding Control in Patients on Antiplatelet Treatment.

Pippi R(1), Santoro M(2), Cafolla A(3).

**PURPOSE:** The current approach for tooth extraction in patients receiving antiplatelet treatment requires the use of local hemostatic agents without previous thromboembolic treatment interruption. The aim of the present study was to evaluate the effectiveness of an extra-alveolar hemostatic agent, the HemCon Dental Dressing (HDD), in controlling postsurgical bleeding.

**MATERIALS AND METHODS:** Routine, atraumatic tooth extractions were performed in a single session under local anesthesia without a vasoconstrictor and without interruption of antiplatelet therapy. All patients underwent extraction of 2 teeth in the same session, with each in a different dental hemi-arch, and the hemostatic method to be used was randomly chosen: in the test site, the HDD was applied, whereas in the control site, a common hemostatic sponge (CollaPlug, Zimmer Dental) was applied and stabilized in situ with a suture. For each surgery, 2 different times were measured: the time required for hemostatic agent application and the time required for hemostasis achievement. Postoperative pain and healing quality also were evaluated.

**RESULTS:** Twenty outpatients were enrolled. The mean application time was considerably shorter in the test group than in the control group; the mean bleeding time in the control group was considerably shorter than in the test group; pain values were lower in the test group than in the control group, especially at suture removal; and postextraction socket healing was better in the test group than in the control group.

**CONCLUSION:** HDD seems to be a valid and safe alternative in treating

postextraction sockets in outpatients under single-drug antiplatelet treatment in the absence of surgical wound lacerations.

84. Anesth Prog. 2017 Spring;64(1):39-44. doi: 10.2344/anpr-64-01-02.

Patients With Type 2 Diabetes: Anesthetic Management in the Ambulatory Setting:  
Part 2: Pharmacology and Guidelines for Perioperative Management.

Cornelius BW(1).

Type 2 diabetes is a disease of metabolism in which the afflicted patient cannot properly utilize carbohydrates, fats, and proteins. Because the prevalence of type 2 diabetes is rapidly increasing throughout the general population, anesthesia providers must realize that a significant percentage of their patients will present with the disease. Anesthesia providers should have an intimate knowledge of the comorbidities and complications that are associated with type 2 diabetes and know the specific pharmacokinetics and pharmacodynamics of the drugs used to treat the disease. Part 1 of this series on the anesthetic management of type 2 diabetes in the ambulatory theater addressed the pathology of diabetes and its comorbid disease states. Part 2 of the series now focuses on the pharmacology associated with the many medications used to treat the disorder and the most recent guidelines for blood glucose management recommended for patients in an ambulatory surgery setting.

85. J Endod. 2017 Mar;43(3):364-369. doi: 10.1016/j.joen.2016.10.036. Epub 2017 Jan 19.

Effect of Topical Anesthesia on Pain from Needle Insertion and Injection and Its Relationship with Anxiety in Patients Awaiting Apical Surgery: A Randomized Double-blind Clinical Trial.

Cho SY(1), Kim E(2), Park SH(2), Roh BD(2), Lee CY(2), Lee SJ(2), Jung IY(3).

**INTRODUCTION:** We aimed to simultaneously investigate the effects of topical anesthesia on needle insertion and injection pain in the labial mucosa of the maxillary central incisors of patients awaiting apical surgery and to assess the relationship between patients' anxiety and pain scores.

**METHODS:** Forty-four patients scheduled for apical surgery of the maxillary anterior incisor or canine were included, and all completed the Modified Dental Anxiety Scale (MDAS) questionnaire. One piece of Xylocaine (AstraZeneca, Sodertalje, Sweden) gauze was applied to the right or left side of the labial vestibule below the central incisor according to a randomization process, and 1 piece of water gauze was applied to the contralateral side of the labial vestibule. Each piece of gauze remained in place for 2 minutes. The subjects were asked to rate their pain according to the numeric rating scale immediately after needle insertion and anesthetic solution injection.

**RESULTS:** Topical anesthetic application significantly reduced both insertion- and injection-related pain. Injection pain was significantly higher than insertion pain throughout the experiment. The difference in pain scores between the placebo

and topical anesthetic groups was significantly greater for insertion pain than injection pain. The group with higher MDAS scores showed significantly higher pain scores, except for insertion pain reported by the topical anesthetic group, which did not show a significant difference between MDAS score groups.

**CONCLUSIONS:** The topical anesthetic was highly effective for both insertion and injection pain during infiltration anesthesia in the maxillary central incisors.

Highly anxious patients reported higher pain scores; however, topical anesthetics reduced the effect of anxiety on increasing pain.

86. *Int Dent J.* 2017 Apr;67(2):85-90. doi: 10.1111/idj.12272. Epub 2016 Dec 8.

Efficacy of preoperative ibuprofen and meloxicam on the success rate of inferior alveolar nerve block for teeth with irreversible pulpitis.

Shantiaee Y(1), Javaheri S(2), Movahhedian A(2), Eslami S(2), Dianat O(3).

**OBJECTIVE:** The purpose of this study was to determine whether premedication with ibuprofen or meloxicam increases the success rate of anaesthesia in teeth with irreversible pulpitis.

**MATERIALS AND METHODS:** In this parallel, double-blind clinical trial, 92 patients diagnosed with irreversible pulpitis were randomly divided into four groups of 23 patients. The first group (the no-premedication group) received no premedication, the second group (the meloxicam group) received 7.5 mg of meloxicam, the third group (the ibuprofen group) received 600 mg of ibuprofen, and the fourth group

(the placebo group) received placebo 1 hour before intervention. Before taking the medication, electrical pulp testing (EPT) and the Heft-Parker visual analogue scale (VAS) were used to evaluate sensitivity and pain at baseline. Then, local anaesthesia was injected, and after 15 minutes, EPT was used again to evaluate tooth sensitivity. The pain during access preparation was also recorded using the Heft-Parker VAS.

RESULTS: Ninety-two patients were analysed. The success rates of local anaesthesia were 21.7%, 34.8%, 78.3% and 73.9% in the no-premedication, placebo, ibuprofen and meloxicam groups, respectively, according to the EPT values.

Considering the Heft-Parker VAS values, no premedication gave a 21.7% success rate, placebo gave a 34.8% success rate, ibuprofen gave an 82.6% success rate and meloxicam gave a 65.2% success rate. The ibuprofen and meloxicam groups showed significantly better results than the placebo and no-premedication groups ( $P < 0.001$ ). However, the difference between meloxicam and ibuprofen groups was not significant.

CONCLUSIONS: Premedication with meloxicam and ibuprofen significantly increased the success rates of inferior alveolar nerve block anaesthesia for teeth with irreversible pulpitis; however, neither drug provided profound anaesthesia.

87. Oral Maxillofac Surg. 2017 Mar;21(1):49-54. doi: 10.1007/s10006-016-0598-6. Epub 2016 Nov 30.

Factors associated to post-operative nausea and vomiting following oral and

maxillofacial surgery: a prospective study.

Albuquerque AF(1)(2), Queiroz SI(3), Germano AR(4)(5), da Silva JS(6)(7).

AIM: This study aims to address and assess possible factors associated with nausea and vomiting (NV) following oral and maxillofacial surgery.

MATERIAL AND METHODS: A prospective study was carried out in the period from December 2013 to January 2016 targeting all attended cases in that period. For statistical analysis, Pearson chi-square and Fisher tests were used to verify association and ANOVA and Student's t tests to test for significant difference, p was defined as  $\leq 0.05$ . The sample group consisted of 207 patients with an average age of 33.56 years ( $\pm 13.23$ ), and 70.5% of subjects were male.

RESULTS: Calculations based on the predictive model showed that a female patient with prior history of nausea and vomiting who used opioids and had intra-oral surgical access would have a 96% chance of experiencing a nausea and vomiting episode. Other factors like age, being overweight, anesthesia, surgery duration, and duration of hospital stay also contribute so that these aspects must be paid careful attention prior to surgery to ensure a suitably orientated treatment that will avoid disturbances caused by post-operative nausea and vomiting.

CONCLUSION: The occurrence of post-operative nausea and vomiting after oral and maxillofacial surgery was found to be more higher incidence associated to female patients who used opioids, who had a prior history of NV, whose surgery involved intra-oral access, who were in the second or third decades of their lives, who have above average weight, and who have long anesthesia when undergoing surgery, resulting in a long hospital stays.

88. Clin Oral Investig. 2017 Jan;21(1):43-52. doi: 10.1007/s00784-016-1974-1. Epub 2016 Nov 11.

Effect of preoperative oral analgesics on pulpal anesthesia in patients with irreversible pulpitis-a systematic review and meta-analysis.

Shirvani A(1), Shamszadeh S(2), Eghbal MJ(3), Marvasti LA(3), Asgary S(1).

Comment in

J Am Dent Assoc. 2017 May;148(5):e47.

**OBJECTIVES:** The objectives of this study were to assess the efficacy of preemptive oral administration of single dose of non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen on the local anesthetic success in adults with irreversible pulpitis and to find the possible covariates that could predict treatment effect.

**MATERIALS AND METHODS:** A systematic search using electronic databases up to March 2015 was conducted. Odds ratio (OR) and 95% confidence intervals (CIs) were estimated using random and fixed-effect inverse variance method. Subgroup and meta-regression analyses were conducted to assess the potential source of heterogeneity.

**RESULTS:** Results showed that preemptive analgesics are more effective than placebo in increasing anesthetic success (OR = 0.30, CI% 0.24-0.39, p = 0.000)

[ $Q = 55.860$  ( $p = 0.001$ )]. In the subgroup analysis, administration of NSAIDs as monotherapy, ibuprofen as mono- vs. combination therapy, oxicam type drugs as monotherapy, and acetaminophen as combination therapy were significantly more effective in increasing anesthetic success  $OR = 0.25$ ,  $CI\% 0.16-0.38$ ,  $p = 0.00$ ,  $Q = 40.539$  ( $p = 0.003$ );  $OR = 0.44$ ,  $CI\% 0.26-0.75$ ,  $p = 0.00$ ,  $Q = 12.833$  ( $p = 0.011$ );  $OR = 0.48$ ,  $CI\% 0.30-0.74$ ,  $p = 0.002$ ,  $Q = 15.898$  ( $p = 0.14$ );  $OR = 0.30$ ,  $CI\% 0.16-0.38$ ,  $p = 0.001$ ,  $Q = 7.506$  ( $p = 0.02$ );  $OR = 0.10$ ,  $CI\% 0.16-0.38$ ,  $p = 0.001$ ,  $Q = 5.075$  ( $p = 0.07$ ), respectively. However, there was no significant difference in increasing anesthetic success between treatment and placebo arms when acetaminophen was administered alone. In meta-regression analysis, an association between different types of NSAIDs (indomethacin, diclofenac potassium, and oxicam-type drugs) and articaine with treatment effect was observed.

**CONCLUSIONS:** The administration of preemptive analgesics can induce superior intraoperative analgesia for patients with irreversible pulpitis. However, strategies such as co-administration of certain types of analgesics and anesthetic solution might be predictors of treatment effect. Additionally, there was no association between different timing and dosage of analgesics and treatment effect.

**CLINICAL RELEVANCE:** When compared to placebo, preemptive oral analgesics are superior in achieving anesthetic success in inflamed pulp.

Inferior alveolar nerve block for the treatment of teeth presenting with irreversible pulpitis: A systematic review of the literature and meta-analysis.

Corbella S, Taschieri S, Mannocci F, Rosen E, Tsesis I, Del Fabbro M.

**OBJECTIVE:** The objective of the present systematic review was to evaluate, in patients with irreversible pulpitis affecting mandibular posterior teeth, if premedication with nonsteroidal anti-inflammatory drugs can increase the efficacy of inferior alveolar nerve block (IANB) if compared to placebo administration; if one anesthetic agent is more effective than another; if 1.8 mL injection is more effective than 3.6 mL injection to increase the efficacy of IANB; and if supplementary buccal injection is able to increase the efficacy of IANB as compared to a negative control/placebo group.

**DATA SOURCES:** Randomized controlled clinical trials investigating different aspects (technique, premedication with anti-inflammatory drugs, different anesthetic agents) were searched. Success of IANB, as defined in the studies, was considered as the primary outcome. A meta-analysis was performed evaluating relative risks (RRs). Electronic databases (Medline, Embase, Cochrane Central) were searched after preparation of an appropriate search string. After application of selection criteria, a total of 37 studies were included; 19 of them were considered in the meta-analysis. There was evidence of a difference in favor of the use of premedication with anti-inflammatory drugs (RR, 1.80; CI 95%, 1.50-2.14;  $P < .0001$ ). There was no evidence of a difference between articaine and lidocaine (RR, 1.05; CI 95%, 0.91-1.21;  $P = .94$ ). With regard to the volume of anesthetic infiltrated, the computed RR was 1.17 (CI, 0.73-1.88) without any

significant difference between the use of one or two cartridges ( $P = .52$ ). The estimated RR for a supplementary buccal infiltration was 1.56 (CI, 1.00-2.42;  $P = .05$ ).

**CONCLUSION:** The use of premedication with anti-inflammatory drugs before IANB can increase the efficacy of the IANB. The type of anesthetic agent, the volume of anesthetic, and the use of a supplemental buccal infiltration do not seem to affect the efficacy of anesthesia.

90. J Oral Maxillofac Surg. 2017 Jan;75(1):87-91. doi: 10.1016/j.joms.2016.06.192. Epub 2016 Jul 21.

Extraction of Maxillary Teeth Using Articaine Without a Palatal Injection: A Comparison Between the Anterior and Posterior Regions of the Maxilla.

Bataineh AB(1), Al-Sabri GA(2).

**PURPOSE:** The injection of a local anesthetic before tooth extraction is always associated with pain, and palatal anesthesia is the most painful type of injection for the patient. The specific aims of the study were to evaluate "pain control" using 4% articaine without palatal injection and to compare adequate anesthesia and pain control in the anterior and posterior regions of the maxilla.

**MATERIALS AND METHODS:** This prospective controlled study followed a split-mouth protocol, in which patients served as their own control. Forty-eight patients who needed routine extraction of permanent maxillary anterior and posterior teeth were referred. After an injection of 4% articaine and a 5-minute wait, 1

posterior tooth and 1 anterior tooth were extracted using standard techniques.

The patient's perception of pain was assessed using a visual analog scale and a verbal rating scale after each injection and extraction. Statistical analysis

consisted of descriptive statistics, paired-sample t test, and

independent-samples t test to determine whether differences were statistically significant ( $P < .05$ ).

**RESULTS:** In total, 48 anterior and 48 posterior teeth were extracted from 48 patients. Extraction of maxillary teeth was possible without an additional palatal injection for 87 teeth (90.6%), whereas only 9 teeth (9.4%) needed an additional palatal injection to complete the extraction. Of the total number of patients, 90% reported that the pain caused by tooth extraction in the anterior and posterior regions of the maxilla was mild. None of the patients rated the pain of extraction in the maxilla as severe.

**CONCLUSION:** There was no difference in pain perception when extracting anterior and posterior teeth. Of the total number of teeth, 90.6% were extracted without the need for palatal injection. In this study, extraction of erupted maxillary teeth using 4% articaine without manipulation of the palatal mucosa obviated palatal infiltration during extraction. Articaine anesthesia provides adequate palatal anesthesia for maxillary teeth extraction in the anterior and posterior regions without the need for a palatal block.

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Dental care attendance and refrainment from dental care among adults.

Hakeberg M(1), Wide Boman U(1).

**OBJECTIVE:** The aim of this study was to analyse dental care utilization, refrainment from self-perceived needed dental care and the association with socioeconomic indicators among adult individuals.

**MATERIALS AND METHODS:** This cross-sectional survey included 3500 randomly selected adult individuals. Telephone interviews were conducted and the participants answered a battery of questions regarding dental visiting habits, health, socioeconomic position (SEP), behavioural factors and lifestyle indicators.

**RESULTS:** The outcome 'dental visits' was significantly correlated with SEP, especially with monetary dimensions, such as income and economic resources for unforeseen expenditures. However, educational level was not a significant predictor in the tested statistical models. Furthermore, other covariates that contributed significantly to the models were ethnicity, dental anxiety and lifestyle factors, albeit with a different pattern of impact on the two outcome dimensions. Important features of the SEP variables were the stepwise gradient relative to the outcomes, implicating that the lower the SEP status, the greater the risk of reporting irregular dental visiting habits and refraining from dental care due to financial problems.

CONCLUSIONS: Dental care utilization and refraining from dental care for financial reasons clearly reveal associations with socioeconomic positions among adult individuals.

92. J Oral Sci. 2017;59(1):139-146. doi: 10.2334/josnurd.16-0219.

Roles of serum uric acid, prolactin levels, and psychosocial factors in oral lichen planus.

Gupta A(1), Mohan RP, Gupta S, Malik SS, Goel S, Kamarthi N.

Free radicals play important roles in the mechanisms underlying lichen planus (LP). Uric acid (UA) is an important anti-oxidant in plasma. Prolactin (PRL) is an immunomodulatory hormone that may promote LP, as has been documented in other autoimmune disorders, such as systemic lupus erythematosus, rheumatoid arthritis, and psoriasis. PRL has multiple immune-stimulatory effects and promotes the development of such autoimmune disorders. Prolactin and uric acid may serve as biomarkers of disease activity in lichen planus. The aim of the present study was to evaluate the roles of depression, stress, and anxiety in LP, as well as serum levels of UA and PRL as potential biomarkers of disease activity and compare these findings with those of the control group. Thirty-nine patients clinically diagnosed with oral LP (study group) and 39 age- and sex-matched controls (control group) were selected in this study. Serum UA and PRL levels were measured. The Depression Anxiety Stress Scale-21 was used for psychometric

evaluation of LP patients and controls. Serum UA level was found to be significantly higher in the control group as well as during the remission phase of disease in the study. There was no significant difference in serum PRL levels between cases and controls. Depression and stress scores were higher in the study group.

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93. J Dent Res. 2017 Feb;96(2):153-162. doi: 10.1177/0022034516678168. Epub 2016 Nov 16.

Association between Anxiety and Pain in Dental Treatment: A Systematic Review and Meta-analysis.

Lin CS(1), Wu SY(1)(2), Yi CA(2).

Comment in

J Am Dent Assoc. 2017 May;148(5):e54.

Accumulating evidence has revealed that dental anxiety (DA), as a dispositional factor toward the dental situation, is associated with the state anxiety (SA) and pain related to dental procedures. However, conclusions from individual studies may be limited by the treatment procedures that patients received, the tools used to assess DA, or the treatment stages when anxiety or pain was assessed. It is

unclear whether DA, at the study level, accounts for the variance in pretreatment SA. The impact of DA and SA on pain at different treatment stages has not been systematically investigated. To address these questions, we present novel meta-analytical evidence from 35 articles (encompassing 47 clinical groups) that investigated DA in a clinical group. Subgroup analyses revealed that the studies of surgical and nonsurgical procedures did not significantly differ in either DA or pretreatment SA. Furthermore, metaregressions revealed DA as a significant predictor that explained the variance in SA assessed before and during treatment but not after treatment. The findings suggest that patient DA has a significant impact on patient SA. Metaregressions revealed DA as a significant predictor that explained the variance in expected pain, pain during treatment and posttreatment pain. In contrast, pretreatment SA was a significant predictor that explained the variance in expected pain. The findings reveal that DA has a consistent impact on pain through the entire period of dental treatment. Altogether, the findings highlight the role of DA as an overall indicator for anxiety and pain, across different types of dental procedures or treatment stages. We conclude that anxiety should be assessed as a critical step not only in anxiety management for high-DA patients, but also in pain control for all dental patients.

94. Oral Dis. 2017 Apr;23(3):387-394. doi: 10.1111/odi.12626. Epub 2017 Feb 8.

Elucidating the role of hyposalivation and autoimmunity in oral candidiasis.

Billings M(1), Dye BA(2), Iafolla T(2), Grisius M(1), Alevizos I(1).

**INTRODUCTION:** Oral candidiasis (OC) is a potential oral complication in Sjögren's syndrome (SS). Some studies indicate that the low stimulated salivary flow and not low unstimulated salivary flow is associated with OC in SS, while others report that the underlying autoimmune disorders contribute to OC, based solely on correlation coefficients. Given the conflicting and limited existing evidence, we purposed to ascertain the role of both salivary gland dysfunction (hyposalivation based on unstimulated and stimulated flow rates) and autoimmunity (SS, other autoimmune disorders) in OC among those with SS, other salivary gland dysfunction, and non-salivary gland dysfunction controls (NSGD).

**METHODS:** A nested case-control study was designed within a larger NIH/NIDCR cohort. Descriptive analyses, nonparametric tests, comparative analyses, and multivariate logistic regression analyses were undertaken.

**RESULTS:** Data on 1526 subjects (701 SS, 247 ISS, 355 Sicca, and 223 NSGD) were obtained from the source cohort of 2046 and analyzed for this study. The median whole unstimulated salivary flow rate (WUS, ml 15 min<sup>-1</sup>) was lower in SS (0.8, interquartile range (IQR) 1.8) compared to ISS (5.5, IQR: 5.2,  $P < 0.001$ ) and NSGD (3.8, IQR: 3.8,  $P < 0.001$ ) but comparable with that of Sicca (1.0, IQR: 1.5,  $P = 0.777$ ) participants. The median total stimulated salivary flow rate (TSS, ml 15 min<sup>-1</sup>) was lowest in SS (7.0, IQR: 12.4,  $P < 0.001$ ) compared to other groups. Of the 45 OC cases in this cohort, 71.1% ( $n = 32$ ) were from the SS group. The prevalence of OC was highest in the SS group (4.6%,  $P = 0.008$ ). SS group had twice the risk of OC than NSGD (OR = 2.2, 95%CI: 1.1-4.2,  $P = 0.02$ ) and Sicca (OR = 2.2, 95% CI: 1.0-4.8,  $P = 0.03$ ), adjusting for confounders; hyposalivation [WUS (OR = 5.1, 95%CI: 2.5-10.4,  $P < 0.001$ ), TSS (OR = 1.9, 95%CI: 1.0-3.5,

P = 0.04)], history of other autoimmune disorders (OR = 4.4, 95%CI: 1.7-11.3, P = 0.002), medications for extraglandular manifestations (OR = 2.3, 95%CI: 1.1-4.9, P = 0.03), and diabetes mellitus (4.2, 95%CI: 1.2-15.2, P = 0.02) were independent predictors of OC; females had a lower risk than males (OR = 0.29, 95%CI: 0.13-0.67, P = 0.004). Age, race, anti-SSA/SSB autoantibodies, focus score, other medications, anxiety, fatigue, cigarette smoking, alcohol, and caffeine use were not associated with oral candidiasis.

CONCLUSION: Salivary gland dysfunction (hyposalivation with WUS being a stronger predictor than TSS) and autoimmunity (SS, other autoimmune disorders, medications, i.e., DMARDS) are both independent predictors of OC. Diabetes mellitus is an independent predictor of OC among those with salivary gland dysfunction. Our findings suggest that these independent predictors should be considered in the prevention and management of OC in this population.

95. Clin Oral Investig. 2017 Dec;21(9):2873-2874. doi: 10.1007/s00784-017-2239-3. Epub 2017 Oct 25.

A reflection and analysis about the tools in the assessment of bruxism.

Oporto GH(1)(2)(3)(4), Salazar LA(5)(6).

Comment on

Clin Oral Investig. 2018 Jan;22(1):331-337.

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96. Clin Oral Investig. 2017 Dec;21(9):2875-2876. doi: 10.1007/s00784-017-2250-8.

Epub 2017 Oct 25.

Dopaminergic pathways for bruxism: a way forward?

Junior RA(1), Frange C(1), Tempaku PF(1), Tufik S(1), Andersen ML(2).

Comment on

Clin Oral Investig. 2018 Jan;22(1):331-337.

97. Int J Prosthodont. 2017 September/October;30(5):437-438. doi: 10.11607/ijp.5210.

Epub 2017 Aug 14.

Current Concepts of Bruxism.

Manfredini D, Serra-Negra J, Carboncini F, Lobbezoo F.

Bruxism is a common phenomenon, and emerging evidence suggests that biologic, psychologic, and exogenous factors have greater involvement than morphologic factors in its etiology. Diagnosis should adopt the grading system of possible, probable, and definite. In children, it could be a warning sign of certain psychologic disorders. The proposed mechanism for the bruxism-pain relationship

at the individual level is that stress sensitivity and anxious personality traits may be responsible for bruxism activities that may lead to temporomandibular pain, which in turn is modulated by psychosocial factors. A multiple-P (plates, pep talk, psychology, pills) approach involving reversible treatments is recommended, and adult prosthodontic management should be based on a common-sense cautionary approach.

98. *Int J Prosthodont.* 2017 Mar/Apr;30(2):123-132. doi: 10.11607/ijp.5082.

Bruxism: Is There an Indication for Muscle-Stretching Exercises?

Gouw S, de Wijer A, Creugers NH, Kalaykova SI.

Bruxism is a common phenomenon involving repetitive activation of the masticatory muscles. Muscle-stretching exercises are a recommended part of several international guidelines for musculoskeletal disorders and may be effective in management of the jaw muscle activity that gives rise to bruxism. However, most studies of muscle-stretching exercises have mainly focused on their influence on performance (eg, range of motion, coordination, and muscle strength) of the limb or trunk muscles of healthy individuals or individuals with sports-related injuries. Very few have investigated stretching of the human masticatory muscles and none muscle-stretching exercises in the management of (sleep) bruxism. This article reviews the literature on muscle-stretching exercises and their potential role in the management of sleep bruxism or its consequences in the

musculoskeletal system.

99. Clin Oral Investig. 2017 Apr;21(3):727-734. doi: 10.1007/s00784-017-2092-4. Epub 2017 Mar 2.

Is there enough evidence to use botulinum toxin injections for bruxism management? A systematic literature review.

De la Torre Canales G(1), Câmara-Souza MB(1), do Amaral CF(1), Garcia RC(2), Manfredini D(3).

**OBJECTIVE:** The objective of the study was to conduct a systematic review of the literature assessing the effects of botulinum toxin (BoNT-A) injections in the management of bruxism.

**MATERIALS AND METHODS:** Search for articles involved the PubMed, Scopus, Web of Science, Embase, Cochrane, Scielo and Lilacs databases. Specific terms were used and the search carried out from 1980 to March 2016 by three independent researchers. Randomized controlled studies (RCTs), prospective and before-after studies that applied BoNT-A at the masseter and/or temporalis muscles were included.

**RESULTS:** Three RCTs and two uncontrolled before-after studies out of 904 identified citations were included in this review. All five articles dealt with sleep bruxism and featured a small sample size. None of them was about awake

bruxism. Two randomized clinical trials were double-blinded, with a control group using saline solution. Two studies used polysomnography/electromyography for sleep bruxism diagnosis, whilst others were based on history taking and clinical examination. All studies using subjective evaluations for pain and jaw stiffness showed positive results for the BoNT-A treatment. In contrast, the two studies using objective evaluations did not demonstrate any reduction in bruxism episodes, but a decrease in the intensity of muscles contractions.

CONCLUSION: Despite the paucity of works on the topic, BoNT-A seems to be a possible management option for sleep bruxism, minimizing symptoms and reducing the intensity of muscle contractions, although further studies are necessary especially as far as the treatment indications for bruxism itself is concerned.

CLINICAL RELEVANCE: BoNT-A has been increasingly diffused in dentistry over recent years, being also used for pain management in patients with bruxism. Nonetheless, there is no consensus about its effects in this disorder.

100. J Oral Rehabil. 2017 Feb;44(2):144-153. doi: 10.1111/joor.12468.

Relationship between obstructive sleep apnea syndrome and sleep bruxism: a systematic review.

Jokubauskas L(1), Baltrušaitytė A(2).

Obstructive sleep apnoea syndrome (OSAS) is a clinical risk factor for sleep

bruxism (SB). Both OSAS and SB are reported to be associated with sleep-related arousal reactions, although no clear causative link has been established. An electronic literature search was conducted of the MEDLINE, ScienceDirect, Wiley Online Library, SAGE Journals and EBSCOhost databases covering the period January 2006 and September 2016. Sequential screenings at the title, abstract and full-text levels were performed. The review included observational studies in the English language with a clearly established aim to assess the relationship between OSAS and SB using full-night PSG. The seven-item quality-assessment tool for experimental bruxism studies was used to assess the methodology across the studies. After a comprehensive screening of titles, abstracts and full texts, only three studies that met the pre-defined criteria were finally included in this systematic review. Two studies gave evidence that OSAS is associated with the occurrence of SB events: (i) SB events frequently occur during micro-arousal events consequent on apnoea-hypopnoea (AH) events and (ii) most SB events occur in temporal conjunction with AH events termination. However, one study did not report a strong association between AH and SB events. It can be concluded that there are not enough scientific data to define a clear causative link between OSAS and SB. However, they appear to share common clinical features. Further studies should focus on the intermediate mechanisms between respiratory and SB events.

101. J Prosthodont Res. 2017 Jan;61(1):87-95. doi: 10.1016/j.jpor.2016.06.003. Epub 2016 Jun 25.

Mandibular movement during sleep bruxism associated with current tooth attrition.

Okura K(1), Shigemoto S(1), Suzuki Y(2), Noguchi N(3), Omoto K(1), Abe S(3),  
Matsuka Y(4).

**PATIENT:** Observation of attrition patterns suggests that mandibular movement in sleep bruxism (SB) may be associated with current tooth attrition. The aim of this study was to confirm this phenomenon by investigating mandibular movement and masseter muscle activity. The subject was a healthy 21-year-old Japanese male. We recorded biological signals including mandibular movement and masseter electromyograms (EMGs) with a polysomnograph. Based on the EMG using Okura's criteria, SB events were classified into clenching, grinding and mixed types according to mandibular movement criteria. The close-open mandibular movement cycles (CO-cycles) during grinding and mixed type events were selected based on mandibular movement trajectories.

**DISCUSSION:** Fifty-eight CO-cycles were selected in seven grinding and three mixed types. We found that SB mandibular movements associated with current tooth attrition. Excessive lateral movements (ELM) beyond the canine edge-to-edge position were observed in the closing (10.3%) and opening (13.8%) phases of the CO-cycle. Total masseter muscle activity was significantly higher during voluntary grinding (VGR) than during CO-cycle including ELM (working side:  $P=0.036$ , balancing side:  $P=0.025$ ). However, in the middle and late parts of the opening phase, working side masseter muscle activity was significantly higher during CO-cycle including ELM than during VGR ( $P=0.012$ ). In the early part of the closing phase, balancing side masseter muscle activity was significantly higher

during CO-cycle including ELM than during VGR (P=0.017).

CONCLUSION: These findings suggest that excessive forceful grinding during ongoing SB events may have caused canine attrition in this patient.

102. J Craniofac Surg. 2017 May;28(3):e214-e216. doi: 10.1097/SCS.0000000000003399.

Eagle Syndrome: An Unusual Cause Limited Mouth Opening and Surgical Management.

Aldelaimi TN(1), Boskani SW, Ali SM, Mahmud PK.

Eagle syndrome, defined "stylalgia," occurs when an elongated styloid process or calcified stylohyoid ligament causes dysphagia, facial pain recurrent throat pain or foreign body sensation, also associated symptoms such as neck or throat pain with radiation to the ear. The symptoms related to this condition can be confused or misdiagnosed to a wide variety of facial neuralgias. The incidence of Eagle syndrome varies among population. Usually asymptomatic, it occurs in adult patients, and can be diagnosed by physical examination and radiologically. A 30-year-old male patient presented to the maxillofacial unit of Sulaimaniyah Teaching Hospital with a complaint of pain in the right side of face interfering with mouth opening and causing deviation to the right side of mouth for 6 months duration. The elongated styloid process of the right side was resected surgically by the intra-oral approach. The patient was asymptomatic and comfortably followed up for 5 months.

103. Prim Dent J. 2017 Feb 28;6(1):37-45. doi: NO\_DOI.

Acid Erosion: An Increasingly Relevant Dental Problem. Risk Factors, Management and Restoration.

Milosevic A.

A review of risk factors and management of acid erosion. Particular emphasis is placed on the use of direct composite as a reversible and relatively straightforward restorative option.

104. J Oral Rehabil. 2017 Apr;44(4):251-260. doi: 10.1111/joor.12489.

Oro-facial functions in experimental models of cerebral palsy: a systematic review.

Lacerda DC(1), Ferraz-Pereira KN(2), Bezerra de Morais AT(3), Costa-de-Santana BJ(4), Quevedo OG(5), Manhães-de-Castro R(6), Toscano AE(7).

Children who suffer from cerebral palsy (CP) often present comorbidities in the form of oro-facial dysfunctions. Studies in animals have contributed to elaborate potential therapies aimed at minimising the chronic disability of the syndrome.

To systematically review the scientific literature regarding the possible effects that experimental models of CP can have on oro-facial functions. Two independent authors conducted a systematic review in the electronic databases Medline, Scopus, CINAHL, Web of Science and Lilacs, using Mesh and Decs terms in animal models. The motor and sensory parameters of sucking, chewing and swallowing were considered as primary outcomes; reactivity odour, controlled salivation, postural control, head mobility during feeding and the animal's ability to acquire food were secondary outcomes. Ten studies were included in the present review. Most studies used rabbits as experimental models of CP, which was induced by either hypoxia-ischemia, inflammation or intraventricular haemorrhage. Oro-facial functions were altered in all experimental models of CP. However, we found more modifications in hypoxia-ischemia models overall. On the other hand, the model of inflammation was more effective to reproduce higher damage for coordinating sucking and swallowing. All of the CP experimental models that were assessed modified the oral functions in different animal species. However, further studies should be conducted in order to clarify the mechanisms underlying oro-facial damage in order to optimise treatment strategies for children who suffer from CP.

105. J Oral Rehabil. 2017 Apr;44(4):313-326. doi: 10.1111/joor.12486. Epub 2017 Mar 1.

Oro-facial impairment in stroke patients.

Schimmel M(1)(2), Ono T(3), Lam OL(4), Müller F(2).

Stroke is considered one of the leading causes of death and acquired disability with a peak prevalence over the age of 80 years. Stroke may cause debilitating neurological deficiencies that frequently result in sensory deficits, motor impairment, muscular atrophy, cognitive deficits and psychosocial impairment. Oro-facial impairment may occur due to the frequent involvement of the cranial nerves' cortical representation areas, central nervous system pathways or motoneuron pools. The aim of this narrative, non-systematic review was to discuss the implications of stroke on oro-facial functions and oral health-related quality of life (OHRQoL). Stroke patients demonstrate an impaired masticatory performance, possibly due to reduced tongue forces and disturbed oral sensitivity. Furthermore, facial asymmetry is common, but mostly discrete and lip restraining forces are reduced. Bite force is not different between the ipsi- and contra-lesional side. In contrast, the contra-lesional handgrip strength and tongue-palate contact during swallowing are significantly impaired. OHRQoL is significantly reduced mainly because of the functional impairment. It can be concluded that impaired chewing efficiency, dysphagia, facial asymmetry, reduced lip force and OHRQoL are quantifiable symptoms of oro-facial impairment following a stroke. In the absence of functional rehabilitation, these symptoms seem not to improve. Furthermore, stroke affects the upper limb and the masseter muscle differently, both, at a functional and a morphological level. The rehabilitation of stroke survivors should, therefore, also seek to improve the strength and co-ordination of the oro-facial musculature. This would in turn help improve OHRQoL and the masticatory function, subsequently preventing weight loss and malnutrition.

106. Dent Mater J. 2017 Sep 26;36(5):654-661. doi: 10.4012/dmj.2016-225. Epub 2017 Jul 12.

Retention and caries-preventive effect of glass ionomer and resin-based sealants:

An 18-month-randomized clinical trial.

Al-Jobair A(1), Al-Hammad N(1), Alsadhan S(2), Salama F(1).

The objective of this study was to compare the retention and caries-preventive effect of glass ionomer (Fuji Triage) and resin-based (Clinpro) sealants among 6-9-year-old children. This split-mouth, randomized clinical trial covered 35 children/140 fully erupted permanent first molars. Evaluation was conducted by two independent examiners after 6, 12, and 18 months and the data were compared in relation to the children's caries risk and age groups. The Kaplan-Meier survival method and chi-square test were used for analysis. There were no statistically significant differences in the survival of partial and fully retained sealants or in the survival of caries-free pits and fissures between glass-ionomer and resin-based sealants. In terms of retention, both sealants performed better in the younger age group at the end of the study, and showed better caries prevention in moderate caries risk children. After 18 months, both sealants had comparable retention and caries-preventive effects in 6-9-year old children.

107. J Contemp Dent Pract. 2017 Mar 1;18(3):241-245.

Treatment of Extrusive Luxation in Permanent Teeth: Literature Review with Systematic Criteria.

Amaral MF(1), de Almeida MM(2), de Faria LP(3), Brandini DA(2), Poi WR(2), Okamoto R(2).

**INTRODUCTION:** Extrusive luxation is a traumatic dental injury caused by the action of oblique forces, characterized by partial displacement of the tooth out of its socket. The ideal treatment for this type of trauma involves repositioning the tooth in its socket. However, in cases where the tooth cannot be repositioned, different options may be considered, such as intentional reattachment and orthodontic intrusion. The aim is to review the literature on the extrusive luxation of permanent teeth while assessing the risks of complications for two methods of delayed treatment for extrusive luxation.

**MATERIALS AND METHODS:** An electronic search from August 2005 to August 2014 was performed by two reviewers independently, and conflicts were resolved by a third reviewer. The databases used were PubMed and Scopus; the reviewers performed a manual search of the following journals: Dental Traumatology, American Journal of Orthodontics, and Clinical Oral Investigation.

**RESULTS:** After removing the duplicate studies, 328 articles were found. Out of these, 321 were rejected as not addressing the proposed research topic. In addition, five articles were excluded because apical repositioning was used for

treatment. Therefore, four articles formed the basis of the study.

**CONCLUSION:** Factors, such as root formation, the degree of tooth mobility, and the presence of tooth vitality were decisive for the choice of treatment.

However, both treatments were effective and showed favorable results, i.e., without periodontal and root damage.

**CLINICAL SIGNIFICANCE:** Knowledge of the risks of complications among two methods of delayed treatment for extrusive luxation, as well as other important factors to take into consideration when choosing a treatment assists dentists in improving the prognostic.

108. Compend Contin Educ Dent. 2017 Mar;38(3):e1-e4.

Two-Year Clinical Evaluation of a Nanofilled Etch-and-Rinse and a Self-Etch Adhesive System Containing MDPB and Fluoride in Non-carious Cervical Lesions.

de Oliveira FG(1), Machado LS(2), Sundfeld-Neto D(3), Giannini M(4), Briso AL(1), Dos Santos PH(5), Sundfeld ML(6), Sundfeld RH(7).

**OBJECTIVES:** The aim of this clinical study was to evaluate the performance of restorations for non-carious cervical lesions performed with a two-step etch-and-rinse or with a two-step self-etch adhesive.

**MATERIALS AND METHODS:** The teeth to be restored (15 patients, N = 90 restorations) were randomly assigned into 3 groups (n = 30), according to the

adhesive system: group 1 (G1): Peak LC Bond; group 2 (G2): Clearfil Protect Bond; and group 3 (G3): prior selective acid etching of the enamel margins before bonding with Clearfil Protect Bond. The NCCLs were restored with Amelogen Plus composite resin. Two calibrated examiners evaluated the restorations using modified US Public Health Service criteria. The data of retention, marginal integrity, and marginal discoloration were analyzed using the Kruskal-Wallis and Wilcoxon tests.

RESULTS: There were no significant differences in clinical performance among the groups for the variables: retention, marginal integrity, and marginal discoloration after 1 year and 2 years. The alpha rates after 2 years were: 93.3% for G1 and 96.7% for G2 and G3 for retention; 93.3%, 100%, and 90% for G1, G2, and G3 for marginal discoloration; 86.7%, 96.7%, and 90% for G1, G2, and G3 for marginal integrity, respectively.

CONCLUSIONS: The adhesives presented similar clinical performance at the end of 2 years. Also, the prior etching with phosphoric acid did not significantly improve the clinical performance of self-etch adhesive.

109. Dentomaxillofac Radiol. 2017 Apr;46(4):20160417. doi: 10.1259/dmfr.20160417. Epub 2017 Apr 6.

Digital transillumination in caries detection versus radiographic and clinical methods: an in-vivo study.

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Simark-Mattsson C(3), Campus G(2)(4).

**OBJECTIVES:** This article aimed to evaluate: (a) the agreement between a near-infrared light transillumination device and clinical and radiographic examinations in caries lesion detection and (b) the reliability of images captured by the transillumination device.

**METHODS:** Two calibrated examiners evaluated the caries status in premolars and molars on 52 randomly selected subjects by comparing the transillumination device with a clinical examination for the occlusal surfaces and by comparing the transillumination device with a radiographic examination (bitewing radiographs) for the approximal surfaces. Forty-eight trained dental hygienists evaluated and reevaluated 30 randomly selected images 1-month later.

**RESULTS:** A high concordance between transillumination method and clinical examination ( $\kappa = 0.99$ ) was detected for occlusal caries lesions, while for approximal surfaces, the transillumination device identified a higher number of lesions with respect to bitewing ( $\kappa = 0.91$ ). At the dentinal level, the two methods identified the same number of caries lesions ( $\kappa = 1$ ), whereas more approximal lesions were recorded using the transillumination device in the enamel ( $\kappa = 0.24$ ). The intraexaminer reliability was substantial/almost perfect in 59.4% of the participants.

**CONCLUSIONS:** The transillumination method showed a high concordance compared with traditional methods (clinical examination and bitewing radiographs). Caries detection reliability using the transillumination device images showed a high intraexaminer agreement. Transillumination showed to be a reliable method and as

effective as traditional methods in caries detection.

110. Int J Paediatr Dent. 2017 Jan;27(1):11-21. doi: 10.1111/ipd.12233. Epub 2016 Apr 21.

A systematic review on the association between molar incisor hypomineralization and dental caries.

Americano GC(1), Jacobsen PE(2), Soviero VM(3), Haubek D(2).

**BACKGROUND:** Molar incisor hypomineralization (MIH) is a defect of enamel. The lower strength of the enamel can lead to fractures that predispose for plaque accumulation and caries.

**AIM:** This systematic review aimed to assess the association between MIH and caries.

**DESIGN:** Studies involving children of all ages, which reported results on MIH and caries in the permanent dentition, were considered eligible. A search was performed in PubMed and was limited to the period from January 2003 to November 2015, and to studies written in English. Reviews, meta-analyses, and case reports were excluded. The studies were evaluated by use of the Newcastle-Ottawa Quality Assessment Scale (NOS).

**RESULTS:** Seventeen publications were compiled in the review. Most publications reported that children with MIH have higher caries experience. One study did not observe a difference in DMF values among children affected or not by MIH. Three

studies reported that children with MIH were 2.1 to 4.6 times more likely to have caries in the permanent dentition than children without MIH.

CONCLUSIONS: A significant association between MIH and caries was found. The results should, however, be interpreted cautiously due to the lack of high-quality studies. The present systematic review confirms the need for further well-designed studies.

111. J Investig Clin Dent. 2017 Feb;8(1). doi: 10.1111/jicd.12188. Epub 2015 Sep 7.

Effect of scaling and root planing with and without adjunctive use of an essential-oil-based oral rinse in the treatment of periodontal inflammation in type-2 diabetic patients.

Alshehri M(1), Alshail F(2), Alshehri FA(3).

AIM: The aim was to assess the effect of scaling and root planing (SRP) with and without adjunctive use of an essential-oil (EO)-based oral rinse in the treatment of periodontal inflammation in type-2 diabetic (T2D) patients.

METHODS: Sixty T2D patients were included. In Group 1 (n = 30), SRP was performed and patients were instructed to rinse twice daily with EO-based oral rinse for 30 days. In Group 2 (n = 30), SRP was performed and participants were instructed

to rinse twice daily with water for 30 days. Periodontal parameters (plaque index (PI), bleeding on probing (BOP), and probing pocket depth (PPD)  $\geq$  4 mm) and hemoglobin A1c (HbA1c) levels were assessed at baseline and after 90 days.

RESULTS: In both groups, periodontal parameters were similar at baseline. After 90 days of follow-up, there was a significant reduction in the severity of periodontal parameters in patients in Group 1 compared with Group 2. After 90 days of follow-up, there was also a significant reduction in HbA1c among patients in Group 1 compared with Group 2.

CONCLUSIONS: Scaling and root planing with adjunct use of an EO-based oral rinse is more effective in the treatment of periodontal inflammation in T2D patients than SRP alone. This approach also helps reduce hyperglycemia in T2D patients as compared with when SRP is performed alone.

112. Dent Update. 2017 May;44(5):409-10, 413-4.

Supra-Therapeutic Oral Paracetamol Overdose in Adults: An Update for the Dental Team.

Leader R, Hackett J, Al-Naher A.

Paracetamol (acetaminophen) is a commonly used analgesic; its 'over the counter' availability, low cost and popularity amongst patients often make it the first choice for dental pain. It is in this that its potential toxicity, made more complicated by the ever extending range of paracetamol-containing products, make

the understanding of this medication key to the safe management of patients presenting to surgery with dental pain. Clinical relevance: The purpose of this article is to supply dental practitioners with the knowledge to manage patients who present having taken an oral supra-therapeutic paracetamol overdose. Consideration is given to those patients who can be treated safely in primary care and to those who require transfer to Accident and Emergency (A&E).

113. Gen Dent. 2017 Jan-Feb;65(1):58-61.

What every dentist should know about opioids.

Seidman LM, Tordik PA, Bashirelahi N.

Prescription drug abuse is on the rise, causing detrimental health consequences and taking lives. Since dentists comprise a large percentage of opioid prescribers, they should be well educated on the uses and effects of opioids. This article discusses the consequences of long-term opioid use, how to identify signs of dependence, and how to prevent future abuse.

114. Contemp Clin Dent. 2017 Oct-Dec;8(4):650-652. doi: 10.4103/ccd.ccd\_550\_17.

Fragile X Syndrome: A Rare Case Report with Unusual Oral Features.

Ray P(1), Singh A(1), Dash JK(1), Sahoo PK(2), Dash JK(1).

Fragile X syndrome (FXS) is a rare variant of special health-care need demonstrating delayed developmental milestones and associated with intellectual and emotional disabilities ranging from learning problem to mental retardation. The syndrome is usually not diagnosed until 8-9 years of age since the clinical manifestations of the syndrome are greatly attenuated in childhood. The physical characteristics such as facial features, hyperactivity, attention deficit, autistic behavior, and macroorchidism are quite evident in younger age group. The most typical orofacial characteristics associated with children suffering from FXS are mandibular prominence, ogival, and cleft palate. Till date, very few dental literatures have been reported regarding the association of FXS with orodental anomalies. Here, we report a rare case of 14-year-old boy suffering from FXS with typical orofacial characteristics, multiple supernumerary teeth, and dental caries.

115. Contemp Clin Dent. 2017 Oct-Dec;8(4):632-636. doi: 10.4103/ccd.ccd\_129\_17.

18p Deletion Syndrome: Case Report with Clinical Consideration and Management.

Goyal M(1), Jain M(1), Singhal S(2), Nandimath K(3).

18p deletion syndrome is characterized by the deletion of short arm of chromosome 18. Presentation of this syndrome is quite variable with dysmorphic features, growth deficiencies, and mental retardation with poor verbal performance. Few patients even fail to thrive when malformations involving the heart and brain are severe. In the present article, we report an isolated case of 18p deletion in a 23-year-old female who for the first time reported to the hospital for dental problems. The patient was short statured with mental retardation and craniofacial, skeletal, dental, and endocrinal abnormalities. Such presentation warrants prompt diagnosis for effective management. Furthermore, genetic counseling for such patients and their families should be considered as a part of treatment itself.

116 J Dent Anesth Pain Med. 2017 Sep;17(3):205-213. doi:  
10.17245/jdapm.2017.17.3.205. Epub 2017 Sep 25.

Prognosis following dental implant treatment under general anesthesia in patients with special needs.

Kim IH(1), Kuk TS(1), Park SY(1), Choi YS(1), Kim HJ(2), Seo KS(2).

**BACKGROUND:** This study retrospectively investigated outcomes following dental implantation in patients with special needs who required general anesthesia to

enable treatment.

**METHODS:** Patients underwent implant treatment under general anesthesia at the Clinic for the Disabled in Seoul National University Dental Hospital between January 2004 and June 2017. The study analyzed medical records and radiographs. Implant survival rates were calculated by applying criteria for success or failure.

**RESULTS:** Of 19 patients in the study, 8 were males and 11 were females, with a mean age of 32.9 years. The patients included 11 with mental retardation, 3 with autism, 2 with cerebral palsy, 2 with schizophrenia, and 1 with a brain disorder; 2 patients also had seizure disorders. All were incapable of oral self-care due to serious cognitive impairment and could not cooperate with normal dental treatment. A total of 27 rounds of general anesthesia and 1 round of intravenous sedation were performed for implant surgery. Implant placement was performed in 3 patients whose prosthesis records could not be found, while 3 other patients had less than 1 year of follow-up after prosthetic treatment. When the criteria for implant success or failure were applied in 13 remaining patients, 3 implant failures occurred in 59 total treatments. The cumulative survival rate of implants over an average of 43.3 months (15-116 months) was 94.9%.

**CONCLUSIONS:** For patients with severe cognitive impairment who are incapable of oral self-care, implant treatment under general anesthesia showed a favorable prognosis.

117. J Dent Educ. 2017 Sep;81(9):eS45-eS52. doi: 10.21815/JDE.017.032.

Preparing the Future Dental Hygiene Workforce: Knowledge, Skills, and Reform.

Fried JL(1), Maxey HL(2), Battani K(2), Gurenlian JR(2), Byrd TO(2), Brunick A(2).

With the health care delivery system in transition, the way in which oral health care services are delivered in 2040 will inevitably change. To achieve the aims of reduced cost, improved access, and higher quality and to advance population wellness, oral health care will likely become a more integrated part of medical care. An integrated primary care system would better meet the needs of an increasingly diverse and aging U.S. population with uneven access to health care services. By 2040, trends suggest that a smaller proportion of dental hygienists will work in traditional solo dental offices; many more will practice with multidisciplinary health care teams in large-group dental and medical practices and in a variety of non-traditional community settings. This integration will require changes in how dental hygienists are educated. To shape the skill sets, clinical judgment, and knowledge of future practitioners, current dental hygiene curricula must be reexamined, redirected, and enhanced. This article examines some of the factors that are likely to shape the future of dental hygiene practice, considers the strengths and weaknesses of current curricula, and proposes educational changes to prepare dental hygienists for practice in 2040. This article was written as part of the project "Advancing Dental Education in the 21st Century."

118. Access to urgent dental care: a scoping review.

Worsley DJ(1), Robinson PG(2), Marshman Z(1).

**Objective:** To summarise the literature on urgent dental care and to identify research priorities on the organisation and delivery of urgent dental services.

**Basic research design:** Scoping review using Andersen's behavioural model of health service utilisation for a framework analysis of the data.

**Main outcome measures:** Gaps in the literature, defined as those factors and interactions identified by Andersen's model as having a contributory role in access to health services that were not evident in the source papers.

**Results:** Fifty-six papers met the inclusion criteria for the review. The factors most often considered were; demographic, socioeconomic, perceived and evaluated need, and health behaviours. Patient outcomes of evaluated health and quality of life following urgent dental care were the least studied variables, with the exception of patient satisfaction. No studies were identified on community values/norms of people accessing urgent dental care, on health economic evaluations or on studies of how urgent dental services mitigate use of other medical services. No studies were identified on urgent need for populations living in water fluoridated areas or on the relationship between service design and efficient or effective access as measured by patient outcomes.

**Conclusion:** Future research on patient outcomes and the comparison of different service models for urgent dental care through measures of equity, effectiveness and efficiency of access are needed to inform future policy and organisation of

these services.

119. J Dent Res. 2017 Sep;96(10):1106-1114. doi: 10.1177/0022034517709961. Epub 2017 May 23.

Dental Decay Phenotype in Nonsyndromic Orofacial Clefting.

Howe BJ(1)(2), Cooper ME(3), Wehby GL(4), Resick JM(3), Nidey NL(5),  
Valencia-Ramirez LC(6), Lopez-Palacio AM(7), Rivera D(8), Vieira AR(3)(9),  
Weinberg SM(3), Marazita ML(3)(9), Moreno Uribe LM(2)(10).

Although children with oral clefts have a higher risk for dental anomalies when compared with the general population, prior studies have shown conflicting results regarding their dental decay risk. Also, few studies have assessed dental decay risk in unaffected relatives of children with clefts. Thus, the question of increased risk of dental decay in individuals with oral clefts or their unaffected relatives is still open for empirical investigation. This study characterizes dental decay in the largest international cohort to date of children with nonsyndromic clefts and their relatives, as compared with controls, and it addresses whether families with oral clefts have a significantly increased risk for dental decay versus the general population. A total of 3,326 subjects were included: 639 case probands, 1,549 unaffected relatives, and 1,138 controls. Decay was identified from in-person dental examinations or intraoral photographs. Case-control differences were tested with regression analysis. No significant

differences were shown in percentage decayed and filled teeth and decayed teeth in the primary dentition (dft, dt) and permanent dentition (DFT, DT) in cases versus controls. In the cleft region, no significant differences were seen in primary or permanent decay (dt, DT) when compared with controls. No difference was found with regard to cleft type and percentage dft, dt, DFT, and DT in case probands. Nonsignificant differences were found in unaffected siblings and parents versus controls (primary and permanent dentitions). Collectively, these findings indicate that individuals with nonsyndromic oral clefts and their families do not have a higher dental decay risk as compared with the general population. These results suggest that either genetic or environmental factors underlying a higher susceptibility for dental anomalies do not increase caries risk or that the seemingly higher risk for dental decay associated with increased dental anomalies in case probands may be superseded by possible greater access to dental care.

120. *Periodontol* 2000. 2017 Jun;74(1):194-199. doi: 10.1111/prd.12199.

The place of periodontal examination and referral in general medicine.

Chan S, Pasternak GM, West MJ.

In many countries, dental services, unlike other health-care services, are not covered by the principle of universal access. It is only in the last couple of decades that there has been a greater interaction between medicine and dentistry. Various health-care systems worldwide may provide public dental services to the

young and the disadvantaged, but few provide access to all. Public policy does not appear to appreciate the vast economic, health and social implications of poor oral health on the overall health of an individual. Recognizing and acting on the interrelatedness between oral health and overall health helps to protect patients from pathological diseases, such as infective endocarditis, suboptimal glycemic control and deterioration in renal function. This review article examines some of the medical conditions to which patients are predisposed as a result of poor dental care. Additionally, the paper provides some real-life case examples to support this hypothesis, reinforces the importance of a strong relationship that needs to be embedded between the dentist and the physician and finally provides some suggestions for a multidisciplinary approach.

121. Am J Orthod Dentofacial Orthop. 2017 Dec;152(6):753-766.e7. doi: 10.1016/j.ajodo.2017.09.003.

Short-term and long-term effectiveness of powered toothbrushes in promoting periodontal health during orthodontic treatment: A systematic review and meta-analysis.

Al Makhmari SA(1), Kaklamanos EG(2), Athanasiou AE(1).

**INTRODUCTION:** Although powered toothbrushes have been reported to reduce gingivitis more than manual toothbrushes in the general population, the evidence regarding orthodontic patients has been inconclusive. Thus, we aimed to compare their effectiveness in relation to any available parameter regarding oral health in orthodontic patients with fixed appliances.

**METHODS:** Searches without restrictions for published and unpublished literature and hand searching took place up to August 2017. Oral-health relevant data from randomized controlled trials of at least 4-weeks duration comparing powered and manual tooth brushing without supervision were reviewed. Data were classified as short term (assessments at 1-3 months) and long term (assessments at >3 months), and the random-effects method was used to combine treatment effects. Individual study risk of bias was assessed using the Cochrane Risk of Bias Tool, and the quality of evidence was evaluated according to the Grades of Recommendation, Assessment, Development and Evaluation approach.

**RESULTS:** The initially identified articles were finally reduced to 9 randomized controlled trials investigating the periodontal health in 434 patients. Eight studies followed patients up to 3 months, and 1 up to 12 months during treatment. One study was at low and the rest at unclear risk of bias. Overall, in the short term, there was low-quality evidence that powered toothbrushes provide a statistically significant benefit compared with manual brushing with regard to the gingival index (weighted mean difference, -0.079; 95% confidence interval, -0.146 to -0.012;  $P = 0.021$ ) and indexes assessing gingival bleeding

(standardized mean difference, -0.637; 95% confidence interval, -1.092 to -0.183; P = 0.006). In the long term, only 1 available study showed a statistically significant benefit of powered over manual toothbrushes with regard to gingival index and bleeding. No differences were observed in probing pocket depth and relative attachment loss. For the rotation-oscillation brushes that involved the greatest body of evidence, statistically significant reductions in gingival index and bleeding were demonstrated only in the long-term study. No included study provided quantified measurements regarding caries activity.

CONCLUSIONS: Overall, powered toothbrushes may promote gingival health better than manual toothbrushes in orthodontic patients. However, no type demonstrated clear superiority. Better study standardization and reporting in longer follow-up studies are necessary to elucidate the clinical relevance of these results.

122. Swiss Dent J. 2017 Jul 24;127(7-8):634-639.

Abrasion of eroded and sound enamel by a dentifrice containing diamond abrasive particles

Wegehaupt FJ, Hoegger VGM, Attin T.

Eroded enamel is more susceptible to abrasive wear than sound enamel. New toothpastes utilizing diamond particles as abrasives have been developed. The present study investigated the abrasive wear of eroded enamel by three commercially available toothpastes (one containing diamond particles) and

compared it to the respective wear of sound enamel caused by these toothpastes. Seventy-two bovine enamel samples were randomly allocated to six groups (S1–S3 and E1–E3; n=12). Samples were submitted to an abrasive (S1–S3) or erosion plus abrasion (E1–E3) cycling. Per cycle, all samples were brushed (abrasion; 20 brushing strokes) with the following toothpastes: S1/E1: Signal WHITE SYSTEM, S2/E2: elmex KARIESCHUTZ and S3-E3: Candida WHITE DIAMOND (diamond particles). Groups E1–E3 were additionally eroded with HCl (pH 3.0) for 2 min before each brushing procedure. After 30, 60 and 90 cycles enamel wear was measured by surface profilometry. Within the same toothpaste and same number of cycles, enamel wear due to erosion plus abrasion was significantly higher than due to mere abrasion. After 30, 60 and 90 cycles, no significant difference in the wear in groups S1 and S2 was observed while the wear in group E1 was significantly ( $p < 0.05$ , ANOVA, Scheffecyc) lower than that in group E2. After 90 cycles, wear in group S3 was about 5 times higher than that in group S2, while wear in group E3 was about 1.3 times higher than that in group E2. As compared to the other two investigated toothpastes, the dentifrice containing diamond particles caused slightly higher abrasive wear of eroded enamel and distinctly higher wear of sound enamel compared to the conventional toothpastes under investigation.

123. Oral Health Prev Dent. 2017;15(3):269-277. doi: 10.3290/j.ohpd.a38160.

Preventive Effect of CPP-ACPF Paste and Fluoride Toothpastes Against Erosion and Erosion Plus Abrasion In Vitro - A 3D Profilometric Analysis.

Soares GG, Magalhães PA, Fonseca ABM, Tostes MA, Silva EMD, Coutinho TCL.

**PURPOSE:** To evaluate the effect of CPP-ACPF paste and fluoride toothpastes on enamel subjected to erosion and erosion plus abrasion in vitro.

**MATERIALS AND METHODS:** A total of 220 human enamel blocks were divided into eleven groups (n = 20): CPP-ACPF paste (MPP), potassium nitrate/sodium fluoride toothpaste (PE), sodium fluoride toothpaste (FD), fluoride-free toothpaste (SO) and control (erosion only with no paste or toothpastes; CO) according to the experimental design: erosion or erosion plus abrasion immediately after erosion (ERO+I-ABR) or 30 min after erosion (ERO+30min-ABR). For 5 days, the specimens were subjected to: (1) erosive challenge (EC) (cola drink, 4 x 5 min/day), topical application of the undiluted paste or diluted toothpastes (1:2 w/w) (4 x 1 min/ day) plus 1 h in artificial saliva (AS) between cycles and overnight; or (2) EC plus abrasion (4 x /60 s/day) performed with the diluted toothpastes (no MMP) plus 1 h in AS between cycles and overnight. Erosion depth was quantified through a 3D profilometer. Data were analysed using Kruskal-Wallis, Mann-Whitney and Wilcoxon tests (p = 0.05).

**RESULTS:** CPP-ACPF paste and NaF toothpaste showed lowest enamel wear among groups and reduced tissue loss by 89% in erosion challenge. Abrasion led to higher enamel wear than erosion only (p = 0.030). ERO+30min-ABR had no protective effect when compared to ERO+I-ABR (p > 0.05).

**CONCLUSION:** A high frequency of CPP-ACPF paste application (4x daily) is effective in reducing the effects of erosion. A waiting period before performing toothbrushing does not protect enamel against erosion regardless the composition

of the toothpastes.

124. J Dent Res. 2017 Jul;96(8):875-880. doi: 10.1177/0022034517708968. Epub 2017 May

18.

Cost-Effectiveness of Caries Prevention in Practice: A Randomized Controlled Trial.

O'Neill C(1), Worthington HV(2), Donaldson M(3), Birch S(4)(5), Noble S(6), Killough S(7), Murphy L(8), Greer M(9), Brodison J(8), Verghis R(8), Tickle M(2).

A 2-arm parallel-group randomized controlled trial measured the cost-effectiveness of caries prevention in caries-free children aged 2 to 3 y attending general practice. The setting was 22 dental practices in Northern Ireland. Participants were centrally randomized into intervention (22,600 ppm fluoride varnish, toothbrush, a 50-mL tube of 1,450 ppm fluoride toothpaste, and standardized prevention advice) and control (advice only), both provided at 6-monthly intervals during a 3-y follow-up. The primary outcome measure was conversion from caries-free to caries-active states assessed by calibrated and blinded examiners; secondary outcome measures included decayed, missing, or filled teeth surfaces (dmfs); pain; and extraction. Cumulative costs were related to each of the trial's outcomes in a series of incremental cost effectiveness ratios (ICERs). Sensitivity analyses examined the impact of using dentist's time

as measured by observation rather than that reported by the dentist. The costs of applying topical fluoride were also estimated assuming the work was undertaken by dental nurses or hygienists rather than dentists. A total of 1,248 children (624 randomized to each group) were recruited, and 1,096 (549 in the intervention group and 547 in the control group) were included in the final analyses. The mean difference in direct health care costs between groups was £107.53 (£155.74 intervention, £48.21 control,  $P < 0.05$ ) per child. When all health care costs were compared, the intervention group's mean cost was £212.56 more than the control group (£987.53 intervention, £774.97 control,  $P < 0.05$ ). Statistically significant differences in outcomes were only detected with respect to carious surfaces. The mean cost per carious surface avoided was estimated at £251 (95% confidence interval, £454.39-£79.52). Sensitivity analyses did not materially affect the study's findings. This trial raises concerns about the cost-effectiveness of a fluoride-based intervention delivered at the practice level in the context of a state-funded dental service (EudraCT No: 2009-010725-39; ISRCTN: ISRCTN36180119).

125. J Dent Res. 2017 Jul;96(7):741-746. doi: 10.1177/0022034517702330. Epub 2017 Apr 4.

A Randomized Controlled Trial of Caries Prevention in Dental Practice.

Tickle M(1), O'Neill C(2), Donaldson M(3), Birch S(4)(5), Noble S(6), Killough S(7), Murphy L(8), Greer M(9), Brodison J(10), Verghis R(8), Worthington HV(1).

Comment in

J Am Dent Assoc. 2017 Jul;148(7):e92.

We conducted a parallel group randomized controlled trial of children initially aged 2 to 3 y who were caries free, to prevent the children becoming caries active over the subsequent 36 mo. The setting was 22 dental practices in Northern Ireland, and children were randomly assigned by a clinical trials unit (CTU) (using computer-generated random numbers, with allocation concealed from the dental practice until each child was recruited) to the intervention (22,600-ppm fluoride varnish, toothbrush, 50-mL tube of 1,450 ppm fluoride toothpaste, and standardized, evidence-based prevention advice) or advice-only control at 6-monthly intervals. The primary outcome measure was conversion from caries-free to caries-active states. Secondary outcome measures were number of decayed, missing, or filled teeth (dmfs) in caries-active children, number of episodes of pain, and number of extracted teeth. Adverse reactions were recorded. Calibrated external examiners, blinded to the child's study group, assessed the status of the children at baseline and after 3 y. In total, 1,248 children (624 randomized to each group) were recruited, and 1,096 (549 intervention, 547 control) were included in the final analyses. Eighty-seven percent of intervention and 86% of control children attended every 6-mo visit (  $P = 0.77$ ). A total of 187 (34%) in the intervention group converted to caries active compared to 213 (39%) in the control group (odds ratio, 0.81; 95% confidence interval, 0.64-1.04;  $P = 0.11$ ). Mean dmfs of those with caries in the intervention group was 7.2 compared to 9.6 in the control group (  $P = 0.007$ ). There was no significant difference in the number of episodes of pain between groups (  $P = 0.81$ ) or in the number of teeth

extracted in caries-active children (  $P = 0.95$ ). Ten children in the intervention group had adverse reactions of a minor nature. This well-conducted trial failed to demonstrate that the intervention kept children caries free, but there was evidence that once children get caries, it slowed down its progression (EudraCT No: 2009-010725-39; ISRCTN: ISRCTN36180119).

126. Quintessence Int. 2017;48(2):123-130. doi: 10.3290/j.qi.a37384.

The effect of a triclosan/copolymer/fluoride toothpaste on plaque formation, gingivitis, and dentin hypersensitivity: A single-blinded randomized clinical study.

Al Habashneh R, Farasin R, Khader Y.

**OBJECTIVE:** The daily removal of supragingival dental plaque is a key factor in the prevention of gingivitis. The aim of the study was to compare the gingival health benefits of a triclosan/copolymer/fluoride toothpaste (Colgate Total, a fluoride toothpaste containing an antiseptic) to a commercially available toothpaste containing 0.243% sodium fluoride in a silica base (Colgate Herbal, a conventional fluoride toothpaste with herbal extracts).

**METHOD AND MATERIALS:** A total of 50 patients with gingivitis and at least one sensitive tooth were included. The subjects were randomly stratified into two groups: Colgate Total toothpaste, and Colgate Herbal toothpaste. After a 4-week pre-experimental phase, baseline Plaque Index (Quigley-Hein Index) (PI), Gingival Index (GI), Gingival Bleeding Index (GBI), and Visual Analog Scale (VAS) were

assessed. The PI, GI, GBI, and VAS were reexamined at weeks 4, 12, and 24 after the baseline.

RESULTS: Fifty subjects complied with the protocol and completed the study. The conventional fluoride toothpaste with herbal extracts group and the fluoride toothpaste containing an antiseptic group exhibited significant reductions in PI, GI, GBI, and VAS over time. The amount of reduction after 6 months of the treatment was higher in the Total group compared to Herbal group (1.82 vs 1.39,  $P = .015$  for PI; 0.67 vs 0.37,  $P < .005$  for GI; and 56.64% vs 34.26%,  $P < .005$  for GBI). No significant difference was seen for VAS.

CONCLUSION: Twice daily brushing with a toothpaste containing 0.3% triclosan and polyvinyl methyl ether and maleic acid copolymer provides a more effective level of plaque control and gingival health with no effect on decreasing dentin hypersensitivity compared to conventional fluoride toothpaste. Toothpastes containing triclosan/copolymer, in addition to fluoride, result in a higher reduction in plaque, gingival inflammation, and gingival bleeding when compared with fluoride toothpastes without triclosan/copolymer.

127. J Oral Rehabil. 2017 Feb;44(2):112-118. doi: 10.1111/joor.12469.

Clinical features and factors associated with non-carious cervical lesions and dentin hypersensitivity.

Yoshizaki KT(1), Francisconi-Dos-Rios LF(1), Sobral MA(1), Aranha AC(1), Mendes FM(2), Scaramucci T(1).

Determining the factors associated with NCCLs and DH in populations could guide the implementation of specific preventive measures. This study evaluated the clinical features and factors associated with non-carious cervical lesions (NCCLs) and dentin hypersensitivity (DH) in a Brazilian population. The participants were 118 patients at the Dentistry Clinic of our dental school. They completed an interview to obtain personal information and determine the possible factors associated with NCCLs and DH. Clinical examination was undertaken to record the NCCLs, shape of the lesion and certain occlusal factors. DH was diagnosed by air and probe tests. Data were analysed with the multilevel Poisson regression and prevalence ratios, and the respective 95% confidence intervals were calculated. The prevalence of NCCLs and DH among patients was 67.8% and 51.7%, respectively. Of a total number of 2902 teeth examined, 9.65% had NCCLs and 5.82% were sensitive to air. The most affected teeth for both conditions were the premolars. Most of the NCCLs were wedge-shaped and located in the maxilla. The factors associated with NCCLs and DH were age and presence of premature occlusal contacts. NCCLs were also significantly associated with consumption of wine and alcoholic beverages, and DH with consumption of acidic fruits and juices. NCCLs were a common finding, with higher frequency in more advanced age groups, the maxilla and premolars. A significant association occurred between NCCLs, premature contacts and consumption of wine and alcoholic beverages. DH was associated with NCCLs, premature contacts and with the consumption of acidic fruits and juices.

128. Clin Oral Investig. 2017 Apr;21(3):831-837. doi: 10.1007/s00784-016-1838-8. Epub 2016 May 27.

Fluoride and calcium concentrations in the biofilm fluid after use of fluoridated dentifrices supplemented with polyphosphate salts.

Nagata ME(1), Delbem AC(1), Hall KB(1), Buzalaf MA(2), Pessan JP(3)(4).

**OBJECTIVES:** The present study evaluated fluoride (F) and calcium (Ca) concentrations in the biofilm fluid formed in situ under cariogenic challenge after using F dentifrices supplemented or not with sodium trimetaphosphate (TMP) or calcium glycerophosphate (CaGP).

**METHODS:** Volunteers (n = 12) were randomly divided into 5 groups according to the toothpastes used: placebo (without F, CaGP or TMP), 1100 ppm F (1100F) and low-fluoride dentifrice (LFD, 550 ppm F) with no supplementation (550F) or supplemented with 1 % TMP (550F-TMP) or 0.25 % CaGP (550F-CaGP). In each phase, volunteers wore palatal appliances containing 4 bovine enamel blocks. Cariogenic challenge was performed with 30 % sucrose solution, 6 times/day. On the morning of the eighth day, biofilm samples were collected 12 h and 1 h after brushing and cariogenic challenge. F and Ca analyses in the biofilm fluid were performed with the inverted electrode after buffering with TISAB III and using the Arsenazo III method, respectively. Data were submitted to two-way ANOVA (repeated measures) and Student-Newman-Keuls test ( $p < 0.05$ ).

**RESULTS:** A dose-response relationship was verified between F concentrations in the dentifrices and in the biofilm fluid. Significant differences were observed

among placebo, 550F, and 1100F only 1 h after brushing, without statistical differences among 550F, 550F-TMP, and 550F-CaGP. No defined trend was observed among the groups regarding Ca concentrations, with the highest values seen for placebo and 550F-CaGP.

**CONCLUSION:** The anticaries effect of LFDs supplemented with CaGP or TMP cannot be related to an increased availability of F and Ca in the biofilm fluid.

**CLINICAL SIGNIFICANCE:** The better performance of LFDs containing CaGP or TMP shown in previous studies should be attributed to their ability to interact with tooth enamel and with the biofilm, rather to their effect on the biofilm fluid.

129. Clin Oral Investig. 2017 Jan;21(1):463-468. doi: 10.1007/s00784-016-1814-3. Epub 2016 Apr 8.

Effectiveness of resin-based materials against erosive and abrasive enamel wear.

Zhao X(1)(2), Pan J(2), Zhang S(1), Malmstrom HS(1), Ren YF(3).

**OBJECTIVE:** The objective of this study was to test the effectiveness of resin-based materials against erosive enamel wear under erosive and abrasive challenges by orange juice and tooth brushing.

**METHODS:** Fifty enamel specimens from third molars were assigned to five groups: ICON resin infiltration with no etching (ICON-NE), ICON resin infiltration with 15 % HCl etching (ICON-AE), Seal & Protect sealant (S&P), Tetric EvoFlow (TEF), and control. Erosive lesions were first created on enamel, then treated with

resin-based materials. Erosive and abrasive challenges by orange juice and tooth brushing were repeated after treatments. Erosive wear of the treated areas was measured with 3D scanning microscopy, and data were analyzed using ANOVA and paired t tests.

**RESULTS:** Treatments with ICON, S&P, and TEF created a protective material coating of  $4.5 \pm 1.9 \mu\text{m}$ ,  $44.3 \pm 8.1 \mu\text{m}$ , and  $84.6 \pm 15.7 \mu\text{m}$  in thickness on the lesion surfaces, respectively. After 15 cycles of erosive and abrasive challenges, enamel or material losses were  $21.9 \pm 2.3 \mu\text{m}$  for control,  $24.5 \pm 4.0 \mu\text{m}$  for ICON-NE,  $24.6 \pm 7.4 \mu\text{m}$  for ICON-AE,  $11.2 \pm 4.1 \mu\text{m}$  for S&P, and  $3.9 \pm 1.9 \mu\text{m}$  for TEF, respectively. The protective coatings were completely lost in the ICON infiltration groups but remained intact in both the S&P and TEF groups after erosive and abrasive challenges.

**CONCLUSION:** In contrast to a resin sealant and a flowable composite, ICON infiltration resin was not effective in protecting enamel surfaces from erosive and abrasive wear.

**CLINICAL RELEVANCE:** Sealant and flowable composite resin may create protective coatings on eroded enamel surfaces and prevent further tissue loss.

130. Clin Oral Investig. 2017 Jan;21(1):291-300. doi: 10.1007/s00784-016-1789-0. Epub 2016 Mar 19.

Caries-preventive effect of anti-erosive and nano-hydroxyapatite-containing toothpastes in vitro.

Esteves-Oliveira M(1), Santos NM(2), Meyer-Lueckel H(3), Wierichs RJ(3),  
Rodrigues JA(2).

**OBJECTIVES:** The aim of the study was to investigate the caries-preventive effect of newly developed fluoride and fluoride-free toothpastes specially designed for erosion prevention. The hypothesis was that these products might also show superior caries-inhibiting effect than regular fluoride toothpastes, since they were designed for stronger erosive acid challenges.

**MATERIALS AND METHODS:** Enamel specimens were obtained from bovine teeth and pre-demineralized (pH = 4.95/21 days) to create artificial caries lesions.

Baseline mineral loss ( $\Delta ZB$ ) and lesion depth (LDB) were determined using transversal microradiography (TMR). Ninety specimens with a median  $\Delta ZB$  (SD) of  $6027 \pm 1546 \text{ vol\%} \times \mu\text{m}$  were selected and randomly allocated to five groups (n = 18). Treatments during pH-cycling (14 days, 4 × 60 min demineralization/day) were brushing 2×/day with AmF (1400 ppm F<sup>-</sup>, anti-caries [AC]);

AmF/NaF/SnCl<sub>2</sub>/Chitosan (700 ppm F<sup>-</sup>/700 ppm F<sup>-</sup>/3500 ppm Sn<sup>2+</sup>, anti-erosion [AE1]); NaF/KNO<sub>3</sub> (1400 ppm F<sup>-</sup>, anti-erosion [AE2]); nano-hydroxyapatite-containing (0 ppm F<sup>-</sup>, [nHA]); and fluoride-free toothpastes (0 ppm F<sup>-</sup>, negative control [NC]).

Toothpaste slurries were prepared with mineral salt solution (1:3 wt/wt). After pH-cycling specimens presenting lesion, surface loss (mainly by NC and nHA) were discarded. For the remaining 77 specimens, new TMR analyses ( $\Delta ZE/LDE$ ) were performed. Changes in mineral loss ( $\Delta \Delta Z = \Delta ZB - \Delta ZE$ ) and lesion depth ( $\Delta LD = LDB - LDE$ ) were calculated.

**RESULTS:** All toothpastes caused significantly less demineralization (lower  $\Delta \Delta Z$ ) than NC (p < 0.05, ANOVA) except for nHA. The fluoride toothpastes did not differ

significantly regarding  $\Delta\Delta Z$  and  $\Delta LD$  ( $p > 0.05$ , ANOVA).

CONCLUSION/CLINICAL RELEVANCE: While both anti-erosive and anti-caries toothpastes reduced mineral loss to a similar extent, the fluoride-free nano-hydroxyapatite-containing toothpaste seemed not to be suitable for inhibition of caries demineralization in vitro.

131. J Appl Oral Sci. 2017 Nov-Dec;25(6):680-688. doi: 10.1590/1678-7757-2017-0050.

Physical properties and biological effects of mineral trioxide aggregate mixed with methylcellulose and calcium chloride.

Lee BN(1), Chun SJ(1), Chang HS(1), Hwang YC(1), Hwang IN(1), Oh WM(1).

OBJECTIVES: Methylcellulose (MC) is a chemical compound derived from cellulose. MTA mixed with MC reduces setting time and increases plasticity. This study assessed the influence of MC as an anti-washout ingredient and  $CaCl_2$  as a setting time accelerator on the physical and biological properties of MTA.

MATERIAL AND METHODS: Test materials were divided into 3 groups; Group 1(control): distilled water; Group 2: 1% MC/ $CaCl_2$ ; Group 3: 2% MC/ $CaCl_2$ .

Compressive strength, pH, flowability and cell viability were tested. The gene expression of bone sialoprotein (BSP) was detected by RT-PCR and real-time PCR. The expression of alkaline phosphatase (ALP) and mineralization behavior were evaluated using an ALP staining and an alizarin red staining.

RESULTS: Compressive strength, pH, and cell viability of MTA mixed with MC/CaCl<sub>2</sub> were not significantly different compared to the control group. The flowability of MTA with MC/CaCl<sub>2</sub> has decreased significantly when compared to the control (p<.05). The mRNA level of BSP has increased significantly in MTA with MC/CaCl<sub>2</sub> compared to the control (p<.05). This study revealed higher expression of ALP and mineralization in cells exposed to MTA mixed with water and MTA mixed with MC/CaCl<sub>2</sub> compared to the control (p<.05).

CONCLUSIONS: MC decreased the flowability of MTA and did not interrupt the physical and biological effect of MTA. It suggests that these cements may be useful as a root-end filling material.

132. J Clin Pediatr Dent. 2017;41(6):446-449. doi: 10.17796/1053-4628-41.6.5. Epub 2017 Sep 22.

Direct Pulp Capping in Primary Molars using Mineral Trioxide Aggregate: An in Vivo Study.

Luczaj-Cepowicz E, Marczuk-Kolada G, Pawinska M, Obidzinska M.

OBJECTIVE: To do a clinical and radiographic evaluation of the effectiveness of

MTA when used as a direct pulp capping material in primary molars.

**STUDY DESIGN:** Clinical and radiographic follow-up was performed on 30 primary molars with deep caries lesions in 30 patients from 3 to 9.75 years of age. Pulp exposed during cavity preparation were treated by direct pulp capping with MTA.

The follow-up clinical and radiographic examinations were carried out at different time intervals: 6, 7-12, 13-18, 19-24, and >24 months after treatment.

**RESULTS:** Twenty-four teeth were evaluated during the entire observation period. Positive clinical and radiographic outcomes were achieved in 19 teeth (13 teeth were saved and 6 were exfoliated). In five teeth, complications were observed only in children under 7 years old.

**CONCLUSION:** Based on these clinical and radiographic results, MTA was found to be successful when used as a direct pulp capping material in primary teeth.

133. Oral Health Prev Dent. 2017;15(4):365-370. doi: 10.3290/j.ohpd.a38739.

Frequency of Application of AmF/NaF/SnCl<sub>2</sub> Solution and Its Potential in Inhibiting the Progression of Erosion in Human Dental Enamel - An In Vitro Study.

da Silva CV, Nazello JL, de Freitas PM.

**PURPOSE:** To evaluate whether increasing the frequency of its use can enhance the protective effect of AmF/NaF/SnCl<sub>2</sub> solution against dental erosion.

**MATERIALS AND METHODS:** Sixty human enamel samples were obtained from sound human third molars, and after the formation of incipient erosive lesions (1% citric acid, pH 4.0, for 3 min), they were divided into five treatment groups (n = 12):

G1 - deionised water (negative control); G2 - NaF solution (positive control) once a day; G3 - NaF solution (positive control) twice a day; G4 - AmF/NaF/SnCl<sub>2</sub> solution once a day; G5 - AmF/NaF/SnCl<sub>2</sub> solution twice a day. The samples were then subjected to 5 days of erosive cycling through 6 daily immersions (2 min each) in citric acid solution (0.05 M, pH 2.6). At the end of erosive cycling, surface wear was determined by means of optical profilometry.

RESULTS: One-way ANOVA showed that the surface wear was affected by surface treatments ( $p < 0.001$ ). Tukey's test showed no difference between the groups in which NaF was applied once or twice, but they showed limited reduction in wear compared to the deionised water group (G1). In the groups treated with the AmF/NaF/SnCl<sub>2</sub> solution, there was a statistically significant difference between one and two application times ( $p < 0.001$ ). Although both demonstrated statistically significantly reduced tissue loss, increasing the frequency increased its anti-erosive potential.

CONCLUSION: The AmF/NaF/SnCl<sub>2</sub> solution proved to be effective in reducing dental enamel surface loss and its use twice a day potentiated its anti-erosive effect.

134. J Oral Facial Pain Headache. 2017 Summer;31(3):257-263. doi: 10.11607/ofph.1754.

Topical Clonazepam Solution for the Management of Burning Mouth Syndrome: A Retrospective Study.

Kuten-Shorrer M, Treister NS, Stock S, Kelley JM, Ji YD, Woo SB, Lerman MA,

Palmason S, Sonis ST, Villa A.

**AIMS:** To evaluate and compare the effectiveness of two concentrations of topical clonazepam solution in improving symptoms of burning mouth syndrome (BMS).

**METHODS:** A retrospective chart review was conducted of patients diagnosed with BMS and managed with topical clonazepam solution between 2008 and 2015. A 0.5-mg/mL solution was prescribed until 2012, when this was changed to a 0.1 mg/mL solution. Patients were instructed to swish with 5 mL for 5 minutes and spit two to four times daily. The efficacies of the two concentrations were compared using patient-reported outcome measures at the first follow-up, including the reported percentage of improvement in burning symptoms and the change in burning severity from baseline ranked on an 11-point numeric rating scale (NRS). Response to treatment was compared between the two concentrations using Wilcoxon rank sum test.

**RESULTS:** A total of 57 subjects were included, 32 in the 0.1-mg/mL cohort and 25 in the 0.5-mg/mL cohort, and evaluated at a median follow-up of 7 weeks. The median overall percentage improvement was 32.5% in the 0.1-mg/mL cohort and 75% in the 0.5-mg/mL cohort. The median reduction in NRS score was 0.5 points in the 0.1-mg/mL cohort and 6 points in the 0.5-mg/mL cohort. The use of either outcome measure revealed that the response to treatment with the 0.5-mg/mL solution was superior to that of the 0.1 mg/mL solution ( $P < .01$ ).

**CONCLUSION:** These findings suggest that a 0.5-mg/mL topical clonazepam solution is effective in the management of BMS. Future randomized clinical trials are warranted.

135. Acta Odontol Scand. 2017 Aug;75(6):437-441. doi: 10.1080/00016357.2017.1331374.

Epub 2017 May 24.

Effectiveness of non-fluoride and fluoride dentifrices for denture hygiene.

Meriç G(1), Güvenir M(2), Suer K(3).

**OBJECTIVE:** To compare the effectiveness of commonly used herbal/non-fluoride with fluoride dentifrices in order to eliminate pathogenic oral microorganisms from denture base material.

**MATERIALS AND METHODS:** Heat-polymerized acrylic resin specimens (n = 288) were divided into three groups and each group inoculated with three various microorganisms (n = 96 for each) *Candida albicans*, *Staphylococcus aureus* and *Pseudomonas aeruginosa* (*P. aeruginosa*). Contaminated specimens were randomly assigned to the application of six herbal/non-fluoride and three fluoride dentifrices. These specimens were divided into two groups: negative and positive control (n = 3 for each). All acrylic specimens were incubated at 37 °C for 24 h for samples inoculated with bacterial strains and 37 °C for 48 h for samples inoculated with yeast strains. After the incubation period, all brain-heart infusion broths that contained disinfectant acrylic specimens were cultured on 5% sheep blood agar for bacterial counts and Sabouraud dextrose agar for yeast counts. The number of colony-forming units per millilitre (CFU/mL) were

calculated. The results were analysed by Mann-Whitney U and Kruskal-Wallis tests ( $p = .05$ ).

RESULTS: Both herbal/non-fluoride and fluoride dentifrices were effective against *Candida albicans*. However, fluoride dentifrices were comparatively better than the herbal/non-fluoride dentifrices against *Staphylococcus aureus* and *P. aeruginosa*.

CONCLUSIONS: Herbal dentifrices could be used, especially among the elderly who lack a degree of manual dexterity during the rinsing of dentifrice chemicals from their dentures.

136. Braz Oral Res. 2017 May 4;31:e32. doi: 10.1590/1807-3107BOR-2017.vol31.0032.

Chlorhexidine with or without alcohol against biofilm formation: efficacy, adverse events and taste preference.

Santos GOD(1), Milanesi FC(1), Greggianin BF(1), Fernandes MI(1), Oppermann RV(1), Weidlich P(1).

In recent years, different chlorhexidine formulations have been tested, including an alcohol-free alternative, but the effect of this solution on early biofilm formation is not clear. A crossover, randomized, double-blind clinical trial was conducted to evaluate the effect of two chlorhexidine solutions against supra- and subgingival biofilm formation (NCT#02656251). Thirty-five participants were randomized and asked to rinse twice daily with 15 ml of an alcohol-containing 0.12% chlorhexidine solution, an alcohol-free 0.12% chlorhexidine solution, or

placebo. The study was conducted in three experimental periods of 4 days each, with a 10-day washout between the periods. All the experimental periods followed the same protocol, except that the solutions were switched. Biofilm distribution was evaluated every 24 hours by the Plaque-Free Zone Index, during 96 hours. Adverse events were self-reported and sensory evaluation was performed using a hedonic scale. Compared to the placebo, the chlorhexidine solutions resulted in a significantly higher number of surfaces free of plaque over 96 hours ( $p < 0.01$ ), and were able to prevent subgingival biofilm formation ( $p < 0.01$ ). The alcohol-free chlorhexidine solution was associated with a lower incidence of adverse events, compared with alcohol-containing chlorhexidine ( $p < 0.05$ ); it also received better sensory evaluation and acceptance by trial participants, compared with the alcohol-containing chlorhexidine ( $p = 0.007$ ), and had a similar inhibitory effect on the formation of supra- and subgingival biofilms.

137. Braz Oral Res. 2017 Mar 30;31:e21. doi: 10.1590/1807-3107BOR-2017.vol31.0021.

Effectiveness of a pre-procedural mouthwash in reducing bacteria in dental aerosols: randomized clinical trial

Retamal-Valdes B(1), Soares GM(1), Stewart B(2), Figueiredo LC(1), Faveri M(1), Miller S(2), Zhang YP(2), Feres M(1).

The aim of this randomized, single blinded clinical trial was to evaluate the effect of a pre-procedural mouthwash containing cetylpyridinium chloride (CPC), zinc lactate (Zn) and sodium fluoride (F) in the reduction of viable bacteria in

oral aerosol after a dental prophylaxis with ultrasonic scaler. Sixty systemically healthy volunteers receiving dental prophylaxis were randomly assigned to one of the following experimental groups (15 per group): (i) rinsing with 0.075% CPC, 0.28% Zn and 0.05% F (CPC+Zn+F), (ii) water or (iii) 0.12% chlorhexidine digluconate (CHX), and (iv) no rinsing. Viable bacteria were collected from different locations in the dental office on enriched TSA plates and anaerobically incubated for 72 hours. The colonies were counted and species were then identified by Checkerboard DNA-DNA Hybridization. The total number of colony-forming units (CFUs) detected in the aerosols from volunteers who rinsed with CPC+Zn+F or CHX was statistically significantly ( $p < 0.05$ ) lower than of those subjects who did not rinse or who rinsed with water. When all locations were considered together, the aerosols from the CPC+Zn+F and CHX groups showed, respectively, 70% and 77% fewer CFUs than those from the No Rinsing group and 61% and 70% than those from the Water group. The mean proportions of bacterial species from the orange complex were statistically significantly ( $p < 0.05$ ) lower in aerosols from the CPC+Zn+F and CHX groups compared with the others two groups. In conclusion, the mouthwash containing CPC+Zn+F, is effective in reducing viable bacteria in oral aerosol after a dental prophylaxis with ultrasonic scaler.

138. J Endod. 2017 Apr;43(4):507-513. doi: 10.1016/j.joen.2016.11.026. Epub 2017 Feb

Comparative Analysis of 2 Calcium Silicate-based Cements (Biodentine and Mineral Trioxide Aggregate) as Direct Pulp-capping Agent in Young Permanent Molars: A Split Mouth Study.

Katge FA(1), Patil DP(2).

**INTRODUCTION:** The purpose of this study was to compare Biodentine and mineral trioxide aggregate (MTA) for direct pulp capping in young permanent molars by clinical and radiographic evaluation in 7- to 9-year-old children.

**METHODS:** In 50 patients, 29 patients with bilateral asymptomatic first permanent molars with carious involvement were selected. According to split mouth design, these patients were then divided into 2 groups, Biodentine group (right side) and MTA group (left side). The pulp-capping procedure was performed by using Biodentine and MTA in 58 asymptomatic bilateral permanent molars with pulp exposure. At each recall (baseline, 6 and 12 months), treatment outcome was assessed clinically through pulpal sensitivity tests as well as radiographically to evaluate dentin bridge formation.

**RESULTS:** The study reported 100% success rate with both Biodentine and MTA at baseline and 6- and 12-month follow-up on the basis of clinical and radiographic parameters. These findings were statistically non-significant ( $P < .05$ ) between both groups (Biodentine and MTA). Radiographically, dentin bridge formation was not evident with both groups at baseline, but it was evident after 6- and 12-month follow-up. These findings were statistically non-significant ( $P < .05$ ) in both Biodentine and MTA groups.

**CONCLUSIONS:** This study reported 100% success rate with both MTA and Biodentine

when used as direct pulp-capping agent in first permanent molars in 7- to 9-year-old children. The major limitations of the study were smaller sample size and short follow-up period.

139. J Am Dent Assoc. 2017 Apr;148(4):e12. doi: 10.1016/j.adaj.2016.11.027. Epub 2017 Feb 14.

No evidence from randomized trials to prefer any direct pulp capping material over another.

Brignardello-Petersen R.

Comment on

Clin Oral Investig. 2016 Jul;20(6):1121-32.

140. J Indian Soc Pedod Prev Dent. 2017 Jan-Mar;35(1):6-13. doi: 10.4103/0970-4388.199232.

Comparison of efficacy of caries removal using polymer bur and chemomechanical caries removal agent: A clinical and microbiological assessment - An in vivo study.

Aswathi KK(1), Rani SP(2), Athimuthu A(2), Prasanna P(2), Patil P(3), Deepali KJ(4).

**BACKGROUND AND OBJECTIVES:** Conservative caries removal has become an integral part of minimally invasive dentistry (MID). Polymer burs and chemomechanical caries removal are two feasible methods of MID. The objective of this study was to assess and compare the efficacy of polymer bur and chemomechanical caries removal agent clinically and microbiologically for selective removal of infected dentin.

**METHODS:** A total of fifty primary second molars with occlusal decay involving dentin were selected from 25 patients aged between 5 and 9 years. They were randomly allocated to Group A (polymer bur group) and Group B (Carie-Care group) for caries removal. Completeness of caries excavation was assessed clinically with the application of caries detector dye. Dentinal samples were collected before and after caries removal and cultured in Luria-Bertani Agar, and total viable count was assessed. All the teeth after caries excavation were restored with Type 2 glass ionomer cement. The data obtained was tabulated and statistically analyzed using paired t-test and Chi-square test.

**RESULTS:** There was a statistically significant reduction in the mean microbial count before and after treatment in polymer bur group and Carie-Care group. The reduction in mean microbial count was found significantly higher in polymer bur group compared to Carie-Care group. There was no significant association was observed between the two groups when efficacy was assessed clinically.

**CONCLUSIONS:** Both polymer bur and Carie-Care were efficient caries removal agents when assessed clinically and microbiologically. Polymer bur was found to be more effective than Carie-Care when assessed microbiologically.

141. J Endod. 2017 Feb;43(2):225-230. doi: 10.1016/j.joen.2016.10.027. Epub 2016 Dec 29.

Treatment Outcomes of Mineral Trioxide Aggregate Pulpotomy in Vital Permanent Teeth with Carious Pulp Exposure: The Retrospective Study.

Linsuwanont P(1), Wimonstuthikul K(2), Pothimoke U(2), Santiwong B(3).

**INTRODUCTION:** This study aimed to illustrate the treatment outcomes of mineral trioxide aggregate (MTA) pulpotomy in vital permanent teeth with carious pulp exposure.

**METHODS:** MTA pulpotomy was performed in 66 vital permanent teeth with carious pulp exposure including teeth with signs and symptoms of irreversible pulpitis and the presence of periapical radiolucency. Patients were assessed for clinical and radiographic outcomes by 2 examiners. The relationship between treatment outcomes and factors was analyzed by means of univariate analysis and binary logistic regression.

**RESULTS:** Fifty patients (a total of 55 teeth) attended the follow-up examination. The age of the patients ranged from 7-68 years old (mean = 29 years old). For the follow-up period as far as 62 months, 48 teeth showed successful outcomes (success rate = 87.3%). Teeth with clinical signs of irreversible pulpitis and the presence of periapical radiolucency could be treated successfully by MTA pulpotomy with success rates of 84% and 76%, respectively. Three of 7 failed cases required pulpectomy after MTA pulpotomy to relieve painful pulpitis. Four other failed cases were asymptomatic, and failure was detected from radiographic

examination. The relationship between treatment outcomes and treatment factors could not be detected statistically.

CONCLUSIONS: Teeth with carious pulp exposure can be treated successfully by MTA pulpotomy. Clinical signs of irreversible pulpitis and the presence of periapical radiolucency should not be considered as a contraindication for pulpotomy.

142. Dent Mater J. 2017 Jan 31;36(1):1-7. doi: 10.4012/dmj.2016-107. Epub 2016 Dec 6.

Cytotoxicity and biocompatibility of resin-free and resin-modified direct pulp capping materials: A state-of-the-art review.

Chen L(1), Suh BI.

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Direct pulp capping is the placement of a dental material directly over exposed pulp to prevent dental pulp from dying and avoid the need for root canal treatments. Calcium hydroxide and calcium silicates/mineral trioxide aggregates (MTA) have been commonly used for direct pulp capping with great success clinically. In recent years, resin-modified calcium hydroxide and calcium silicates have been developed with the advantages of precise placement, command set, and superior physical strength. As pulp capping materials would be in direct contact with the pulp, the cytotoxicity and biocompatibility is of particular importance in order to avoid pulp irritation and maintain pulp vitality. Therefore, this review article will summarize the cytotoxicity and biocompatibility of direct pulp capping materials, particularly resin-modified

materials.

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143. Dent Update. 2017 Mar;44(3):201-2, 205-6, 208.

Periodontal Treatment in Patients with Learning Disabilities Part 2: Professional Mechanical Intervention.

Kaka S, Dickinson C.

The first part of this two part series discussed the potential barriers and risk factors that may lead to an increased incidence and severity of periodontal disease amongst patients with learning disabilities. Additionally, preventive strategies and tools that can be used by general dental practitioners, oral health promotion teams as well as specialists within the field to control and prevent disease progression were explored. To prevent periodontal disease progression and attain optimal periodontal health, a combination of prevention and professional mechanical instrumentation is usually required. The second part

of the series concentrates on the role of the dental professional in implementing professional mechanical instrumentation to attempt to reduce the burden of disease further in this patient group. Clinical relevance: Although research continues into which professional techniques for instrumentation are the most successful amongst patients with periodontal disease, very little data specifically explore the needs of patients with learning disabilities, despite their high unmet needs. This paper aims to report on any available data present to produce suggestions for care.

144. Oral Health Prev Dent. 2017;15(1):23-32. doi: 10.3290/j.ohpd.a37710.

Fact or Fiction? Powered Toothbrushing is More Effective than Manual  
Toothbrushing.

Goh EX, Lim LP.

**PURPOSE:** To answer the question of whether powered toothbrushing is more effective than manual toothbrushing, this paper reviews various aspects of powered toothbrushes in terms of efficacy, safety, acceptability and special considerations for certain patient groups. Future research directions and gaps in the current knowledge are also discussed.

**MATERIALS AND METHODS:** The literature review was conducted using PubMed. A hand search of the references of the retrieved articles was also performed.

**RESULTS:** Powered toothbrushes have been found to be as effective as manual toothbrushes in removing plaque and reducing gingival inflammation. They are safe with no adverse effects on hard or soft tissues. Among the powered toothbrushes, there is evidence to suggest that rotation-oscillation toothbrushes may be more effective than others. The results seem to suggest that certain special-needs patient groups, such as the elderly and the disabled, may benefit from the use of powered toothbrushes.

**CONCLUSION:** Powered toothbrushes are as effective as manual toothbrushes in facilitating oral hygiene. They may be recommended for certain patient groups to improve the efficacy of oral hygiene measures. More data on the safety and acceptability of powered toothbrushes are necessary.

145. *Int Dent J.* 2017 Feb;67(1):16-17. doi: 10.1111/idj.12313.

FDI/IADH policy statement on Oral health and dental care of people with disabilities: Adopted by the FDI General Assembly, September 2016, Poznan, Poland.

FDI World Dental Federation(1).

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146. Braz Oral Res. 2017 Dec 18;31:e98. doi: 10.1590/1807-3107bor-2017.vol31.0098.

Reclassification and treatment of odontogenic keratocysts: A cohort study.

Ribeiro-Júnior O(1), Borba AM(1), Alves CAF(2), Gouveia MM(2), Deboni MCZ(1),  
Naclério-Homem MDG(1).

The odontogenic keratocyst (OKC) is a recurrent cyst that has been recently reclassified from an odontogenic tumor to an odontogenic cyst. The aim of the present study was to investigate its treatment and address issues related to its association with nevoid basal cell carcinoma syndrome (NBCCS). Lesions from the cohort of patients included in the present study consisted of 40 OKCs, of which 27 lesions were treated by enucleation (GE) and 13 underwent decompression (GD). Complementary treatment occurred in 38 (95%) lesions, of which 10 underwent isolated peripheral ostectomy (GO) and 28 underwent peripheral ostectomy combined with Carnoy's solution (GC). Thirteen lesions were associated with NBCCS (GS), while the others (n=27) were non-syndromic lesions (GnS). The recurrence-free

periods (RFP) in the sample groups were compared using the Kaplan-Meier function and log-rank test at a significance level of 5% ( $p < 0.05$ ) and were used to calculate the cumulative risk of recurrence (CRR) in each postoperative year. During the follow-up period, which had a mean of 43.5 months (range: 12-102 months), six (15%) recurrences were diagnosed. There was no significant difference among the RFP for the compared groups ( $p > 0.05$ ) or increased CRR for the decompression (15.4%) over five years. Application of Carnoy's solution did not increase the efficacy of the peripheral ostectomy, but was related to a CRR of 0% for the syndromic lesions over five years. Therefore, 1) decompression did not increase the recurrence risk; 2) peripheral ostectomy demonstrated a similar efficacy as the combination with Carnoy's solution; 3) the association of NBCCS did not seem to significantly influence OKC recurrence; and 4) syndromic lesions seem to behave in the same manner as non-syndromic lesions when submitted to complementary treatments.

147. Braz Oral Res. 2017 Sep 28;31:e79. doi: 10.1590/1807-3107BOR-2017.vol31.0079.

Caries experience and salivary aspects in individuals with fragile X syndrome.

Amaral COFD(1), Straioto FG(1), Napimoga MH(2), Martinez EF(3).

Fragile X syndrome (FXS) is the most common cause of hereditary mental retardation, but studies on the oral health condition of these patients are rare. The aim of this study was to determine the experience of dental caries in individuals with FXS, by examining the saliva profile, oral hygiene, socioeconomic characteristics and use of controlled drugs in these patients. Dental health was estimated using the decayed, missing and filled teeth index (DMF-T) and sialometry, and the pH value and buffering capacity of the saliva, colony forming units of *S. mutans* (CFU/mL), visible biofilm index, and socioeconomic status were all examined. The sample, comprising 23 individuals, had an average age of  $17.3 \pm 5.6$  years, a DMF-T index of 5.5, a diminished salivary flow (78.3%), and a low (73.9%) saliva buffering capacity. Most (52.2%) individuals presented with a high abundance (CFU/mL) of *S. mutans*. The experience of caries was correlated with salivary parameters, poor oral hygiene, lower socioeconomic status and an increased count of *S. mutans* in saliva.

148. Oral Surg Oral Med Oral Pathol Oral Radiol. 2017 Sep;124(3):248-252. doi: 10.1016/j.oooo.2017.05.508. Epub 2017 May 30.

Triggers of oral lichen planus flares and the potential role of trigger avoidance in disease management.

Chen HX(1), Blasiak R(2), Kim E(3), Padilla R(4), Culton DA(5).

**OBJECTIVE:** Many patients with oral lichen planus (OLP) report triggers of flares, some of which overlap with triggers of other oral diseases, including oral allergy syndrome and oral contact dermatitis. The purpose of this study was to evaluate the prevalence of commonly reported triggers of OLP flares, their overlap with triggers of other oral diseases, and the potential role of trigger avoidance as a management strategy.

**STUDY DESIGN:** Questionnaire-based survey of 51 patients with biopsy-proven lichen planus with oral involvement seen in an academic dermatology specialty clinic and/or oral pathology clinic between June 2014 and June 2015.

**RESULTS:** Of the participants, 94% identified at least one trigger of their OLP flares. Approximately half of the participants (51%) reported at least one trigger that overlapped with known triggers of oral allergy syndrome, and 63% identified at least one trigger that overlapped with known triggers of oral contact dermatitis. Emotional stress was the most commonly reported trigger (77%). Regarding avoidance, 79% of the study participants reported avoiding their known triggers in daily life. Of those who actively avoided triggers, 89% reported an improvement in symptoms and 70% reported a decrease in the frequency of flares.

**CONCLUSIONS:** Trigger identification and avoidance can play a potentially effective role in the management of OLP.

149. Evid Based Dent. 2017 Jun 23;18(2):57-58. doi: 10.1038/sj.ebd.6401244.

Little evidence to support or refute interventions for the management of burning mouth syndrome.

Fischhoff DK(1), Spivakovsky S(1).

Comment on

Cochrane Database Syst Rev. 2016 Nov 18;11:CD002779.

Data sourcesCochrane Oral Health's Trials Register, Cochrane Central Register of Controlled Trials (CENTRAL), Medline Ovid, Embase Ovid, US National Institutes of Health Ongoing Trials Register (ClinicalTrials.gov) and the World Health Organization International Clinical Trials Registry Platform. Handsearch of the proceedings from the British Society for Oral Medicine (BSOM), British Society for Dental Research (BSDR) and the International Association for Dental Research (IADR).Study selectionAll included studies were randomised placebo controlled trials comparing a treatment to placebo with no language or year of publication restrictions. Symptom relief and changes in quality of life were considered primary outcomes.Data extraction and synthesisTeams of two authors independently screened for inclusion, extracted data using an ad-hoc tool and assessed the risk of bias using the Cochrane's tool. Outcomes were analysed for <3 months (short term) and  $\geq 3$  to  $\leq 6$  months (long term). For single studies with multiple interventions, the number of participants in the control group was adjusted to

half before combining the results. For crossover studies without washout periods, the first period was analysed. RRs (risk ratios) and 85% confidence intervals were calculated for dichotomous outcomes and MDs (mean differences) and 95% confidence intervals for continuous data. Results A total of 23 studies encompassing 1121 patients were included. One study was considered as having overall low risk of bias, four unclear and the rest as high risk of bias. The interventions were grouped into: antidepressants and antipsychotics, anticonvulsants, benzodiazepines, cholinergics, dietary supplements, electromagnetic radiation, physical barriers, psychological therapies and topical treatments. Short-term symptom relief was demonstrated by: energy waves (one study, 58 participants) MD -30.36, 95% CI -44.22 to -16.50, physical barriers (one study, 50 participants) MD -1.1 95% CI -2.14 to 0.06, the anticonvulsant gabapentin (one study, 100 participants) RR 4.00, 95% CI 2.09 to 7.67 and topical benzodiazepine (two studies, 111 participants) MD -1.89 95% CI -2.19 to -1.59. Long term symptom relief was achieved with topical benzodiazepine (one study, 66 participants) MD -1.39 95% CI -1.96 to 0.83 Conclusions From studies mostly classified as high risk of bias, there is insufficient evidence to support or refute the use of any particular intervention for the management of BMS.

150. *Pediatr Dent*. 2017 Jan 15;39(1):9-14.

Stevens-Johnson Syndrome: A Review and Report of Two Cases.

Gandhi RP(1), Klein U(2).

Stevens-Johnson syndrome (SJS) is a rare condition, characterized by its dramatic involvement of the skin and various mucosal surfaces including the oral mucosae, that severely impairs the affected patient's ability to speak, chew, or swallow. The purpose of this report was to present two cases with significant variations in the clinical presentation of Stevens-Johnson syndrome. In both situations, the patients' conditions were not immediately recognized. Pediatric dentists should be aware of these variations in the clinical manifestations of SJS, as the signs and symptoms can initially mimic common viral conditions. Appropriate diagnosis can result in timely referral to a hospital environment, optimizing patient management and recovery.

151. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2017 Apr;123(4):482-495. doi: 10.1016/j.oooo.2017.01.005. Epub 2017 Jan 24.

Is it Sjögren's syndrome or burning mouth syndrome? Distinct pathoses with similar oral symptoms.

Aljanobi H(1), Sabharwal A(2), Krishnakumar B(3), Kramer JM(4).

Sjögren's syndrome (SS) and burning mouth syndrome (BMS) typically occur in postmenopausal women. Although these conditions have significantly different etiopathogeneses, patients with SS or BMS often present with analogous oral complaints. The similarities between the two conditions have led to considerable confusion on the part of medical and dental practitioners, and those with BMS or SS often wait years to receive a diagnosis. Therefore, it is imperative for clinicians to understand the characteristic subjective and objective features of each disease and how these can be used to distinguish them. This review will discuss the proposed etiology, clinical manifestations, histopathology, diagnostic criteria, and patient management of SS and BMS. We also identify key differences between the two pathoses that aid in establishing the correct diagnosis. Recognition of the defining features of each condition will lead to reduced time to diagnosis and improved patient management for these poorly understood conditions.

152. Braz Oral Res. 2017 Jan 16;31:e8. doi: 10.1590/1807-3107BOR-2017.vol31.0008.

Effects of periodontal treatment on primary sjögren's syndrome symptoms.

Ambrósio LM(1), Rovai ES(1), França BN(1), Balzarini DA(1), Abreu IS(1), Lopes SB(2), Nunes TB(2), Lourenço SV(2), Pasoto SG(3), Saraiva L(1), Holzhausen M(1).

The aim of this longitudinal prospective study was to evaluate the effects of periodontal treatment on the clinical, microbiological and immunological periodontal parameters, and on the systemic activity (ESSDAI) and subjective (ESSPRI) indexes in patients with primary Sjögren's Syndrome (pSS). Twenty-eight female patients were divided into four groups: pSS patients with or without chronic periodontitis (SCP, SC, respectively), and systemically healthy patients with or without chronic periodontitis (CP, C, respectively). Periodontal clinical examination and immunological and microbiological sample collection were performed at baseline, 30 and 90 days after nonsurgical periodontal treatment (NSPT). Levels of interleukin IL-1 $\beta$ , IL-8 and IL-10 in saliva and gingival crevicular fluid (GCF) were evaluated by ELISA, as well as the expression of *Porphyromonas gingivalis* (Pg), *Aggregatibacter actinomycetemcomitans*, (Aa) *Tannerella forsythia* (Tf), and *Treponema denticola* (Td), by qPCR. Systemic activity and pSS symptoms were evaluated by ESSDAI and ESSPRI. NSPT resulted in improved periodontal clinical parameters in both SCP and CP groups ( $p > 0.05$ ). Pg, Aa, and Tf levels decreased after NSPT only in CP patients ( $p < 0.05$ ). Significantly greater levels of IL-10 in GCF were verified in both SCP and CP groups ( $p < 0.05$ ). SCP patients showed increased salivary flow rates and decreased ESSPRI scores after NSPT. In conclusion, NSPT in pSS patients resulted in improved clinical and immunological parameters, with no significant effects on microbiological status. pSS patients also showed increased salivary flow and

lower ESSPRI scores after therapy. Therefore, it can be suggested that NSPT may improve the quality of life of pSS patients.

153. J Craniofac Surg. 2017 Jan;28(1):197-202. doi: 10.1097/SCS.0000000000003250.

Odontogenic Orofacial Infections.

Bertossi D(1), Barone A, Iurlaro A, Marconcini S, De Santis D, Finotti M, Procacci P.

Acute dental abscess is a frequent and sometimes underestimated disease of the oral cavity. The acute dental abscess usually occurs secondary to caries, trauma, or failed endodontic treatment. After the intact pulp chamber is opened, colonization of the root canals takes place with a variable set of anaerobic bacteria, which colonize the walls of the necrotic root canals forming a specialized mixed anaerobic biofilm. Asymptomatic necrosis is common. However, abscess formation occurs when these bacteria and their toxic products breach into the periapical tissues through the apical foramen and induce acute inflammation and pus formation. The main signs and symptoms of the acute dental abscess (often referred to as a periapical abscess or infection) are pain, swelling, erythema, and suppuration usually localized to the affected tooth, even if the abscess can eventually spread causing a severe odontogenic infection which is characterized by local and systemic involvement culminating in sepsis syndrome. The vast majority of dental abscesses respond to antibiotic treatment, however, in some

patients surgical management of the infection may be indicated. In the present work, a retrospective analysis of the patients with dental orofacial infections referred to the Unit of Dentistry and Maxillofacial Surgery of the University of Verona from 1991 to 2011 has been performed.

154. *Int Dent J.* 2017 Apr;67(2):67-77. doi: 10.1111/idj.12264. Epub 2016 Nov 9.

Periodontal disease and the metabolic syndrome.

Lamster IB(1), Pagan M(2).

The metabolic syndrome (MetS) is a spectrum of conditions that increase the risk of cardiovascular disease and diabetes mellitus. The components of MetS include dysglycemia, visceral obesity, atherogenic dyslipidemia (elevated triglycerides and low levels of high-density lipoprotein) and hypertension. An association of periodontal disease and MetS has been suggested. This association is believed to be the result of systemic oxidative stress and an exuberant inflammatory response. When examined individually, the components of the MetS that are most closely related to the risk of periodontitis are dysglycemia and obesity, with lesser contributions by atherogenic dyslipidemia and hypertension. Data suggest that the odds of periodontitis increase with the number of MetS components present in an individual. The direction of the relationship between MetS and periodontal disease cannot currently be determined because the majority of studies are cross-sectional. The association between MetS and periodontitis,

however, suggests that improved understanding of this association could promote interprofessional practice. Evidence suggests that periodontal therapy can reduce the levels of inflammatory mediators in serum. If this finding is confirmed, periodontal treatment could become part of therapy for MetS. Oral health providers who identify patients at risk for MetS could refer them to a medical provider, and physicians could refer patients to dentists to ensure that patients with MetS receive a dental evaluation and any necessary treatment. These clinical activities would improve both oral and general health outcomes.

155. Medwave. 2017 Sep 21;17(8):e7045. doi: 10.5867/medwave.2017.08.7045.

Oral and dental health issues in people with mental disorders.

[Article in English, Spanish; Abstract available in Spanish from the publisher]

Torales J(1), Barrios I(2), González I(2).

Patients with mental disorders are subject to a greater number of risk factors for oral and dental disease than the general population. This is mostly caused by the side effects of the medications that they receive, lack of self-care, difficulty to access health services, a negative attitude towards healthcare providers, and patients' lack of cooperation in dental treatments. The most

common psychiatric disorders in our population are depression, anxiety disorders, schizophrenia, bipolar disorder, and dementia. In disorders such as anxiety and depression, the main issue is the loss of interest in self-care, which results in a poor hygiene. The most frequent oral and dental diseases in these patients are dental cavities and periodontal disease. The purpose of this brief review is to provide up-to-date information about the management of oral and dental diseases of patients with mental disorders.

156. Oral Health Prev Dent. 2017;15(1):7-12. doi: 10.3290/j.ohpd.a37708.

A Potential Role of Periodontal Inflammation in Alzheimer's Disease: A Review.

Ganesh P, Karthikeyan R, Muthukumaraswamy A, Anand J.

Periodontitis, the chronic inflammatory disease of the supporting tissues of the teeth, has now been implicated in a variety of disparate systemic infections of various organs such as the lungs, heart, kidneys and brain. This review examines various associations involving chronic inflammatory processes arising from the periodontium and Alzheimer's disease, a progressive dementia of the brain with an as yet unknown origin. Causal pathways are also reviewed, e.g. the direct

invasion of oral pathogens such as *T. socranski* and *T. denticola* from the periodontium across the blood-brain barrier, as well as common susceptibilities between the two tissues in terms of systemic dissemination from oral infections. Finally, potential anti-inflammatory therapies targeted at both the periodontium and brain are discussed, as periodontal infections are one of the treatable, preventable aetiopathologies involved in Alzheimer's disease.

157. Acta Odontol Scand. 2017 Apr;75(3):220-226. doi: 10.1080/00016357.2017.1278789. Epub 2017 Jan 24.

Severity of illness and extra pyramidal symptoms as predictors for oral diseases among patients with schizophrenia.

Singh A(1), Mittal P(2), Goel P(1), Purohit BM(3), Thukral R(1).

**OBJECTIVE:** The study explores the association between severity of illness (positive, negative, depressive and cognitive symptoms) and extra pyramidal symptoms (EPS) with dental caries, periodontal disease and prosthetic needs among patients with schizophrenia.

**MATERIAL AND METHODS:** A total of 71 schizophrenic patients diagnosed based on ICD-10 criteria participated in the study. Clinical Global Impression - Schizophrenia (CGI-SCH) scale was used to evaluate positive, negative, depressive, cognitive symptoms and overall severity of schizophrenia. Simpson-Angus Scale (SAS) was used for assessment of EPS. Dental examinations were conducted as per WHO (1997) criterion.

RESULTS: Mean DMFT and CPI scores with periodontal pockets were  $5.57 \pm 2.12$  and  $2.37 \pm 0.74$ ; significant differences being noted among those with and without EPS ( $p < 0.001$ ). Positive and EPS associated with dental caries with odds ratio of 5.26 (1.05, 26.2) and 8.52 (2.31, 31.4) ( $p < 0.001$ ). Depressive and EPS were associated with periodontal disease with odds ratio of 4.19 (1.53, 32.5) and 5.27 (1.29, 21.5), respectively ( $p < 0.001$ ). Cognitive and EPS were associated with dental prosthetic needs with odds ratio of 4.33 (1.47, 31.2) ( $p < 0.001$ ) and 7.78 (1.43, 42.2), respectively ( $p < 0.001$ ).

CONCLUSIONS: Patients with schizophrenia had high dental caries, periodontal disease and unmet dental prosthetic needs. Severity of the schizophrenic and EPS was associated with poor oral health. Efforts need to be focused on strengthening the evidence of its association with oral health indicators through further studies including cohort investigations.

158. J Oral Sci. 2017 Mar 31;59(1):39-46. doi: 10.2334/josnugd.16-0325. Epub 2016 Dec 28.

Five-year longitudinal study of dental caries risk associated with *Streptococcus mutans* and *Streptococcus sobrinus* in individuals with intellectual disabilities.

Oda Y(1), Hayashi F, Wakita A, Nagatani Y, Okada M.

Streptococcus mutans (*S. mutans*) and Streptococcus sobrinus (*S. sobrinus*) are important etiologic agents in human dental caries. Using quantitative real-time polymerase chain reaction assays for the presence of those strains, we examined 145 outpatients with intellectual disability (ID), calculated the proportion of each of these strains to total bacteria, and compared dental caries incidence over 5 years. Plaque samples were collected from all erupted tooth sites, and dental examinations were performed annually to determine numbers of decayed, missing, and filled teeth (DMFT score; World Health Organization caries diagnostic criteria). Elevated DMFT scores were calculated as  $\Delta$ DMFT, and sites of newly affected caries ( $\Delta$ SNAC) were identified. Sixty-six patients had both strains. The proportion of *S. mutans* to total bacteria was moderately correlated with DMFT in year 2,  $\Delta$ DMFT in years 2 and 5, and  $\Delta$ SNAC in years 2 and 5 (correlation coefficient = 0.470,  $P < 0.001$ ), while the proportion of *S. sobrinus* to total bacteria was moderately correlated with DMFT in years 2 and 5,  $\Delta$ DMFT in years 1, 2, and 5, and  $\Delta$ SNAC in years 2 and 5 (correlation coefficient = 0.695,  $P < 0.001$ ). Individuals with ID who harbored both bacterial strains had a higher risk of dental caries and a significantly higher proportion of *S. sobrinus* to total bacteria.

159. Clin Oral Investig. 2017 Jan;21(1):17-32. doi: 10.1007/s00784-016-1934-9. Epub 2016 Sep 8.

Oral health and orofacial pain in older people with dementia: a systematic review

with focus on dental hard tissues.

Delwel S(1)(2), Binnekade TT(3), Perez RS(4), Hertogh CM(5), Scherder EJ(3),  
Lobbezoo F(6).

**OBJECTIVE:** The aim of this review was to provide a systematic overview including a quality assessment of studies about oral health and orofacial pain in older people with dementia, compared to older people without dementia.

**METHODS:** A systematic literature search was performed in PubMed, CINAHL, and the Cochrane Library. The following search terms were used: dementia and oral health or stomatognathic disease. The quality assessment of the included articles was performed using the Newcastle-Ottawa Scale (NOS).

**RESULTS:** The search yielded 527 articles, of which 37 were included for the quality assessment and quantitative overview. The median NOS score of the included studies was 5, and the mean was 4.9 (SD 2.2). The heterogeneity between the studies was considered too large to perform a meta-analysis. An equivalent prevalence of orofacial pain, number of teeth present, decayed missing filled teeth index, edentulousness percentage, and denture use was found for both groups. However, the presence of caries and retained roots was higher in older people with dementia than in those without.

**CONCLUSIONS:** Older people with dementia have worse oral health, with more retained roots and coronal and root caries, when compared to older people without dementia. Little research focused on orofacial pain in older people with dementia.

CLINICAL RELEVANCE: The current state of oral health in older people with dementia could be improved with oral care education of caretakers and regular professional dental care.

160. Dentomaxillofac Radiol. 2018 Jan;47(1):20170172. doi: 10.1259/dmfr.20170172. Epub 2017 Nov 1.

Osseous changes in patients with medication-related osteonecrosis of the jaws.

Gönen ZB(1), Yillmaz Asan C(2), Zararsiz G(3), Kiliç E(4), Alkan A(4).

OBJECTIVES: Medication-related osteonecrosis of the jaw (MRONJ) is a severe side effect of antiresorptive agents. The aim of this study was to investigate the osseous changes in patients with MRONJ.

METHODS: Cone beam CT (CBCT) images of 25 patients with MRONJ and controls were retrospectively evaluated. Buccal, lingual, apical cortical bone thicknesses; buccal, lingual, apical intracortical and cancellous bone density; diameter of mental foramen and incisive canal, and width of mental foramen were measured.

RESULTS: Buccal and apical cortical bone thicknesses were increased; however intracortical radiodensity values decreased in the Study Group when compared with the Control Group ( $p = 0.007$ ,  $p = 0.001$ ). Narrowing of incisive canal was

observed in patients with MRONJ ( $p = 0.000$ ).

CONCLUSIONS: Clinician should have awareness about narrowing of incisive canal, apical and buccal cortical bone thickening, decreasing in cancellous bone radiodensity, and the lingual cortex destruction in patients with MRONJ.

161. *Odontology*. 2017 Apr;105(2):208-213. doi: 10.1007/s10266-016-0246-5. Epub 2016 May 9.

Poor dental hygiene and periodontal health in nursing home residents with dementia: an observational study.

Zenthöfer A(1), Baumgart D(2), Cabrera T(2), Rammelsberg P(2), Schröder J(3)(4), Corcodel N(2), Hassel AJ(2).

Poor oral health conditions are well documented in the institutionalized elderly, but the literature is lacking research on relationships between dementia and periodontal health in nursing home residents. The purpose of this cohort study, therefore, was to assess whether dementia is associated with poor oral health/denture hygiene and an increased risk of periodontal disease in the institutionalized elderly. A total of 219 participants were assessed using the Mini Mental State Examination (MMSE) to determine cognitive state. According to the MMSE outcome, participants scoring  $\leq 20$  were assigned to dementia group (D) and those scoring  $>20$  to the non-dementia group (ND), respectively. For each of the groups D and ND, Gingival Bleeding Index (GBI) and Denture Hygiene Index

(DHI) linear regression models were used with the confounders age, gender, dementia, number of comorbidities and number of permanent medications. To assess the risk factors for severe periodontitis as measured by the Community Index of Periodontal Treatment Needs, a logistic regression analysis was performed. Statistical analysis revealed no significant differences of GBI as well of DHI for demented and healthy subjects ( $p > 0.05$ ). Severe periodontitis was detected in 66 % of participants with dementia. The logistic regression showed a 2.9 times increased risk among demented participants ( $p = 0.006$ ). Oral hygiene, denture hygiene and periodontal health are poor in nursing home residents. The severity of oral problems, primarily periodontitis, seems to be enhanced in subjects suffering from dementia. Longitudinal observations are needed to clarify the cause-reaction relationship.