Thursday 3 November

Dental anomalies

PO001

Oro-dental abnormalities in patients with mental retardation

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The present study included 132 cases with mental sub normality, who attended the Human Genetics clinic; (N.R.C). The aim of the study was to investigate the prevalence of oral and dental abnormalities in patients with mental retardation. All patients had a full history taken, thorough oro-dental examination and IQ assessment. Chromosomal studies and metabolic screening were done when needed. Results showed that 50% of the studied cases had mild mental retardation (MR), 25% had moderate MR and 25% had severe or profound MR. Cases with mild MR experienced more caries than other subjects. Oral region abnormalities were present in 95%, followed by mouth abnormalities in 83%, teeth abnormalities in 59% and maxilla and mandible abnormalities in 14%. The studied cases were divided into four groups according to the etiology of mental retardation the chromosomal group showed the highest percentage of oral region abnormalities 97% and mouth abnormalities 81%, followed by the single gene defect group 89% and 78% and the multi-factorial group 80% and 81%. The chromosomal group showed tongue abnormalities in 62% and palatal abnormalities in 63%. The single gene defect and multi-factorial groups showed maxillary abnormalities in 19%. It is concluded that oro-dental abnormalities are more frequent in patients with severe or profound mental retardation. The oral region abnormalities represent a major problem in the oral health of patients with mental retardation. We recommend medical dental services and care for the affected cases since there is no National Oral Disease Prevalence data for patients with mental retardation.

PO002

Multiple ankylosis of maxillary and mandibular primary molars without successors

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Ankylosis is defined as a fusion of cementum or dentine with alveolar bone. Due to the loss of the periodontal ligament in the ankylotic area, the tooth is incapable of continued eruption and hence is unable to follow the normal vertical development of the neighbouring teeth and alveolar process. A 6-year-old female was referred to the Dept. of Paediatric Dentistry for ankylosis of primary molars and congenital missing permanent premolars in both jaws. She had no specific past medical history or trauma and infection history in the oral and maxillofacial region. Radiographic findings revealed that the maxillary primary molars showed early onset of ankylosis with fast root resorption rate, but the mandibular primary molars had ankylosed later and were being resorbed slower than the maxillary primary molars. The object of treating this case is the maintenance of proper alveolar bone growth and retention of the deciduous molars. Proper treatment observation, restoration, or extraction should be established after thorough consideration of the time of onset, the root resorption rate, progression of infraocclusion and the development of alveolar bone support. We should consider the timing of extraction of the ankylosed teeth without the problem of neighbouring alveolar bone growth and tilting of adjacent teeth during the growth spurt. Early diagnosis is important to avoid many of the complications with infra-occluded primary molars.

PO003

Morphological study of mouse gutter shaped roots using micro-CT

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Purpose: The objective of this study was to demonstrate how to develop Gutter shaped roots (GSR) of lower second molar (M2) and to determine when the root formation of GSR complete.

Methods: We used C57L/J mouse and ICR mouse to observe dental root formation. It has been reported that C57L/J mouse has GSR high frequency. We observed the M2 roots of C57L/J and ICR from 9 days after birth to 80 days using micro-CT 20 times. During the scan, the animals were lying on the bed in the prone position under anaesthesia and the mandibular bone was fixed with thin plastic film. We used a prototype *in vivo* micro-CT scanner R-mCT (Rigaku; Akishima, Japan). Mice were scanned under 35 kV and 200 mA. Three-dimensional images were reconstructed and observed using i-view (Morita; Kyoto, Japan).

Results: We found differences of development in GSR and normal root. In early period of root formation, there was bifurcation point in normal root as a non-transmitted image but did not observe it in GSR. In latter period, mouse dental root did not develop among at 35 day, 50 day and 80 day compare until 34 day after birth.

Conclusion: In this study, we found that appearance of bifurcation point as a non-transmitted image decided Normal root or GSR in early period of root formation and we found that root formation of mouse M2 was completed at 35 days in mouse.

PO004

Amelogenesis imperfecta: enamel formation and genomic DNA analysis K. OHNO

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The case reported here is a seven-year-old girl with pitted enamel of all teeth. Her father and paternal relatives had same teeth. Her exfoliated primary teeth were observed by micro-CT and the ground section was observed by SEM. The distribution of the elements was analyzed by EPMA. The genomic DNA was isolated from her oral mucosa by phenol–chloroform method. The patient had the features of hypoplastic type of AI. The pitting hypoplastic enamel zone and normal enamel zone ran parallel and vertical to the crown. The area of enamel defect lacked enamel prisms and contained more Mg, but less P and Ca than the normal.

PO005

Prevalence of supernumerary teeth

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The aim of this study was to present the prevalence of supernumerary teeth in the Department of Paediatric Dentistry and Orthodontics of Semmelweis University, Budapest and to report one interesting case. 2219 radiographs were studied. The examined radiographs demonstrated a prevalence of supernumerary teeth of 1.8%. An eight and a half year-old girl with supernumerary teeth of tuberculate and odontoma type is shown. Treatment of the patient was undertaken on conventional lines with a combination of surgical and orthodontic methods. Early diagnosis and treatment of this anomaly is necessary in order to avoid severe orthodontic disturbances.

PO006

The fusion of bilateral maxillary and mandibular primary incisors K. MOCHIZUKI*, K. TSUJINO, Y. OHTAWA &

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Many case reports on geminated or fused teeth were found in the literature. Fusion of the lateral incisor and cuspid is the most common of these manifestations in the primary dentition, and symmetrical occurrence is often found. There are few reported cases in the primary dentition involving the central incisor and lateral incisor teeth. Cases involving the bilateral fusion of maxillary and mandibular primary central and lateral incisors are very rare. This case reports the bilateral fusion of both mandibular and maxillary primary incisor teeth. A three-year and five-month old Japanese boy was brought to the outpatient ward of dentistry for children, Tokyo Dental College Hospital with the chief complaint of dental caries. The child's hair and skin appeared normal and no systemic abnormalities or congenital diseases were noted in the medical history of the patient or his family. The clinical findings were as follows: Bilaterally the upper and lower primary central incisor and lateral incisor teeth were fused. The maxillary primary central and lateral incisors were joined on both the right and left sides of the arch. Bilateral presence of unusually large teeth in the lower incisor region was observed. Radiographic examination demonstrated separate root canals within the fused upper left teeth. The remaining three fused teeth were observed to have single pulp chambers and root canals.

PO007

Management of bilateral mandibular lateral incisor transposition with the primary canine

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Transposition is a rare dental anomaly. Mandibular transpositions account for 15%-30% of all transpositions. Mandibular lateral incisor-canine (Mn.l2.C) transpositions have a prevalence of 0.03%. This results from distal intraosseous migration and ectopic eruption of the permanent mandibular lateral incisor towards the deciduous first molar. The early signs are distal tipping, coronal displacement and severe mesiolingual rotation of the lower lateral incisor and premature exfoliation of the deciduous first molar. Radiographically, the crown of the mandibular lateral incisor is seen to be distal to the crown of the permanent mandibular canine whereas the roots are not yet transposed. If left untreated, this progresses to a complete transposition of the mandibular lateral incisor with the permanent canine, which is difficult to correct. This presentation discusses an incidental finding of bilateral Mn.l2.C transposition in an 8-yearold boy who presented at the paediatric trauma clinic at the Eastman Dental Hospital. The management and treatment options for Mn.12.C transpositions are discussed. This presentation highlights the association of transpositions with other dental anomalies and newer reports suggesting genetic predilection. It should be noted that early detection and interception at the early mixed dentition stage by the general dental practitioner or paediatric dentist can prevent transposition of the mandibular lateral incisor with the permanent canine.

PO008

Supernumerary primary tooth

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A total of 75% supernumerary permanent teeth develop in the maxillary central incisor region and most of supernumerary primary teeth erupt in the primary lateral incisor region. It occurs in 1% to 3.5% in the permanent dentition and 0.03% to 1.19% in the primary dentition. The reason for the wide incidence range of supernumerary primary teeth is that parents fail to recognize them because of their normal shape, normal eruption and exfoliation. The first case is of a 4-year-old boy, who visited for an oral examination. The oral examination showed a loss of the anterior developmental space with a supplemental supernumerary tooth at the maxillary right primary lateral incisor region. Radiographic examination revealed an impacted succedaneous supernumerary tooth at the palatal side of the supernumerary primary tooth. The second case is of an 8-year-old boy, who visited with a chief complaint of an impacted supernumerary tooth. Clinical and radiographic examination showed a normal shaped supernumerary primary tooth in the maxillary left lateral incisor area and an impacted succedaneous supernumerary tooth on the palatal side.

PO009

Dentinogenesis imperfecta in two young brothers A. VINEREANU^{1,2}*, R. LUCA^{1,2} & R. SCORUS ¹*IAPD*, ²*Romanian College of Dentists, Romania*

Background: Dentinogenesis imperfecta (DI) is an inherited disorder of dentine. It may or may not be associated with osteogenesis imperfecta (OI). Clinical features such as pulpal obliteration, short clinical bulbous crowns, narrow roots and severe coronal attrition may raise serious restorative problems.

Case report: Two cases of DI non-associated with OI are presented. The patients were brothers and aged 15 (A) and 19 years (B). They both demonstrated characteristic features of DI, with severely worn opalescent crowns and reduced vertical dimension. Anamnesis revealed that their mother and maternal grandfather also had the condition. No other data concerning

family heritage of the disorder was available. Treatment aimed to improve aesthetics and function. Treatment planning was different for the two patients: patient A. Maxilla: front teeth interconnected substituton crowns; lateral stainless steel crowns. Mandible: overdenture after protection of lateral teeth by provision of stainless steel crowns. Patient B. Both jaws: Front teeth interconnected substitution crowns; lateral teeth stainless steel crowns. In both subjects the second molars were left uncovered. The median line was not crossed by fixed restorations. Besides function and aesthetics restoration the later stages of treatment will aim to: 1) maintain best available support for further restorations; 2) further increase lower face height; 3) caries prevention for the teeth yet left uncovered; 4) coverage of the second molars.

PO010

Localization of impacted supernumerary teeth in the maxilla with 3D dental-CT

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Supernumerary teeth, which result from the continued budding of the enamel organ of the preceding tooth or from excessive proliferation of cells, can be responsible for a variety of irregularities in the primary and transitional dentition. There are two morphological types of supernumerary teeth: supplemental and rudimentary. Supplemental teeth have the shape of normal teeth, while rudimentary can have conical, barrel-shaped, tubercular, odontome or some other shape. Approximately 25% of supernumerary teeth erupt spontaneously, while the rest remain unerupted. We report three cases of incisor shaped supplemental teeth in the maxillary anterior region. In all cases, three-dimensional computed tomography with dental software was used, together with conventional plain films- periapical, occlusal, and panoramic. The 3D dental CT clearly showed the intraosseous location, inclination, and morphology of the impacted supernumerary teeth as well as distances from adjacent roots and teeth. All three cases were 6year-old males who had incisor shaped teeth located between the central and lateral incisor teeth. In addition the third case had two further tubercular shaped teeth. All of the supernumerary teeth were surgically removed and the children seen for periodic observation to monitor eruption of adjacent permanent incisors.

Prevention

PO011

Method of forecasting eruption age of teeth for the purposes of prevention of caries

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Until now researchers studying the dynamics eruption of teeth and development of occlusion have not used mathematical models to predict eruption times or occlusal patterns. Development of a mathematical model to allow qualitative and objective evaluation of the development and eruption of teeth would be helpful for dental public health programmes to plan dental care at different ages. Previous research is limited both having used simple representation of statistical material, or elementary statistical evaluation. The equations of linear regression do not reflect the qualitative character of the development. This can be described by the following differential equation: dy/dt = iy(100 - y), y(t0) = y0, 0 < y0 < 100, which shows the dynamics of growth in children related to the eruption of different teeth. The parameters can be influenced by regional, geo-climatic, gender, and social factors.

PO012

Abstract withdrawn.

PO013

Motivation, implication and competition in children's education for oral health

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Aim: The goals were the education and modeling of children's dental emotional pattern and socialization of children's oral health behaviours. The objectives of the programme were: interdisciplinary assessment of current trends of child oral diseases in Romania in relation to a socio-cultural model and child emotional patterns and dental behaviours.

Method: A case-control interdisciplinary pilot study was carried out in a group of 441 children (228 boys and 213 girls) aged from 3–11 years from Lasi. They were divided on three representative age stages: 3, 7 and 11 years. Oral hygiene and oral health assessments using WHO criteria; psycho-sociologic assessment using criteria recommended by Wright, Milgrom and Klinberg; social inquiry, test of drawing, questionnaires were carried out. After the application of the prevention and educational program, which allowed for the different ages, the final re-evaluation will be in 2007.

Results: This programme has shown constant carioactivity; an increase of the score 0 for O.H.I. index – from 18% to 62.15%; decrease of dental fear – no fear pattern – 59.79% to 62.26%; behavioural shaping – coparticipative extrovency – from 65.80% to 79.36%; increase of applicative preventive addressibility.

Conclusions: Motivation, implication and competition show real support of long-term efficiency of the child's oral health education and prevention.

PO014

Abstract withdrawn.

PO015

Compliance with preventive care following dental treatment of children under general anaesthesia F. B. M. PEERBHAY

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Purpose: This study evaluated the self-reported compliance of families with preventative dental care, including follow-up visits, for children who had full mouth rehabilitation under general anaesthesia.

Methods: Records of 68 paediatric patients who attended the Paediatric Dentistry Department were included in the survey. Parents of 41 patients (60%) were interviewed by telephone. The interview assessed the following: (i) Parental dental health knowledge and preventive practices; (ii) Children's' dental health behaviours and preventive practices including sugar consumption; (iii) Follow-up appointments at one week and 3 months after dental general anaesthesia (DGA).

Results: A total of 37% parents had not visited the dentist at all but 85% had a good idea of the causes of caries. 44% of parents brushed their children's teeth whereas 34% brushed by themselves and 22% reported that tooth brushing was done by both the mother and child. Since treatment under general anaesthesia, 17 parents (41%) reported that their children had reduced the frequency of sugar consumption and 21 parents (51%) said that there was no change. 32 children (78%) did not return for the three-month follow up visit.

Conclusions: The findings of the current study indicate that, for patients who receive dental rehabilitation using general anaesthesia, parental belief that proper dental health behaviour helps maintains the teeth did not influence their subsequent behaviour with regards their children's oral hygiene practices and frequency of sugar intake. A high-percentage of return for the recommended one-week follow up visit.

PO016

An evidence-based chronology of prevention J. BROWNBILL

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All humans need to engage in some positive behaviours in order to prevent dental disease. They need to avoid behaviours that promote dental and systemic ailments. Some of these behaviours are lifelong and others are at specific times of their lives. There are sub-groups who are particularly susceptible to certain diseases at specific times. A chronology of prevention will be presented based on scientific evidence. Age groups discussed will be: before birth, infant, toddler, pre-schooler, first-grader, midgrader, teenager, young adult, adult and elderly. Preventive energies should be devoted to the most likely beneficiaries. Fluoridation, dietary advice, remineralization, oral hygiene, sealants and mouthguards have benefits at varying life points. Carers and patients have evolving roles in brushing and flossing as time progresses. Every patient should have a cancer check at each examination.

PO017

The oral health component of quality of life among underprivileged compared with middle class socioeconomic populations

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Introduction: Research has emphasized the importance of assessing oral health-related quality of life in general, and specifically the association with socio-economic class.

Objective: Comparison of the oral health component of quality of life according to the OHIP-14 questionnaire among underprivileged and middle class populations.

Methods: A total of 100 parents attending the 'DVI' clinic for underprivileged children in Jerusalem answered a 14 item questionnaire, containing seven domains that measure people's perceptions of the impact of oral conditions on their well being. 100 middle socio-economic class parents from the Paediatric Dentistry Clinic in Hadassah School of Dentistry in Jerusalem served as controls.

Results: Out of seven domains, five demonstrated a higher impact among the low socio-economic class. For functional limitation, the underprivileged group reported 19% impact compared with 5% among the middle class group. For physical pain the levels were 60% and 43%; for psychological discomfort: 52% and 29%, for psychological disability: 46% and 24%; and for handicap: 23% and 9%. These differences were statistically significant. The differences for physical disability and social disability were non significant. 45% of DVI group had large families of six children or more, compared to 18% in the controls. Almost triple the numbers of participants in the Hadassah group had higher-ranking occupations compared with the DVI group. Conclusions: The lower socio-economic class group reported more suffering from oral health problems, which have significant influence on their quality of life. The high impact measured by the psychological domain indicates the importance of this specific aspect of oral health among underprivileged people's quality of life.

PO018

Caries-preventive effect of an oral health program for preschool children in a low socioeconomic,

multicultural area in Sweden: results after one year

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The aim of this study was to evaluate the caries-preventive effect of an oral health program for preschool children living in a multicultural, low socio-economic area. 804 two-year-old children were invited and recalled every third month to an outreach facility for parent education and tooth brushing instruction. Fluoride tablets were provided. A clinical examination and a questionnaire were completed at baseline and at the age of 3 years. The results of the intervention were compared with a non-intervention reference group. More than 90% of the children attended at least four of their scheduled appointments. Parent's daily assistance with tooth brushing and the use of fluoride toothpaste and tablets improved significantly during the intervention. Compared with the reference group, when the children were 3 years old, the number of children in the intervention group who consumed frequent in-between meals and sweet drinks at night was significantly lower. Caries prevalence at age 3 years was significantly lower in the intervention group than in the reference group (3.0 deft versus. 4.4 deft; P < 0.01). The number of caries-free children after the 1-year intervention was 37% in the intervention group compared with 15% in the reference group. The relative risk (RR) was calculated to be 2.5 (95% CI 1.8-3.4) and the number needing treatment (NNT) 4 and 6. In conclusion, this study demonstrated that the oral health program significantly affected the prevalence of caries and various risk factors for caries development.

PO019

Differentiation by LPS and IFN-y of expression of adenosine receptors in macrophage cell lines RAW264 and .J774

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Lipopolysaccharide (LPS) and interferon- γ (IFN-gamma) are external and internal activator of macrophages, respectively. During infection, adenosine has physiological effects at the site of inflammation mainly through four subtypes of adenosine receptors including A1, A2a, A2b, and A3. Moreover, A2a adenosine receptor is a critical part of the physiological negative feedback mechanism for limitation and termination of tissuespecific and systemic inflammatory responses. It was useful and meaningful to gain information about interaction with LPS, which generates the inflammation, and IFN-gamma, which is a major activation factor for macrophages, and adenosine receptors, which terminate the inflammation. The aim of this study is to evaluate the abilities of LPS and IFN-gamma on the expression of adenosine receptors in mouse macrophage cell lines RAW264 and J774. LPS increased the proliferation in RAW264, but not J774. IFN-gamma didn't alter the proliferation in RAW264 nor J774. LPS significantly potentiated the expression of all adenosine receptors in J774, but not in RAW, whereas IFN-gamma markedly potentiated the expression of all adenosine receptors in RAW, but not in J774. These results suggest that LPS and IFN-gamma may differently affect the expression of adenosine receptors in macrophage cell lines RAW264 and J774.

Medically compromised

PO020

Dental management of children with hereditary angioedema

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Hereditary angioedema (HAE) in children is a rare and serious condition caused by a defect in the gene controlling C1 esterase inhibitor. Angioedema attacks occur spontaneously or can be triggered by stress, anxiety or trauma. Clinically, the condition is characterised by episodes of acute oedema of the face, oropharynx, larynx, gastrointestinal tract or extremities. Oedema in the orofacial region can cause life threatening airway obstruction and asphyxiation.

Clinical management: The dental management of four children with HAE is described. Clinical and radiographic assessment revealed caries in both primary and permanent teeth. Treatment was planned under general anaesthetic in close liaison with the patient's haematologist. Two children received C1-INH as a prophylactic measure. Minor post-operative facial swelling was noted, however, all the children were fit for discharge the following day.

Discussion: Children diagnosed with HAE should be identified early and preventive programmes commenced to avoid the need for restorative intervention. Wherever possible, extractions

should be avoided by the effective use of pulp therapy and stainless steel crowns. Behaviour management and sedation techniques should also be used to reduce the risk of emotional triggers and the requirement for general anaesthesia. Although rare, clinicians should be aware of the potential morbidity and mortality risks associated with treating children with HAE in dental practice. Dental care should be planned jointly with the patient's haematologist and undertaken in a hospital setting where appropriate medical and anaesthetic facilities are available

PO021

Characteristics of oral functions in patients with cerebral palsy

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The aim of this study was to investigate the effects of a vibration-stimulus (VS) applied to the muscle attached to the lower jaw of patients with cerebral palsy (CP) in the lower-jawposition (LJP) sensation. The response of the muscle attached to the lower jaw of patients with CP was compared with the response in control subjects, that is healthy adults without functional abnormalities of the jaw and oral cavity, using a LJP sensation discrimination test. This study included eight CP patients and eight healthy adults as control subjects. The ability to discriminate the LJP was evaluated and measured by using the method of Morimoto's. The subjects were then asked to determine whether the diameter of the test stick was 'larger' or 'smaller' than that of the reference stick. In the experiments, the subjects were subjected to this test both before and after the application of the VS. The following results were obtained: when the discrimination ability of patients with CP was compared between before and after the stimulus application, R.M.E. was significantly lower after the stimulus application when the test stick diameter was smaller (9.5 mm) than the reference stick diameter. Thus, this is because of the appearance of the tonic vibration reflex in CP patients, which results in a decrease in the activity of α -motor neurons. The threshold value of muscle sensation was increased by the VS.

PO022

Development of an intra-oral appliance to assist rehabilitation of children with oro-facial burns K. HALLETT* & S. KING

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Clinical dental examination of a number of children with oro-facial burns managed at the RCH Burns Unit with elasticised facial garments have noted a retruded mandibular position and lower incisor tooth crowding following completion of external compression therapy. Parental concerns have also been expressed with regard to frequent sleep disturbances such as snoring and apnoea following application of the facial garment. A single case study, published in 1994, reported adverse dental and jaw relationship changes in a 5 year old boy treated with a compressive facial garment. This paper recommended the use of an intra-oral device. a modified bi-maxillary mouth-guard, in conjunction with the face

garment therapy to help prevent facial skeletal changes, lower incisor tooth crowding and sleep disturbances. We report a case study to determine the clinical effectiveness of the modified bi-maxillary appliance to assist rehabilitation of children with oro-facial burns.

PO023

A comparison of costs in providing dental care for disabled patients under sedation or general anaesthesia N. PRABHU^{1,*} & J. H. NUNN²

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Objective: To compare the costs of providing dental treatment under general anaesthesia or sedation in a group of disabled patients in England.

Methods: The study adopted a qualitative approach using a Delphi panel to collect in-depth questionnaire responses from the dental service managers. The contents of the questionnaire related to staff costs including NI and super-annuation costs, depreciation cost for building and equipments, overhead costs including consumable and drug costs. Information was also sought on the average number of special needs patients treated per session. Finally, service managers were asked to comment if the costs provided were derived from observational or accountability data.

Results: The questionnaire was sent out to nine dental service managers within the Northern part of the Northern and Yorkshire region. The initial response rate after one month was 55%. After a telephone follow-up, a 100% response rate was achieved. The cost for treatment under general anaesthesia ranged between £203.65– £479.50 (mean = £285.79) and for sedation between £57.60– £153.50 (mean = £90.81) across the Trusts.

Conclusions: There will always be a need for general anaesthesia in dentistry for some patients with disability who fail to respond to the usual behaviour management techniques either due to fear or their disability, which prevents them from cooperating sufficiently to undergo routine dental care. The costs of delivering dental care under sedation or general anaesthesia for people with disabilities has been shown to be very variable; these costs are substantial and cognisance needs to be taken of the considerable investment in such services.

PO024

Localized scleroderma in a child

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Scleroderma is a connective tissue disease of unknown etiology, but known as a kind of autoimmune disease. It is most common in women especially in 30–50 years and very rare in childhood. It can be classified into two main classes: localized scleroderma & systemic sclerosis. Localized type has better prognosis, and usually involves skin only, or in some cases, the muscle below, except inner organs. Systemic type involves skin, oral mucosa and major internal organs. Involving facial skin, we can see small and sharp nose, expressionless stare and narrow oral aperture. Usually they have Raynaud's phenomenon, and in progress, show mouth opening limitation and sclerosis of tongue and gingiva. It is called CREST syndrome showing calcinosis cutis, Raynaud's phenomenon, esophageal dysfunction, sclerodactyly, and telangioectasia. Treatment of scleroderma is systemic and localized steroid therapy, use of collagen-link inhibitor (D-penicillamine), immune depressor and etc. Mouth opening limitation can be improved by mouth stretching exercise. We report a 6 years old boy, diagnosed with localized scleroderma who had mouth opening limitation. We could get additional mouth opening, and have done successful restorative treatment of mandibular and maxillary 1st and 2nd deciduous molar under deep sedation with nitrous oxide and enflurane.

PO025

Assessment of dental caries and erosion in children with phenylketonuria

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Objective: The aim of this study is to assess the prevalence of dental caries and dental erosion in children with phenylketonuria (PKU).

Methods: A total of 64 children (30 girls, 34 boys) and 47 healthy children (as controls) (21 girls, 26 boys) 2–15 years of age attending the Paediatric PKU Clinic of Istanbul, Faculty of Medicine and the Dental Clinic of Department of Pedodontics at Istanbul University were assessed for dental caries, dental erosion, use of fluoride supplements; dft, dfs, DMFT, DMFS caries indices (WHO), dental erosion scores (TWI) were determined and the baseline data were analyzed according to gender and age. The findings were statistically compared by ANOVA and Turkey multiple comparison tests.

Results: No significant differences (P > 0.05) in DMFT and DMFS scores were obtained between PKU and the control group; the mean dft (P < 0.05) and dfs (P < 0.001) scores of PKU children at 0–6 years of age were found significantly lower than the control group. Analysis of findings indicated that scores of mild, moderate and severe dental erosion in PKU children of all age groups were higher than the control group. Prevalences of mild dental erosion in PKU and control group children at 0–6, 7–11, 12–15 years of age were obtained as 24.9% – 17.6%, 19.7% – 8.4%, 12.1% – 3.7%, respectively. Significant differences (P < 0.001) in mild erosion scores were obtained between PKU and control group children.

Conclusions: The data of this study demonstrate that diet-treated PKU patients are at high risk for dental erosion and PKU children having preventive multidisciplinary treatment could have lower levels of dental caries than healthy controls.

PO026

Compliance and efficacy of mouth-care in paediatric cancer patients

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Objectives: To assess patient compliance with a protocol for the management of chemotherapy related oral complications and to compare the reported efficacy of chlorhexidine with alternative mouth-rinses.

Methods: A cross sectional survey of 41 paediatric patients was performed at the hospital between May and August 2003. All hospitalised children that had received minimum four weeks duration of chemotherapy and mouth-care prescription during

this period were recruited for the study. An interviewer-assisted 16point questionnaire was used to obtain details from parents regarding mouth-care compliance, efficacy and side effects. All children were examined at initial cancer diagnosis at the hospital dental clinic and dental caries experience was recorded using WHO recognised dmft or DMFT indices. The data were cross-tabulated using the Chi-square procedure on the SPSS biostatistical program (Version 11.5).

Results: Fifty nine percent of patients complied with the prescribed protocol (0.2% chlorhexidine mouth-rinse 4x daily for 60 seconds). Fifty five percent of patients who developed oral complications such as ulceration, painful mouth and bleeding gums reported that chlorhexidine helped to alleviate these problems. Thirty two percent discontinued use of chlorhexidine due to bad taste and were prescribed an alternative (1% sodium bicarbonate mouth-rinse 4x daily for 60 seconds). Ninety one percent of patients reported that sodium bicarbonate helped to alleviate oral complications. Reported prevalence of mouth ulcers during chemotherapy and dmft/DMFT > 6 at cancer diagnosis were significantly associated (P = 0.04).

Conclusions: Compliance with and efficacy of the current oral protocol for management of oral complications during chemotherapy were considered satisfactory. Children with severe caries at initial cancer diagnosis are at high risk for oral complications during their course of chemotherapy.

Cariology

PO027

Evaluating effectiveness of promotoras in the prevention of early childhood caries (ECC) F. RAMOS-GOMEZ^{1,*}, J. O. F. REIMANN², G. A. TALAVERA² & E. MARTINEZ³ ¹University of California, San Francisco, ²San Diego State

University, ³San Ysidro Community Health Centre, USA An Oral health curriculum was developed in a community of the

US-Mexican border to increase awareness, oral health promotion and prevention of Early Childhood Caries (ECC)

Objectives: (1) To determine the effectiveness of training promotoras (Community Health Advisors) in increasing their dental knowledge and prevention strategies for Early Childhood Caries (ECC); (2) To determine the effectiveness of promotoras in increasing the dental knowledge and prevention strategies among Mexican–American leaders and community members. The effort was part of an Infant Oral Care (IOC) Project at the San Ysidro Health Center, a San Diego community clinic located in the US– Mexico Border.

Methods: A total of 14 promotoras completed a validated IOC knowledge and behavior survey before and after their 12-hour training. The survey included 31 true/false and multiple-choice items assessing respondents' knowledge about basic facts and behavioral strategies relevant to ECC prevention. Within-subjects t-test analyses assessed whether, on average, the promotoras learned a significant amount of ECC related information as a result of their training. Subsequent pre-post participation t-tests using the same IOC survey measured changes in ECC knowledge and actions among the trained community members.

Results: It indicates that training significantly increased promotorass' scores on the IOC Survey's 'knowledge' [t (13) = 5.37, P < 0.0001], and 'behavior' [t (13) = 7.77, P < 0.0001] items. Thus they acquired a significant amount of overall ECC related information [t (13) = 9.26, P < 0.0001]. In addition, initial prepost tests indicate that community members recruited into the IOC project (n = 299) and trained by the CHAs also acquired significant amounts of ECC related information [t (298) = 3.95, P < 0.0001]. **Conclusion:** Overall, preliminary results indicate that CHAs were able to gain ECC related information and successfully pass it on to other Mexican–American community members as part of a multidisciplinary team approach.

Supported by The California Endowment and part of the UCSF-CANDO center.

PO028

Oral hygiene status and dental caries in children on long term liquid antibiotics and those not administered with such medications

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Introduction: Young children who are suffering from urinary tract infection (UTI) need to intake long-term liquid oral anti-microbial medicines (LOAM) to prevent chronic renal failure (CRF) as further complication. The aim of this study was to compare oral hygiene and dental caries in children on LOAM with healthy children who are not receive such medications.

Methods and Materials: Plaque index and dental caries prevalence (dmfs) of 40 4–6 year-old children with urinary tract infection who received LOAM more than 2 months as case group were compared with their healthy aged matched siblings as control group (n = 40). **Results:** There were statistically significant differences between dmfs and plaque index in case (dmfs = 6.94, PI = 7.65) and control group (dmfs = 4.27, PI = 6.37) *P* value <0.0001 and *P* value <0.004 respectively.

Discussion: Increased sugar intakes from LOAM have dominant role in dental caries prevalence than the anti-cariogenic effects of antibiotics in such medicines so in children who are taking longterm sugar-containing liquid medicines have an increased risk of developing dental caries.

PO029

Comparison of the performance of pit and fissure sealants provided by dental hygienists and general dentists

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Introduction: Occlusal caries accounts for approximately 80% of all caries in children. Sealants were proved to be safe, effective when placed by appropriately trained dentists or auxiliaries. Effectiveness depends on case selection, meticulous technique, and follow-up. The DVI (Dental Volunteers for Israel) clinic in Jerusalem offers free oral health care to underprivileged children. **Objective:** To compare the longevity and effectiveness of sealants provided at DVI clinic by dental hygienists, with those provided by general practitioners in a municipal clinic.

Methods: Suitability of teeth to be sealed by hygienists was determined by one senior paediatric dentist while general practitioners decided themselves. All sealants were examined using dental light, mirror and probe. Proximal caries was detected on radiographs. Criteria for sealant evaluation: A – Intact, covering the groove, continuous with the tooth enamel, no caries. B – Sealant partially or completely missing, no caries detected. C – Sealant completely or partially retained and caries found in the groove. D – Sealant replaced by a filling because of proximal caries.

Results and interm conclusions: A total of 492 teeth in 93 children were examined. 356 sealants were applied by dental hygienists and 136 by dentists. In the hygienist group 36% matched criteria A, 44% - B, 9% - C, and 11% - D. In the dentists group 48% matched criteria A, 17% - B, 32% - C, and 3% - D. 32% of the sealants applied by dentists tended to develop caries, when they were completely or partially missing. Only 9% failed sealants applied by dental hygienists developed caries.

PO030

Oral condition, chemistry of saliva in thalassemic patients

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Purpose: The purpose of this investigation was to determine the oral status in a group of patients with thalassemia major (TM). **Method:** Thirty-one TM patients (12m, 19f) and 31 healthy controls aged from 10–18 years, randomly matched for age sex and socio-economic status of parents were examined for dental caries using the decayed, missing, and filled teeth (DMFT) index and for oral hygiene conditions using the oral hygiene index (OHI-S). Unstimulated saliva was collected from each subject, and the biochemical composition (calcium, phosphorous, potassium, sodium, magnesium, urea and total protein) was determined. Statistical analyses were performed for means comparison.

Results: The dental status (DMFT index) in healthy and thalassemic group was 2.65 ± 1.91 and 5.26 ± 4.16 respectively (P = 0.003). The occurrence of plaque (OHI-S) was higher in the thalassemic group, but no statistically significant association was observed between the oral hygiene condition in the two groups (P = 0.478). Biochemical saliva composition was very similar in the two groups; phosphorus concentration was higher (P = 0.018), and calcium was lower in the TM group (P = 0.008), and this difference was statistically significant. The concentration of sodium, potassium, urea and total protein was higher in the TM group and magnesium was higher in control group but it was not statistically significant (P > 0.005).

Conclusion: The findings could provide an explanation for the higher dental caries experience observed in TM group.

Acknowledgement: This project was supported by Research Council of Babol University of Medical Sciences (Iran).

PO031

Management of patients with early caries using ozone therapy – a preliminary study

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Introduction: Multi-surface carious lesions in small patients are a very difficult clinical problem. The antibacterial action of ozone has found a practical application in the KaVo HealOzone appliance, which allows for modern preventive and therapeutic management of patients.

Aim: The aim of this clinical study was to evaluate the possibility of remineralization of lesions in the deciduous dentition in patients with a diagnosis of early caries.

Materials and method: Ozone therapy was used in a group of patients aged 2 to 4 years with multi-surface carious lesions in different groups of teeth. On the basis of initial examination, a preventive and treatment program was established. Patients

received ozone therapy three times for 20 seconds, at 2-week intervals. After the last exposition, 'Duraphat' fluoride varnish was applied. The cycle was then repeated. After completion of the program, in one of the groups, in cases of significant destruction of the crowns of molar teeth, steel crowns were placed.

Results: Initial observations confirm the efficacy of ozone therapy in the program established. A substantial increase was observed in the hardness of carious dentin, as well as resolution of painfulness of lesions.

Conclusions: The study confirms the strong remineralizing action of ozone. The application of these properties in the youngest patients with advanced early caries makes new methods of prevention and treatment possible.

PO032

Caries inhibitory activities of epigallocatechin gallate oligomers *in vitro*

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Streptococcus mutans are one of the most important pathogenic microorganisms responsible for dental caries in experimental animals and humans. The bacterium synthesizes adherent and water-insoluble glucan from sucrose by the enzymatic action of glucosyltransferases (GTFs), and firmly adheres to tooth surfaces, contributing to the induction of dental caries. Epigallocatechin gallate (EGCG) is one of the main green tea polyphenol components, and has been shown to have bacteriostatic activities against such Gram-positive bacteria as Staphylococcus aureus and Streptococcus mutans. Further, EGCG has been reported to possess a low level of anti-GTF activity. Recent evidence indicates that GTFs are inhibited more effectively as the degree of polymerization of catechin increases. In the present study, we examined the caries inhibitory activities of 5 EGCG oligomers, laccase-catalyzed oxidative oligomer, peroxidase-catalyzed oxidative oligomer, acetaldehyde polycondensate, hydroxybenzaldehyde polycondensate (EGCG-HB oligomer), and trihydroxybenzaldehyde polycondensate, in vitro by investigating their inhibitory effects on insoluble glucan synthesis by the cell-associated GTF (CA-GTF) of S. mutans MT8148. Of the tested oligomers, insoluble glucan synthesis was most effectively inhibited by EGCG-HB, with a 50% inhibitory dose toward insoluble glucan found to be 0.06 mg/ml. In addition, it significantly abrogated the sucrose-dependent adherence of S. mutans MT8148. These results indicate that EGCG-HB oligomer possesses significant caries inhibitory activities.

PO033

Presence of *Streptococcus mutans* or *Streptococcus sobrinus* in elementary school children in Kobe city, Japan and its relationship with caries risk

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The aim of this study was to detect the presence of *Streptococcus mutans* or *Streptococcus sobrinus* in Cariostat-inoculated plaque samples from children in elementary school in Kobe City, Japan, through a conventional PCR technique and establish its relationship with caries risk. Plaque sampling and caries risk assessment using the Cariostat was done on 420 subjects (219 boys and 201 girls), ages 6 to 12 years old. Extracted bacterial DNA from each resulting sample was then subjected to PCR analysis. Results

showed a highly statistical significance between caries risk as assessed using the Cariostat method and the presence of *S. mutans* or *S. sobrinus* in the plaque. The Cariostat method can be used to further establish caries risk by detecting the presence of *S. mutans* and *S. sobrinus* from plaque samples of children through conventional PCR techniques.

PO034

Assessment of plaque pH changes after oral rinsing with five infant formulas

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Introduction: Infant formulas are a complex synthetic combination of nutrients, including fermentable carbohydrate, which may be associated with the development of early childhood caries.

Objective: To assess the plaque pH changes following rinsing with five different infant formulas; Bear Brand, Dumex, Lactogen, Promil and Isomil.

Materials and methods: Twenty-four hour-old supragingival plaque was collected from 10 adult volunteers before and after a 1-minute rinse with 5 ml of formula or sucrose control. The pH of each sample was measured using pH meter model 520A every 10 minutes for 1 hour. The analysis of variance with repeated measurement and a paired *t*-test were employed in data analysis.

Results: The changing patterns of plaque pH did not differ among all formulas and sucrose although rinsing with Isomil, a soy-based formula, took the shortest duration to reach the minimum plaque pH. All formulas, except Promil, had the ability to reduce pH significantly below the pre-rinse pH.

Conclusions: These results suggest that infant formulas are cariogenic and, with an inappropriate feeding practice, may increase the risk of caries development.

PO035

Caries patterns, oral health habits and acidogenic ability of plaque bacteria in Beijing children younger than 4 years of age affected by severe early childhood caries

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The aims of the study were to characterize caries risk factors in Beijing young S-ECC children; to describe the caries distribution among tooth types and surfaces, and to compare the acidogenic ability of dental plaque bacteria between S-ECC children and caries-free children. 117 children less than 4 year-old with four carious teeth as S-ECC subjects were from the Department of Paediatric Dentistry, Peking University Stomatological Hospital, and 129 caries-free children less than 4 year-old as controls were from four urban kindergartens in Beijing. The questionnaire was designed to collect the background information, feeding practices, dental care and oral hygiene practices. Plaque samples were collected from buccal surfaces, and placed into Cariostat test medium (Cariostat®, Sankin Co., Tokyo, Japan), then incubated for 48 hours. The mean dmft(s) score of S-ECC children was 9.22 (15.51) and the mean dt(s) score 8.80 (14.91). Almost every S-ECC children suffered maxillary anterior caries. The strong association between biologic factors and S-ECC was shown by the Cariostat test. Most caries-free children were in the low level with none in the extremely high level when compared with most S-ECC children who were in the extremely high level

(P < 0.001). The Mothers of S-ECC children tended to have a low education level, and lack oral hygiene knowledge (P < 0.001). Night feeding and misuse of sugar appeared to be the significant contributor to S-ECC (P < 0.001). The study suggests that improvement of public oral hygiene education and development of child dental care should be the principal to fight against ECC in China.

PO036

Influence of excavation and application on the survival rate of class II art restorations

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Aim: The aim of this study was to investigate the influence of residual caries and cervical gaps on the survival rate of Class II ART restorations.

Methods: A total of 191 children, mean age 6.31, having a class II cavity in a primary molar, were randomly divided into two groups: in one group the cavity was filled by using hand instruments, in the other the cavity was filled by using a syringe. After restoration a bite-wing was taken and assessed on the presence of a cervical gap and residual caries. Thereby the depth of the filling in mesio-distal direction and in occluso-cervical direction was recorded.

Results: The radiographic findings reveal a high amount of residual caries (40%) and also a high amount of cervical gaps (45%). There is a significant influence of the operator on the presence of residual caries and cervical gaps. The success rate (after 8 months) with hand application is 56.0% with the syringe 61.6%. There is no influence of the operator on the success rate. The success rate is 58.8% if there is no caries left behind, no cervical gap and there is some enamel left cervical from the restoration. It is 28.6% if there is definitely caries left behind, definitely a gap and there is no enamel left cervical from the restoration. The success rate decreases when the number of variables increases. However, no significant influences could be found.

Conclusions: The success/ failure rate of an ART class II restoration is most likely multi causal defined.

PO037

Clinical evaluation of the efficacy of carisolv in caries removal in primary canine teeth

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Background: Pain is one of the most important factors in paediatric dentistry. A new product for chemo-mechanical caries removal named Carisolv was introduced to the market. According to the manufacturer, Carisolv removes caries without any pain.

Aim: The aim of this study was to evaluate the clinical efficacy of Carisolv in caries removal of primary canines, compared with rotary instruments.Patients and methods.For this purpose, 30 children (17 girls and 13 boys) with average age of 7 years and 4 months, who had a pair of decayed upper or lower primary canines (18 pairs upper and 12 pairs lower) participated in this study. The usual method applied for one tooth and Carisolv gel and its hand instruments were used for the other one of the pair. Factors such as caries removal, pain, need for anaesthesia, smell and taste of Carisolv, time of instrumentation and the amount of gel used were evaluated.

Results: Complete caries removal was achieved in the usual method rather than with Carisolv. Carisolv caused less pain and discomfort, but the need for anaesthesia was the same in both methods. Smell and taste of the gel were not a problem.

Dental anxiety and sedation

PO038

Conscious sedation for dental treatment of children with disabilities

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Aim: Sedatives for conscious sedation have been proved to be highly safe. This study aimed to survey the duration of anaesthesia and operation time and analyze the dosages of sedatives used.

Materials and method: All the patients who received dental treatment under conscious sedation at Kaohsiung Medical University Hospital from 2000 to 2004 were selected as the samples. Out of a total number of 750 children, there were 510 normal children and 240 with disabilities. Treatment data were extracted from the hospital records for analysis.

Results: The duration of both conscious sedation and operation times for people with disabilities was shorter than that of normal children. Statistically, the duration of conscious sedation for children with disability was significantly shorter than that of normal children. However, the duration of the operation did not show significant differences between normal children and those with disabilities. For both normal and disabled patients aged from 3–6 years, there was no significant difference in the duration of operation or duration of conscious sedation.

Conclusions: People with disabilities require shorter sedation time and operative time for dental treatment, but require a higher sedative dosage than normal children. This is influenced by the age of the patients. No significant differences can be found with sedation duration, operative duration and sedative dosage when the age of the patients is adjusted to 3–6 years.

PO039

The effect of relatives' presence (except parents) in the operating room during dental treatment for children M. ESKANDARI

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Introduction: Recently there has been a trend in accepting parental presence in the operating room, but this interaction may interfere with the delivery of treatment. For instance, the parent(s) may want to explain and repeat the instructions to the child, which usually results in the patient dividing his/her attention between the parent and the treating dentist. The presence of a relative or a close friend (e.g. an older brother or sister, an uncle or aunt, or a friend of the family) particularly for children under 5 years of age may be beneficial during a dental visit.

Aim: The aim of the present study was to compare the behavior of pediatric patients throughout the course of restorative dental treatment by using the Sarnat Behavior Scale.

Material and Methods: A total of 360 patients (3 to 5 year old) was divided into two groups (A, the parent group including 180 patients and B, the relatives group including also 180 patients).

Patient behavior was recorded throughout the course of the first restorative dental visit.

Results: The results showed that Sarnat scores of 3, 4 or 5 (S345) were frequently seen in the parents' group, as compared to the relatives' group. The difference between the two groups was statistically significant (P < 0.001).

Conclusion: Conclusion, the presence of a relative during treatment can help towards behavior management in pediatric dentistry.

PO040

Abstract withdrawn.

PO041

A survey of sedation practices in the Korean pediatric dental office

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Sometimes dentists encounter children who cannot be treated with traditional behavior management techniques (for example, rewards, restraint, Tell-Show- Do, familiarization). In such cases, the dentist may use a sedation approach. Recently, in Korea, the use of sedation by pediatric dentists has increased. However, the guidelines for sedation dental practice and previous surveys are insufficient. The need for a new survey in Korea is required. Therefore, a survey in the form of a questionnaire was carried out to determine the current use of sedation by pediatric dentists in Korea.

Conclusions: 1. Sixty six percent (66%) of pediatric dentists use sedative agents in their practice. In this study, there was an increase in the use of sedation in Korea compared to the past. 2. Determining factors for using sedation were disruptive behavior management, number of visits required, the clinician's opinion, amount of treatment, and overall general condition. 3. Most children requiring sedation were aged 3 years or less, followed by age groups 4–5 years, under 2 years, 6–10 years, more than 10 years. 4. Particular sedative drugs used included chloral hydrate 60–70mg/kg, and hydroxyzine 10–40 mg/kg (25 mg/kg). The oral route was the most favorable route. 5. Observation of skin and nail color, and pulse oximetry were the most frequently utillized monitoring methods during sedation. 6. Only fifty six percent (56%) of pediatric dentists completed the cardiopulmonary resuscitation course.

PO042

Dental anxiety and children with mental disorders K. BOMZE

USA

Pediatric dentists are mostly able to help reduce a child's anxiety in the dental care situation by communication. However, in a child with a mental disorder, it is the communication pathways that are either most impaired or not functioning at all. It is therefore necessary to find out what is the status of these pathways. What is functioning and what is not. And if functioning, at what stage of development. In the USA, based on the latest children's mental health status (1999), 11% have disorders that limit ability to function, and 21% that cause at least some impairment. These disorders include the following major headings: mental retardation, learning disorders, communication disorders, pervasive development disorders, attention-deficit disorders, disruptive behavior, and social disorders. It is only with recognizing and understanding these disorders that one can begin to plan the approach to reducing dental anxiety. Dental anxiety reducing strategies consist of the communication approach and pharmacologic adjuncts (which include inhalants). This paper gives an overview of the scope of the problem and ways to develop workable strategies.

PO043

DENFAC, Ankara, Turkey, changes in the teaching and practice of conscious sedation in Turkey since September 2003

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During the September 2003 DENFAC in Ankara, Turkey, we discussed the teaching of conscious sedation with emphasis on the ongoing revision of the AAPD guidelines for conscious sedation. This poster will detail the effect on the teaching and practice of conscious sedation in pediatric dentistry in Turkey.

PO044

Comprehensive dental treatment for children under general anesthesia in Jeonju district, Korea

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Dental caries in children has declined over the past few decades. However, certain child populations experience high levels of dental disease. To perform the highest quality dental care for the pediatric patient, the practitioner may need to use pharmacological means to obtain a quiescent, cooperative patient. Furthermore, as complex treatment can impose high demands on very young children, these may need general anesthesia, a preferred approach for such patients. General anesthesia is widely used to provide comprehensive dental treatment for children in the USA, Europe and Scandinavia. Parental and patient satisfaction following completion of dental care under general anesthesia is reported occasionally. Dental general anesthesia has the disadvantages that it is expensive and carries a small but significant risk of mortality. However, it has the advantages of permitting treatment in a single visit, allowing immediate relief of pain and requiring little or no cooperation from the child. The major indication for using general anesthesia was rampant caries in the younger age group or medically compromised patients. This study describes the characteristics of patients receiving comprehensive dental treatments under general anesthesia through a 4-year period, from January 2001 to May 2005. This study was performed at the pediatric dentistry department, Chonbuk National University Hospital in Jeonju city, Korea.

PO045

A study on factors associated with children's behavior at first dental visit

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Factors associated with children's uncooperative behavior at dental settings had been discussed in a number of retrospective studies. Low percentage of negative behavior due to unpleasant dental experience was noted. The purpose of this study was to explore inherent factors, which are not associated with dental experience in children's behavior at the first dental visit. The study consisted of 120 healthy children (62 female and 58 male), whose age ranged from 2-6 y/o and have no dental experience before. Data collected from questionnaires for guardians and children's background containing psychometric scales of guardian and child's dental Anxiety level. Children's behavior during first dental visit was rated with Frankl's rating scale. Caries index (dfs) and oral hygiene status were evaluated as well. A logistic regression of GEE model was used for data analysis. Results revealed that toothache, poor oral hygiene, higher caries index, younger age, male, shyness temperament is related to uncooperative behavior at first dental visit. The results imply that, in addition to pre-appointment behavior modification, good oral hygiene practices play an important role to positively influence the child's behavior before the first dental visit.

PO046

Treatment expenses and acceptance of public dental care by children treated under nitrous oxide sedation or general anaesthesia

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Objectives: To compare treatment expenses and acceptance of public dental care by children treated under nitrous oxide sedation or general anaesthesia at the Turku University Hospital.

Methods: This study included 76 healthy children (55 boys and 21 girls) referred for dental treatment because of management problems and extensive treatment needs. These were treated either under nitrous oxide sedation (N₂O, n = 40; median age: 5.9 years) or general anaesthesia (GA, n = 36; median age: 5.3 years) at the Paediatric Dentistry unit during 2000 and 2001. Three years after completion of treatment, the number of visits and total duration of treatment at the hospital was reviewed. A questionnaire was mailed to all referring dentists and parents to evaluate the children's acceptance of public dental care.

Results: Children treated under N₂O-sedation had more hospital visits (mean \pm SD 6.1 \pm 1.8), and more time (3.8 \pm 1.4 hours) was used for their dental treatment than for those treated under GA (2.8 \pm 2.1, 2.5 \pm 1.7 h) *P* < 0.001 and *P* < 0.001, respectively (ANOVA). However, when the treatment was converted to human resource-hours, the expenses of the GA-children exceeded those of the N₂O-children (*P* < 0.05). In addition, more teeth (*P* < 0.05) were extracted in the GA-group (1.4 \pm 1.7) than in the N₂O-group (0.73 \pm 1.2). According to the referring dentists and

parents, the GA-children had more difficulties accepting normal dental care (P < 0.05) and presented more often with dental anxiety (P < 0.05) than the N₂O-children.

Conclusions: Treatment expenses of GA were higher than those of N_2O -sedation and children treated under GA had more problems adjusting than those treated under nitrous oxide sedation.

PO047

The effect of dental treatment on children's attitudes to dental care

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Introduction: Dental anxiety can be associated with negative dental experiences. A five-year cohort study of 5-year-old provides the opportunity to investigate the relationship between treatment provided and attitude to dental care.

Methods: Children were selected from two fluoridated (Dudley, Walsall) and two non-fluoridated areas (South Glamorgan, Mid Glamorgan) in UK. Caries data were recorded by trained and calibrated examiners three times in five years. In addition parents/ guardians returned a record card whenever their child attended a dentist detailing reason for attendance, treatment information and pain experience. The children were asked to code their attitudes to visiting the dentist on a five point 'happy face' scale. Treatment history over the period of the study was categorized as: no caries detected, all caries untreated, all caries treated and mixed treated and untreated caries.

Results: A total of 2654 children were recruited and 2408 (90.7%) followed for the entire study. Complete parental records were available for 1885 (71%) children. At baseline, 45.5% of children were very happy about dental visits, falling to 32.1% at their final visit (P < 0.001). Children's attitudes to dentistry at end point were significantly associated with treatment history. The proportion of children who were very happy was significantly higher in the no caries group (37%). Change in attitude during the study was not associated with treatment history or number of visits to the dentist but was associated with experience of pain.

Conclusion: Negative changes in attitudes to dental visits are associated with pain and not treatment history.

PO047A

Study of the possible role of serotonin in the anxiolytic effect of nitrous oxide in rodents

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Previous research has studied the influence of N_2O on brain monoamines but the role of catecholamines and serotonin in the behavioral effects of N_2O remain unclear. The objective of the present research was two-fold: (1) determine the influence of N_2O exposure on regional brain concentrations of monoamines and their metabolites in rat brain; and (2) determine the influence of serotonin antagonist and uptake inhibiting drugs on the anxiolytic-like behavioral response of mice to N_2O . In part 1, male, 150–200 g Sprague–Dawley rats were exposed to either room air or 70% N_2O in oxygen for 15 min. The frontal cortex, hippocampus, corpus striatum and hypothalamus were removed and assayed for monoamines and their metabolites by high performance liquid chromatography with electrochemical detection. In part 2, male 18–22 g NIH Swiss mice were pretreated with cinanserin, a serotonin 5HT2 antagonist, LY278, 584, a serotonin 5HT3 antagonist, the serotonin reuptake inhibitor fluoxetine or saline and tested in the light/dark exploration test 30 min after pretreatment.

Results: Part 1: Compared to room air, 70% N₂O significantly raised serotonin in the frontal cortex and 5-hydroxyindoleacetic acid in the hypothalamus but not in the hippocampus or corpus striatum. N₂O failed to appreciably alter levels of dopamine or 3,4-dihydroxyphenylacetic acid in any of these areas. Part 2: Pretreatment with cinanserin but not LY278, 584 significantly reduced the N₂O – induced increases in both time in the light compartment and the number of transitions; however, fluoxetine failed to potentiate the effects of N₂O.

Conclusions: These data are suggestive of a possible effect of N_2O on serotonin. There is a possible involvement of 5HT2 receptors in N_2O -induced anxiolytic-like behavior.(Supported by NIH Grants DE-09378 and DA-10343.)

Syndrome and genetics

PO048

Unusual dental findings in a paediatric dental patient with incontinentia pigmenti achromians

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Presenting problem: A 9 year-old boy was referred to the paediatric dental department for a consultant opinion. Clinical examination showed a pattern of light patches on his skin, midface hypoplasia, enamel hypoplasia, microdontia affecting maxillary teeth with a marked contrast in tooth size in the opposing arches, and a marked class III malocclusion. Radiographic examination demonstrated multiple missing permanent teeth and microdontia in the maxillary arch. Medical history revealed he had previously been diagnosed with a genetic condition. Clinical management. Comprehensive management included: liaison with medical colleagues and dental colleagues; intensive preventive regime and acclimatisation; restoration of carious upper second deciduous molars; restoration of hypoplastic lower incisors.

Discussion: This case illustrates an unusual pattern of microdontia and hypodontia in a young patient diagnosed with incontinentia pigmenti achromians. This presentation stresses the importance of a multidisciplinary approach in the management of the paediatric dental patient. This is demonstrated by the provision of preventative and restorative treatment, managed by close consultation and liaison with medical and dental specialties. Long-term management will include input from craniofacial and orthodontic specialties.

PO049

Rare case of Brachmann's (Cornelia de Lange's syndrome)

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The authors describe the case of a 15-year old boy suffering from a very rare Brachmann's syndrome (Cornelia de Lange syndrome), the defect characterized by numerous developmental abnormalities and various degree mental retardation. It occurs once per 50–100 thousand births. The most often mentioned cause is the connection with the duplication of the third chromosome long arm. Characteristic features of that syndrome include: low birth weight, short size, microcephaly, facio-cranial dismorphia. Remarkable is the

changed appearance of the face - so called 'clown's face'. Other symptoms include: hypotonia and muscular contractions, skeletal defects and defects of the heart and alimentary tract. Insufficient immune system makes the body susceptible to recurrent infections of the airways, ear and skin. The patient underwent examination of the mouth performed under general anesthesia for the first time in his life. Oral examination detected advanced dental caries expressed as DMF and dmf values 10 and 4 respectively. The values were mainly due to the D and d component, i.e. the number of teeth affected by decay. Another finding was advanced bite defect - complete distocclusion with protruding maxillary incisors and narrowed mandibular alveolar arch, lack of space for tooth 33, crowding and rotation of mandibluar incisors, persistent primary teeth. In the lower alveolar arch both seven were unerupted. All abnormalities prove impaired disodontiasis. Considering patient's general condition, he remains under continuous dental care with special emphasis on professional cleaning and fluoride prophylaxis.

PO050

Treatment of a paediatric patient with achondroplasia accompanying sleep apnea

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Achondroplasia is an autosomal dominant inheritance disease with low stature, morphological abnormalities such as cranial and maxillo-facial hypogrowth, and functional disorders such as sleepdisordered breathing. In this study, using analysis with lateral cephalogramsof a male patient with achondroplasia, who was diagnosed as having obstructive sleep apnea and underwent adenoidectomy and tonsillectomy, we evaluated the craniofacial and pharyngeal airway morphology both immediately before surgery (aged 5 years and 6 months) and 1 year after surgery (aged 6 years and 8 months). Regarding craniofacial morphology, values for facial depth, maxillary depth, point A to McNamara line, and point pog to McNamara line were larger 1 year after surgery compared with those immediately before surgery, showing catch-up. Pharyngeal airway morphology showed larger values for D-AD1, D-AD2, upper pharynx, and lower pharynx, and airway expansion was noted. These results suggested that craniofacial and pharyngeal airway morphology was improved by adenoidectomy and tonsillectomy, and that sleep apnea was relieved.

PO051

Effect on plaque removal in 360°-type new model toothbrush

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Introduction: At the Osaka Dental Center for Crippled Children, Osaka Dental Association (CP Center), instruction in cleaning the teeth of mentally and physically handicapped children and adults is a special point of emphasis in dental care. The motto of the center is 'Everything begins and ends with brushing teeth'. After deliberation regarding the use of regular toothbrushes for disabled children and adults, it was decided to make comparisons using new types of 360° < toothbrushes made by VIVATEC.

Subjects: 1) 20 mentally and physically handicapped children and adults. 2) 20 normal children. 3) 20 dental hygienists. Each of the five sides of the upper and lower left and right backmost molars

were divided into nine sections for a total of 45 areas to check for plaque residue.

Method: 1) The patients were checked after they had brushed their teeth by themselves using the toothbrushes normally used in the CP Center and had their teeth dyed. 2) The patients were checked after they had brushed their teeth by themselves using the new type of VIVATEC toothbrushes. 3) The patients were checked after dental hygienists performed a finishing brushing of the patients teeth.

Results: The new types of 360 toothbrushes were more highly effective than had been expected. Especially in cases when handicapped children and adults used the new VIVATEC toothbrushes by themselves, the results were not only effective in reducing plaque but also produced very interesting findings in comparison with the toothbrushes normally used at the CP Center.

PO052

Orthodontic treatment strategies in five patients with Down syndrome, congenital heart defect, and oligodontia

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Objectives: Tooth agenesis is about 10 times more common in individuals with Down syndrome (DS) than in the general population (Russell & Kjaer 1995). About half of the children with DS are born with a congenital heart defect. Oligodontia is a rare condition that can be considered an oral disability.

Aim: The aim of this presentation was to describe orthodontic treatment strategies in five individuals with Down syndrome, congenital heart defect, and oligodontia.

Materials and method: Four girls and one boy with Down syndrome and congenital heart defect were missing 6–12 permanent teeth, third molars excluded. Oral habilitation was planned with a multidisciplinary team approach. The patients' ability to cope with dental treatment varied greatly. Different behavioural management techniques including conscious sedation with N_2O/O_2 and general anaesthesia were used.

Results: Two patients underwent only serial extractions of primary teeth. Two patients had serial extractions, surgical removal of impacted teeth, and orthodontic treatment with fixed appliances. One patient had serial extractions, surgical exposure of teeth, and is now undergoing planning for maxillofacial surgery. In three of the patients, primary second molars with no permanent successors were saved.

Conclusions: When planning orthodontic treatment for patients with intellectual and medical disability and oligodontia, a multidisciplinary approach was necessary. The treatment chosen depended mostly on the individual's ability to cope with dental treatment, but alternative orthodontic solutions were also made concerning the risk of inducing endocarditis. Ethical considerations were essential.

PO053

Gingival hyperplasia in a mucopolysaccharidosis patient: a case report

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Mucopolysaccharidosis (MPS) is a disorder of storage in which there is excessive accumulation of glycosaminoglycans (GAGs) from lysosomal enzyme defect. Lysosomal accumulation of GAGs

eventually results in cell, tissue and organ dysfunction. This patient may manifest mental retardation and physical disorders. The MPS shares many clinical features though in variable degrees. These include chronic and progressive course, multi-system involvements such as organomegaly, dysostosis multiplex of bone and joint. Coarse facial features, claw hand deformity, lumbar kyphosis, decreased muscle tone, hearing and visual disability, obstructive airway and cardiovascular involvement may be seen. Oral manifestations of MPS include enlarged tongue, gingival hyperplasia, multiple impacted teeth, thin enamel and abnormal spacing of teeth. This clinical report presents a 13-year-old girl with MPS having severe gingival hyperplasia and supernumerary teeth. Gingivectomy and extraction of supernumerary teeth were performed under general anesthesia. Patient's oral condition has been controlled periodically.

Conclusion: The dentist must be aware of oral manifestations present in the MPS. The approach to dental management will require teamwork between the dentist and the patient's physician.

PO054

A case report of 6 year follow-up of a patient with oligondontia: problematics and therapy

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Oligodontia is defined as the congenital absence of six or more teeth, excluding the third molars. Genetic factors may play an important role in oligondontia, which can occur as an isolated finding or as part of a syndrome. We describe here a 6-year followup of an 8-year-old boy who was missing 28 permanent teeth. The patient has facial, skeletal symmetry and is not associated to any syndrome. The dental clinical an dradiographic examination revealed the presence of only four permanent (16, 26, 36, 46), of all the primary teeth, lower incisors and cuspids are conical, and, 54, 64 and 65 are in infra-position. Occlusal examination showed a lateral cross-bite and edge-to-edge anterior bite. His malocclusion was corrected by an orthodontic therapy. A transpalatine arche was associated to an esthetic treatment and provided a guide for growth. The patient will be evaluated for a definitive oral rehabilitation at the end of the patient growth. Hypodontia diagnosis and management should be performed as early as possible not to interfere with the craniofacial development of the child.

Fluoride

PO055

The prevalence of developmental defects affecting the enamel in young Singaporeans

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Introduction: The public water supply in Singapore has been centrally fluoridated since 1957. The concentration of fluoride has been moderated over the years and is presently set at 0.6 ppm.

Methods: The prevalence of developmental defects affecting the enamel (DDE) was investigated as part of oral health surveillance exercise amongst 18 year olds in Singapore. Examiners were trained and calibrated to use the DDE index based on the BASCD Standardised criteria 1996/97 in which the four upper front teeth were examined.

Results: A total of 1,208 subjects were examined and 549 subjects (45.4%) did not present with any form of DDE. The most common

form of DDE observed was diffused opacities and this was observed in 1/3 of the participants. In most cases (>85%), these diffused opacities extend up to 1/3 of the labial surfaces of the affected teeth. However, the aesthetic impact of the diffuse types of DDE observed were minimal (2.5% with compromised impact score). The mean DMFT of the participants without any DDE (1.7) was significantly lower compared to those with 3–4 affected teeth (2.23) (P < 0.05). Statistically significant differences in the prevalence of DDE was also noted in subjects of differing ethnicity and highest educational level attained (P < 0.05).

Conclusion: Developmental defects affecting the enamel (DDE) were observed in 54.6% of participants. The most common type of DDE observed was diffused opacities. These diffused defects were of limited extent and posed minimal aesthetic impact.

PO056

Enamel fluoride uptake after use of Chulalongkorn University mouth-rinse and a commercial brand R. PUANAIYAKA^{1,*}, E. BENJAVONGKULCHAI² & P. CHAYUTTI³

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Objective: To compare the fluoride uptake in enamel after use of Chulalongkorn University mouth-rinse and a commercial brand mouthrinse.

Method: Sixty-eight participants were recruited from 8–14 yearold boys in Pakkred home for boys. They were divided into two groups according to their surface enamel fluoride concentration. An acid-etch enamel biopsy was performed on the incisal part of the labial surface of the caries and the lesion free upper central incisors, before and after one-month usage of a fluoride mouthrinse. The enamel samples were analyzed for the amounts of fluoride and calcium by using fluoride electrode and atomic absorption spectrophotometer respectively.

Result: Enamel fluoride uptake of Chulalongkorn University (4,708.46 \pm 878.10 part per million) was not statistically different (*P* > 0.05) from a commercial brand (4,548 \pm 872.00 part per million).

Conclusion: Chulalongkorn University mouth-rinse is as good as a commercial brand in term of promoting enamel fluoride uptake.

PO057

Apoptosis induced by acidulated phosphate fluoride on rabbit oral mucosa

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The use of acidulated phosphate fluoride (APF) agents has become very popular among dental practitioners to prevent caries in children. When applying on the tooth surface, the APF closely contacts with the oral mucosa. The aim of this study was to investigate the effect of APF on rabbit oral mucosa. Rabbits were applied APF or sham to oral mucosa and performed biopsy after 5 days. Apoptosis (cell shrinkage, membrane blebbing, apoptotic bodies) in epithelial basal cell layer was demonstrated and quantified by H&E staining use. Apoptosis was confirmed and further quantified by positive terminal deoxynucleotidyl transferasemediated dUTP biotin nick end labeling (TUNEL) signaling via digital semiquantitative analysis, which revealed a significant increase in apoptotic cells (P < 0.001). These results demonstrate that APF induced apoptosis on the basal layer of rabbit oral mucosa.

PO058

Abstract withdrawn.

PO059

Effect of fluoridated milk on human enamel demineralization *in vitro*: **a preliminary study** Y. L. HU^{1,4,*}, G. F. HUANG^{2,3}, H. H. CHANG^{1,2}, Y. L. WANG² & M. GUO

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Milk fluoridation as a dental caries preventive measure for children has been implemented in several countries. However, some scientists consider milk to be an unsatisfactory fluoride carrier, since binding of ionic fluoride to milk would result in irretrievable loss of fluoride in the milk. The purpose of this study was to investigate the effect of fluoridated milk on enamel caries formation in vitro. Thirteen thin sections in each group, prepared from the buccal and lingual surfaces of extracted human premolars, were sealed with acid resistant varnish with a 2×1 mm window exposed on both lingual and buccal surfaces. The sections were placed in a pH 7 remineralization solution (RS, 1.2 mmol/l; Ca, 0.72 mmol/L; P, 30 mmol/l; KCl, 50 mmol/l HEPES) for 2 days, and were divided into three groups and placed in pH 4.5 (1) demineralization solution (DS), (2) acidified milk and (3) acidified milk with 5 ppm fluoride for 12 weeks to produce caries-like lesions in the specimens. The number of caries-like lesions and the depth of the lesions were observed and measured under polarised microscopy. 84.6%, 42.3% and 15.4% of the specimen in the respective groups produced lesions. The depth of artificial lesions created was greatest with DS and least with fluoridated milk. The results imply that fluoridated milk can be used for the purpose of preventing dental caries.

Friday, 4 November

Cariology

PO060 Modified concept of restoring severely decayed primary incisors

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Failures in multi-surface anterior restorations demonstrate the blind spots of the traditional approach, such as undercuts for retention and pre-formed crown restorations. Combining current adhesive systems, a modified concept of labial preparation, etch all surfaces, veneer Wrap-around type restoration and/or tooth reshaping is proposed. Considerations for final restoration are applied in the following priority: retention, ease of maintenance, aesthetics, and function.

Materials and Methods: Part I: Failures in restorations of primary incisors were reviewed from collected clinical cases. Part II: Proposed concept of restoring primary incisors was applied in our clinic. We reviewed the clinical and digital image records of 60 consecutive cases with 172 incisor restorations placed. Only teeth that required restoration of more than four surfaces were included. Flow able composite is the material of all restorations. Reasons of re-treatment, and unsatisfactory results were recorded.

Results: Part I: Excessive tooth structure removal, inadequate retention, secondary caries, margin discoloration, and compromised aesthetics are common causes of failure in traditional approach. Part II: Cases treated under modified concept showed excellent aesthetics, ease of oral hygiene maintenance, and good retention. The average post-treatment period is 16 months. One hundred fifty four restorations (89.5%) had complete retention. Partial fracture of veneer and crown fracture were among the most common reasons for re-treatment.

Conclusions: Lessons can be learned from failed cases of the traditional approach. Limited life span of primary anterior teeth allows flexible management in the restoration. A modified concept of restoring primary incisors may provide good service in treating severely carious incisors.

PO061

Children's medical history and caries status: results from a 5-year cohort study

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Medical conditions affect a clinician's treatment decision and the type of dental care a child receives. A cohort study of 5-year-olds in the UK allows the caries status of children with significant medical histories to be examined.

Methods: Four areas (two fluoridated: Dudley and Walsall; two nonfluoridated South Glamorgan, Mid Glamorgan) were chosen and schools randomly selected. Consents were obtained for 2654 children and parents/guardians completed a detailed medical history (MH) for their child. Caries-data were recorded by trained and calibrated examiners at baseline and on two further occasions. Positive MHs were assessed by an experienced dental clinician as: 'definitely significant', 'possibly significant – further information required', 'minor significance', with respect to dental care. A comparison of relevant MH and caries status during the study is presented.

Results: Completed MH were received for 2257 (85%) children. Results are presented for the 2093 (78.9%) seen for all three examinations. 85 (4.1%): significant MH (included heart problems, chest problems, epilepsy, diabetes and cancer), 431 (20.6%): possibly significant MH, 839 (40.1%): minor significant MH and 738 (35.3%): no medical problems. 37.8% of children with significant and 38.3% with possible significant MH had caries at two dental examinations compared to 30.4% and 32.9% of children with minor MH and no problems respectively (P = 0.044).

Conclusions: Children with significant and potentially significant MH were more likely to have dental caries at multiple examinations that those who were fit or had only minor medical problems.

PO062

Trends of the prevalence of severe early childhood caries in Bucharest, Romania

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Romanian College of Dentists, Romania

Previous studies (2000) showed a prevalence of Severe Early Childhood Caries (IpS-ECC) of 32.66% for the patients of the Paediatric Dentistry Department. At their first visit to the clinic 21.05% of the S-ECC children were aged 3 years or less.

Aim: To evaluate the trends of IpS-ECC over the last 4 years (2001–2004).

Material and method: Dental records of four groups of patients (635 children) were used, each group corresponding to one year (2001–2004). IpS-ECC was calculated for each group and separately for boys and girls. Age at presentation was recorded. Data was analysed using Windows SPSS 10.0, statistic parametric/non parametric and variance analysis.

Results: 1) IpS-ECC 2001: 20.66%; 2002: 36.06%; 2003: 33.53%; 2004: 26.31% (SS between 2002 and 2001, t = 2.7; P < 0.05). 2) IpS-ECC for girls: 21.87% (2001); 26.41% (2002); 36.48% (2003); 26.04% (2004). IpS-ECC for boys: 19.29% (2001); 43.47% (2002); 31.11% (2003); 26.51% (2004). Differences between sexes were SS only for 2002 (t = 2.0066, P < 0.5). 3) Percentage of patients aged 3 years or under at the time of their first visit was: 52.0% (2001), 61.36% (2002), 54.55% (2003), 61.67% (2004).

Conclusions: 1) Global IpS-ECC between 2001–2004 was relatively high (approx. 30%), with a slight decrease trend during 2003 and 2004 (NS). 2) IpS-ECC is relatively the same for both sexes. 3) The increase in the percentage of children presenting under the age of 3 years may indicate an increase in parents' awareness of the subject due to specialists' interventions through the media.

Conclusion: Further programs are needed in order to decrease IpS-ECC.

PO063

Reliability and clinical usefulness of sudorometry in measuring dental fear of children

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Introduction: The currently existing measures for dental fear are numerous. We know psychometric scales, behavioural rating scales, physiological and hormonal measures. The use of these tests is limited. The methods are time consuming, restricted to specific test situations, require special and expensive equipment. Sweating is an indirect measure of dental fear. We would like to introduce a sudorometric method for measuring sweating (skin surface hydration). The measurement, which is simple, quick, not threatening for even a small child and reproducible, is conducted with the Corneometer CM825.

Aim: The aim of the study was to evaluate and compare the use of the various tools for assessing dental fear in children and to validate the use of sudorometry.

Material and method: A total of 30 child patients were investigated before, during and after dental treatment. Dental fear was assessed with the Dental Fear Survey (DFS) scale. Blood pressure, pulse rate and sweating were recorded in five situations (baseline, injection, drilling, filling, endpoint). Each measure in each phase of treatment was analyzed in a repeated-measures analysis of variance.

Results: (1) Dental fear increased blood pressure, pulse rate and sweating during dental treatment. (2) The most fearful steps of dental treatment were the local anesthesia (injection) and the cavity preparation (drilling). (3) We found correlation between the systolic blood pressure, pulse rate and sweating. (4) The correlation between dental fear and sweating was significant.

Conclusion: The measurement of sweating (sudorometry) has been found to be a reliable method for measuring stress and fear in children.

PO064

A new concept for continuing education in pediatric dentistry in the Danish oral health care system for children

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In Denmark, paediatric dentistry is not a recognized specialty, and thus there is no systematic postgraduate training in paediatric dentistry. In order to offer an alternative to specialty training, a continuing education course in paediatric dentistry was developed in collaboration between the departments of paediatric dentistry at the two dental schools and the Danish Association of Public Health Dentists.

Purpose: To inspire and promote skills in seeking new knowledge and thereby enhancing the professional progress within the Pedodontic specialty. To improve quality in daily work and create professional networks.

Structure: The course consists of three consecutive modules (five days each) offered within a two year period. Each module focussess on a specific age group (0–5 years, 6–12 years and 12–18 years). Interdisciplinary teams of professionals elucidate the specific medical, dental, and social conditions of these groups. Based on own cases, the participants wrote a literature review or carried out a clinical investigation. The results were presented in a paper and an oral presentation. **Results:** A total of 106 participants obtained diplomas and 60 papers were written covering 11 of the 14 abstract official themes of the IAPD meeting. Some of the papers were later published in scientific publications.

Evaluation: The participants emphasized that learning to write a paper was the most rewarding. Several of the participants showed increased interest in formal postgraduate education in paediatric dentistry at the speciality level.

PO065

Change of alpha-haemolytic bacterial ratio in human saliva caused by inhabitation of mutans streptococci T. FUJIWARA^{1,*}, T. HOSHINO¹, M. KAWAGUCHI²,

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Introduction: Dental caries is the infectious and transmissible disease caused by mutans *Streptococci*. As mutans *Streptococci*

require tooth surface as a habitat, infants do not harbor this organism until some time after teeth emerge. On the other hand, mitis group streptococci are alpha-hemolytic and can be identified from predentate infants. In order to select the candidate bacteria that communicated with mutans *Streptococci* in the dental plaque biofilm, we carried out longitudinal and cross-sectional studies of the change in oral microflora.

Materials and Methods: The composition of bacterial flora in saliva of two subjects was periodically analyzed from 3 or 4 months-of-age to 36 or 43 months respectively. In the cross-sectional research, saliva samples were collected from 40 nursery school children, who were one- to four-years old. From these samples, the numbers of total bacteria, total *Streptococci*, and total mutans streptococci were counted using blood agar, MS agar, and MSB agar respectively. Furthermore, the rate of alpha-hemolytic bacteria was determined in blood agar.

Results and Discussion: The habitation of mutans streptococci induced a decline of alpha-hemolytic bacteria population. The number of mutans streptococci showed a reverse-corelation with that of alpha-hemolytic bacteria in the cross-sectional research. These results suggested that the decrease of alpha-hemolytic bacteria might be a landmark of the fixation of mutans streptococci in the oral cavity and that mutans streptococci and alphahemolytic bacteria might communicate with each other in the process of the biofilm formation.

PO066

The effect of pit and fissure sealants (pfs) on visual, tactile, radiographic, transillumination, and laser fluorescence detection of occlusal caries

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This study investigated the effect of an opaque (OPS) and a clear fluorescing (CFS) PFS on the diagnosis of occlusal caries. The aims were to compare, in vitro, the sensitivity and specificity of several caries diagnostic methods before and after the placement of OPS and CFS. Occlusal surfaces of 67 extracted molars were examined under standardised conditions by six fifth year dental students. Each student conducted: visual, tactile, bitewing radiography, transillumination (FOTI) and laser fluorescence (DIAGNOdent) (LF) diagnoses. The teeth were then randomly assigned to two groups for PFS placement: OPS (Helioseal, IvoclarVivadent), and CFS (Helioseal, Clear Chroma, IvoclarVivadent); diagnoses were repeated. Caries presence/absence was determined histologically under stereo microscopy (10x). The sensitivity (Sens) and specificity (Spec) of the diagnostic methods compared with histological diagnosis pre- and post PFS placement are tabled.

	Tactile (%)	LF (%)	Visual (%)	Radiog (%)	FOTI (%)
Pre PFS Sens	38.7	48.7	67.7	15.3	35.5
Pre PFS Spec	68.6	82.8	70.9	94.7	92.7
OPS Sens	_	19.5	13.4	_	36.6
OPS Spec	_	93.1	98.3	_	90.5
CFS Sens	_	52.1	42.5	_	26.0
CFS Spec	_	81.7	80.2	_	99.2

Correlations (Spearmanils Rho) between diagnostic methods and histological diagnosis for pre- PFS, OPS, and CLS were: LF: 0.41, 0.45, 0.30; visual: 0.38, 0.32, 0.34; FOTI: 0.41, 0.45, 0.35, respectively. The sensitivity of all diagnostic methods was less than ideal. OPS significantly decreased LF sensitivity, whereas CFS

had little effect. (The assistance of IvoclarVivadent Australia is acknowledged.)

PO067

Prevalence of dental caries and associated factors in preschool children from Mexico City

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Aim: Caries is a multi-factorial disease of a dynamic nature and its prevalence continues to be a problem in the paediatric population. The aims of this study were to determine the prevalence and severity of dental caries and correlate these with risk factors in urban preschool children to designate an appropriate preventive oral and dental health program.

Methods: A representative sample of 411 children between 4 to 6 years were examined by one calibrated dentist (Kappa 0.85) following WHO protocols. Anthropometric measures were recorded. The mothers of the children provided information about risk factors including nutritional and oral hygiene habits.

Results: Prevalence of caries in preschool children was 80.5%; the total decayed, missing, filled-teeth index (dmf-t) was 4.85 + 4 and dmf-s was 9.22 + 6.23% of the children, in this study presented with malnutrition; 13% reported premature birth. Less than half had had a dental visit. The tooth brushing frequency, mothers' caries experience and high consumption of sugar-containing products correlated well with caries in preschool children. (P < 0.05).

Conclusions: Caries is still prevalent in Mexican preschool children. Therefore the current approaches for prevention should be reoriented including dietary modification, oral hygienic programs and use of fluoride varnishes and fissure sealant. The high numbers of untreated preschool children is a cause of concern.

PO068

How the high and low caries activity of mothers influences their children's caries status

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Introduction: Improvement of the mother's caries activity is important to prevent future caries initiation in their children. **Objective:** Cariostat® was used to examine how the mother's caries activity influences their children's caries status.

Materials and Methods: Caries risk assessment using the Cariostat (Sankin, Co. Tokyo) was done initially on 846 pairs of mothers and their children when the child was 10 months old at a community center in the southern part of Okayama prefecture. The high and low caries activity for each mother and their children were divided into two groups according to the Cariostat results. Dental check-up was done by one dentist for all children. The second examination was when the children were 18 months old, and the caries activity was measured and dental check up was done by district dentists. The third examination was when the children were 36 months old wherein dental check up was done by district dentists.

Results: For the high mother-high child group and the low motherlow child group, a significant difference was seen between the Cariostat score at 18-month-old children (P < 0.05) and df at 36-month-old children (P < 0.01). Between the high mother-high child group and high mother-low child group, a significant difference was seen between df at 18-month-old children (P?f0.05) and df at 36-month-old children (P?f0.01).

Conclusion: The Cariostat is a convenient and effective method to motivate nursing mothers to lower their caries activity to prevent future caries initiation in their children.

PO069

The prevalence of caries in malnourished children at Menganti, Gresik, Indonesia

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Malnutrition is one of the main problems especially for children and babies during the growing and development process. Findings of various studies have stated that there is correlation between low malnourished status and high caries prevalence. This study of 110 children at Menganti area, district of Gresik, East Java, Indonesia, compared their malnutrition status with their DMF, the height and weight status and also with the findings from a questionnaire. Anthropometric measurements using National Centre for Health Status (NCHS) were used to categorize the nutritional status; good if the division of body weight to body height is above -2 SD and bad if the division value is under -2 SD according to WHO/ NCHS standard deviations. The results show that 34.5% of the respondents had a bad nutritional status and 65.5% had a good nutritional status. DMFT in children with good nutritional status was 0.55 compared with 0.68 DMFT in children with bad nutritional status. These differences were not statistically significant.

PO070

Cloning and expression of antigen genes encoding cellsurface fibrillar protein and glucosyltransferase from *Streptococcus mutans* GS-5

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Streptococci are Gram-positive, facultative anaerobes without catalase activities. Among mutans Streptococci containing a-type hemolytic activity, Streptococcus mutans has been known as a causative agent for dental caries. As well as acid production yielding the demineralization of tooth enamel, adherence and colonization of S. mutans to the teeth are also important for their virulence. These early colonizers are accomplished by the bacterial fibrillar protein, Antigen I/II (AgI/II), and glucosyltransferase (GTF). In this sense, AgI/II and GTF are reasonable targets for the development of vaccine against S. mutans GS-5. Here we report that the agI/II and gtfD genes from S. mutans GS-5 were cloned by PCR amplification of the bacterial chromosomal DNA and the integrity of cloned genes were confirmed by nucleotide sequencing. Sequence analyses showed the nucleotide sequences of cloned genes had high homology to those of the sequences previously reported. The sequence alignment of 280 nucleotides between the cloned AgI/II and the reported sequence of S. mutans GS-5 showed the perfect match. Comparing with the sequence of gtfD from S. mutans UA159, the corresponding nucleotide sequence of S. mutans GS-5 showed some mismatches, resulting changes in four residues out of 105 amino acids. The cloned genes were transferred into bacterial expression vector and the recombinant proteins were purified as HIS-tag fusion proteins. In addition, antibodies against the recombinant proteins were generated. Experimental results using these recombinant proteins and antibodies will be discussed.

Dental anxiety and sedation

PO071

Evaluation of oral midazolam and chloral hydrate, with and without hydroxyzine in the conscious sedation of physically and neurologically compromised pediatric dental patients

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Purpose: The purpose of this study was to compare the effectiveness of midazolam (MDZ) and chloral hydrate (CH) combined with hydroxyzine for the sedation of children undergoing dental treatment.

Method: Sixty-eight uncooperative children, aged 2 to 8 years were submitted to a comparative scheme. All children requiring at least two restorative visits. In the first session, Group A (n = 34) received MDZ (0.5 mg/kg) 20 minutes before or MDZ (0.5 mg/kg) 20 minutes before or MDZ (0.5 mg/kg) 20 minutes before or MDZ (0.5 mg/kg) 20 minutes before + Hydroxyzine (1 mg/kg) 35 minutes before. At the second visit the treatments were reversed. Group B (n = 34) received CH (40 mg/kg) 20 minutes before or CH (40 mg/kg) 20 minutes before. At the second session the treatments were also reversed. Children's behavior was categorized as: quiet, crying, relaxed, asleep or moving. These ratings were evaluated at the beginning of every dental appointment.

Results: Groups A and B who received MDZ or CH alone showed quiet behavior at the beginning of treatment, with crying and movement increasing towards the end. Those children who received the combined drugs were more quiet, sedated or asleep.

Conclusions: The combination of MDZ + Hydroxyzine and CH + Hydroxyzine are a safe and effective sedation approach for the dental management of young children. These two combinations of drugs have advantages over the non combined MDZ or CH. This is reflected in less crying and movement during the first 20 to 30 minutes of treatment.

PO072

Teaching behaviour management in paediatric dentistry: a two-centre comparison

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The management of difficult children is an integral part in the teaching of clinical paediatric dentistry. The aim of this study was to determine the perception of undergraduate students on the effectiveness of teaching behavioural techniques in paediatric dentistry. This study was conducted at two different centres, the School Dental Service (SDS) and the Faculty of Dentistry (FoD). Final year dental students (n = 33) were asked to 1), evaluate anonymously via a questionnaire the application of behavioural techniques, and 2) the relevance of the clinical centres in their learning of paediatric dentistry. The questionnaire used a five-point Likert scale and data was analyzed using the McNemar test at significance level of 0.05. Results showed that a significantly higher proportion of students perceived the SDS as having children with difficult behaviour to manage, and these patients required more behaviour management skills than children treated at FoD (P < 0.01). Ninety-seven percent (97%) of students agreed or strongly agreed that their behaviour management skills improved after treating children at SDS, compared to 88% of students treating children at FoD. Almost an equal number of students, 82% and 85% for SDS and FoD respectively, agreed or strongly agreed that these behavioural techniques were applied when treating children. A significantly higher proportion of students perceived that children treated at SDS were typical of those patients they would expect to treat upon graduation. In conclusion, teaching of behavioural techniques in paediatric dentistry was more effective with the inclusion of difficult to manage patients from SDS into the programme.

PO073

Protective glasses and dental fear

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Objective: For patient safety, certain dental procedures require the use of protective glasses. In our previous study a significant correlation was found between the level of the dental fear scale values and the rate of sweating. The aims of this present study were (i) to investigate the effect of protective glasses on children's sweating, (ii) and to find out whether the rate of sweating in the various treatment phases (base, injection, drilling, filling, end) was influenced by the variable treatment conditions (wearing none, wearing colorless, and wearing colored glasses of a chosen color). Methods: Thirty-six children (18 girls, 18 boys) randomly selected (12 year-olds) were asked to complete the dental fear test. For objective parameters sweating was measured before treatment, during anesthetic injection, drilling, filling and after the treatment. All five measures were recorded for children without wearing glasses, wearing colorless glasses and wearing glasses of a chosen color. Each dependent variable was analyzed in a repeated-measure analysis of variance (ANOVA).

Results: 1. Treatment phase and type of treatment significantly influenced the rate of sweating. 2. In each treatment phase there was a different interaction between the rate of sweating and dental fear scale values.

Discussion: The interrelations between these measures and the possible explanation of the findings will be presented on the poster.

PO074

The effectiveness of salivary chromogranin A as a stress-indicator in children

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It is well known that stress may be involved during dental treatment. This stress can lead to dental anxiety or fear of future dental care. Therefore, it is important to determine if children are under a high degree of stress or not. It has been reported that salivary Chromogranin A (CgA) might be a sensitive and promising index for psychosomatic stress in adults. The aim of this study is to verify whether salivary CgA may also be used as an index of stress in children. The subjects were 42 children ranging in age from 5 to 9 years old (mean 7.5 years). Saliva samples were collected before and after each dental treatment by using a cotton swab. CgA levels were determined by EIA Enzyme Immuno Assay. In order to determine the level of the children's dental anxiety and their personality traits, the Dental Sub-scale of Children's Fear Survey Schedule (CFSS-DS) and a questionnaire that included a personality test were used. The CgA value was measured to be 3.17 \pm 2.17 pmol/mg protein at pre-treatment, and 1.97 \pm 1.79 pmol/ mg protein at post-treatment. This is a significant decrease

of.83.8%, but there were no significant correlations between CgA values and CFSS-DS. However, children with a high score on the CFSS-DS tended to have a higher CgA value. These results suggest that CgA may be used to verify children's stress during dental treatment.

PO075

Influence of nitrous oxide on pulpal blood flow, consciousness and vital signs

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Introduction: Nitrous oxide is the oldest of the gaseous inhalational anesthetics. Ever since, nitrous oxide has been widely used in the dental setting. Clinically, this form of conscious sedation technique allows for vital reflexes to remain intact while pain and anxiety is reduced.

Methods: A total of 25 volunteers aged 25-30 were included in this study. After administration of nitrous oxide, EPT, verbal description scale, PBF, PR and SpO₂ were recorded. The pulse oximetry probe was placed on the 2nd finger and pulse rate and SpO₂ were monitored. Each of nitrous oxide recording time was the same at the end of each concentration of nitrous oxide. The Data was analyzed by repeated measurements, ANOVA and t-test. Administration of nitrous oxide resulted in a significant increase of EPT values (P < 0.005). Administration of nitrous oxide resulted in a significant increase of PBF (P < 0.005). Administration of nitrous oxide resulted in a significant decrease of pulse rate (P < 0.005). Administration of nitrous oxide resulted in no significant difference of SpO₂ (P < 0.005). Administration of nitrous oxide resulted in no significant difference of administration techniques (P < 0.005) Therefore the results of the present study show that administration of nitrous oxide is an effective method to control pain and anxiety. The above results show that administration of nitrous oxide can be clinically effective.

PO076

Comparative evaluation of two ketamine regimens for pediatric dentistry

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Introduction: Sedation is usually required for uncooperative young dental patients the aim of this study was to evaluate the effectiveness of two schemes of sedation: ketamine, droperidol, nalbufine (KDN) versus ketamine, midazolam and nitrous oxide(KM-N₂0).

Methods: Children (n = 60) aged from 24 to 60 months, ASA I, with negative conduct according to Frankl's behavior rating scale (1 or 2) were selected and randomly distributed in two groups for each one of the regimens. Informed consent was obtained. Premedication was administrated by the intramuscular route. Sedation levels were then evaluated. Oxygen saturation, respiratory and cardiovascular functions were continuously recorded using a PROPAQ 104 HP monitor.

Results: Sedation times averaged 60 minutes, with all patients reaching a level 6 according to the Ramsay's scale. The induction and recovery times were smaller for the group that received KMN₂0 (P < 0.05). Although no clinical complications were noted, differences in cardiovascular function were recorded. The KMN₂0 showed greater stability. (P < 0.05).

Conclusions: Both methods, KDN and KM-N₂0 were similarly effective for sedation in pediatric dentistry. Nonetheless, the KM-N₂0 combination is more recommendable and safer for pediatric dentistry.

PO077

Retrospective study of 100 inhalation sedation sessions with a 50% $N_2O/50\%$ O₂ premix for dental care C. DELFOSSE^{1,*}, T. TRENTESAUX¹, S. LHOIR¹,

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Introduction: Behavioural management problems in children sometimes require either pharmacological and/or psychological approaches. Until recently, general anaesthesia was the only way to treat these patients in the paediatric department of the Dental Faculty in Lille (France). In 2004, dental care under inhalation sedation with a prefixed mixture (Antasol®) was set up. This study aims to describe the first 100 sessions after the creation of this special dental unit.

Methods: In a nine-month period, patients for whom conventional dental care had failed were managed with inhalation sedation. This approach was used in combination with specific cognitive and behavioural management techniques. A sedation session was considered successful if the planned dental treatment was achieved. To evaluate patient behaviour, the modified Venham scale was used.

Results: Three groups of patients were identified: 37 % patients with intellectual disability (mean age: 11.5 years \pm 3.5), 28% of pre-cooperative children (mean age: 3.5 years \pm 0.5), and 35% with dental anxiety (mean age: 7.5 years \pm 2). The 100 sessions included first ever experiences of sedation and also repeat procedures, with a success rate of 91.4% and 94.3% respectively. Behavioural scores improved during a particular session but also with subsequent appointments. No serious adverse effects were recorded, although minor events occurred in 8% of the cases. **Discussion:** These results are similar to a previous national French study and it strengthene the interact in developing inhalation

study and it strengthens the interest in developing inhalation sedation for dental care in France; not just for children but also for adults with intellectual handicaps or dental phobia.

PO078

Systematic review on sedation of anxious children undergoing dental treatment: recommendations for future studies

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A recent systematic review entitled Sedation of anxious children undergoing dental treatment identified problems with research carried out to date. In light of this review we propose some guidelines for consideration when planning future studies.

Summary of Review: Sixty-one studies from 16 countries were selected for inclusion. The majority compared an agent or agents to another agent(s), with over 35 different agents or combinations being compared. Outcome measures varied widely (33 different types) with Houpt or modified Houpt Scales used in 44% of studies. Only 2 studies carried out sample size calculation. Virtually no two studies were alike making results difficult to summarise. In addition, no conclusion to which method or agent is more effective to a given group.

Recommendations: In common with many systematic review recommendations we advise that CONSORT guidelines on reporting be followed in the future. More specific recommendations when investigating the use of sedation in children include use of blinding wherever possible; study design; greater consistency in use of outcome variables; use of sample size calculations, consideration of different age groups and the effect this will have on sedative agent and outcome measures; fasting time; side-effects; monitoring; cost effectiveness considering equipment required, time of onset of sedation, dental treatment and recovery.

Oral medicine and pathology

PO079

Presentation of children with major salivary gland hypofunction: a clinical audit

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The causes of decay in children are multi-factorial and include environmental factors such as dietary habits and oral hygiene. It is recognised that salivary function also plays a vital role in maintenance of oral health, and children with salivary hypofunction often present with rampant and rapidly progressive lesions at atypical sites such as lower anterior teeth, incisal edges, cusp tips of molars and smooth surfaces. A previously reported study (Hibbert SA et al) demonstrated an association between high levels of dental caries in children with velocardiofacial syndrome and salivary gland hypofunction. In that study the mean DMFT was 3.9 (range of 0-13), mean dmft was 7.7 (range 0-20). 47% of children in the permanent dentition had lower incisor caries. Six children had scintiscans performed, which demonstrated markedly reduced salivary function, especially from the submandibular glands. It was hypothesised that other groups of children with medical co-morbidities could also be affected by salivary hypofunction. An audit was therefore conducted of children who had presented at Westmead Hospital or the Children's Hospital Westmead with a clinical picture suggestive of salivary hypofunction. These children had nuclear medicine scintigraphy performed to quantify the degree of salivary function. Their dental status at presentation was noted, together with medical co-morbidities and the dental treatment undertaken.

Conclusion: The presentation of atypical dental caries is an important diagnostic sign and dentists should be aware of its association with major salivary gland dysfunction.

PO080

Osteopathia striata with cranial sclerosis: a case report J. CAMACHO* & S. MALHI

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A case of Osteopathia Striata with cranial sclerosis (OSCS) is reported. This is a rare skeletal dysplasia that presents with significant facial manifestations and previously unreported dental anomalies. OSCS derives its name from the characteristic linear striations seen in radiographs of the long bones. The additional features of osteosclerosis affecting the cranial and facial bones have a profound clinical impact on the patient with facial disfigurement and disabilities such as deafness, caused by pressure on cranial nerves. This case report presents the findings in a 13-year-old female initially referred for assessment of her malocclusion. Clinical findings demonstrated craniofacial dysmorphism including frontal bossing, hypertelorism, broad nasal bridge, everted ears, maxillary hypoplasia with reduced mid-face height and mandibular prognathism. While there have been previous reports of an association with Robin sequence in these children, there was no evidence of the presence of clefting. Of significance was the overretention of the primary dentition due to the osteosclerosis. Developing premolar teeth failed to erupt through the dense bone, despite of the absence of atypical bone mineral biochemistry. Both primary and permanent teeth showed the presence of intracoronal calcification and tauradontism. There was severe crowding in the lower anterior dental arch and a transverse maxillary deficiency with posterior cross-bite. Panoramic radiographs confirmed the dense appearance of the maxillary and mandibular alveolar bone, the lack of primary tooth root resorption, convergent primary root apexes and delayed eruption of the permanent teeth. This report discusses the clinical assessment, multidisciplinary management of patients affected by OSCS.

PO081

Interaction of angiogenic behavior of endothelial cells with peptide SVVYGLR *in vitro*

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Objectives: In this report we found that angiogenic growth peptide, which is a synthetic peptide containing the fragment SVVYGLR placed on Osteopontin (OPN) as a single unit peptide, had useful vascularization (tube formation with cell differentiation) functions. Its effect was equivalent to VEGF, which is known to have an important angiogenesis function. This report showed for the first time that SVVYGLR played a pivotal role in vascularization by endothelial cells.

Methods: Synthesis and verification of peptide; Peptide was synthesized with a high efficiency solid-phase method by using an automatic peptide synthesizer. Cell culture; Transformed rat lung endothelial cells (TRLEC cells) were used. Evaluation of cells ability of proliferation; Cells were assessed by the WST-1 assay. Evaluation of cells ability of adhesion; Cells were assessed by the Cell adhesion assay. Evaluation of cells ability of migration; Cells were assessed by the formation ability (Three-dimensional assay).

Results: 1. In an adhesion assay, we found that the cells ability of adhesion increased significantly compared with that of the control group, but there was no difference in the ability of adhesion between the various peptide concentrations (P < 0.005). 2. In a migration assay, the cells ability of migration increased significantly compared with200 ng/ml or 2000 ng/ml SVVYGLR and the control group (P < 0.005).

Conclusions: Thus, we found that SVVYGLR peptide did not influence the cells ability of proliferation but could influence the abilities of adhesion and migration. This study showed that SVVYGLR plays the role of ideally assisting angiogenesis by vascular endothelial cells.

PO082

Comparison of temporomandibular disorders in adolescents among diagnostic subgroups

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Temporomandibular Disorders (TMD) patients can be divided into diagnostic subgroups.

Objectives: The purpose of this study was to compare pain intensity, difficulty of daily living activity and treatment outcome in young TMD patients among three diagnostic subgroups.

Methods: One hundred twenty one TMD patients (90 females, 31 males; 16.0 ± 2.9 years) at the University of California San Francisco Center for Orofacial Pain were selected. All of the patients received a comprehensive examination including the RDC/TMD and assessed by using standardized examination and subjective symptom forms. Patients were diagnosed and divided into three diagnostic subgroups; temporomandibular joint (TMJ)

problem group (JT), masticatory muscle pain group (MM) and TMJ problem and muscle pain combined group (JM). A subjective symptom form consisted of five pain ratings (0–10 scale) in orofacial region and six daily living activity ratings (0–10 scale). The symptoms were compared among three groups by utilizing ANOVA and Kruskal–Wallis statistics.

Results: Gender ratio, ages, chronicity of symptom, jaw/face tightness, talking and yawning were not significantly different among three groups. However, patients in MM group and JM group scored significantly higher on jaw/face pain, headaches, neck pain, tooth pain and eating soft foods than patients in JT group (P < 0.001). Approximately 60% of patients had better treatment outcome in each group.

Conclusions: These results suggest that even in a young population, TMD patients with myofascial pain suffered from pain in orofacial region and difficulty of daily living activity more than TMD patients with TMJ problem only.

PO083

Stomatological status of children operated on for thyroid cancer in Belarus

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One of the consequences of Chernobyl disaster for health of citizens of Belarus was the increasing of number of children with thyroid cancer. Pathology of thyroid gland may have been the cause of mineral disbalance in oral cavity that allows to relate children with thyroid cancer to the risk group of development of dental caries. We studied the stomatological status to determine possible factors, which conducive to dental caries in 120 children aged 11-15 operated on for thyroid cancer in 1990-1999 years. Control group included 40 healthy children of the same age without endocrinological pathology. It has been found out the intensity of dental caries and surfaces by DMFT index (5.07 ?61617; 0.33) and by DMFS index (8.53?61617;0.70) in children with thyroid cancer were significant higher than in healthy children (2.98 \pm 0.40 and 5.00 \pm 0.90 accordingly, P < 0.01). We determined the decreasing of salivary flow rate $(0.36 \pm 0.02 \text{ ml/min})$ in operated children in comparison with healthy children (0.44 \pm 0.02 ml/min, P < 0.01)). Analysis of distribution types of salivation showed up prevalence of hyposecretion of saliva in operated children $(49.17 \pm 4.56\%)$ in comparison with healthy children (10.00 \pm 4.74%, P < 0.001). The content of calcium in unstimulated saliva in patients with thyroid cancer was significantly higher than in children without endocrinological pathology (1.43 \pm 0.08 mmol/l and $1.12 \pm 0.08 \text{ mmol/l}, P < 0.01$). The phosphorus concentration in saliva was lower than the control (4.54 \pm 0.15 mmol/l and 5.21 \pm 0.24 mmol/l, P < 0.05). Finally, deterioration of salivary functional parameters and mineral disbalance in unstimulated saliva in children operated on for thyroid cancer may have been the cause of active dental caries.

PO084

Evaluation the efficacy of intra oral appliance (palatal crib) and behavior therapy (aversive taste and positive reinforcement) in digital-sucking management in 6–12 year-old children

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Introduction: The purpose of this study was to evaluate the efficacy of intraoral appliance (Palatal crib) and behavior therapy (aversive

taste and positive reinforcement) in Digit –sucking management in 6–12 years children.

Methods: This study included 29 Children who attended the pediatric dental clinics, Pediatric clinics or psychiatry clinics for treatment of Digit-sucking habits. After underlying data collection and oral-dental examinations, they were randomly assigned in two groups. Group A: Appliance therapy (Palatal crib) for 4 months, group B: Behavior therapy included aversive taste on nails and positive reinforcement and for breaking night Digit-sucking habits, The use of hand wraps or gloves in this group.

Results and discussion: Four months follow-up revealed that appliance therapy was relatively effective in ceasing daytime habit (about 50%) but more effective in ceasing nighttime habit (about 79%). The effectiveness of palatal crib decreased with time. Aversive taste and positive reinforcement, had high efficacy in daytime thumb-sucking control (about 87%). But were relatively effective in nighttime Digit –sucking control (about 50%) comparing the treatment results of 1, 2, 3, 4 months, separatively in day & night time habit between two groups, showed no significant difference, whereas it was significant between sum of the means of 4 months results for day habit (P = 0.047). It means that behavior therapy method, totally was very effective in day time habit control.

PO085

Immediate, intermediate and long-term multidisciplinary management of a patient with a dentigerous cyst associated with a permanent lateral incisor

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Dentigerous cysts are the most common cyst of the jaw in children. The prevalence of dentigerous cysts is from 2.5% to 35.5%. It can be associated with an unerupted tooth or an impacted supernumerary tooth. A case of a dentigerous cyst in the maxillary arch associated with the lateral permanent incisor is presented. A multidisciplinary approach in the management and treatment of this case stresses the importance of immediate, intermediate and long-term treatment planning.

Sealants

PO086

Compare the effect of fluoride APF Gels on microhardness of two types of fissure sealants M. MOSLEMI^{1.*} & S. KHLILI²

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Methods: This research was carried out on the basis of both experimental and *in vitro*. Thirty-two cylindrical (dimension 2.6 mm) specimens were made using equal number of each fissure sealant (Helioseal & Clinpro) which were randomly divided into four equal groups. After storing the first two groups in distilled water for forty-eight hours. They have been exposed to APF gels for 4 minutes and half an hour in synthetic saliva for thirty minutes prior to immersion into distilled water for another 30 minutes. The above procedures were repeated once again. This method is similar to routine fluoride therapy in the clinic (twice per year). The second two groups were used as control for Helioseal and Clinpro respectively while they were stored in distilled water. Vickers

microhardness test values were obtained. The data were subjected to ANOVA and *T*-test analyses.

Results: The data indicated that application of APE had only a significant effect on the microhardness of Clinpro (P < 0.05). But in the case of Helioseal it was not so significant.

Conclusion: The main conclusion is that the results obtained indicate a higher resistance by Helioseal in comparison to Clinpro against APF Gel.

PO087

The dependence of caries indice on geochemical characteristics of Pribaikalie landscapes Y. LEV

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In geochemical conditions of various landscapes in Pribaikalie (Irkutsk region) a varying degree of the resistance of hard teeth tissues to caries is seen in the population. The caries indices depend upon the values of drinking water mineralisation in natural landscapes, general hardness of the waters, fluorides concentration and pH. Various degree of the resistance of hard teeth tissues manifests itself during the diagnostics of both surface defects and the complicated forms of dental. For the verification of this statement we have analysed the examination bands of the oral cavity of 12-year-old children. The investigations dealt with the examination bands of the children who were born and grown in various natural landscapes, totalling 1826 children. The investigations have shown that with the growth of the parameters characterising mineral composition of natural drinking waters in forest-steppe and a taiga landscape, the quantity of children with uncomplicated caries in relation to the complicated forms (pulpitis and periodontitis) occurs as well. The analysis conducted indicated that the increase of fluoride-calcium saturation of drinking waters and as well as the increased alkaline content leads to increase of caries resistance of organism in children.

PO088

Clincal evaluation of glass ionomer sealant to saliva contaminated enamel under unrinse condition

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To evaluate the retention and efficacy of a GIC sealant on saliva contaminated enamel after air-dry procedure in clinical situation. **Method:** Initial population consisted of 220 schoolchildren, ages 6–8 years, whose permanent molars were sound sealed. A GIC (Fuji IX) was used as sealant material. Sealants were placed in a school setting by the same dentist. The teeth were randomly assigned to control side on which the treatment procedures were followed with manufacturer's instruction. The contra lateral tooth surface was intentionally contaminated with saliva then air-dried without rinse before sealant placement. Evaluations were done with a dental probe with light pressure. Double-blind recall examinations for sealant retention were done at 3 months intervals until 18 months. 178 subjects returned for evaluation after 18 months.

Results: After 18 months, 17.9% of the sealed teeth showed complete present, 35.3% partial present without caries, 45.3% complete loss without caries, and 1.5% caries or filled on occlusal surface of the contaminated side. On the control side, the corresponding figures were 22.6%, 42.1%, 33.7% and 1.6%,

respectively. Statistical analysis (Chi square test) revealed that there were no significant difference between the retention rate of the experimental side and the control side in the study periods. As to caries incidence, there was no significant difference (McNemar's test) between experimental side and control side.

Conclusion: Air-drying to the saliva contaminated enamel without rinse prior to GIC placement seems to have comparable retention rate to teeth with regular procedure.

PO089

Effect of the time from application to light exposure on the penetration of sealant

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The purpose of this study was to evaluate the effect of the lapse of time from the application of sealant until exposure to the light of curing unit on the sealant penetration. Extracted human premolars were used. Following the etching the enamel, light-cured sealants (filled and unfilled type) were applied and four different periods of time (3, 5, 10, 20 sec) were allowed until exposure to the light source. After sectioning, specimens were observed with zoom stereoscope and recorded with CCD camera connected to PC image analysing system. 20 sec of pre-curing time showed greatest penetration rate in both type of sealants (P < 0.05). Specimens in mandibular position showed significantly greater penetration rate than those of in maxillary position. Unfilled sealant revealed greater penetration rate than filled sealant (P < 0.05). On the basis of above results, 20 sec was considered to be optimal pre-curing time or inducing the deep penetration of sealant into pit and fissure.

PO090

Ultra-structure and acid etching characteristics of occlusal fissure enamel

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Purpose: The purpose of this study was to compare the effectiveness of mechanical and acid treatment on enamel surfaces for the retention of pit and fissure sealants and evaluate the presence of a prism less layer.

Method: The etch pattern produced on enamel from immature and mature premolar teeth extracted with varying period of acid etching using 37% phosphoric acid was examined using a scanning electron microscope (SEM). The composition of each group was evaluated using an energy dispersive x-ray (EDX) spectroscopy.

Result: Prismless layer was commonly observed on the fissure enamel in young and mature premolar. The most effective etching pattern for retention of pit and fissure sealant was observed in 60 seconds of etching time. The etching pattern obtained by grinding enamel surface with a bur followed by 60 seconds of etching was similar to that of 60 seconds of etching without any pre treatment of fissure surface. The calcium content and P/Ca ratio in fissure enamel between the young and the mature premolar were significantly different (P < 0.05). But content of calcium, phosphate and P/Ca ratio on various regions of fissure enamel in both young and mature premolar did not showed any difference.

Conclusion: The results showed that the mechanical removal of the prismless layer by grinding prior to etching or by prolonged etching time of enamel within the fissure system should result in an improved bonding of a pit and fissure sealant.

PO091

Monomer release from pit and fissure sealant following various surface treatment by HPLC

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The aim of this study was comparison of effectiveness of surface treatment methods in reducing the oxygen-inhibited layer of a commercially available freshly polymerised, light cured dental sealant (concise, 3M, USA). Experimental groups were consisted of no treatment (negative control group) and three experimental groups according to surface treatment of light-cured sealant. Experimental group 1 was 10 seconds' exposure to distilled water syringe, group 2 was 10 seconds' manual application using a cotton pellet wetted with 75% alcohol and group 3 was 10 seconds' prophylaxis with pumice/water slurry using rubber cup on a slowspeed handpiece. All specimens were immersed in 5§¢ distilled water and stored at 37°C water bath for 10 minutes. All evaluates were analysed by HLPC for identification and quantitative analysis of monomers. The result of this study can be summarised as follows. 1. None of the chromatograms of the tested sealant displayed peaks with the same retention time as that of the standard solution, except for TEGDMA. 2. All surface treatment groups had a statistically significant decrease of monomer release in comparison with no treatment group. 3. Removing effects of unreacted monomer was group 1 < group 2 < group 3 in magnitude. 4. Removal effects of unreacted monomer in group 3 was statistically significant in comparison with group 1 and group 2. But, removal effect of unreacted monomer in group 1 and group 2 was statistically equivalent.

PO092

The utilisation of pit and fissure sealants by dental therapists in Victoria, 1992 and 2004

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This study investigated demographics and utilisation of PFS by dental therapists (DTs) in Victoria in 1992 and 2004. Ethical approval was obtained. A questionnaire was mailed to DTs employed in the public sector in Victoria (1992, n = 193; 2004, n = 163). The useable response rates were: 1992, 173 (90%); 2004: 81 (50%) (97% and 98% females respectively). Distribution of respondents were: 74% of both groups graduated after 1970; further formal qualifications obtained: 10% (1992) and 25% (2004) (p < 0.001); read dental journals: 39% (1992) and 57% (2004); resident in a local population of >100,000: 47% (1992) and 51% (2004). PFS were used by 100% of DTs; >20 PFS/week were applied to permanent teeth by 76% (1992) and 67% DTs (2004). Two year survival rate of PFS was estimated to be ?70% by 70% (1992) and 72% (2004); PFS were recommended to ?50% children by 87% (1992) and 67% (2004). Glass ionomer cement (GIC) was used by 9% DTs (1992) and 73% (2004) (P < 0.001); 50% (1992) and 89% (2004) of these DTs used GIC for ?20% of their PFS placements. In 2004, the most prevalent reasons given for using GIC were: tooth difficult to isolate (n = 59, 68%); used as an intermediate material for a partially erupted tooth (n = 59, 90%). All DTs applied PFS, with over two thirds applying ?20 PFS per week. The appropriate use of GIC as an interim sealant has increased significantly from 1992 to 2004. (This project was supported by the Victorian Health Promotion Foundation, and Dentsply Pty Ltd.)

PO093

Longevity of two different fissure sealing procedures – a four year randomised clinical trial

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As most of the still highly prevalent fissure caries lesions start already within the first months after eruption, early sealing has been suggested. This leads to the problem of absolute moisture control during the sealing procedure. The use of non-rinsing conditioners instead of acid etching before application of the sealant has been suggested favourable in these and other dental treatment procedures of difficult saliva control. The aim of this prospective split-mouth randomised clinical trial was to compare the success rate of a compomer with non-rinsing conditioner and a 1-bottle adhesive (Dyract Seal, NRC, Prime & Bond NT) (procedure 1) with an acid-etched composite resin (Estiseal F-)(procedure 2) for fissure sealing of freshly erupted permanent first molars under relative dryness. 57 teeth for each procedure were applied and evaluated at baseline and after 6, 12, 24, 36 and 48 months (marginal integrity, marginal discolouration and retention). Teeth treated with procedure 1 revealed the following success rates: 66.7% (6 months), 45.6% (12 months), 22.8% (24 months), 12.3% (36 months) and 8.8% (48 months). Procedure 2 showed success rates of 93% (6 months), 75.4% (12 months), 52.6% (24 months), 40.4% (36 months) and 33.3% (48 months). The differences in success rate was highly significant in favour of procedure 2 for each recall (P < 0.01, Wilcoxon test, Bonferroni correction, alpha-level = 0.01). Regarding this specific group of patients with freshly erupted molars associated with difficult moisture control, Dyract Seal in combination with the non-rinse conditioner NRC and Prime & BondNT showed significantly lower success rates than the conventionally acidetched Estiseal F-.

Cariology

PO094

Caries predictive ability of caries experience and salivary mutans streptococci in Japanese preschool children

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The aim of this study was to investigate the caries predictive ability of baseline caries experience and salivary mutans streptococci (SMS) levels according to age in Japanese preschool children. A total of 556 Japanese children, 2 - 5 years-of-age at baseline, were examined. These children were divided into four groups according to age (2-, 3-, 4- and 5-year-olds). Caries scores (dmfs) were assessed according to criteria provided by WHO at baseline and after one year. The SMS level was measured by the Dentocult MS Strip mutans test (Orion Diagnostica, Finland) at baseline. For statistical analysis, the Mann-Whitney U-test and ANOVA were used. Relative risk was also computed. As a positive microbial test, SMS score > = 2 was chosen while a caries experience of dmfs > = 1 was thought as positive at baseline. New caries incidence after one year was thought as disease ($f \notin dmfs > = 1$). The $f \notin dmfs$ mean of the 2-, 3-, 4- or 5-year-old children was 1.60, 1.99, 2.65 and 1.73, respectively. The caries predictive ability of caries experience and SMS levels separately was the best in the 3-year-olds. The sum of sensitivity and specificity in combination with caries experience and SMS levels at the 2-, 3-, 4- or 5-year-old children was 141%, 151%, 147% and 125%, respectively. These results suggest that salivary MS levels and the caries experience may be useful as a caries predictor in preschool children but the age of patient should be taken into account when using these.

PO095

Caries patterns for children aged under three in Taiwan

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Objectives: The oral health status of toddlers in Taiwan has been reported to be poor. Subsequently, the analysis of cause, invading process, and prevention of caries for toddlers has become an important issue. The purpose of this study was to analyze caries patterns for toddlers in Taiwan.

Materials and Methods: The research was conducted on 557 children aged under 3 years in Taiwan. The sample cases were selected by stratified cluster sampling. The protocol of examination was based upon the criteria from WHO, and children's dentitions were classified according to five etiology-oriented caries patterns. The data was analyzed with the Student *t*-test for significant differences between age and sex groups. The data was also analyzed for caries pattern.

Results: Caries prevalence in one, two and three year olds was 0%, 37.40% and 62.68% respectively. The deft values were 0, 2.05 and 3.10 for one, two and three year olds respectively. The defs values were 0, 3.04 and 4.7. There were no significant differences between males and females. The facial-lingual pattern occupied 24.78% of the total caries patterns, pit and fissure pattern 12.75%, facial lingual/molar proximal pattern, 10.59% and molar proximal pattern, 2.51%.

Conclusions: The oral health status of toddlers in Taiwan is still poor. Facial-lingual pattern of caries occupied almost 1/4 of the caries patterns. Therefore, it is suggested that it may be strongly related to a nursing problem.

PO096

Abstract withdrawn.

PO097

Dietary and tooth brushing habits associated with dental caries in children with mental retardation in Taiwan

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The purpose of this study was to analyze the related factors of diet, tooth brushing habits and dental caries in children with mental retardation.

Methods: 168 disabled children with mental retardation aged from 6–12 years participated in this study. The oral examinations were carried out by trained dentists with the same inter and intra examiner standards. The demographic data, dietary and tooth brushing habits were collected by standardized questionnaires. Stratified cluster sampling design and Probability Proportional to Size (PPS) were used. A database was designed by using MS Access and analyzed by SAS and JMP after data entry.

Results: In the primary dentition, children with habits of asking for sweets, children eating sweets at least once a day, children getting sweets as a prize for behaviour control and children usually holding food in the mouth had higher numbers of decayed teeth (1.29, 1.66, 1.56 and 2.17 respectively). Children with higher numbers of decayed teeth and higher deft index tended to have bad appetite for food, eat soft food like porridge and spend a long time eating. Most children (39.62%) needed others to help clean teeth. 34.59% of children could clean their teeth by themselves. Children who did not clean their teeth regularly had the highest number of decayed teeth (2.38).

Conclusions: Children with mental retardation had poor oral health and high numbers of decayed and a high caries prevalence. The main reasons that appeared to cause decay were eating sweet food and not having good oral hygiene habits of tooth brushing after eating.

PO098

Diet, oral hygiene habits and dental caries status in preschool children in Taiwan

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Objective: To evaluate the relationship of diet, oral hygiene habits and dental caries status in preschool children in Taiwan.

Material and Methods: The study population consisted of 616 preschool children aged from 4 to 6 years. The population was selected using stratified cluster sampling and probability proportional to size (PPS) design. The protocol, design and performance of oral examination followed WHO criteria. The questionnaire which asked about milk-feeding schedules, dietary habits and oral health related behaviours was completed by the children's caregivers.

Results: 616 children participated in our study, including 345 (56.01%) boys and 271 (43.99%) girls. The average age was 5.24 + 0.59 years. The mean deft index was 6.17 + 4.66; the mean defs index was 10.51 + 9.81; and the caries prevalence was 83.60 + 37.05. The deft index and caries prevalence were significantly higher in children with improper nursing habits before reaching 3 years-of-age. Improper nursing and oral hygiene habits for children under 3 years included bottle-feeding before sleep or insufficient oral cleaning after bottle feeding. Other improper dietary and oral hygiene habits that caused a higher deft index and caries prevalence included brushing teeth fewer than three times a day and the frequent drinking of sweet beverages (P < 0.05).

Conclusion: Proper feeding habits, reducing intake of sweet beverages and increasing the frequency of tooth brushing are important for the dental health of preschool children.

PO099

The influence of caregiver's knowledge, attitudes, and practices on the oral health status of preschool children

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The aim of this study was to investigate the oral health status of preschool children and the relationship between dental caries and the caregiver's knowledge, attitudes, and practices.

Materials and methods: A total number of 616 children aged from 0 to 6 years were included in the study. The children received oral examinations by a dentist, and a questionnaire was dispatched to the children's caregivers to collect the data about the KAP of the caregivers.

Results: The number of caries-free children taken care of by caregivers with good dietary habits was 1.8 times as many as those who had caregivers with poor dietary habits. When investigating the number of children presenting with five or more decayed teeth, this study found that the number of children with low KAP and suffering from five or more decayed teeth was 1.5 times as many as those with high KAP caregivers.

Conclusion: The oral health knowledge, attitudes, and practices of caregivers highly relate to the oral health status of children.

PO100

The prevalence of caries in the malnourished children at Menganti, Gresik, Indonesia

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Malnutrition is one of the main problems especially for children and babies which is in growing and development process. Findings of various research's stated that there is correlation between low malnourished status and high caries prevalence. The study of 110 children aged 68 years old at Menganti area, District of Gresik, East Java, Indonesia with good and bad condition status were compare in their DMF, the height and weight status and also in questionnaire result. Antropometri measurements using National Centre for Health Status (NCHS) are used to categorize the nutritional status; good if the division of body weight to body height is above -2 SD and bad if the division value is under -2SD according to WHO/ NCHS Standart Deviation. The result shows that 34.5 % of the respondents have a bad nutritional status and 65.5 % have a good nutritional status. DMFT in children with good nutritional is 0.55 compare to DMFT in children with bad nutrition is 0.68 but these differences statistically are not significant.

PO101

One month of dental care under general anaesthesia in New Zealand

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In New Zealand, which has a population of about 1 000 000 children and adolescents, the majority of children receiving dental

care under general anaesthesia will receive this with public-funding. The settings for care include day care surgical units, hospital operating rooms and a mobile surgical bus with full day care facilities. Little national data has been available on numbers of children receiving care or on waiting lists.

Aim: The aim of this study was to capture information about all the children treated under general anaesthesia in the public system for one month in 2004.

Method: A questionnaire was sent to the Manager of each dental service. Numbers of children waiting, numbers receiving comprehensive care, extractions only or other care were recorded. Information was also collected on the experience of dentists providing the care, what facilities and equipment were available, what range of care was provided and how long was available for each patient.

Results: In the 18 Services providing care, 442 children received care in May 2004. In addition, about 30 more children would have been treated on the mobile surgical bus as it moved through rural areas. There were 1268 children on the waiting lists at the beginning of the month and 550 new referrals during the month suggesting a gradual increase in numbers requiring this care is probably occurring. Services reported children waiting from 2 to over 6 months for comprehensive care. Most of the care was provided by experienced general or hospital dentists. Not all units provided the whole range of comprehensive care with only six providing stainless steel crowns routinely and only four providing pulpotomy routinely. In some Services only GIC restorations or extractions were done. Surprisingly few services provided routine preventive care.

Conclusions: It appears that the number of New Zealand children requiring GA for dental care may be increasing. Those receiving dental restorative care do not always receive comprehensive care. The reasons are thought to be due to time constraints and unfamiliarity of operators with successful procedures.

PO102

Dental health status in 3–5 year-old kindergarten children in Tehran, Iran, in 2003 M. G. MOTLAGH & H. ZERAATI

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Assessing oral hygiene in children plays an important role in determining the health status of communities and in evaluating national health promotion programs. In 1997 in Geneva, international organizations agreed on the global goal of achieving a minimum of 90% caries free teeth in 5 year-old children.

Purpose: This study was designed to assess the oral health status in Iranian children.

Materials and Methods: Among kindergarten children residing in the capital of Iran, Tehran, 400 children between the ages of three and five years were randomly chosen and entered in the study.

Results: In this age group, only 48.3% of the children had no tooth decay. This fact shows how far we are from accomplishing the aforementioned goal. A significant increase in tooth decay in these children was correlated with neglecting oral and dental hygiene, and also failing to brush the teeth regularly and wash the mouth after consuming sweets (P < 0.001). Unfortunately, visits to dentists for regular check-ups are not frequent enough, and dental caries was seen more in children who did not have regular visits than those who did (P < 0.001).

Conclusion: More accurate planning seems necessary to achieve 90% caries free teeth in 5 year-old children. More emphasis must be placed on prevention programs and educating public to observe dental hygiene by brushing the teeth regularly, washing

PO103

The relation between carious activity and hospitalization length

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Dental carries is the result of microbial activity that induces the progressive destruction of teeth. It is the most common bacterial infection in children all over the world, and still most neglected. Recent studies have shown that chronic odontogenic infections could pose a risk for myocardial infarction, rheumatic fever, cerebral ischemia and atherosclerosis, indicating that dental disease affects indirectly related body organs. Oral health has a positive impact on Quality of Life (QoL), especially in children. This study will examine the relation between active caries and diseases length and severity in children admitted at the pediatric department of Barzilai Medical Center. A skilled dentist examined 89 children, 46 boys and 43 girls, aged 2.5-14.5 years-old, for caries during their hospitalization in the pediatric department. The dental examination was performed using a flashlight and a dental mirror. The data regarding the children heath status was taken from their hospital charts. The carious activity was determined as present or absent, and compared to various parameters of the disease and statistically analyzed using Students' t-test. No differences in mean age and disease types or severity were found between boys and girls. 50% of boys and 39.5% of the girls showed no visible caries. The hospitalization period was longer for boys for similar diseases. In both gender the duration of hospitalization was significantly related to carious activity. The preliminary results of this study showed that caries activity influences the immune status and reduces the potential of healing in children.

PO104

Retrospective analysis of children requiring multiple general anaesthetics for dental treatment at Westmead Hospital

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An audit was conducted of the records of children requiring multiple occasions of management under general anaesthesia in the Department of Paediatric Dentistry at Westmead Hospital. The aim was to determine the frequency and reasons for repeat treatment. The review was conducted by accessing the hospital data of records of all children who had dental treatment performed between January 1990 and 2002. Data were collected for all children who had multiple treatment sessions under general anaesthesia. These data were entered into a MS Access database and statistical analysis was performed using the SPSS analysis software. A total of 9768 individual children had treatment performed under general anaesthesia during this time period of which 410 children required a repeat anaesthetic. This represents a repeat treatment rate of 4.2% which is comparable with that published in other reports. The mean age at first operation was 5.2 years. A total of 918 treatment occasions were undertaken on these children, with 87% of these for routine restorations and/or extractions. A further 11% were for surgical procedures. The majority of children (339) required two operations, with 21 children requiring ≥ 4 operations. The mean number of days between the first and second operation was 873.

Conclusion: The repeat treatment rate at this facility is low, with the majority of children requiring further treatment for the management of dental caries.

Growth and development

PO105

Space changes following premature loss of the maxillary primary first molar

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The purpose of this study was to evaluate the space changes after premature loss of the maxillary first deciduous molar during the eruption of first permanent molar. Nineteen children with unilateral premature loss of the maxillary first deciduous molar were selected from the children's dental clinic for this study. The age ranged from 4.1 to 7.1 years with an average of 5.9 years. Maxillary study casts were made from alginate impression for each initial examination and follow-up examination 6 months later. Six measurements including D and E space, arch width, arch length, arch perimeter, intercanine width and intercanine depth were tested for comparisons between the initial examination and the follow-up examination six months later. The results showed that the D and E space on the extraction was significantly shorter in the group with the follow-up examination six months later as compared to that group with the initial examination (P < 0.01). The arch length was significantly shorter in the group with the follow-up examination 6 months later as compared to that group with the initial examination the follow-up examination 6 months later (P < 0.01). The intercanine width after the follow-up examination 6 months later was significantly wider than the initial examination (P < 0.01). It is concluded that early space changes after premature loss of the maxillary first deciduous molar during the eruption of first permanent molar are mostly distal shift of the primary cuspid and maxillary permanent anterior incisors.

PO106

Visual information processing of children looking at a human face – the comparison of a photo and a line drawing

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Objectives: The aim of this study was to find out how differently children of varied ages process visual information when they look at a human face in a comparison using a photograph and a line drawing.

Methods: With a photograph and a line drawing used as test images, eye movements of children were measured by means of a non-contact type of eye movement measuring instrument (Free-View). The child subjects totaled 90 in number and ranged in age from 2 years 11 months to 12 years 11 months. They were divided into three age groups.

Results: 1. In every age group, the saccadic movements and the fixation points on the features of the face (the eyes, the nose

and the mouth) were more in the photo than in the line drawing. 2. When it came to the appearance of the face (other parts of the above in the head), in every age group, there was little difference in the saccadic movements and the fixation points between the photo and the line drawing. 3. In every age group, the saccadic movements and the fixation points in the background were less when the photo was shown to the children than when the line drawing was shown.

Conclusion: There were characteristic differences in the children's way of looking at the features of the face and the background between when the photo was used and when the line drawing was used.

Reference

Sanpei S, et al., Ped Dent J 2005.

PO107

Osteogenesis of dental pulp stem cells in vitro

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We hypothesized that cells derived from dental pulp possess the characteristics of mesenchymal stem cells with the potential to differentiate into any somatic cell type including myocytes adipocytes, and osteocytes. In the present study, the in vitro osteogenic differentiation potential of rat dental pulp stem cells was examined. Induction of differentiation was carried out under the same conditions as used for bone marrow cells. Alkaline phosphatase (ALP) activity and mineralization were measured at 1, 2, 3, and 6 weeks after induction. The level of ALP activity was very high at 1 week after induction and this level was maintained for 3 weeks, however the level of ALP activity dramatically decreased (to 50%) after 6 weeks. This sequential fluctuation of ALP activity of rat dental pulp stem cells under induction is considered to correlate with the ALP activity in bone during differentiation of bone marrow stem cells. The number of mineralized nodules was counted using von Kossa staining. The number of nodules was 7.8 \pm 1.0 at 1 week, 9.0 \pm 0.8 at 2 weeks, 12.0 ± 1.4 at 3 weeks, and 29.1 ± 2.2 at 6 weeks. Although mineralization was detected at low levels after 3 weeks, the number of nodules was further significantly increased more than 3 fold at 6 weeks after the start of induction (P < 0.01). We have shown that in vitro osteogenic differentiation of rat dental pulp stem cells can be induced following the increase in ALP activity at an early stage of induction.

PO108

Osteoclasts are essentially involved in normal bone morphogenesis

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Osteopetrosis is an inherited disorder characterized by an increase in bone mass due to reduced bone resorption. It has been reported that the osteoclast deficiency in osteopetrotic op/op mice is due to a mutation in the coding region of the macrophage colony stimulating factor (M-CSF) gene. Using op/op mice, we explored roles of osteoclasts in ectopic bone formation induced by bone morphogenetic protein (BMP). Collagen sponge disks containing human recombinant BMP-2 were implanted into the dorsal muscle pouches in op/op and wild-type mice for 3 weeks. Bone mineral density of each ossicle was measured by single energy xray absorptiometry. Quantitative histomorphometric analysis was also performed. Bone mineral density of BMP-induced ectopic bone in op/op mice was about 3-fold higher than that in wild-type mice. Histological examination revealed that BMP induced higher calcified trabecular bone formation in op/op mice than in wildtype mice. Interestingly, the periphery of ectopic bones formed in op/op mice showed extremely rough surface, whereas that in wildtype mice showed smooth ones. We previously reported that serum levels of RANKL were markedly elevated in osteoprotegerin (OPG)-deficient mice. Unexpectedly, serum levels of RANKL in op/op mice were as high as those in OPG-deficient mice, whereas those in wild-type mice were under detectable levels in the RANKL assay. These results suggest that BMP-induced ectopic bone formation is accurately enhanced in the absence of osteoclasts, and osteoclasts are involved in normal bone morphogenesis.

PO109

Associations between increments in dental maturity, number of erupted permanent teeth, somatic size and nutrient intake between 6 and 12 years of age M. KARJALAINEN^{1,*}, H. NIINIKOSKI², O. SIMELL² &

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Objectives: To explore associations between increment in dental maturity, somatic size, energy and nutrient intake.

Methods: 104 randomly selected children (57 boys, 47 girls) from the Special Turku Coronary Risk Factor Intervention Project (STRIP) participated in this study. In STRIP, launched 15 years ago, half of the children have received detailed individualised nutritional and counseling half-yearly since 7 months of age, while children the control group have received routine advise. Dental maturity was assessed (Demirijan *et al.*, 1973) at 6 and 12 years of age using panoramic radiograph. Axiological data were collected at each visit, and energy and nutrient intakes were analyzed annually using 4 day food diaries. Associations between 6 year increments in these parameters were then analyzed.

Results: The increments in dental maturity correlated significantly with the increments in the number of erupted permanent teeth (r = 0.216, P = 0.03, Spearman) and increments in body weight (r = 0.324, P = 0.02). The boys showed slightly tighter associations (r = 0.261, P = 0.055 and r = 0.383, P = 0.008, respectively) than the girls (r = 0.085, P = 0.570 and r = 0.232, P = 0.134, respectively). The boys within the highest quartile of dental maturation had larger increments in height, weight and protein intake than the boys within the lowest dental maturation quartile (P = 0.049, P = 0.011 and P = 0.029, respectively) Student *t*-test).

Conclusion: The increment in dental maturity between the ages of 6 and 12 years associated significantly with the increments in the number of erupted permanent teeth, height, weight and protein intake. These associations were tightest in boys representing the highest and lowest quartiles of dental maturity increment.

PO110

Dental age assessment from dental panoramic radiographs using meta-analysis

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Methods of Dental Age Assessment (DAA) have shown considerable variation due to the difficulties in the precision of age assessment using radiographic images of the developing teeth.

Objectives: This study used meta analysis to estimate the Dental Age (DA) of living children from standard Dental Panoramic Tomograph (DPT) radiographs. This was compared to the chronological age (CA) to test the reliability of DA as an estimation of CA.

Materials and methods: A sample of 50 healthy children consented to participate, providing 50 DPT's for analysis. Dental stages for all available and visually discernible developing permanent teeth on the left side were assessed using the methods devised by Demirjian and Haavikko. Data was analysed using STATA meta analysis to produce an estimate of DA with mean and standard errors for 95% confidence intervals (CI).

Results: Analyses produced a mean difference between DA and CA of 0.5 years with a 95% CI of one year. This improves on previous studies which have reported 95% CI's of approximately 2 years.

Conclusions: Whilst this study is in its preliminary stages, the results are encouraging and show great potential for improving DAA using meta analysis. This has implications for forensic and legal estimation of age by the dentition and is an important step in the multicentre collaboration for UK reference standards.

PO111

Visual perception analysis of visual aids: with or without dental education

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In children who have not fully developed verbal skills, the use of visual aids appears to be effective. However, it is not clear if visual aids are understood by children as intended by dentists. After clarifying the visual perception of adults, we plan to ascertain that of children. Subjects were a total of ten students: five first-year dental students who had not received dental education, and five fifth-year dental students who had received dental education. Four test images were created, showing a term and a picture in different positions. The term used in the present study was rubber dam dry field technique and the picture showed a person with a rubber dam. Because the analysis would have been difficult if a sentence to describe the picture was presented, only the term was shown with the picture. In the laboratory, test images were projected onto a screen, and the Free View T.K.K. 2920 was used to measure and record the eye movements of the subjects. In the present study, using the Eye Movement Statistics Program II T.K.K. 2995, positional distributions were displayed as bar charts to quantitatively and qualitatively analyze gaze. While the students with dental education understood the meaning of the term and paid attention to the correct area of the picture, the students without dental education did not understand the meaning of the term and looked at large area of the picture.

Syndrome and genetics

PO112

Oral health and nutritional therapy of children with cholestatic chronic hepatopathy

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Child carriers of chronic hepatic disease (CHD) require specialised nutritional support, because they are predisposed to malnutrition as the liver is fundamental to the nutritional homeostasis (Molleston, 1997). In the paediatric period, the malnutrition current from CHD is one of the determinant factors for morbidity and mortality, either in the pre transplant period or after it, increasing the occurrence of infections, surgical complications and decreasing the survival of transplant and patient (Moukarzel et al, 1990; Harrison et al, 1997). The nutritional therapy has to be based on a hypercaloric diet with increased amount of medium chain triglycerides, being supplied in several meals a day. However, this diet may interfere with the oral health of these patients, and due to the disease, a lot of complications may also occur, such as, higher susceptibility to caries, periodontal disease, endodontical compromise and consequently an increased tendency to the premature loss of dental elements (Shapiro et al, 1975; Seow, 1991; Hosey, 1999). The accomplishment of good oral hygiene becomes imperative, with constant dental attention, and a search for alternatives that may decrease the probable implicated effects of nutritional therapy in the oral cavity of these patients. As seen many patients end up loosing their place in the transplant program, due to the inappropriate conditions of their oral cavity. It is important to emphasise that any alteration in nutritional therapy of patients with CHD should be done following nutritionist prescription and supervision.

PO113

Clinical manifestations of children with ectodermal dysplasia in an Australian cohort

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A retrospective review of children at Westmead Hospital with a diagnosis of Ectodermal Dysplasia (ED) was undertaken. The aim of the study was to determine the diagnostic history and clinical manifestations of a group of Australian children presenting to one institution. Ectodermal Dysplasia is a term that describes a group of inherited disorders involving two or more ectodermally-derived tissues: including the teeth, skin, nails, skin, hair, sweat glands, mucous glands. The clinical records of 100 children with the diagnosis of ectodermal dysplasia were reviewed from a departmental database The number and frequency of congenital absence of teeth was noted, based on radiographic and clinical data. Morphological details were also recorded. Data regarding other clinical manifestations, referral source, age of referral and diagnosis; and genetic and dermatological investigations were collected. A total of 52 females and 48 males were reviewed at Westmead Hospital, a majority of whom had a diagnosis of X-linked

hypohidrotic ED (74), 25 with a diagnosis of autosomal dominant ED. The average age at diagnosis was 5.8 years. The most preserved teeth were the upper central incisors, the upper canines and the first permanent molars. The age at diagnosis was dependent on the number and location of missing teeth, the shape of preserved teeth, family history of the condition and the presence of extra-oral manifestations. Female carriers were diagnosed later than males with X-linked ED.

PO114

Long-term follow-up of a patient with dyskeratosis congenita

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Dyskeratosis congenita is a rare inherited condition, characterised by progressive bone marrow failure. Typically it presents with the triad of cutaneous reticulated hyperpigmentation, nail dystrophy, and mucosal leukoplakia (Dokal, Br J Haematol 2000). Noncutaneous abnormalities (dental, gastrointestinal, genitourinary, neurological, ophthalmic, pulmonary, and skeletal) have also been reported (Sirinavin et al, J Med Genetics 1975; Knight et al, Br J Haematol 1998). Bone marrow failure is the principal cause of early mortality, with an additional predisposition to malignancy and fatal pulmonary complications. Transmission is by X-linked recessive, autosomal dominant and autosomal recessive inheritance, the major form being X-linked. A case is presented of a young adult male with dyskeratosis congenita, who has been followed for 15 years. The progress of dyskeratosis congenita in the patient is illustrated. The typical oral mucosal signs of leukoplakia are presented, with later evidence of dysplastic changes. To date, no malignant transformation has been observed in this patient. Dokal I (2000). Dyskeratosis congenita in all its forms. Brit J Haematol, 110, 768-779. Sirinavin C, Trowbridge AA (1975). Dyskeratosis congenita: clinical features and genetic aspects: report of a family and review of the literature. J Med Genetics, 12, 339-354 Knight SW, Vulliamy T, Copplestone A, Gluckman E, Mason P, Dokal I (1998A). Dyskeratosis congenita (DC) Registry: identification of new features of DC. Br J Haematol, 103, 990-996.

PO115

Oro-facial clinical features of congenital muscular dystrophy linked to collagen VI mutation: a case report

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Collagenopathies belong to the wide nosological group of inherited connective tissues disorders including Osteogenesis Imperfecta, Marfan or Ehler-Danlos syndromes, which have also many implications in paediatric dentistry. Congenital muscular dystrophies are an heterogenous group of myopathologies characterized by phenotypic and genotypic variability, sharing similar clinical features like general muscular weakness, joints contractures or hyperlaxity, spine rigidity and respiratory problems. One type of myopathy is linked to mutations of genes coding for the subunits of collagen VI molecule leading to Bethlem myopathy and to scleroatonic Ullrich muscular dystrophy. We present a patient with a medical history of all the muscular and articular signs of congenital muscular dystrophy which lead to the clinical and molecular diagnosis of collagen VI gene mutation. The extra-oral and intra-oral dental, periodontal and orthodontic examinations showed facial asymmetry and mandible deviation associated with an uni-lateral posterior cross-bite, anterior infraclusion, palatal

swelling and gingivitis. Cranio-facial growth was studied by a cephalometric analysis and bone loss was assessed by peri-apical and panoramic radiological examination. Dentin expression of collagen VI molecule was analysed by immuno-histochemistry experiments. As Collagen VI has structural, cellular and morphogenetic functions and presents a pleiotropic tissular distribution, this lead to dental and periodontal manifestations requiring a multi-disciplinary approach.

PO116

Premature exfoliations of primary teeth: clinical and genetic diagnosis

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Premature exfoliations of primary teeth is an event of great diagnostic value whose the most frequent cause is traumatic injury of anterior teeth. If the differential diagnosis excludes traumatic loss, natal or neo-natal teeth and congenital absence of teeth, the clinician will research clinical, biological and genetic signs of a bone metabolic disease like hypophosphatasia, which is linked to a mutation of the Non-Tissue Specific Alkaline Phosphatase gene (NTSAP, locus 1p36.1-p34). A first patient presented premature exfoliation of the central mandibular primary incisors at 9 monthold. The radiological features included generalized bone hypomineralization, osteopenia, skeletal deformities and rachitic bone changes. Biological and genetic features were hypercalcemia, reduction of plasmatic enzymatic activities of alkalin phosphatase, increase of urinary ethanolamines and 5'-phosphate-Pyrodoxal and mutation of NTSAP gene, confirming the diagnosis of hypophosphatasia. A second patient showed premature loss of maxillary deciduous central incisors at 3 years-old, with no biological signs suggesting hypophosphatasia, including a normal phospho-calcic ratio, and no decrease of plasmatic enzymatic activity of alkalin phosphatase. The differential diagnosis excluded cyclic neutropenia, leucocytes adhesion defects and alterations of leucocyte chemotaxis or phagocytic functions. Biological and genetic signs of syndromic leucocytes dysfunctions like Papillon-Lefevre or Chediak-Higashi syndromes, as well as neoplasic etiologies should be investigated. Other clinical cases will illustrate the differentail diagnosis. The paediatric dentist could be the first clinician to diagnose these severe metabolic or genetic diseases as premature exfoliation of deciduous teeth can be their first signs.

PO117

Rieger's syndrome: case report of a five year old child A. ARTEMIS^{1,*}, D. EMMANOUIL¹, G. POLYZOIS², H. FRYSSIRA³ & L. PAPAGIANNOULIS¹ ¹Dept of Pediatric dentistry, ²Div of Removable Prosthodontics, Dental School ³Department of Medical Genetics, University of Athens, Medical School, Greece

Rieger's syndrome (MIM 180500) is a rare autosomal-dominant disorder characterized by dental hypodontia, mild craniofacial dysmorphism, ocular anterior chamber anomalies, and umbilical stump abnormalities. It is one of the most serious causes of tooth agenesis, with an incidence rate of about 1: 200,000. Recognition of the dental anomalies may result in early diagnosis of the syndrome and prevent progressive visual loss. This is a case report of a 5-yearold female with medical history of surgical treatment for congenital annal atresia after birth, a crucial feature for the diagnosis of Rieger syndrome. She presented also with hypodontia of primary and permanent teeth. Family history revealed that the father had also annal abnormalities as well as hypodontia. DNA analysis confirmed the diagnosis of hypodontia for the MSX1 gene on chromosome 4p16.1 for both father and child. None of the two had any ocular chamber abnormalities suggesting subtle manifestations of the syndrome. To improve facial aesthetics and function, an upper jaw overdenture and a lower jaw partial denture were fabricated. The overdenture was designed over four primary teeth, not specially prepared to accept copings, in order to increase the vertical dimension of occlusion. Comprehensive preventive dental care was performed to increase the resistance of the covered teeth to dental caries. Follow-up care is most important. 3 month hygiene recall visits are scheduled to maintain and reinforce home care performance as well as to assess the need to reline, rebase, or remake prostheses.

Endodontics

PO118

A comparison of two liner materials for use in the ferric sulfate pulpotomy

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Ferric sulfate is one of the most recent agents used in vital pulp therapy and has enjoyed reasonable success. Controversy, however, exists in terms of the type of base, which is placed over the amputated pulp. The choice of the base seems to determine the pulpal response. Two bases, calcium hydroxide and zinc oxide-eugenol have both been used in separate studies but have never been compared.

Objectives: To compare the clinical and radiographic success rates obtained when applying either a calcium hydroxide (Dycal) or a zinc oxide-eugenol (Kalzinol) base following a ferric sulfate pulpotomy.

Methods: After haemostasis with ferric sulfate, pulpotomies were performed on a total of 38 primary molar teeth. Twenty-two teeth received a Kalzinol base and 16 received a Dycal base, covered with a Vitrebond lining. All teeth were permanently restored with amalgam restorations.

Results: At the six-month follow-up visit, teeth treated with Dycal demonstrated a lower clinical success (53.85%) compared to the Kalzinol base (94.74%). The radiographic success rate for the Dycal pulpotomies was also much lower (50%) in comparison to the Kalzinol (81.25%). Abscess formation and internal resorption were the most common causes of failure. Even though the Kalzinol base demonstrated greater success, there were still quite a few failures. **Conclusion:** This study demonstrates, that even with the use of a haemostatic agent, calcium hydroxide cannot be recommended as a medicament in primary tooth pulpotomies. It also highlights the need for alternative pulpotomy medicaments that are not irritating or harmful to the pulp.

PO119

Application of Ni-Ti rotary files for pulpectomy in primary molars: 15 month clinical results

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Aim: To explore the feasibility of nickel-titanium (Ni-Ti) rotary instruments for root canal preparation in primary molars.

Methodology: 61 primary molars with intact root apex in 26 children (age range: 3.2 years to 7.7 years) were treated. A modified protocol for Protaper Ni-Ti rotary files using only two instruments (SX and S2) was used for root canal preparation, and canals were filled with a calcium hydroxide-iodoform paste. All teeth were restored with stainless steel crowns. Post-operative radiographs were taken immediately following treatment and at 3-month intervals. Healing was assessed based on clinical and radiographic criteria.

Results: The overall success rate was 95.6 % (ranging from 89.3 % ~ 100 % at different follow-up time) with mean follow-up of 12.2 months. Neither instrument separation nor lateral perforation occurred in any tooth.

Conclusions: With the modified protocol, ProTaper Ni-Ti rotary files could be safely and efficiently applied for root canal instrumentation in primary molars, and the quality of treatment was good.

PO120

The induction of bone regeneration at furca areas with pulpectomy and furcalcurettage in primary molars with fistulous openings and furcal radiolucencies

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Deep caries in primary molars without early intervention frequently induces a pulpal disease and consequent furcation lesion with fistulous openings. Up to now, majority of the textbooks on pediatric dentistry and literatures have described that extraction of the inflicted teeth is indicated for these cases and in reality these teeth have usually been extracted in the dental clinics. However, when we recognize the excellent capacity of bone regeneration in children and the presence of numerous accessory canals at furcation areas, the removal of infection source in pulp by pulpectomy and inflammatory granulation tissues at furcation areas by furcal curettage might open the possibility of rapid healing at the furcation regions. In this report, 10 cases of primary molars in 3-6 year old children with fistulous openings and furcation lesions in moderate size of 2-4 mm depth radiolucency at furcation lesion have been chosen. After pulpectomy and furcal curettage, evident bone regeneration was detected radiographically in all cases. Through the cases, we came to realize that all the cases previously described are not the indications of extraction and this approach could make many cases with pulp and furca combined lesions survive and remain healthy in the children's dental arches. However, in order for this approach to acquire objective appropriateness, more scrupulous evaluation is thought desirable on the various factors regarding the indications such as the extent of furcation lesions, absorption status of teeth, amount of covering bone on succeeding teeth and so on.

PO121

Clinical and radiographic outcomes of pulpectomy with an iodoform/calcium hydroxide paste in primary teeth: a retrospective study

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Several filling materials have been used for the pulpectomy in primary teeth, and developing the ideal root canal filling material has been advocated. The purpose of this retrospective study was to evaluate the clinical and radiographic outcomes of pulpectomy in

primary teeth filled with a relatively new commercial available iodoform/calcium hydroxide paste (Vitapex). In anterior teeth, the clinical success was 100%, and the radiographic success was 87.5%. In posterior teeth, the clinical success was 97.8%, and the radiographic success was 97.5%. The overall results of the clinical and radiographic success were 98.5% and 94.6%, respectively. In addition to the success, some clinical and radiographic findings were also noted: absorption of the extruded paste, increase in bony density in the pre-operative osseous lesion, and normal physiological root resorption of the treated teeth.

Dental anomalies

PO122

The transposition of impacted primary molar and the tooth germ of second premolar: two case reports S. Y. KIM*, K. H. LEE & J. H. PARK

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An impacted tooth is a tooth that has failed to erupt into normal position beyond the time usually expected for such an appearance. Most impacted teeth reported are permanent teeth. Impaction of primary teeth, caused by primary failure of eruption, is rare. The majority of impacted primary teeth are second primary molars. The aetiology of a primary molar impaction would appear to be a physical barrier, early ankylosis of the tooth, abnormal development of the primary molar germ or malposition of the successor bud. Transposition has been described as an interchange in the position of two teeth within the same quadrant of the dental arch. It is most commonly seen with canine and lateral incisor teeth, but is rarely associated with the primary dentition. The aetiology of transposition is still obscure, although genetic factors have been postulated, together with, transposition of the developing dental lamina, injury to the primary tooth and retained primary teeth. These two cases both show the transposition of an impacted primary molar and the tooth germ of second premolar. In case 1, the mandibular second primary molar was deeply impacted, inferiorly to the tooth germ suspected to be a second premolar. In case 2, all 4 second primary molars were positioned inferiorly to the tooth germs, suspected to be their successors. All 4 second primary molars and the associated tooth germs were extracted under general anesthesia.

PO123

Natal teeth – a seven-year monitoring of a case report M. K. SKAPIN^{1,*}, M. S. FLUDERNIK² & N. LAVRENCIC¹ ¹Community Health Center Celje, ²General Hospital Celje, Department of Maxillofacial and Oral Surgery, Slovenia

This is a case report of a baby boy born with eleven natal teeth. The paper describes the monitored development of his teeth and the necessary treatment received. In this described case the aetiology is hereditary; the boy's mother, maternal uncle and cousin were all born with natal teeth. The natal teeth were grey-yellowish and glassy, with a fish scale appearance. They were loose, badly anchored and without developed roots. The presence of natal teeth did not cause this child or his mother any complications and breastfeeding was normal. Some natal teeth exfoliated in the first 4 months, although the natal molars remained in the mouth up to 3 years. Other primary teeth which grew regularly were of normal shape but poorly mineralised. Preventive and restorative procedures were employed in an attempt to maintain these teeth at the age of four and a half, the panoramic radiograph of teeth and jaws demonstrated severe oligondontia of permanent dentition. When

the child turned five, a removable prosthesis was inserted. At he age of six and a half, fenestration of the upper and lower central incisors was necessary. The permanent incisors and first molars were bigger andthicker with a strongly expressed triconodontia and were of irregular shape. We have also recorded some other ectodermic disorders, for example dry skin and thin hair.

PO124

Conservative management of odontogenic remnants after extraction of neonatal teeth: report of two cases C. L. TSAI* & Y. T. LIN

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The phenomenon of growth of a gingival mass following extraction of natal or neonatal teeth is rare. The purpose of this report was to present two cases of newborns that presented with enlarging masses on their anterior mandibular alveolar ridges, following extraction of natal teeth. The masses shrunk away very slowly in about a one-year period and a calcified mass, or tooth-like structure formed. In one case the calcified mass spontaneously exfoliated immediately. In the other case presented the tooth-like structure with root, persisted in the lower anterior ridge. Similar clinical cases have been reported in the literature, the first in 1912. It has been suggested that the continued growth masses are odontogenic remnants with the ability to form tooth-like structures. Management of these masses is based on the clinical findings and due to the nature of the condition tends to be conservative. Hence, extraction of natal and neonatal teeth should be followed by curettage of the socket to prevent continued development of the cells of the dental papilla.

PO125

Autotransplantation of impacted mandibular canine

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Impacted mandibular canines are less common than impacted maxillary canines. Studies report an incidence of impacted mandibular canines of approximately 0.1%. The treatment method of these cases is varies from simple observation to orthodontic traction, autotransplantation and extraction. Autotransplantation is the transplantation of the embedded, impacted, or unerupted tooth into the same individual's surgically prepared recipient socket. It simplifies the orthodontic treatment and reduces the treatment period. The prognosis for successful autotransplantation depends on a number of factors such as root development, surgical technique, patient's age, endodontic treatment, preservation of periodontal ligament, storage medium, time and type of splinting. It is important to transplant the tooth as quickly and as atraumatically as possible to reduce the chance of ankylosis and root resorption. This case reports a patient with a compound odontoma and impacted mandibular canine. The compound odontoma was surgically removed and the mandibular canine was transplanted, after space regaining, because the canine was in the position where orthodontic traction was difficult.

PO126

Abnormalities of maxillary incisors and canines in Chinese cleft lip and palate children

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Objective: To study the anterior maxilla of Southern Chinese complete cleft lip and palate (CLP) children for (i) the prevalence

of different kinds of dental anomalies, (ii) percentage of rotations for central incisors adjacent to the cleft, (iii) the relationship of permanent canine position with the adjacent laterals and (iv) the asymmetry of dental development. Sample: The sample consisted of 195 Southern Chinese CLP children aged between 3 and 17 years.

Materials and Methods: The medical, dental and social histories were studied as were the radiographs which the dental development was determined using the system devised by Demirjian and co-workers (1973).

Results: The cleft side permanent lateral incisor was missing in 19.2% of unilateral CLP cases and 20.5% in bilateral CLP cases. The cleft side central incisors were rotated in 78.1% and 95.9% respectively for the unilateral and bilateral CLP cases. The mesially positioned canines were often associated with an absence of the permanent lateral incisor while the distally positioned canines were always associated with the presence of supernumeraries in the cleft region. The permanent teeth on the cleft side showed statistically significant delayed development compared with their antimeres on the non-cleft side.

Conclusion: This group of Chinese CLP children demonstrated statistically significant higher prevalences of hypodontia, microdontia and delayed dental development in the cleft side than the non-cleft side. Mesial inclined canine in the cleft region is often associated with missing lateral incisors while distal inclined canine is often linked with presence of supernumeraries.

PO127

Congenital epulis and impacted maxillary primary canine

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Impacted teeth are usually found in the permanent dentition, however, they are rare in the primary dentition. We encountered a case of an impacted maxillary right primary canine in a 3-year-2-month-old Japanese girl. At birth, a small round pedunculated tumor was pointed out in the same region. Since the tumour did not disappear, she visited an oral surgeon at the age of 2 years. The lesion was clinically diagnosed as a congenital epulis and accompanied an impacted maxillary right primary canine. The epulis was excised and fenestration of the impacted maxillary primary canine was surgically performed. The pathological diagnosis was epulis fibromatosa. Afterwards, since the impacted maxillary primary canine did not erupt, she was referred to our Paediatric Dentistry Clinic. Oral examination revealed that the maxillary right primary canine had failed to erupt, with associated slight swelling of the buccal bone. A panoramic radiograph showed a radiolucent area around the impacted crown. At the age of 3 years 3 months the tumour was enucleated and fenestration of the impacted primary canine were performed under general anaesthesia. Following surgery, the primary canine began to erupt spontaneously and moved into the maxillary dental arch in 5 months. Its width was larger than the left side canine and the buccal surface was covered with hypoplastic enamel. Histologically, the tumour consisted of dental papilla like mesenchymal tissue with odontogenic epithelial islands. The pathological diagnosis was an ameloblastic fibroma. Although the congenital epulis and impacted primary canine appeared in the same region, the cause of impaction was not the epulis, but an ameloblastic fibroma surrounding the canine.

PO128

Dentinogenesis imperfecta: a treatment case of a patient with mixed dentition

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Children with dentinogenesis imperfecta (DI) are seldom encountered in dental clinics. Dentinogenesis imperfecta is a hereditary condition, with autosomal dominant inheritance. Early diagnosis and treatment of DI not only enhances the patient aesthetically, but also prevents further deterioration of the dentition. This case report presents the diagnosis and treatment of a nine-year-old male patient with DI. The patient presented with opalescent, discoloured teeth with severe attrition. The treatment provided for the patient included stainless steel crowns, composite veneers and an overdenture. Future treatment options are implants.

PO129

Dental anomalies in Chinese children with cleft lip and palate

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Introduction: The prevalence of dental anomalies in cleft lip and palate (CLP) patients has been reported in the literature; however, such findings have never been expressed specifically for different racial groups.

Objective: A retrospective case control study was conducted to determine the prevalence of different dental anomalies in southern Chinese CLP children and to compare the results with sex and age matched non-cleft southern Chinese children.

Methodology: The sample consisted of 231 pairs of age and sex matched Chinese children, aged from 3 to 12 years. Intra-oral and extra-oral radiographs were examined along with clinical histories to gather data on anomalies of tooth number, size, shape and the relative position of the lateral and central incisors to the cleft.

Results: Hypodontia was found in 57.6% of CLP children compared to 7.3% of non-cleft children while 10.0% of CLP children had hyperdontia in the permanent dentition compared to 2.6% in the non-cleft group. In addition 42.4% of the CLP children had microdontia and 1.4% had dens evaginatus compared 0.9% of the non-cleft children who had microdontia while none had dens evaginatus. In the primary dentition, the most frequently occurring anomaly in the CLP children was hyperdontia (12.1%), while this anomaly was less frequent in the non-cleft lip children (0.9%). The prevalence of dental anomalies amongst the CLP southern Chinese children were consistently higher than in their non-CLP counterparts and the differences were statistically significant.

PO130

Taurodontism: occurrence of hypertaurodontism and hypotaurodontism in permanent and primary molars

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Introduction: Taurodontism was thought to be absent in modern populations, especially in the extreme forms. However there are an increasing number of reports of it occurring in permanent and primary dentitions. Keith (1913) coined the term taurodontism as enlargement of the body of the tooth at the expense of the roots. In

this reported case taurodontism was identified as a chance finding in a 10 years old boy. The radiographic examination, Panelipse and bite wings revealed unusual extension of the pulp chamber of all the primary second molars and permanent first molars. The roots of all permanent molars were short and the cervical constriction of the pulp chambers were missing. Several methods have been proposed to classify taurodontism based on the size of pulp chamber, root length and crown length, one of the methods is if the distance (D) between the baseline connecting the two cemento-enamel junctions and the highest point of the floor of the pulp chamber is greater than 2.5 mm (Shifman and Chanannel, 1978). The Taurodont Index (TI) established by Keene (1966) could not be applied on the primary molars because of physiologic resorption.

Conclusion: All the permanent molars were 'hypertaurodont' (D > 9mm) and the primary second molars were 'hypotaurodont' (D = 2.5 mm < 5 mm). The presence of the taurodontism presents a challenge to the endodontist and orthodontist due to their abnormal root morphology.

PO131

The prevalence and characteristics of dental anomalies in the primary dentition of southern Chinese children N. K. VELLORE LOGANATHAN*, S. TONGKOOM, R. RANA & N. M. KING *Prince Philip Dental Hospital, Hong Kong*

Introduction: Developmental morphological anomalies of the dentition are frequently observed during a routine dental examination. There are no epidemiological baseline data available for dental anomalies and traits in the primary dentition of southern Chinese children.

Objective: The study was to investigate the prevalence of dental anomalies and traits amongst kindergarten children in Hong Kong. **Methods:** Study casts and Panelipse radiographs were taken for 936 randomly selected children. The 443 girls and 493 boys were examined clinically by a single examiner who also studied the radiographs to determine the occurrence of eight anomalies and 12 traits. Chi-square test was used to test the quality of proportion and the Pearson coefficient was used to determine any association between the anomalies and traits.

Results: Hypodontia (6.3%) was the most common of the anomalies and occurred most often in girls (P < 0.05) while hyperdontia occurred more frequently in boys than girls with a ratio of 1:0.34. Of the various traits occlusal groove occurred in all subjects while double fold occurred in only 11.3% of subjects. Sixth accessory cusp, deflecting wrinkle, triangular shape (P > 0.001) and metaconid ridge (P > 0.01) occurred more in boys, whereas shoveling and distal trigonid (P > 0.01 < 0.05) occurred more frequently in girls. The inter-examiner reproducibility, according to the Kappa coefficient ranged from 0.55 to 1.00 for the anomalies and traits.

PO132

Severe hypomineralization in first permanent molars. Evaluation of quality, experience and sensibility to treatment for the child patient at the age of nine years. A two-year follow up.

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Aim: To evaluate treatment outcome in seriously damaged hypomineralized first permanent molars with surface breakdown concerning type of restorative material: its extent, discolouration, form, fracture and adherence and the child's personal experience of sensibility and treatment among children aged nine.

Method: All 7-year-old children, in all 911, at 22 randomly selected clinics, were examined at regular check-up by general practitioners.

They followed a code key, specially designed for the study, when they examined the first permanent molars. They found that 37 (4,1 %) children had such a degree of destructed teeth, that conservative treatment was indicated and performed. At the 2-year-followup the 37 children were examined by two specialists in paediatric dentistry (in accordance with Ryge version 2000, van Dijken 1986). The findings were statistically analysed according to data which and how many teeth had a loss of substance, number of treated surfaces, materials' discolouration, form, fracture, adherence and sensibility to temperature, chewing and tooth brushing. Materials used were Zink-Oxideugenol, Glass-Ionomer cements, Compomers, Composites and Fissure Sealants. The patient's subjective experience was evaluated according to a face-scale.

Result: There were no significant findings concerning the choice of restorative materials and other investigated factors among the children. The children did not have high sensibility scores in affected teeth and were not negative concerning the treatment.

Conclusion: The treatment of hypomineralized first permanent molars with surface breakdown did not affect this group. The method of care was good.

PO133

Dentinogenesis imperfecta and its genetics

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Dentinogenesis imperfecta (DI) is an autosomal dominant dentine disorder which affects one in 8,000 in the population. DI is classified into three types based on clinical features, they all share opalescent blue grey or yellow brown discoloration of the teeth. Multiple spontaneous abscesses and rapid tooth wear will result in almost complete destruction of the dentition. Recently, the dentine sialophosphoprotein (DSPP) gene has been implicated as a potential candidate gene for isolated form of DI (Type II) on the basis of its restricted expression within dentine and its physical localization on the human chromosome four within the DGI III locus. Apart from DSPP gene, little is known about the aetiology of DI. However, we have preliminary data showing that not all individuals with DI II have the DSPP mutation. This has led to the hypothesis that at least one other gene is responsible for DI II. Since between 20 and 73% of individuals with osteogenesis imperfecta (OI) have DI (DI type I), it is possible that mutation in genes COL 1A1 or COL 1A2 may be involved in DI Type II. Therefore, we can hypothesize that DI II individuals without DSPP mutation have COL 1A1 or COL 1A2 mutations. The aim of this study is to complete a comprehensive review of the phenotypic presentation of families with DI II and to screen these families for mutations in DSPP, COL1A and COL 1A2. This project requires participation by as many affected families as possible. Anyone with families who might like to participate are invited to contact us through Dr Kar Mun Chan at: chankm98@yahoo.com.

Dental materials

PO134

Hardness and elasticity of bonded carious and sound primary tooth dentine using one-step adhesive system Y. HOSOYA^{1.*} & F. R. TAY²

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The biomechanical properties of bonded dentine are important factors for resin restorations. With the exception of our previous study there is little information on primary teeth. This study evaluated the hardness and elastic modulus of bonded carious and sound primary tooth dentine using a one-step adhesive system. Six sound primary molars and six carious primary teeth (5 molars and 1 canine) were used. For sound teeth, flat occlusal dentine surfaces were prepared with a high-speed diamond bur. For carious teeth, infected dentine was removed with a low-speed round steel bur and a hand instrument. The prepared dentine was bonded with One-Up Bond F Plus (Tokuyama Dental Co.). The resin-dentine interface and dentine beneath the interface were measured with a nano-indentation tester (ENT-1100a, Elionix Co.) and observed with a SEM and TEM. Ten indentations were made at intervals of 10 µm. Compared to the sound dentine, the hybrid layer on the carious dentine was thicker and more complicated patterns. Both for the carious and sound teeth, there was no significant difference between the hardness of the interface dentine and dentine 10-80 µm beneath the interface. However, Young's modulus of the interface dentine was significantly lower than the dentine 40-80 µm (carious teeth) or 50-80 µm (sound teeth) beneath the interface. There was also no significant difference in the hardness and Young's modulus of the interface dentine between the carious and sound teeth. Physical properties of bonded primary tooth dentine might differ from that of permanent dentine.

PO135

Effect of pre etching on sealing ability of two current sels etching adhesives

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Background: To evaluate effect of phosphoric acid etching on microleakage of two current self-etching adhesives on enamel margins in comparison to a conventional total- etch system.

Methods: Sixty buccal class V cavities were made at the cementoenamel junction with beveled enamel margins of extracted human premolar teeth and randomly divided into five groups of 12 specimens each. Group 1 was applying with Clearfil SE bond, Group 2 with 35% phosphoric acid etching of enamel margins plus Clearfil SE bond, Group 3 with i bond, Group 4 with 35% phosphoric acid etching of enamel margins plus i bond and Group 5 with Scotch bond multi-purpose and all groups restored with a composite resins. After 24 hours of 100% humidity storage, the samples were thermocycled, immersed in a dye solution and sectioned buccolingually and enamel margins microleakage were evaluated on a scale of 0 to 2.

Results: Significant differences were evident between the Group 3 and Groups 4 and 5 (P < 0.001) and no significant differences between Groups 1 and 2 or 1 and 5.

Conclusion: The findings suggest that, all in one adhesive systems need of pre-etching enamel margins with phosphoric acid for effectively seal.

PO136

A comparative retrieval study on the clinical performance of compomers vs composite in class II restorations in primary molars

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The purpose of the present study was to comparatively evaluate the performance of polyacid modified resin composites (PAMRC) and resin composite (RC) restorations in class II cavities of primary

molars retrieved due to exfoliation after 3-5 years in service. Retrieval analysis involved 20 Dyract (DeTrey/Dentsply), 20 F2000 (3M/ESPE) and 20 Spectrum (DeTrey/Dentsply) Class II restorations. The teeth were subjected to evaluation of the marginal outline by video-microscopy and of the entire restoration walls by computerized X-ray microtomography. Then they were embedded in resin, cross-sectioned with a hard tissue microtome and the tissue-material interfaces were analyzed by FTIR microscopy and molecular mapping, HV-SEM plus X-Ray EDS microanalysis and elemental mapping. Video-microscopy demonstrated higher rate of marginal debonding and defects in PAMRC with F2000 providing better results. No significant differences were found in the extent of interfacial lesions, hard surface deposits and marginal overhangs. Computerized X-ray tomography revealed bulk porosity and interfacial defects. FTIR microscopy showed a reduction in the mineral to matrix ratio in the dentine lesions adjacent to PAMRC implying greater decalcification. In the presence of resin liners interfacial gaps were observed. The best interfacial topography was obtained when the resinous materials were bonded directly to the cavity walls. Nevertheless, variations in the thickness of the adhesive layers were detected at axial-pulpal and axial-cervical angles. The quality of dentin hybridization varied among the materials and cavity walls.

PO137

Abstract withdrawn.

PO138

The effects of various curing light sources on the microhardness of light-activated restorative materials N. K. CHOI*, K. H. YANG, S. M. KIM & C. H. CHOI Department of Pediatric Dentistry, College of Dentistry and Dental Research Institute, Chonnam National University, Gwanju, South Korea

The aim of this study is to evaluate the effects of blue light emitting diode (LED) Light Curing Units (FreeLight 2, L.E.Demetron I, Ultra-Lume 5) on the microhardness of three resin composites (Z250, Point4, Dyract AP) and to determine their optimal curing time. Samples were made using acrylic molds (2.0mm x 3 mm) of each composite. All samples were prepared over a Mylar strip placed on a flat glass surface. After placing composite in the molds, the top surface was covered with another Mylar strip and a glass slab was gently pressed over it. The times of irradiation were as follows: Elipar TriLight, 40 s; Elipar FreeLight 2, L.E.Demetron I, and Ultra-Lume 5 s, 10 s, 20 s, 40 s, respectively. Mean hardness values were calculated at the top and bottom for each group. ANOVA and Sheffe's test were used to evaluate the statistical significance of the results. Results showed that FreeLight 2, Ultra-Lume 5, and L.E.Demetron I were able to polymerize point4 in 20 seconds to a degree equal to that of the halogen control at 40 s. FreeLight 2 and L.E.Demetron I were able to polymerize Z250 in 10 s to a degree equal to that of the halogen control at 20 s. FreeLight 2 and L.E.Demetron I were able to polymerize Dyract AP in 10 s to a degree equal to that of the halogen control at 40 s.

PO139

DENFAC, Ankara, Turkey, changes in the teaching of pediatric restorative dental treatment since 2003 R. MUSSELMAN*, A. FUKS, N. ALTAY, Z. CEHRELI, P. RITWIK & G. WRIGHT LSU School Of Dentistry, Hacettepe University, USA

LSU School Of Dentisiry, Hacettepe University, USA

At the September 2003 DENFAC we looked at the use of rubber damn, matrix band use & the use of tooth colored restorative

materials. This poster will detail the changes in the teaching of dental restorative techniques in Turkey since 2003.

Medically compromised

PO141

What kind of symptoms do children with sleep-disordered breathing have?

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The primary cause of obstructive airway diseases in adults is obesity. In children, the major cause of Sleep-Disordered Breathing (SDB) is hypertrophy of tonsils and adenoid. Although SBD in adults has long been the subjects of study, in children it has only recently attracted attentions. The purpose of this study is to evaluate symptoms and problems in children with SBD. The 337 children consisted of school or preschool children who visited the Saitama Prefecture Children's Medical Center in Japan between April 2000 and September 2002. The children were informed by a pediatric otolaryngologist and pediatric dentist that they would be admitted for a more detailed examination, if they had sleep problems, such as habitual snoring. Their clinical history was obtained from their mothers and/or fathers, and oral findings were also evaluated. Results of examination revealed that the patients consisted of 71% in boys and 29% in girls, and preschool children with low Kaup Index were frequently observed. For the clinical symptoms related to dentistry, oral breathing was frequently observed. Major differences in clinical symptoms both during daytime and sleep between SDB in the middle-climacteric age and that in childhood were findings associated with otolaryngological disorder in childhood. In conclusion, the clinical symptoms in SDB children partly differ from those in middle-climacteric aged SDB patients. Therefore, specialized examination, diagnosis, and treatment at some department are necessary.

PO142

Assessment tools used in an oral motor function therapy clinic

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The Oral Motor Function Therapy (OMFT) clinic at Westmead Centre for Oral Health in Sydney, Australia provides early intervention for children under the age of 6 years, who have significant drooling and wish to explore alternative therapies. The multi disciplinary clinic is comprised of a visiting Oral Motor Specialist from Showa University, Japan, a Speech Pathologist, Special Needs Dentists, and a Paediatric dentist. Therapy includes appropriate positioning for feeding, modifying foods where required, oral exercises, behaviour modification, facilitation techniques to improve sensory awareness and to elicit muscle movement and removable oral appliances. All patients are seen by referral from professionals working in the area of disabilities using a form specifically designed by our team. Before the initial assessment carers are asked to complete an OMFT questionnaire and to bring typical foods and drinks their child likes, as well as feeding utensils. The initial assessment comprises of a thorough medical, antenatal and perinatal (including feeding) history. Consent is requested for photographs and video footage. There is a dental examination, feeding assessment, and video documentation of the session. An assessment form outlining lip, tongue, and jaw function, saliva control and presence or absence of sialorrhea is completed. The patient needs are discussed and a care plan is formulated. Any exercises prescribed are demonstrated. The patient is given a booklet containing recommendations and review appointment. Motivational tools (positive reinforcement and rewards) are used to encourage active participation and co-operation.

PO143

Oral rehabilitation therapy for a child with posttraumatic syndrome after head injury: ten year follow-up

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We performed oral rehabilitation therapy for a boy with spastic quadriplegia due to head injury received at 9-years-old. On initial examination, he displayed a low level of consciousness. The mouth was kept open and protrusion of the relaxed tongue was observed. Dysphagia and speech pathology were marked. In addition to rehabilitation nursing, mouth cleaning was continued daily. One year later, level of consciousness had recovered and he was able to ingest food. However, open bite caused by tongue relaxation interrupted recovery of oral function. Oral rehabilitation therapy was started using a palatal plate for tongue exercise, a plate-type orthodontic appliance and a tongue crib appliance. Appliances were used from 10-to 11-years-old. A palatal lift plate for activation of soft palate was also applied for 1 year. The patient started training mouth closure with a lip-exercises appliance from 17-years-old. The patient is now 19-years-old and oral function is steadily improving. Mouth closure during rest and ingestion has been regained. Speech is not vet clear, but he enjoys talking with people around him. Post-traumatic syndrome after head injury can cause many oral function disorders. Oral dysfunction accompanies morphological changes to the developing dentition and occlusion. In the current case, early and continuous intervention by dentists contributed to minimize morphological changes and improve oral dysfunction.

PO144

Oral health and related factors in cystic fibrosis children

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Cystic Fibrosis (CF) is the most common lethal recessive inherited disease in Caucasians. CF patients can be considered as high caries risk patients; they frequently consume sugar-rich in-between-meal and they have a high intake of sugar containing syrups, aerosols and salivary flow reducing medication. Salivary disfunction and changes in salivary composition and are frequent complications of CF. The aim of this study was to evaluate caries experiences, home oral care and salivary thromboplastic activity, flow rate, pH and total protein levels in CF patients and healthy controls. A sample of 35 CF patients (3-12 years old) and a similar number (12) of age matched control subjects were selected. A questionnaire was used to obtain information about home oral care and other dental aspects of each child's care that may have influenced their oral health. Unstimulated saliva was collected and analysed. Differences between the groups were tested with Independent Sample ttests. Oral hygiene habits and caries experience were not significantly different between the control subjects (P > 0.05). There were statistically significant difference in salivary thromboplastic activity (P < 0.05) and salivary pH (P < 0.05) between the CF and healthy controls while there is no changes in salivary flow rate and salivary total protein (P > 0.05). It can be concluded that the significant decrease in salivary thromboplastic activity where as no changes in salivary flow rate implies that local salivary hemostasis function can be affected and this may result bleeding tendency in periodontal problems.Consequently, CF patients potentially run a high caries risk. There is a need for a thorough investigation on this issue.

PO145

Role of platelets in the innate immune response: clinical role in itp and dental disease and *in vitro* functional impairment of neutrophil activation

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The innate immune system is crucial for oral defenses against pathogenic bacteria. Neutrophils form a crucial arm of innate defence secreting protective cytokines and phagocytosing bacteria. Platelets are activated at sites of injury in the periodontal area. It has been reported that activated neutrophils have been shown to reduce dental caries. It is likely that platelets assist in neutrophil activation. Seven patients with idiopathic thrombocytopenic purpura (ITP) who presented to our clinic with significant dental disease were reviewed and investigated for the interaction of platelets with neutrophils. The result suggests that there is evidence of a role for platelets in the induction of innate immune responses as activated platelets induced IL-1 and IL-6 mRNA when cocultured with neutrophils. These are crucial inflammatory cytokines and may play a role in protective innate immune responses. For ITP patients, the exact role of reduced neutrophil activation (due to platelet deficiency) in affecting dental plaque and subsequent dental disease warrants further investigation.

PO146

Development of an extraoral appliance to prevent microstomia in children with oro-facial burns L. BOURKE* & S. TAYLOR

Children's Oral Health Service, Australia

The lip stretching appliance is used in the treatment of oral microstomia or reduction of the oral opening often associated with oral burns. The appliance has been effective in maintaining and increasing the vertical and lateral stretch of the oral opening while insuring a continuous constant pressure on the lip tissue is maintained. The appliance is also used to restore the oral lip form and prevent reduction of the airway caused by lip and facial scarring. We report a case study to determine the clinical effectiveness of a lip stretching appliance to assist rehabilitation of children with oro-facial burns.

PO147

The Children's Oral Health Service

K. HALLET* & S. ATKIN² Royal Children's Hospital, Australia

The Children's Oral Health Service (COHS) provides specialist consultative, diagnostic, and treatment services for eligible children in the fields of orthodontics and paediatric dentistry, servicing all areas throughout Queensland and Northern New South Wales. The activities at Children's Oral Health Service may be divided into three prime foci of operation, viz. clinical, research, and education. Clinical services are provided in accordance with clearly defined eligibility guidelines. Comprehensive specialist oral health care is provided for patients with a wide range of complex clinical disorders, diseases, or conditions, including cleft lip and/or palate deformity, craniofacial anomalies, trauma cases, and medicallycompromised children. Staffing utilises a mix of full-time and parttime staff to suit operational requirements, and includes orthodontists, paediatric dentists, visiting dental specialists, dental assistants, dental technicians, administrative and ancillary staff. Research activities with a clinical focus are actively encouraged, and supported financially from within the COHS operational budget and from external sources. Clinical staff at COHS provide educational support at the undergraduate and postgraduate level in cooperation with the University of Queensland School of Dentistry, and at the general practitioner level through continuing education courses. 'In-service' training is also provided to nursing staff on oral health care for medically-compromised patients. The poster will present aspects or clinical treatment, innovation and development, and educational activities undertaken at Children's Oral Health Service.

PO148

Abstract withdrawn.

PO149

Oral health care for the paediatric oncology patient K. HALLETT* & S. MOOR

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Chemotherapy and Radiation to the head and neck predispose the individual to a variety of potential oral side effects. These oral side effects / complications resulting from cancer therapies can significantly affect the morbidity, the patients tolerance to treatment and their quality of life. A strict and comprehensive oral health care program is essential to decrease the severity and prevalence of oral complications, to prevent the occurrence of opportunistic infections and to minimise adverse effects on the developing dentition. This program was developed to clearly outline step by step the processes involved in ensuring an adequate oral health care program and to emphasise the importance of a multi disciplinary team approach in the treatment of the Oncology Patient. There were two components to this program. The first component was the development of a poster that clearly outlined an oral health care protocol. This would be for the benefit of not only the patients and their parents but also to the nursing staff who take care of them. The second component was the development of a brochure to give to the parents of new patients diagnosed with cancer to inform

them of the role of the dental team and clearly outline the step by step oral care protocol.

Orthodontics

PO150

Influence of bite raising on the memory and hippocampal function of the young and aged SAM mice

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Masticatory disorder widely known to cause the TMD Syndrome and general physical complaints, e.g. migraine and stiffness in shoulder. In addition the loss of the teeth in aged mice has shown to decline spatial memory, being due to various pathological changes in the hippocampus, suggesting the involvement of malocclusion in hippocampal pathology. The purpose of this study is to investigate the influence of masticatory dysfunction (bite raising) on the memory and hippocampal function. Senescenceaccelerated mice (SAMP8) were used. A vertical dimension in the occlusion of mice of 20 weeks (young) and 50 weeks (aged) after birth was raised by putting composite resin on their upper molars (raising group) bilaterally. Mice were kept under these condition for 2 weeks. After treatment, spatial performance in water maze and hippocampal Fos induction by the immunohistologically were examined. In the aged mice, the time to arrive at the platform in the control group was shorter than that in the raising group, and Fos induction in the hippocampal CA1 region in the control group was higher than that in the raising group. In the young mice there was no difference between the control and raising groups. This results suggest that bite raising in the aged may reduce input activity in the hippocampus, thereby leading to senile deficits in memory, but no affects in the young.

PO151

The role of orthodontics in interdisciplinary approach – in cases with congenitally missing mandibular second premolars

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In patients with congenitally missing teeth, neither methods nor goals of orthodontic treatment can be identical to those of routine orthodontic procedures, for treatment approaches vary greatly depending on not only the location and the number of missing teeth but also the skeletal pattern. This applies to, for example, difficult cases with certain characteristics such as skeletal Class III cases with congenitally missing maxillary teeth and skeletal Class II cases with congenitally missing mandibular teeth as well as cases requiring surgery. A study was conducted to examine the treatment approaches taken, including conventional interdisciplinary approaches (bridges, dentures, implants, grafts and otthodontics) and the treatment results achieved in patients with congenitally missing mandibular second premolars, which are often seen in clinical practice. Findings on variations in treatment approaches and results in this.

PO152

The best timing to modify skeletal growth in Class III malocclusion

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Aim: The aim of this study was to determine the best timing to modify skeletal growth and to underline the importance of early dento-facial functional orthopedics in the prevention and correction of severe sleletal class III deformities.

Methods: The methods were considered two experimental groups with 67 patients aged 4–15 years old, 32 males 35 females, treated with protraction headgear or face mask, palatal expansion, orthopedic and fixed orthodontic appliances.

Results: The typical protocol of orthopedic correction produced forward and downward movement of the maxilla with concomitant forward and downward movement of the maxillary dentition, downward and backward rotation of the mandible, and retroclination of the mandibular incisors. These changes were contraindicated in the class III pattern with excessive vertical development. Significant skeletal changes with great improvement in the soft tissue were observed above all in deep bite malocclusion. A significantly better correction of the class III pattern with orthopedic appliances was observed in 4 to 9 years old. Face mask produced important dental and skeletal changes in older children, when the collaboration and the growth were greater.

Conclusion: The early treatment during either the primary or transitional dentition could intercept malocclusions with a better and more stable results, reduce the time and the complexity of fixed appliance therapy. Unlike deep bite, open bite cases must have a corrective approach much earlier to resolve vertical discrepancies.

PO153

Orthodontic management of two impacted incisors associated with fibroepithelia

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The impacted tooth and its associated pathosis is usually a great clinical challenge for dentist in terms of diagnosis and treatment. This case report describes the treatment of a 12 years old Taiwanese girl with an impacted maxillary left central and lateral incisors resulting from obstruction of the overlaying fibrous tissue. Combing traction of the two impacted teeth with upper fixed appliance after surgical exposure with incision biopsy of the fibrous tissue, the impacted incisors were successfully moved into their proper positions. The diagnosis of the specimen was fibroepithelia hyperplasia. It is also critical to observe the long-term stability and the periodontal health of the incisors.

PO154

The use of the third finger x-ray to determine the optimum treatment time for Class II skeletal correction

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When treating Class II malocclusions, chronological age cannot be used to identify the ideal time to start treatment when dental-facial orthopedics is indicated. The skeletal contribution for Class II correction can be greatly accelerated during functional orthopedics by treating patients during the period of peak growth as identified by standing height growth curves. Often this is as early as 8–9 years of age in girls, or as late as 13-14 years of age in boys. Rate of growth curves of standing height are the most useful aid for estimation of the growth potential of the mandible. Skeletal maturity can be assessed by using the hand-wrist radiograph, or simply by radiographic observation of the third finger. This presentation concentrates on the relationship of the epiphysis to the diaphysis of the middle and distal phalanx of the third finger in growing children to determine the ideal time to begin functional orthopedic corrections of Class II malocclusions. Clinical cases are shown using this methodology to accelerate the treatment time of these cases.

PO155

Treatment of class III malocclusion and deepbite by Frankel functional regulator III: three cases report

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The FR-III is a functional regulator appliance developed by Rolf Frankel in 1966. This appliance is used during the deciduous, mixed, and early permanent dentition to correct skeletal Class III malocclusion, characterized by maxillary skeletal retrusion. In preadolescents with severe skeletal Class III malocclusion, the treatment modality would be maxillary protraction with facemasks and rapid palatal expansion appliances. however in mild or pseudo Class III children, the FR-III appliance can be the treatment of choice at the beginning. The Frankel appliance is used to effect changes in sagittal, transverse, and vertical jaw relationships and remove the abnormal muscle forces in the labial and buccal areas that restrict skeletal growth, thereby, providing an environment which maximizes skeletal growth In the cases presented, three preadolescents treated with FR-III. This appliance was used during early mixed dentition stage to correct skeletal Class III malocclusion, characterized by anterior deepbite. After treatment, there were correction of anterior crossbite and deepbite. The treatment effect were from clockwise rotation of the mandible, linguoversion of the mandibular incisors, labioversion of the maxillary incisors.

PO156

The clinical study on the interceptive treatment for the hypodontia

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Purpose: By the early treatment for the different types of hypodontia during mixed dentition in order to probe into the interceptive treatment method.

Methods: By the developing characteristics of the mixed dentition, we took different treating methods for the different types of hypodontia. These treatment methods included 1) maintain the space; 2) centralize the space and maintain the space; 3) treat the malocclusion, centralize the space and maintain the space; 4) treat the malocclusion and prepare for the last orthodontic treatment; 5) by the developing characteristics of the mixed dentition, finish the serial treatment with the orthodontic methods.

Results and Conclusion: The results of all the cases treated with the early treatment during mixed dentition were satisfaction. It is necessary to take the interceptive treatment for the hypodontia during the transitional dentition. (Acknowledgement: this study was partly supported by the Beijing Nature Science Foundation, No.7022022 and the Youth Foundation of 985 Plan of Medical Science Center, Peking University.)

PO157

Searching for the proper seating method of seamless bands with uniformly coated cement

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Orthodontic seamless bands are frequently used for various intraoral appliances in pediatric dentistry. In the process of seating bands with luting cement coated inside, we often fall in doubt whether the cement is uniformly coated beneath the bands even after cemented on teeth. Not uniformed coating might bring about various problems such as enamel decalcification and/or gingivitis, and this clinical trial was made to review several band-seating methods to exclude these risks. One kind of band luting cement (Rely X Luting Cement, 3M Espe Co.) and one size of seamless bands (Tomy Co.) were used on the resin replicas of an extracted maxillary and mandibular 1st molar with three different seating methods; 1. seating the band with the luting cement coated only inside the band, 2. seating the band with the luting cement coated inside the band and on axial surfaces of the teeth, 3. seating the band with the adhesive strip on the occlusal opening of the band (to make the excess cement escape only to gingival side) and the luting cement coated only inside the band. After cement was completely set, bands were vertically incised and peeled off from the teeth and the status of cement coating was evaluated. With this in vitro experiment, more uniformed coating of the luting cement was found between the bands and specimen teeth in latter two groups. These methods are thought more appropriate to almost completely rule out the risk of unevenly coated cement beneath the bands by conventional method.

PO158

Eruption cyst associated with rotation displacement of the underlying tooth

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Objectives: The purpose of this paper is to report the possibility of rotation displacement of central incisor with incomplete root formation resulted from an eruption cyst.

Case report: A bluish-translucent swelling on labial surface of the alveolar ridge was R/O as an eruption cyst in a 10 year-old girl. Tooth #11 was rotated distally and the long axis of it was in labiopalatal direction. Surgical expose the tooth and full mouth orthodontic treatment to correct the displaced tooth was done.

Results: Surgical expose and orthodontic procedures, the rotated central incisor was corrected and with good result.

Conclusions: (underline) An eruption cyst may be associated with displacement of the underlying tooth and inhibiting its eruption. Under this circumstance, an aggressive treatment such as surgical expose and forced eruption orthodontic treatment is recommended.

PO159

Fibre reinforced composites for direct bonded lingual retainers

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Glass fibre reinforced composite resins (FRC) have been developed for dental applications in recent years. FRC are new to the dental market, and they can be used as an alternative for direct bonded retainer. There has been increased interest in fibre-reinforced composites in dentistry. A recent introduction is a new FRC material composed of densely packed silanated E glass fibers in a light-curing gel matrix (everStick®). everStick® is a translucent colored, semi-manufactured products made of glass fibres, thermoplastic polymer and a light curing resin matrix for reinforcing the dental polymer. FRC retainers (everStick® ORTHO) were direct bonded on the lingual surface of all six anterior teeth just after removal of the orthodontic appliances to retain their corrected positions. A total of fifteen FRC retainers were applied in either 7 maxillary and 8 mandibular arch. The technique is quick and easy and produces excellent results. This study showed that the FRC direct bonded retainers functioned well during a short-term evaluation. The cost effectiveness of fibre reinforcement technology comes from three factors: 1-The dental materials and equipment needed for use with the fibres are not expensive to buy or use, 2-The working methods are time saving. By using FRC the patients' visits to the clinic and the time reserved for the treatment can be reduced to a minimum. 3-The treatment options offer effective solutions that require only a part of the preparations associated with conventional treatment.

PO160

Postoperative pain management for children receiving comprehensive dental treatment under general anaesthesia

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Outpatient general anaesthesia (GA) is administered for a full range of dental procedures, ranging from examination to minor oral surgery. The incidence of major morbidity is acceptably low, but postoperative pain, nausea and vomiting are still problematic in children, particularly following dental extractions. 3763 procedures were performed under GA at a tertiary paediatric hospital, of which 1271 were for dental procedures. Cases were grouped into less than five restorations or extractions (< 5 group) and five or more (5+ group). Post-operative pain was self assessed using the Wong Baker Faces Pain Scale. The presence or absence of post-operative nausea and vomiting was recorded by nursing staff. Pain was absent more often in the < 5 group compared with the 5+ group (P < 0.01). No significant difference was found in nausea and vomiting between the two groups. Pain was absent more often following dental procedures compared with other medical procedures. Nausea and vomiting was significantly less frequent (P < 0.001) and severe pain was significantly less common following dental procedures (P < 0.001) when supplemental local anaesthesia infiltration was given. We conclude that, while pain and nausea/vomiting are less frequent following dental procedures compared with other medical procedures, postoperative pain management should still be considered for dental procedures under GA, particularly supplemental local anaesthesia infiltration.

Prevention

PO161

Result of preventive oral health activities for children with special needs

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Objectives: Previous epidemiological surveys of oral health status of children with special needs (CSN) in Lagos showed they had high unmet needs and made less dental visits than other children. The purpose of these activities is to improve the oral health awareness and preventive practices of the children and their caregivers through oral health education (OHE), early preventive and restorative care and regular dental checkups.

Methods: Participants in this ongoing project are teachers, parents and their children attending three day institutions for CSN in Lagos. Consent for participation was obtained from parents through head teachers. An interactive discussion on oral health was organised and demonstrations carried out for participants using posters, dental models and toothbrushes. These are being followed up with weekly dental examinations for the children, distribution of toothbrushes, toothpaste, cups and reinforcement of taught skills by teachers. Toothbrush prophylaxis is carried out for some children in the school clinic while others were referred to the hospital for dental care. Mouth props and other aids are constructed for those whose parents expressed difficulty with tooth brushing.

Results: So far, 77% of children seen have been referred for prophylaxis, 14.5% for extractions, 12.5% for restorations and 6% for prostheses. Improved knowledge of oral health and tooth brushing skills by children with mild to moderate or no mental impairment have been seen. Parents reported improved cooperation with home oral hygiene procedures.

Conclusion: Interactive preventive OHE activities could improve oral health awareness, preventive practices and access to care of CSN. Supporting Agency: CAP Plc, Nigeria.

PO162

Salivary mutans streptococci in pregnant women after three-month consumption of xylitol chewing gum

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An important strategy in modern caries prevention includes measures to avoid transmission and colonization of mutans streptococci (MS). This approach is called primary-primary prevention, where all prophylactic measures are carried out in pregnant women in order to prevent the maternal transmission. The aim of this study was to evaluate the effect of the use of xylitol chewing gum on salivary mutans streptococci (MS) counts in the Japanese pregnant women.

Methods: After screening, 96 pregnant women with high counts of salivary MS were randomly assigned to the xylitol (n = 54) and the control (n = 42) groups. The participants in the xylitol group were instructed to chew one piece of the gum for 5 min at least four times a day, starting at the sixth month of the pregnancy. The participants in both groups received oral hygiene instruction and professional tooth cleaning. The levels of salivary MS in the pregnant women were evaluated using Dentocult SM (Orion Diagnostica, Finland) at the screening, prior to and after 3-month intervention.

Results: After 3 months, one out of seven (13.8%) in the control group, one out of two (47.7%) in the xylitol group showed low counts of salivary MS. Compared with the control group, there was a significant reduction of salivary MS in the xylitol group ($\hat{fO2} = 9.59$, P = 0.022).

Conclusions: This result showed that habitual use of xylitol chewing gum is effective as an additional caries preventive procedure among pregnant women. Supported by Grant-in-Aid KAKENHI15791208 from Japan Society for the Promotion of Science.

PO163

Oral health care knowledge and practices in a group of Turkish children, Istanbul

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The use of oral health care products such as toothbrushes, tooth paste, dental floss, gargle and menthol is insufficient in Turkey. For all age groups, the annual tooth brush numbers purchased equals one for every four people in the population. The purpose of the study was to determine tooth brushing habits of Turkish children aged six to 12 years, what they do for oral health care, their dental knowledge and how they perceive dentists.

Method: The study was carried out with 139 children, who applied to Marmara University School of Dentistry (MUSD) Department of Paediatric Dentistry in December 2002–April 2003.

Results: 48.9 % (n = 68) of children were girls and 51.1% (n = 71) were boys. The mean \pm standard deviation of age for girls was 8.82 \pm 2.06 and for boys was 8.87 \pm 2.04 (P > 0.05). 56% of children brushed their teeth regularly. Although the recommended age to begin tooth brushing is 1.5 years, in our study the age of starting tooth brushing was found to be about 4.5 years. 11.5 % (n = 16) of children said they changed their toothbrush once a year, 38.8 % (n = 54) twice a year and 25.9 % (n = 36) three times a year.

Conclusions: It is recommended that schools and especially kindergartens have to increase dental prevention in terms of providing

tooth brushing instruction and encouraging the use of oral health care products.

PO164

An epidemiological study of the periodontal condition in nursery school children in Sendai, Japan

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Epidemiologic data on the prevalence of periodontal disease in young children are somewhat contradictory in Japan. This is partly due to differences in definitions and criteria used by different investigators. The examination of periodontal disease in the maxillary incisal region only is commonly used as the method of measuring the prevalence of periodontal disease in preschool children in Japan. The aim of this study was to clarify the periodontal conditions of both anterior and posterior regions in nursery school children in Sendai, Japan.

Method: 335 children aged 4–5 years old were examined by two examiners previously calibrated. Periodontal conditions were registered using Modified P-M-A Index (Parfitt), GBI (Ainamo) and PDI (Ramfjord), indices. Presence of calculus and melanin pigmentation in gingiva were also assessed.

Results: The results show that with each index, the prevalence of gingivitis in children aged four are 54.7% (P-M-AI), 60.9% (GBI) and 81.8%(PDI) respectively. Those of children aged five are 52.2%, 65.5% and 86.5%. The percentage of children aged four who have calculus is 3.7% and those of children aged five is 1.8%. Regarding melanin pigmentation, 49.0% of children aged four and 60.2% of children aged five have slight or wide pigmentation of their gingiva.

Conclusions: The results suggest that preschool children seem to have gingivitis not only in the anterior region but also in the posterior region, because the prevalence of gingivitis with GBI and PDI is higher than those with P-M-AI. Therefore we should include the examination criteria in both the anterior and posterior regions to evaluate periodontal condition exactly.

PO165

Risk-based early prevention of dental caries

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Screening for high caries-risk during early childhood and individual prevention with work division is more cost-effective than conventional population based practice.

Aim: To test the hypothesis by comparing two organizational models of caries prevention.

Material and methods: Data for the study was collected from the files of the Public Health Care Centre of Kemi, Finland. The subjects were born in 1980, 1983, 1986, 1989, 1992 or 1995, and had a life-long oral health record. The study covered years 1980–2004. The conventional model was applied to cohorts in 1980, 1983 and 1986, and the risk-based model to cohorts in 1989, 1992 and 1995.

Results: The mean number of DMF-teeth in 12-year-olds decreased from 1.2 to 1.0 during the study years. At the same time, the cumulative number of visits to the dentist by the age of 12 years decreased from 15.0 in the 1980 cohort to 7.6 in the 1992 cohort (Student's t-test, P < 0.001), while the number of visits to dental hygienists increased from 6.2 to 7.7, and the visits took place

earlier. Altogether, six visits were saved. The results in the 1995 cohort were in line with these findings.

Discussion and conclusions: Reduction in the number of the more expensive visits improved cost-effectiveness because dental health remained on the same level in the risk-based as in the conventional practice. Early prevention enables economic benefits from work division.

PO166

Attitude and awareness of Turkish general dental practitioners towards Paediatric dentistry

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The purpose of this study was to describe the attitudes towards the oral health care of children by general dental practitioners and to find out their preferences for oral health caries prevention, behaviour management, usage of rubber dam, local anaesthesia, restoration of primary teeth and pulp therapy.

Method: The questionnaire prepared by Roshan *et al.* (2003) was translated to Turkish. Data were collected by face-to-face interview and via the Internet.

Results: 338 dentists completed the questionnaire and of this 185 were male (54.7%) and 153 were female (45.3%). Among dentists, 55.3% (n = 187) were aware of the usage of fluoride drops or tablets; 95.6% (n = 323) give oral hygiene instruction; 17.8% (n = 60) give diet analysis and 62.7%(n = 212) use fissure sealants for prevention purposes. The most common technique for behaviour management was found communicating behaviour management in 99.1% (n = 335) of dental practitioners. The other techniques were nitrous oxide (n = 3, 0.9%), oral sedation (n = 72, 21.3%), physical restraint (n = 17, 5%) and general anaesthesia (n = 54, 16%). In order to restore primary teeth, 50.9% (n = 172) of Turkish dentists prefer amalgam, 81.7%(n = 276) glass ionomer cements, 12.7%(n = 43) strip crowns, 57.1% (n = 193) composite resins, and 8.0% (n = 27) stainless steel crowns. 25.2% of dental practitioners (n = 85) prefer to use rubber dam. Pulpotomies were reported to be carried out by 55.6% (n = 188) of the respondents and pulpectomies by 71.3% (n = 241). Root treatment of abscessed primary teeth was claimed to be carried out by 48.8% (n = 165) of dental practitioners.

PO167

Long-term effect of maternal use of xylitol chewing gum

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In a clinical study by Söderling *et al.* 2000 and Isokangas *et al.* 2000, a significant reduction in MS colonization and occurrence of dental decay were observed in two to 5 year-old children after maternal use of xylitol. The mothers in control groups got fluoride or chlorhexidine varnish treatments. The maternal preventive treatment was carried out when the child was 3–24 months old. The children themselves were not treated.

Aim: The aim of this study was to analyse the long-term effect of the maternal use of xylitol chewing gum.

Materials and methods: At the age of 10 years, information from 148 out of the original 188 children were available for analyses. Data of dental health (dmf indices) and provided dental treatment (number of the diagnostic, preventive, and restorative visits) were collected from the files of the public health care centre in Ylivieska.

Results: Children in the xylitol group maintained their lowest dmf index from five to 10 years of age. Also the proportion of caries-free dentitions at the age of 10 years was highest in the xylitol group. The amount of all dental visits had been lowest in the xylitol group compared to the fluoride and chlorhexidine groups.

Conclusions: Prevention of mother-child transmission of MS by maternal use of xylitol has a long-term effect on the health of children's deciduous teeth.

PO168

Comparison of two different dental health resources for somali families

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Previous studies have identified that Somali children have high caries rates, poor dental attendance and may be subject to the traditional practice of primary canine enucleation. The aim of this study was to investigate effectiveness and user acceptance of two different oral health education resources specifically developed for this priority group

Methods: The learning resources comprised a 20-minute interactive multi-media dental health education programme produced on CD-ROM and a colourful leaflet providing the same factual information. Each resource was disseminated to 20 Somali households for a period of 1 week, prior to a structured evaluation. A visual analogue scale (VAS) was employed to quantify responses, where 0 = the most negative response and 10 = the most positive response.

Principal results: 83% of the Somali mothers reported that they had never previously received any dental health education for their families. 84% of subjects spoke little or no English. There was very positive feedback for both learning resources in terms of perceived relevance (mean VAS for CD-ROM = 7.5, leaflet = 6.7), enjoyment (mean VAS for CD-ROM = 7.7, leaflet = 7.0), and educational value (mean VAS for CD-ROM = 7.8, leaflet = 6.9). Feedback for the CD-ROM resource was more positive than that for the leaflets but was not significantly better. Both groups demonstrated a significant increase in dental health-related knowledge following use of the learning resources.

Conclusion: Both interactive electronic learning programmes and leaflets offer an acceptable and effective means of dental health education delivery to non-English speaking Somali mothers.

PO169

Paediatric dentistry and orthodontics rural and regional specialist program

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The provision of public specialist oral health services in NSW is limited with no access to these services outside metropolitan Area Health Services (AHS). A pilot program was developed to increase access of specialist paediatric and orthodontic services in rural and regional areas of NSW. The aims of this program were to determine the need for specialist paediatric oral health services and develop a state-wide model for delivery of specialist oral health services; improve patient access to specialist services and increase satisfaction; develop relationships between specialist paediatric services in teaching hospitals and other oral health services in these pilot AHSs. Three AHSs were selected (Hunter, Mid Western, and South Western Sydney).Local personnel and infrastructure were provided by the host AHS. Specialist paediatric services were offered on one day per month in addition to telehealth services. Referrals were received from public and private practitioners. Results revealed an overall increase in demand and access for these services from regional and rural AHSs. This novel program has been an inexpensive method of providing specialist paediatric oral health services to rural NSW and has now been extended to other AHSs including Midnorth Coast (Coffs Harbour) and Greater Southern (Albury). Future programs should be directed toward involving other specialist oral health care services to offer their services to these areas.

PO170

Relationship between caries prevalence and increased weight in 1298 primary school children

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In 1298 children (646 girls, 652 boys; 1st to 4th grade) attending primary school in an average German town, the caries prevalence was examined, taking into account the body mass index (BMI) and possible correlations. Prophylactic measures and the presence of caries was also recorded. The height as well as the body weight (BMI) were determined. The caries prevalence (DMF-T, dmf-t values) showed in 1st grade a value of 0.39 (DMF-T), and 1.92 (dmf-t) respectively, in 2nd grade values of 0.6 (2.17 dmf-t), in 3rd grade 0.65 (2.01 dmf-t), and in 4th grade values of 0.83 (1.44 dmf-t). This study showed an age-dependant decreasing percentage of caries-free dentitions: 6-year-old children (49.2%), 7-year-old (40.6%), 8-year-old (37.6%), 9-year-old (29.2%), 10-year-old (28.1%), 11-year-old (9.1%) and 12-year-old (25%). The evaluation of the BMI data showed especially in children attending 2nd, 3rd and 4th grade an increase in overweight children. When looking at the dmf-t/DMF-T values, with respect to weight, the children with low weight showed an average dmf-t value of 1.43 and a DMF-T value of 0.38. The index in children with normal weight was 1.82/0.53 (dmf-t/DMF-T). A further increase could be seen in overweight children (2.3/0.85). The obese pupils showed an average dmf-t of 2.3 and a DMF-T of 0.85. The present study showed a clear relationship between dental health and high weight, therefore it underlines the health politics-related challenge of preventing increased weight at an early age.

PO171

Effects of rewards in tooth brushing

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The dental health of 411 children at Pak Kret Instituition was very poor due to the handicapping conditions and the untrained and unmotivated caretakers.

Objective: To evaluate the effectiveness of rewards for the motivated caretakers and to study the duration of motivation.

Methods: The caretakers were taught dental health care including the practice of tooth brushing. The control group of 118 normal orphans was checked every 6 months for their PI (Podshadley). The rest of the children were randomly assigned by dormitories to groups of Experiment I (130 children) and II (163 children) for PI at 2 and 3 months intervals. Due to the divergent conditions of the children in various dormitories, the PI measurement was compared with their own original indices.

Results: At the end of 1 year, all groups had a significant decrease in PI when compared with the baseline I (P < 0.05). The average mean PI of the experimental groups decreased nearly three times compared with that of the control group (29.46%:11.2%). In comparison with the baseline III, the improvements were more significant in the EXP I and II groups whose caretakers received the rewards at shorter intervals (P < 0.05).

Conclusions: All interventions showed improvement in the PI. There were no differences of the PI improvement between the experiment groups with the time duration of 2 and 3 months. However, in comparison with the control group the PI improvement and motivation is quite pronounced.

Dental materials

PO172

Effect of 2% chlorhexidine containing cavity disinfectant on the bond strength and microleakage of dentin bonding agents

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Incomplete removal of bacteria contaminated dentin or enamel associated with caries is a potential problem in restorative dentistry. Secondary or residual caries, pulpal inflammation and hypersensitivity may result from bacteria left after the initial preparation, especially if an adequate seal against microleakage is not obtained. A possible solution to eliminate residual bacteria left in a cavity preparation would be to treat the cavity with cavity disinfectant wash. But a potential problem with using a cavity disinfectant with dentin bonding agents could be their interference with the ability of the resin to bond micromechanically to the tooth. The purpose of this study was to evaluate the effect of 2% chlorhexidine containing cavity disinfectant (Consepsis) on shear bond strength and microleakage of dentin bonding agents, Adper Scotchbond Multi-Purpose, Adper Single Bond and Adper Prompt L-Pop. 60 sound human third molar teeth were used for shear bond strength test and 60 for microleakage. For experimental group, cavity disinfectant was applied for the control group. The result from the this study can be summarized as follows; 1. Use of 2% chlorhexidine containing cavity disinfectant (Consepsis) does not significantly affect shear bond strength of dentin bonding agents. 2. Use of 2% chlorhexidine containing cavity disinfectant (Consepsis) does not significantly affect microleakage of dentin bonding agents.

PO173

Quality development through research collaboration. Results from 15 years' collaboration between universities and the public dental health care services in Denmark and Norway

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The project was initiated in 1991, in order to assess various clinical and biologic consequences of a ban of mercury used for dental amalgam, planned by the Danish Environmental Protection agency. It includes five longitudinal studies of restorations made under everyday conditions using amalgam and alternative materials in the Public Dental Health Care Services. The first four studies from 1991, 1993, 1994, and 1999, investigate the longevity and the cariostatic effects of restorations in primary teeth. The fifth study from 2002, is part of a Danish-Norwegian research project, investigating longevity and qualitative changes over time, of posterior restorations in

permanent teeth in children and adolescents. Study design: Randomization Large number of restorations and adjacent, unrestored surfaces All children and adolescents, needing one ore more restorations Large number of dentists from several municipalities Treatment and subsequent controls under everyday conditions Individualized recall intervals Simple assessments of restorations and adjacent surfaces Follow-ups until shedding of primary teeth, failure of restorations or operative treatment of adjacent surfaces.

Conclusions: 1991, 1993, and 1994: The results showed that result modified glass ionomer and compomer, but not conventional glass ionomer, are usable alternatives to amalgam for restorations in primary teeth. The variations in longevity and cariostatic effects of restorations in these materials were generally less than the interindividual variations among the dentists. New Danish mercury legislation, based on the results: From 15th July 2003, mercury may only be used for 'Dental products for filling permanent molar teeth, where the filling is worn'.

PO174

Experimental study of chitosan paste on root canal filling of primary teeth

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Objective: To investigate the effect and reaction of vital pulpotomy and root canal filling with chitosan on primary teeth in order to establish experimental base for studying and making biological vital pulp preservative and root canal filling material for primary teeth. **Method:** Sixty primary pre-molars from eight five-month old miniature pigs were selected. One side of primary pre-molars was randomly selected as test group, while the other side was as control group. Chitosan-barium sulfate paste and ZOE paste were used to fill root canals in two groups respectively. The miniature pigs were sacrificed in sequence at 1 day, 1, 2, 4 and 8 weeks to investigate the clinical and histological changes of periapical tissue

Result: The inflammation to chitosan paste at periapical tissue was weak, the reaction to overfilling materials at nearb tissue was also light with fast resorption. Inflammation to ZOE paste at periapical tissue was severe, the reaction to overfilling material at nearby tissue was also severe with some particles of ZOE being enwrapped by fibrous tissue and showed slow resorption.

Conclusion: Chitosan can be used as a kind of root canal filling materials on primary teeth. It has the ability of good biocompatibility and of improving tissue regeneration.

PO175

Long term evaluation of the remineralizing effects of glass ionomer restorations on adjacent interpoximal caries – a microtomographic study

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This study compared the remineralization effect of glass ionomer cements (highly- filled glass ionomer cement, compomer, resin- modified glass ionomer cement) on adjacent incipient interproximal caries with that of resin composite (control).The density-changes in remineralization area were evaluated by microtomography. Proximal restoration was simulated with placing tooth specimens and the various glass ionomer cements in a closed containers with artificial saliva at plus 37 °C and pH 7.0 for 30 days with constant circulation. At 30, 60, 90, 180 and 270 days, tomographic images were obtained with a micro CT scanner and the micro-density of carious lesions on the specimens were calculated by density-measuring software. The mean density changes were compared between groups in order to evaluate the effects of remineralization. All data were analyzed using ANOVA and the post hoc Tukey multiple comparison test at P < 0.05. The density of carious lesions increased for all treatments, and the increases for the study groups were significantly higher than that for the control group in every month. In all study groups, there were significant differences in density increases between months.

PO176

Short term effects of amelogenin gene splice products implanted in the exposed pulp of rat's maxillary molar N. JÉGAT*, M. BONNEFOIX, K. TOMPKINS, A. VEIS, M. GOLDBERG & D. SEPTIER

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For decades amelogenin have been considered as a group of molecules specifically secreted by ameloblasts at early stages of enamel formation. Once secreted, they are reinternalized after enzymatic degradation by secretory ameloblasts during the thickening of enamel layer and by post-secretory ameloblasts during enamel maturation. Recently, a small molecular weight molecule extracted from dentin has been shown to display a chondrogenic-inducing activity resulting from alternative splicing: A + 4 and A - 4. A + 4(8.1kDa) is expressed by all exons and A – 4(6.9kDa) is expressed by all exons except exon 4. We have shown recently that the implantation into the pulp of a maxillary first molar of agarose beads soaked with A + 4 and A - 4 leads to the formation of reparative dentinal bridges, or coronal and root mineralization 15 days after implantation. In order to shed some light into the physiopathological process leading to reparative dentin formation, we investigate here the phenotype of cells recruited by A + 4 and A - 4, 1, 3 and 8 days after their implantation. This experimental approach induces an initial inflammatory process before recruitment, proliferation and differentiation of cells that are odontoblast/osteoblast progenitors, actively involved in pulp repair.

PO177

Characterization of as-received and retrieved prefabricated paediatric stainless steel crowns T. LABRINAKI*, K. KAVVADIA, S. ZINELIS & L. PAPAGIANNOULIS

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Prefabricated stainless steel crowns are extensively used for the restoration of posterior teeth in clinical pediatric dentistry. Although few previous studies have focused on the in vitro aging, still there is no relevant information on the intra oral alterations of these materials.

Aim: The purpose of the present study was to assess the morphological and elemental alterations of retrieved stainless steel crowns after intraoral exposure.

Materials and methods: Seventeen in vivo aged stainless steel crowns (3M ESPE), were collected. The intraoral exposure time varied from 3 to 101 months. For every retrieved crown one new crown of the same type was used as a reference. The reference and in vivo aged crowns were examined by reflected light stereomicroscopy, high-vacuum scanning electron microscopy and energy dispersive x-ray microanalysis. The elemental composition between the as received and in vivo aged crowns was statistically analyzed by t-test (a = 0.05).

Results: In vivo aged crown surfaces demonstrated significantly morphological alterations with accumulation of amorphous intraoral integuments, biting imprints, wear and occlusal perforations, the latter being the most common finding. The results of microanalysis showed that there were no statistically significant differences in the elemental composition of the stainless steel crowns between the two conditions.

Conclusions: Under the conditions of the present study, retrieved prefabricated paediatric stainless steel crowns exhibit morphological changes mainly due to plastic deformation, without changes in elemental composition.

PO178

Micro-computerised tomographic visualisation and quantification of dentinal caries

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Bitewing and panoramic radiographs are widely used clinically to diagnosis dental caries but they only allow two-dimensional visualisation of a three dimensional specimen. An x-ray tomography system allows visualisation and measurement of three dimensional objects without sample preparation or chemical fixation. The 'SkyScan-1072' is a compact desktop system for xray microscopy and microtomography. It consists of the combination of an x-ray shadow microscopic system and a computer with tomographic reconstruction software which can reach a spatial resolution of 5 μ m corresponding to near 1x 10–7 cubic mm voxel size. Objects can be serially recreated by cross section reconstructions with possibilities to rotate and cut the object model. The aim of this study was to investigate the use of micro CT to qualitatively and quantitatively analyse the mineral content of carious dentine. Bite-wing and panoramic radiographs were used to assess pulpal involvement of deep carious lesions. Ten extracted carious permanent first molars were extracted and visualised using the SkySkan-1072. The mineral density analysis was calibrated and quantified based on changes in mineral absorption of x-rays. The diagnosis of pulpal caries was compared between radiographs and microCT.The results showed a marked difference between clinical diagnoses of pulpal caries and in vitro evidence of pulpal exposure. Of interest, mineral density analysis demonstrated a zone of dentine remineralisation adjacent to glass ionomer restorations.

Growth and development

PO179

A retrospective study of impacted dilacerated maxillary incisors

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An impacted incisor with dilaceration refers to a dental deformity characterized by an angulation between crown and root causing non-eruption of the incisor. The purposes of this investigation were to gather the general information about maxillary dilacerated incisors, and to evaluate the treatment outcomes retrospectively. Twenty-eight children (29 maxillary incisors) diagnosed with dilacerated incisors were selected from pediatric dental clinic of Kaohsiung Chang Gung Memorial Hospital, Taiwan. The average age was 9.1 years old. Clinical investigations included sex difference, quadrant affected, trauma history, midline shift, and treatment methods. Cephalometric analysis used crown root axis angle (CRAA) and crown axis inclination angle (CAIA) to measure the position and severity of the dilacerated incisor. Treatment alternatives including extraction followed with orthodontic alignment and resin?bonded bridge restorations, orthodontic traction, and extraction followed with orthodontic space rearrangement were evaluated retrospectively to find the possible relationships with CRAA and CAIA. The results showed that no sex difference and position preference were found in these cases. Only one case had an obvious traumatic history on the maxillary anterior region. Space analysis of upper arch showed a significant midline shift toward the non-eruption side. Retrospective treatment results concluded that cases with CRAA?Õ90¢Xand CAIA > 100¢Xtended to extract the dilacerated teeth and restore with resin bonded bridge. Cases with CRAA?Ö90¢Xand CAIA?Õ100¢X, the dilacerated incisors could be successfully positioned through orthodontic traction.

PO180

Surgical approach to the infracluded teeth by using space-regaining treatment

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Infraclusion occurs when a previously erupted tooth becomes embedded in the oral tissues. The etiology of this process is still obscure. However, recent histological and SEM studies of the root surfaces of the removed secondary retained teeth have shown that most of these teeth are ankylosed. Delayed exfoliation, malocclusion, increased susceptibility to dental caries and periodontal disease of both the neighboring teeth and retained molar, and dislocation of the successors are the consequences of infraclusion of primary molars. The therapeutic approach of the infracluded teeth varied from preservation to extraction. The teeth with simple infraclusion without any signs of interference with occlusal and jaw development may be examined periodically with follow-up check and radiographically. In case the infracluded tooth interferes with normal eruption of successor or shows any sign of delayed resorption, or when the tipping of adjacent teeth or supraeruption of opposing teeth is expected, the teeth inflicted should be extracted and appropriate measures be provided in order to maintain the normal development of occlusion and dentition. The adjacent teeth which have been collapsed over a infracluded deciduous teeth can disturb the arch length perimeter. In such cases, surgical approach might be necessary, although it would be difficult when teeth are severely leaned. However, an easier surgical 1 access have been obtained by space regaining procedures, in young patients whose arch length has been shortened due to the infracluded teeth.

PO181

Clinical application of a newly developed voice analyzing system

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Wearing removable appliances influences the pronunciation of a child patient. Also ankyloglossia in a child patient can be a reason of the speech defect. In order to improve the shape of intra-oral appliances so that they wouldn't disturb the pronunciation and to train patient with ankyloglossia for the better pronunciation, objective evaluation system for the sound analysis is indispensable. The newly developed voice analyzing system that quickly computes the energy spectral density (ESD) can detect the higher frequency

band more precisely than the ordinary system computing the power spectral density (PSD) which has been commonly used. The aim of this study was to evaluate the new system from the clinical viewpoint. The five vowels of 'i', 'e', 'a', 'o', 'u' were pronounced for two seconds by both adult and child volunteers. Analysis of the recorded voices was conducted in two ways using the new system and the ordinary system, and results were compared each other. Prior to the study, the purpose and method of this experiment were explained to all subjects and their guardians, and their permissions were obtained. By using the new system, several characteristic band patterns were detected in the higher frequency area, which couldn't be shown in the chart by the ordinary system. Each character of vowels was found more clearly by the new system than by the old one. The inter-individual differences of voice could be distinguished by the new system. The possible clinical application of the new analyzing system will be discussed in this paper.

PO182

Gja1 associated with occulodentdigital dysplasia regulates ameloblast differentiation

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Tooth development was regulated by their specific gene expression. To identify the molecules that express stage specifically in tooth germ, we performed the digital differential display (DDD) method (NCBI) using pooled molar UniGene library. The molecules that expressed in tooth germ stronger than other 9 organs, including brain, liver, thymus, and kidney, were checked their expressions in mouse incisor using the immunofluorescence. We found that Gjal mRNA in tooth germ was expressed stronger than that of other 9 organs by DDD method. The tissue expression of Gja1 in mouse incisor was stage specific in amelogenesis, and in odontoblasts. It expressed strongly in secretary stage, and no expression in maturation stage of ameloblasts. Gjal also expressed in odontoblasts. In ameloblastic cell line, Gja1 localized in cell-to-cell interface. This protein formed gap junction in cell surface. Over expression of Gja1 gene in ameloblastic cell line showed the enhanced expression of tooth markers. Further, down regulation of Gja1 gene expression showed inhibition of ameloblast differentiation. These results suggest that Gja1 is necessary for ameloblast differentiation. This gene expression may be associated with occulodentdigital dysplasia phenotype in tooth, especially anodontia, microdontia and amelogenesis imperfecta.

PO183

The accuracy of different age estimation methods based on radiographic assessment of developing teeth H. LIVERSIDGE*, M. MABER & M. HECTOR

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Developing teeth are used to assess maturity and estimate age in a number of disciplines however, the accuracy of different methods has not been systematically investigated. The aim of this study was to test the accuracy of several methods. Mandibular tooth formation was assessed from radiographs of 946 healthy children attending a dental teaching hospital (491 boys, 455 girls, aged 3 to 16.99 years). Panoramic radiographs were examined and seven mandibular teeth staged according to Demirjian's dental maturity scale (Demirjian *et al.* 1976, CD 1993–94), Nolla (1960) and Haavikko (1970). Dental age was calculated for each method, including an adaption of Demirjian's method with updated scoring (Willems *et al.* 2001). The mean difference between dental and real age was calculated for each method and each tooth type. For individual tooth assessment, only

stages up to and including root complete (parallel apical walls) were included. Results show that the most accurate method was Willems (-0.13 y + 0.85), Demirjian overestiated age (0.23 y + 0.85), while Nolla and Haavikko's methods underestimated age (-1.03 y + 0.92 and -1.70 y + 2.05 respectively). The tooth with the highest accuracy (Haavikko) was the first premolar (within +0.5 y between ages 3 and 10), followed by the first molar and second premolar. All methods were more accurate for younger children. These results suggest that the adapted scoring of Willems is the most accurate for children younger than 12 years of age. An easier but slightly less accurate method was to use a single tooth (first premolar) with data adapted from Haavikko.

PO184

Occlusal status and the movement of the body's center of gravity in children

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Aim: The purpose of this study was to measure the occlusal status and the movement of the gravity center of the body in children and to assess the relationship between them.

Subjects and methods: Two hundred and eighty eight children (6 to 15 years old) in a rural seaside area in Japan, participated in this study. Their occlusal contact area, average bite pressure and bite force were measured by biting a Dental Prescale film and analyzed using an image scanner (Occluzer; FPD-705 Fuji Film Co. Japan). The body's gravity center movement was measured by an automatic analysis system of posture (VTS-311 EGG 2000v; Patella Co. Japan).

Results: 1. The occlusal contact area and the bite force of junior high school children were significantly larger than elementary school children (P < 0.001). 2. The body's gravity center movement of junior high school children were significantly smaller than elementary school children (P < 0.001). 3. There was a high correlation between the body's gravity center movement and average bite pressure. Conclusion: Oral health and development and the general well being of children early in life is an important pre-requisite for a healthy life.

PO185

The correlations between pre-term birth, neonatal factors, nutrition and Primary teeth eruption

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Objectives: This study compared the primary teeth eruption status between pre-term (gestational duration < 37 weeks) and full-term birth children and evaluated the effect of neonatal factors and nutrition status.

Materials and Methods: We recruited 72 pre-term, and 141 fullterm birth children in Kaohsiung Medical University Hospital. Oral and medical examinations were performed by pedodontists and pediatricians. Medical charts and questionnaires were used to collect other neonatal and nutritional factors.

Results: As a result, when using chronological age in the calculation, pre-term birth children had slightly delayed primary teeth eruption than full-term birth children (P = 0.0126), especially for children in the 6~11 months age group ($3.13 \pm \acute{0}0.44$ & $4.82 \pm \acute{0}0.42$, P = 0.0079). When using corrected age in the calculation, pre-term birth children didn't have significant delayed primary teeth eruption compared with full-term birth children (P = 0.9392). Besides, 'catch up growth' might happen to the preterm children, in physical growth and in primary teeth eruption. No specific neonatal or nutritional factor was significantly correlated with primary teeth eruption.

Traumatology

PO186

Management of intrusion with immediate surgical repositioning – 2 case reports P. ARANGANNAL

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Intrusive luxation involves the displacement of tooth apically into the alveolar socket. It is the most serious injury to the periodontal ligament in dental trauma. There are various treatment options that are currently practiced and indicated depending on the clinical presentation. Hereby presenting 2 cases of intrusion. Casel reported to the clinic 2 hours after trauma and case 2 presented 14 hours after trauma. Case 1 showed intrusion of both 11 & 21(FDI), Case 2 presented with intrusion of 11 (FDI). The treatment procedure that was carried out in both the cases was immediate surgical repositioning followed by composite splint using orthodontic wire. Immediate surgical repositioning was chosen due to the severity of the intrusion. Root canal was opened immediately in both the cases within 2 days, pulp was removed and the canal filled with calcium hydroxide and was left in place for 3 weeks to overcome resorption and other complications. Regular root canal procedure was completed with the splint in place and splint was removed only after 4 weeks. Subsequently the fractured coronal fragment was repaired with composite. Both cases are being followed up.

PO187

Effect of mouthguard on tooth and periodontal tissue M. SHOMURA^{1,2,3,*}, T. TAKEDA¹, K. NAKAJIMA¹,

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Pediatric dentists often encounter tooth injury in daily clinical practice. Causes vary but it is often sports. This is a problem for pediatric dentists who aim to normally develop stomatognathic organs in children. Of course, injured teeth due to sports should be appropriately treated, but measures to prevent injury are the most important. At present, the mouthguard is considered to be effective for preventing and reducing the severity of such injury, and its use during sports (particularly contact sports) is recommended in both adults and children. However, many studies on the preventive effects of mouthguard on injury have been performed using human or bovine extracted teeth, but there have been few studies performed investigating the preservation of the surrounding tissues such as the gingiva and periodontal ligament. Therefore, to evaluate the effects of mouthguard under conditions similar to the oral, we applied strain gauges to bovine teeth in the intact state with preservation of the surrounding tissue, and also to the alveolar bone corresponding to the root apex, and applied impacts using an

impact loading system with an accelemeter in the absence or presence of mouthguard (1.0, 2.0, 3.0, 4.0 mm in thickness). Both strain and acceleration tended to decrease in the presence of mouthguard compared with the absence of mouthguard and with an increase in mouthguard thickness. In particular, the decrease in strain in the alveolar bone was marked. These results suggest the usefulness of mouthguard for preventing and reducing the severity of sport related injury.

PO188

The influence of post-core system difference on impact stress

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Purpose: The purpose of this study was to clarify the influence of the difference of the post core system on a shock resistant capacity of the non-vital incisor of high injury risk.

Methods: The bovine lower jaw front tooth was used and standardized with CELAY system (MIKRONA, Switzerland) into the human upper incisors root form as a test specimen. Two types of post core systems are engaged, one was constructed with casted metal post core (Metal) and the other was composite resin and the fiber post (Fiber-Resin). Three specimens were made for each condition. Four gauges in total were affixed on the surface of core and the root both on the labial and the lingual side. These specimens were fixed into the metal mold frame with super-hard plaster. Afterwards, the shock was added with the device of the pendulum type, and the maximum distortion was measured and analyzed.

Result and consideration: In the core (crown), fiber-resin showed significantly (*t*-test; P < 0.05) larger distortions than metal. On the contrary, in the root, fiber-resin showed significantly smaller distortions than metal. Because of the elastic modulus of fiber-resin is lower than metal, the distortions of core became large, relatively the distortion of root became small. This result means that tooth with fiber-resin beaks easily in the core or crown and tooth with metal in the root. In other words, fiber-resin can preserve remaining root. Therefore, from the viewpoint of preservation of the remaining teeth from impacts, fiber-resin is more suitable for non-vital teeth.

PO189

New Orleans – Athens: a sharepoint collaboration for a pediatric dentistry Postgraduate seminar

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This poster will detail the use of MS sharepoint to facilitate the collaboration between LSUSD pediatric dentistry postgraduate students & a pediatric dentist in private practice in Athens, Greece and another in Metairie, LA for a seminar series on pediatric dental traumatic injuries. MS sharepoint is an Internet browser environment aiming at providing the tools for a multilevel exchange of information and a point providing easy access links to relevant scientific web sites. The implementation of MS sharepoint by the LSUSD Department of Pediatric Dentistry postgraduate web site is described and an example is provided as a "case report" in how these resources were employed in a PG dental traumatology seminar.

PO190

Tooth replantation after traumatic avulsion: an eight vear-follow up

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Tooth avulsion implies total displacement of the tooth out of its socket and is relatively infrequent, ranging from 0.5% to 16% of traumatic injuries in the permanent dentition. Avulsion usually causes inflammatory root resorption and ankylosis, and ankylosis cause severe functional and esthetic problems, especially in childhood. A 7-year-old female visited the Department of Pediatric Dentistry, Yonsei University with the chief complaint of avulsive trauma to the upper right incisor, which was left dry for 40 minutes. Tooth was irrigated with saline and replanted immediately and splinted. Anti bacterial agent and anti-inflammatory agent were prescribed. After 4 months of replantation slight external root resorption and apical radiolucency was seen at radiographic examination, therefore pulp extirpation and calcium hydroxide (Vitapex¢â) canal filling were carried out. After 16 months, root canal was filled with gutta-percha, and bleaching treatment was done. Treatment results were satisfactory both esthetically and functionally for 8 years and 5 months.

PO191

Application of carbon fiber post in fractured and endodontically treated teeth

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Background: The frequency of crown fracture involving pulp is high among traumatic dental injuries in children. After root canal therapy, the fractured tooth should be restored to maintain space as well as to improve esthetics and pronunciation. Carbon fiber post can be used for temporary restoration, as it increases retention strength and is easy to be removed.

Purpose: The present study evaluated the application of carbon fiber posts in children with crown fracture of maxillary central incisors.

Methods: Twenty-five teeth, with more than 50% of their coronal structure lost, were involved in the study. All the teeth had completed root development and had no root fracture. After root canal therapy, the teeth were prepared. Carbon fiber posts were inserted and cemented, followed by build-up of resin cores and direct restoration by composite. The patients were followed up at 6-month intervals after treatment. The teeth were subjected to clinical and radiographic examinations at each visit.

Results: The 25 teeth had been under observation for 12–24 months post-treatment. There was no presence of periodontal disease or endodontic failure, no signs of root fracture or internal resorption. All the restorations remained intact except one, which debonded from the resin core at the time of 8 months after treatment.

Conclusions: Carbon fiber post is a good choice for restoration of fractured and endodontically treated teeth in children. Further studies with more clinical samples and long-term observations were needed to assure its effect.

PO192

Application of autotransplantation of teeth for reconstruction of missing low first molar: a case report F. M. KUO^{1,*} & K. Y. HO²

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In an appropriate case selection, autotransplantation of teeth might be a valuable alternative treatment of missing teeth. The predictability and prognosis of autotransplantation are thought to be strongly associated with case selection, the technique of surgical procedures, and understanding of the biologic principles. It is announced that the major parameters which influence the success of a transplantation are: the stage of root formation, the atraumatic removal and insertion of the germ, the final position of the transplant and the post-operative fixation. The purpose of this case report is to utilize the technique of autotransplantation of teeth as described by Professor J. O. Andreasen 1993 to reconstruct mandibular first molar of a twenty-nine years old male. Satisfactory results were achieved in the observation of periodontal situation by means of both clinical examination and radiographic films after 12-month follow up. The advantage, disadvantage and clinical application of this technique are also presented and reviewed with the case report.

PO193

Conservative treatment of traumatized young permanent teeth using mineral trioxide aggregate J. LEE^{1,*}, Y. LEE¹, J. WHANG¹ & J. LEE²

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Introduction: IInd permanent dentition, crown fractures comprise 26%–76% of all dental injury. When the root formation is not completed, the injured teeth need proper treatment with consideration for root development and maxillary or mandibular growth. Though calcium hydroxide has been used for pulp treatment agent of permanent teeth generally, it has presented problems such as micro-leakage and internal root resorption. Mineral trioxide aggregate (MTA) has been introduced as a superior material for pulpal therapy and has been widely studied and reported as pulpotomy or pulp capping agent in the treatment of permanent teeth. In these two cases, crown fractured incisors were treated with pulpotomy and pulp capping using MTA followed by fragment reattachment. During the follow-up periods the teeth remained vital, suggesting clinical and radiographical success.

Purpose: To investigate the possible treatment received by the school age children who suffered from accidental crown fracture and to analyze the main factors affecting the therapy.

Materials and Method: Questionnaire and clinical examination were used to collect the history of the accident, treatment before the study and clinical status of the injuries of the children coming to Paediatric Clinic of West China College of Stomatology, Sichuan University. All the data were analyzed with the SPSS software.

Result: Sixty-four children age from 7 to 10 were chosen for this study with the male to female ratio 3:1.81% of the children did not receive immediate or proper treatment because of the following reasons: parents did not find the problem in time; parents and the children were reluctant to take day off from school; and the dentists with whom the children and their caregivers consulted provided inappropriate therapy. The main complaints for the children to come to the hospital were pain, swelling and the loosening of the injured teeth.

Conclusion: Crown fracture of school age children could impose serious problems upon the patients and their caregivers who lack of necessary knowledge of dental health. It is essential to introduce certain programs aiming at both common people and dental clinicians in order to avoid or reduce such untoward outcomes.

PO194

Possible treatments after crown fracture of school age children in Chengdu and the relative affecting factors M. Liu*, Q. Xu & E. Chen

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Purpose: To investigate the possible treatment received by the school age children who suffered from accidental crown fracture and to analyze the main factors affecting the therapy.

Material and Methods: Questionnaire and clinical examination were used to collect the history of the accident, treatment before the study and clinical status of the injuries of the children coming to Paediatric Clinic of West China College of Stomatology, Sichuan University. All the data were analyzed with the SPSS software.

Result: Sixty-four children age from 7 to 10 were chosen for this study with the male to female ratio 3:1. 81% of the children did not receive immediate or proper treatment because of the following reasons: parents did not find the problem in time; parents and the children were reluctant to take day off from school; and the dentists with whom the children and their caregivers consulted provided inappropriate therapy. The main complaints for the children to come to the hospital were pain, swelling and the loosening of the injured teeth.

Conclusion: Crown fracture of school age children could impose serious problems upon the patients and their caregivers who are lack of necessary knowledge of dental health. It is essential to introduce certain programs aiming at both common people and dental clinicians in order to avoid or reduce such untoward outcomes.

PO195

Inflammatory and replacement resorption in traumatized maxillary permanent incisors: a case report

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Of the trauma of the permanent incisors, damage to the periodontal tissue includes concussion, subluxation, extrusion, lateral luxation, intrusion, and avulsion and these happen commonly in the maxillary incisors. There may be complications such as pulpal necrosis and root resorption as a result of trauma of the incisors. Root resorption is divided into internal resorption and external resorption. External resorption is divided into surface resorption, inflammatory resorption, and replacement resorption. Surface resorption is the trauma partially limited to the cementum, healed within 2 weeks after the initiation of root resorption, and regenerates to the new cementum. Inflammatory resorption is the rapid resorption, which take place in the root and alveolar bone caused by pulpal and periodontal degeneration. The progress of the resorption is so rapid, that tooth mobility could be increased and if not treated properly, the tooth may be lost. Replacement resorption is caused by severe trauma to the periodontal tissue, and ankylosis can be observed between exposed dentin surface and alveolar bone. This case report highlights replacement root resorption and inflammatory root resorption in the traumatized maxillary permanent incisors.

PO196

Management of non-vital incisors: retrospective study of calcium hydroxide Therapy and prospective study of mineral trioxide aggregate

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Introduction: The use of calcium hydroxide for apical barrier formation in traumatised incisors can be very lengthy and thus

associated with high costs and root fractures. Recently mineral trioxide aggregate has been introduced as a root end filling material.

Aim: 1) Retrospectively determine the mean length of time of calcium hydroxide therapy for apical barrier formation in a paediatric dentistry specialist unit and look at the prevalence of root fractures.2) Prospectively determine the mean length of time of MTA therapy for apical barrier placement.

Methods: A retrospective study of 500 patients treated with calcium hydroxide therapy from 1974 till 2004 and a prospective study of 30 Patients treated with MTA Results: Retrospectively the commonest type of injury was crown fractures 57.2% followed by subluxation injuries 10.2% with a 60% being males. Initially 62% of patients presented with clinical signs and 80% with periapical pathology. The mean time for calcium hydroxide dressing was 27.4 months. Out of the whole sample 25 had fractures not related with trauma with a 40.2 mean time for calcium hydroxide being present in the root canal. Prospectively MTA study to date had a mean time of 3 months. This offers a reduction in cost of treatment and a decrease in the exposure time to calcium hydroxide thus avoiding fractures.

Conclusion: Clinical results of MTA to this point are highly promising, which may provide an improvement over the standard calcium hydroxide therapy.

PO197

The rationale for the treatment of traumatic primary teeth

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Orofacial injuries to a young child are not only traumatic in a physical sense, but also in an emotional and psychological sense. The treatment that offers the best prognosis should be performed, because risky procedures can increase the chances of failure. A review of the literature, which included numerous epidemiological studies, several review articles on the prevalence and incidence of trauma to the primary teeth and many case reports, was conducted to determine the rationale for treatment of traumatized primary teeth. Sadly, the recommendations for most types of injuries are not based on reliable research data rather they have been taken from individual case reports. For concussion and subluxation injuries that do not render the tooth excessively mobile, no active treatment should be provided. It is agreed that regular monitoring of an intruded tooth should take place because spontaneous eruption can be expected within 4 weeks. For extrusion, repositioning of the tooth can be made when it is slightly displaced from the socket. Most authors opine not to reimplant avulsed primary teeth because of the possibility of chronic infection and dystrophic changes to the developing tooth. For teeth with root fractures, which are not excessively mobile, conservative treatment is appropriate while extraction should be performed if the tooth has excessive mobility. As the majority of the recommended treatment is based on case reports it is open to criticism; nevertheless, long-term follow-up is essential because of the sequelae to the injured tooth and the developing permanent tooth.

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