VP-30 **Reducing Pain on Needle Insertion: Proposal for an Alternative Technique.** **PHAN A. HUNG* (Faculty of Odonto-Stomatology, University of Medicine and Pharmacy at HCM City, Vietnam).**

When delivering local anesthesia to children, reducing pain on needle insertion is of major concern to both patients and dentists. The purpose of this investigation was to evaluate the efficacy of an alternative procedure as compared to the conventional one in reducing pain. A total of 134 children, aged between 3 and 12, undergoing dental treament in the pediatric dental clinic were assigned into two groups. In both groups, local anesthesia was given, using a 30-gauge short dental needle and 2% lidocaine with 1:100,000 adrenaline. Eighty subjects received the alternative procedure and 54 the conventional one. The proposed procedure consisted in quickly and gently pulling the buccal mucosa, which is next to the muco-buccal fold, into the tip of the needle to a depth of 1 to 1.5 mm, at the injection site. Topical anesthetic gel was not used before injection in this procedure while it was applied in the conventional one. Pain-related behavior on needle insertion was rated on video tapes by two independent evaluators, using the Sounds, Eyes and Motor scale. Inter-rater reliability was established at 90%. The results, as analysed by Chi-square test, showed that the alternative procedure was able to reduce significantly pain-related behavior as compared to the conventional one, with a percentage of 95% and 59.3% pain-free insertion, respectively ($p<.000$). It is, therefore, concluded that the alternative technique for needle insertion should be considered for use in order to reduce pain and fear-related to local anesthesia in children.

VP-31 **Salivary Soluble CD14 and Elastase as Co-biomarkers for Periodontal Assessment.** **L.J. JIN*, W.K. LEUNG and E.F. CORBET (Faculty of Dentistry, The University of Hong Kong, Hong Kong)**

Mixed saliva contains egress from gingival crevices or periodontal pockets, and thus it may be used as a medium for overall assessment of periodontal conditions. Our early studies showed that neutrophilic elastase in gingival crevicular fluid may be a marker of periodontal disease and that salivary soluble CD14 (sCD14) may be an indicator of oral and periodontal health. This study was to determine sCD14 and neutrophilic elastase in saliva and evaluate whether these molecules could be used for an overall periodontal assessment. The participants were 61 non-smoking adults with untreated chronic periodontitis and 11 periodontally healthy subjects as controls. Full-mouth probing depth (PD) and bleeding on probing (BOP) were recorded by the Florida Probe®. Stimulated whole saliva was collected by a standard spitting method immediately prior to clinical examination. sCD14 levels (ng/mL) were determined by ELISA. Neutrophilic elastase was analyzed with a neutrophil-specific substrate (pGluProVal-pNA) and the maximal rate of elastase activity (MR-EA, mAbs/min) was calculated. Salivary sCD14 levels in healthy controls were significantly higher than in the patients ($p<0.02$), while MR-EA in patients was significantly higher than in healthy controls ($p<0.001$). Overall, a moderate negative correlation existed between these two molecules ($r= -0.371$, $p=0.0013$). sCD14 was negatively correlated with sites% showing PD 5.0mm ($r= -0.311$, $p=0.0208$) and BOP ($r= -0.368$, $p=0.0152$). In contrast, MR-EA was positively correlated with these two parameters ($r=0.610$, $p=0.0001$; $r=0.356$, $p=0.0191$). Increased MR-EA or reduced sCD14 levels in saliva elevate the relative risk of a subject presenting with periodontitis to 4.26 or 2.21, respectively. This study suggests that salivary neutrophil elastase and sCD14 levels may serve as co-biomarkers for an overall periodontal assessment. Supported by the Hong Kong Research Grants Council (RGC, HKU 7310/00M).

VP-32 **Molecular Detection of *Actinomyces* Species in Root Canals Medicated with Calcium Hydroxide and Septomixine.** **Gaoyan Tang*, Lakshman P. Samaranayake, Hak-Kong Yip (*Oral Bio-sciences, Faculty of Dentistry, The University of Hong Kong, Hong Kong)**

Calcium hydroxide and Septomixine are common endodontic medicaments. However, their *in vivo* microbicidal efficacy has been questioned, as the constituents of the complex dentinal system may hamper or neutralize their action. Therefore, we evaluated the *in vivo* efficacy of calcium hydroxide ($Ca(OH)_2$) and Septomixine in eliminating intra-canal bacteria, particularly *Actinomyces* spp. during endodontic treatment. A total of 31 single-rooted teeth with primary root canal infections were studied immediately after opening the canals and subsequently one week after medication with either $Ca(OH)_2$ (25 specimens) or Septomixine (6 specimens). Whole bacterial genomic DNA was isolated directly from samples and, PCR performed to detect total bacteria. The variable regions of 16S rDNA of bacteria were amplified and labeled with digoxigenin for further hybridization and detection of *Actinomyces* spp. A total of seven oligonucleotide probes specific for *A. bovis*, *A. gerencseriae*, *A. israelii*, *A. meyeri*, catalase-negative *A. naeslundii* (genospecies 1 and 2), catalase-positive *A. naeslundii* genospecies 2 and *A. odontolyticus* were used to detect *Actinomyces* spp. in 22 of 31 medicated root canals ($Ca(OH)_2$: 17; Septomixine: 5). PCR results showed that in general there was no significant difference between $Ca(OH)_2$ and Septomixine in inhibiting endodontic bacterial growth. The bacterial load in 23 of 31 examined canals was totally or partly eradicated either by $Ca(OH)_2$ (18) or Septomixine (5). Thus, only six canals ($Ca(OH)_2$: 5, Septomixine: 1) were aseptic one week after medication and the other eight canals ($Ca(OH)_2$: 7, Septomixine: 1) presented with an increased bacterial load after medication. Hybridization results showed higher detection frequency and quantity of both *A. odontolyticus* and *A. gerencseriae* after medication. No significant correlation was found between a quantitative increase in the bacterial load after medication and clinical signs. The traditional, one-week application of either $Ca(OH)_2$ or Septomixine as an inter-appointment medicament in endodontic therapy may not effectively disinfect all root canals. However, further investigations with large clinical samples are needed to confirm or refute our observations. (Supported by the RGC (10202943) and CRCG (10203286 and 10203775) grants in Hong Kong. We appreciate Drs. Fred C. S. Chu and Peter C. S. Tsang for their supply of clinical samples.)

VP-33 **Glass-ionomer-based/ containing materials: Effects of pH on surface texture.** **MA MOHAMED TAHIR* and AUJ YAP. (Faculty of Dentistry, National University of Singapore)**

The objective of this study was to determine the effect of pH on the surface texture of commonly used glass-ionomer-based/ containing restorative materials. The materials evaluated included a compomer (Dyract AP), a giomer (Beautifil) and two highly viscous glass ionomer cements (Fuji IX and Ketac Molar). A composite resin (Esthet-X) was used for comparison. Forty-two specimens (3 mm wide x 3 mm long x 2 mm deep) were made for each material and were stored in deionised distilled water for 2 weeks at 37°C to ensure complete post-cure of the materials. The specimens were divided into 6 groups and conditioned in the following solutions at 37°C for 1 week: Citric acid (pH 2, 3, 4, 5 and 6) and distilled water (pH 7). The latter (distilled water) was used as the control group. After conditioning, the surface roughness (Ra, μm) of each specimen was measured using a surface profilometer (Surftest, Mitutoyo Corp., Tokyo, Japan). Data was analyzed using one-way ANOVA and Scheffe's test at a significance level of 0.05. The effects of pH on the surface texture of glass-ionomer-based/ containing restoratives were material dependent. Ra values ranged from 0.02 (± 0.01) μm to 0.15 (± 0.03) μm and 0.03 (± 0.01) μm to 4.40 (± 0.21) μm for pH 7 and 2 respectively. With the exception of the composite, the surface roughness of all materials evaluated was significantly affected by acids of low pH. Acidic pH affects the surface texture of glass-ionomer-based/ containing restorative materials. The surface texture of highly viscous glass ionomer cements deteriorated significantly after exposure to acids which makes them more susceptible to clinical failure.

VP-34 **Restoration of root-filled teeth by General Dental Practitioners in Klang Valley, Malaysia.** **[1]L.L. SEOW*, [1]C.G. TOH, [2]N.H.F. WILSON ([1]Dept of Conservative Dentistry, University of Malaya, [2]GKT Dental Institute, King's College London, UK)**

Selecting an optimum restorative modality to restore root-filled teeth is often complicated by the many clinical techniques currently available. The aim of this study was to survey the use of these systems and techniques by General Dental Practitioners (GDPs) in the Klang Valley, Malaysia. A questionnaire comprising of 19 multiple-choice type questions was mailed in November 2002 to 605 GDPs in the Klang Valley area. The questionnaire sought details of the use of posts, the types of posts and core materials used, the GDP's understanding of the effects of posts and also preference for final restoration. 284(47%) of the practitioners responded to the survey. The restoration of root-filled teeth was normally undertaken within 1-2 weeks of root canal therapy by 46% of the practitioners. 52% of the GDPs used posts routinely in the restoration of root-filled anterior teeth - the corresponding figure for posterior teeth being 30%. While cast, non-precious metal posts and prefabricated posts were used in almost equal frequency to restore anterior teeth, the use of prefabricated posts predominated in the restoration of posterior teeth. Glass ionomer cement was the preferred cement to lute posts. 45% of the practitioners were of the opinion that posts did not strengthen endodontically treated teeth; an equal number of practitioners thought otherwise. Regarding core materials, composite resin was preferred in anterior teeth (64%) and amalgam in posterior teeth (50%). The majority of the practitioners restored root-filled teeth by means of porcelain-fused-to-metal crowns while one third of the practitioners used direct composite and amalgam in the anterior and posterior region respectively. It is concluded that, in general, the practitioners surveyed had a fair understanding of the principles involved in the restoration of root-filled teeth except, possibly in relation to the need to establish a durable coronal seal as soon as possible after the placement of a root filling and the effects of post on the restored tooth unit. This study was supported by University Malaya: F0378/2002B.

VP-35 **A Study of Dental Arch Changes in Children from 3 to 5.5 years of age..** **NGO T.Q. LAN*, HOANG T. HUNG (Faculty of Odonto-Stomatology, University of Medicine and Pharmacy at HCMcity, Vietnam)**

The aims of this longitudinal study were to determine the dimensional changes and the growth pattern of the dental arches in the period from 3 to 5.5 years old and to clarify if there are significantly differences between males and females. The sample consisted of Vietnamese children, free from facial anomalies and with sound dentition, (N=117, 54 males, 63 females, aged 3 years old at the starting of the study). Impressions were taken at ages 3; 3.5; 4; 4.5; 5 and 5.5 years. Study casts were used for dental arch width and length measurements by one examiner based on the method described by Chang *et al.* (1998). A total of 8 measurements were obtained from each dental arch, (4 for width and 4 for length), using a digital caliper. ANOVA test was used to assess total changes in dental arch dimensions from 3 to 5.5 years old. T-test was applied for annual changes assessment and comparison between sexes. The results showed that the dental arches of Vietnamese children were wide and short as compared to Caucasian ones (Moorees, 1969; van Der Linden, 1979). All dimensions were larger in boys than in girls, in upper than in lower dental arch. From 3 to 5.5 years old, the increase in width of the dental arches was significant (1.33mm and 1.35mm in upper arch; 1.33mm and 1.26mm in lower arch, in boys and girls respectively; $p<.001$), but the annual increase was not. On the other hand, the changes in length, total and annual, were not significant. From 3 to 4.5 years old, the length increased slowly, then slightly reduced until 5.5 years old while the width showed a rapid increase during this same period. From 3 to 5.5 years old, the growth pattern of the dental arches of Vietnamese children could be described as follows: the width increased significantly and steadily while the length showed a slight decrease from 4.5 to 5.5 years of age, in both sexes and both upper and lower arch.