VO-1 **Influence of curing modes on crosslink density in polymer structures. M.S. SOH* and A.U.J. YAP (National University of Singapore).**

The objective of this study was to investigate the influence of curing modes on the crosslinking density of dental composites. A light-cure unit (BISCO VIP) that allowed for independent command over time and intensity was selected. Four different light curing modes investigated were: Control (C), Pulse delay (PD), Soft-start (SS) and Pulse cure (PC). The light energy density which is critical for polymerization was kept constant for all curing modes. The degree of crosslinking was assessed directly by measuring the glass transition temperature (Tg) of 2 mm thick composite (Z100, 3M-ESPE) using a differential scanning calorimetry (DSC 2920). Hardness testing was also used as an indirect method for assessing the degree of polymer crosslinking. After light curing, the specimens were stored in air at 37°C for 24 hours and subjected to hardness testing using a digital microhardness tester (n=6, load = 500g; dwell time = 15 seconds). The specimens were then placed in 75% ethanol-water solution at 37°C for 24 hours and post-conditioning hardness was determined. Mean hardness (HK)/hardness deterioration (ΔHK) was computed and data was subjected to analysis using one-way ANOVA/Scheffe's test. Softening upon storage in ethanol (ΔHK) was used as a relative indication of crosslink density. When evaluating the degree of crosslinking density by DSC, ranking were as follows: C > PC > SS > PD. For the degree of crosslinking density by the indirect method, ΔHK were found to range from 10.8 ± 0.9 to 12.9 ± 0.6. Specimens polymerized with PD mode were significantly more susceptible to softening in ethanol than specimens cured with PC. No significant difference in crosslink density was observed between C, SS and the various cure modes. Hence, polymerization with PD resulted in a lower crosslink density and gave rise to polymers with an increased susceptibility to softening in ethanol.

VO-2 **Interaction of resin-modified glass ionomer cements with hydrated dentin. [1]C.K.Y.YIU*, F.R. TAY, [1]N.M. KING, [2]D.H. PASHLEY, [3]R.M. CARVALHO, [3]M.R.O. CARRILHO. [1]University of Hong Kong, China; [2]Medical College of Georgia, USA, [3]University of São Paulo, Brazil)**

Tandem scanning confocal microscopy revealed water flux and permeability of RMGIC/dentine interface. The consequence of such water movement is unknown. Objectives: The objective of this study was to examine the ultrastructure of resin-modified glass ionomer cement (RMGIC)/bonded, hydrated human dentine. Methods: Dentine surfaces from extracted third molars were abraded with 180-grit SiC paper. Ten teeth were prepared for each of the two RMGICs tested (Fuji II LC Capsule, GC and Photac-Fil Quick Aplicap, ESPE). RMGIC buildups were made according to the manufacturers' instructions. After storage at 37°C, 100% humidity for 24 h, the bonded specimens were cut occlusogingivally into 0.9 x 0.9 mm beams. Dentine surfaces bonded with the two RMGICs were examined along the fractured RMGIC/dentine interfaces. Additional beams fractured 3mm distant from the interfaces were used as controls. All the fractured beams were prepared and examined using SEM, FE-ESEM and TEM. Results: SEM and FE-ESEM revealed numerous solid spherical bodies along the RMGIC/dentine interfaces. By contrast, no spherical bodies could be identified in RMGIC fractured 3mm distant from the bonded interface. TEM and energy dispersive X-ray analyses performed on carbon-coated ultrathin sections showed that these solid spherical bodies consisted of a thin aluminum and silicon-rich shell with an amorphous hydrocarbon core within the air voids of the original resin matrix. Conclusion: The spherical bodies represent a continuation of GI reaction and poly(HEMA) formation that results from water diffusion from underlying hydrated dentine. Their existence provides evidence for the increased permeability along the RMGIC/dentine interfaces.

VO-3 **Physical properties of resin cement polymerized with two different lamps. M.YAMAUTI*, R. SHIMURA, T. NIKAIDO, M.OTSUKI, J. TAGAMI (Cariology & Operative Dentistry, Tokyo Medical & Dental University)**

Blue light emitted diode lamps were developed to overcome some drawbacks of halogen curing units. The purpose of this study was to evaluate the microhardness and Young's modulus of resin cement cured with two light curing units under different curing strategies. The resin cement used in this study was Panavia F2.0 (Kuraray Medical). Two curing units were used: Candelux (Halogen, J.Morita)/20 sec, Elipar Freelight (LED, 3M ESPE)/20 sec. Discs of Panavia F2.0 (4.0x0.36 mm) were made using vinyl molds. The discs were photocured at the top surface using two curing strategies: direct contact and through 2 mm disc of resin composite (Estenia, Kuraray Medical). After 24h of storage in water at 37°C, the specimens were cut into halves, embedded in epoxy resin and polished up to 0.25 μm diamond paste. The microhardness and Young's modulus of the resin cement were measured using a nanoindentation tester (ENT-1100, Elionix) under load of 5 gf. The data was statistically analyzed using Two-Way ANOVA and Tukey test ($p<0.05$). Table: N=6, Kg/cm^2 and GPa (SD). Same capital letters indicate no significant difference between hardness values; small letters refer to Young's modulus values.

	Candelux (CDX)		Elipar Freelight (EFL)	
	Hardness	Young's modulus	Hardness	Young's modulus
Direct contact	64.0 (4.8)A	17.6 (3.6)a	56.3 (4.5)A	17.2 (1.0)a
Through Estenia	53.1 (5.4)B	16.4 (11.4)a	57.6 (3.3)B,C	17.1 (7.4)a

The light curing unit type did not affect the microhardness of Panavia F2.0, while there was a significant difference between both curing strategies. There was a significant interaction between light source and curing strategy. Regarding the Young's modulus there was no difference among the groups. The interposition of a material layer during curing affected the hardness. Both factors did not affect the Young's modulus.

VO-4 **Effects of Dentin Conditioners on Bond Strength of HNPM/ TEGDMA Adhesive Resin to Bovine Dentin. A. SOUFYAN*, B. IRAWAN, G. GUNADI, A. NOERDIN (Faculty of Dentistry, University of Indonesia, Jakarta, Indonesia)**

The aim of this study was to evaluate the effects of dentin conditioners on the tensile bond strength of 2 Hydroxy-3, 2-Napthoxy-Propyl Methacrylate/Triethylene Glycol Dimethacrylate (HNPM/TEGDMA) adhesive resin to bovine dentin. Sixty dentin specimens were divided into 6 groups. Each group of dentin surface were then conditioned with 10% (A_1), 25% (A_2), and 35% phosphoric acid (A_3); $FeCl_3$ in 10% citric acid (B); 3% (C_1), and 5% hydrogen peroxide (C_2) respectively before being bonded with HNPM/TEGDMA adhesive resin. Tensile bond strength were performed using Universal mechanical testing machine (Shimadzu AG5000) with a crosshead speed at 0.5 mm/min. Fracture morphology on dentin surface was observed using SEM. The mean (MPa) and standard deviation values of tensile bond strength were : A_1 = 4.72 ± 0.40; A_1 = 4.11 ± 0.31; A_3 = 4.09 ± 0.41; B= 5.75 ± 0.44; C_1 = 1.52 ± 0.26 and C_2 = 1.63 ± 0.23. One-way ANOVA showed significant differences among the groups. Double comparison Tukey test revealed significant differences among groups ($p< 0.05$) except between 25% and 35% phosphoric acid and between 3% and 5% H_2O_2 groups. It can be concluded that dentin conditioner of $FeCl_3$ in 10% citric acid obtained highest tensile bond strength of HNPM/TEGDMA adhesive resin to bovine dentin.

VO-5 **Cytokines Up-regulate MMP Production of Primary and Metastatic Cancer Cells. S. KOONTONGKAEW*, B. YAPONG and P. AMORNPHI-MOLTHAM. (Thammasat University, Patumthani, Thailand)**

Numerous studies have implicated matrix metalloproteinases (MMPs) particularly MMP2 and MMP9, in the process of metastasis by malignant tumor. It has been suggested that cytokines play an important role in MMP production. However, no comparison study of MMP regulation has been done using low- and high- metastatic tumor cells. Objective: The aim of this study was to compare the effect of cytokines on the production of MMP2 and MMP9 in primary and metastatic oral cancer cells. Methods: IL-1α IL-1β IL-6, hepatocyte growth factor (HGF), TNF-α and TGF-β were used at concentration of 1 ng/ml. Primary oral cancer cell line (HN30), metastatic oral cancer cell line (HN31) or human keratinocyte (HaCaT) was grown with and without cytokines for 24 hours. Conditioned media were collected and analyzed for MMP2 and MMP9 using gelatin zymography. The activities of MMPs were normalized with the number of cells in culture. Data were analyzed by ANOVA and post hoc Tukey's test (α=0.05). Results: IL-1α and IL-1β demonstrated modest induction of MMP2 and MMP9 in HN30, HN31 and HaCaT when compared with control ($p< 0.05$). IL-1α enhanced MMP2 1.4 -, 5.2-fold in HN30 and HN31, respectively whereas IL-1β stimulated 2.2 and 4.6-fold of MMP2 in HN30 and HN31, respectively. MMP9 was increased 4.6-and 6.3-fold in HN30 after exposure to IL-1α and 5.5-, 13.5-fold in HN31 after interaction with IL-1β. Stimulation of oral cancer cells with IL-6, HGF, TNF-α and TGF-β enhanced production of MMP2 and MMP9, compared with control. However, no significant differences in enhancement were noted for IL-6, HGF, TNF-α and TGF-β ($p>0.05$). Conclusions: our findings indicated that IL-1α and IL-1β dramatically enhanced the production of MMP2 and MMP9 in normal and oral cancer cells. The enhancement was obviously demonstrated in metastatic oral cancer cells. This study was supported by the Thailand Research Fund, RGD 03/03/2543.

VO-6 **Oral lesions among Malaysian HIV-positive drug addicts. S.L. SUJAK, R. ABDUL-KADIR*, O. ROZIAH. Faculty of Dentistry and Institute of Postgraduate Studies, University of Malaya, Kuala Lumpur, MALAYSIA**

Oral mucosal lesions are a common infection observed in HIV-positive individuals. Such lesions can affect the quality of life of the said target population. In 2002, Malaysia reported a total of 35,200 (76.7%) HIV-positive individuals who were intravenous drug users. A cross-sectional study to look into the status of oral lesions was conducted among medically diagnosed HIV-positive drug addicts who were undergoing government rehabilitation programme in Malaysia. Oral examination to determine oral lesions' occurrence was conducted on a sample of 509 male inmates aged from 15 to 60 years old with a mean age of 31 years old from 13 rehabilitation centres in three states. Results showed that on the average, the subjects had been on the drugs for the last 11 years. The age at which they first tried out the drugs was at 21 years of age. Findings from the survey showed that oral lesions were detected in 40.7% of those subjects examined. Pseudomembraneous candidiasis was the most common lesion observed (21%), followed by hairy leukoplakia (11.8%), erythematous candidiasis (9.6%), angular cheilitis (7.5%), erythematous gingival banding (4.5%), necrotizing periodontitis (0.6%) and atypical ulcerations (0.6%). Of those with lesions, 78% were found to have more than one lesion. Of these, 0.6% was found to have 10 oral mucosal lesions at the time of examination. In terms of location, majority (39.9%) of the lesions were observed on the tongue, the labial (8.4%) and buccal (1.2%) mucosa and sulcus, 7.5% on the commissures, and a smaller proportion on the hot (3.8%) and soft (1.4%) palate, floor of the mouth (0.8%) and upper lip (0.4%). Although oral mucosal lesions were more prone to occur among those 35 to 55 years old. However, those in the age group 30 to 34 years old were found to have 2.5 times more mucosal lesions. Findings from this study conclude that oral mucosal lesions is prevalent amongst HIV-positive drug addicts requiring attention. This study was supported by University of Malaya, Grant No. F 0112/200B, and Ministry of Science and Technology Grant No. IRPA 99-06-05-01-0142.