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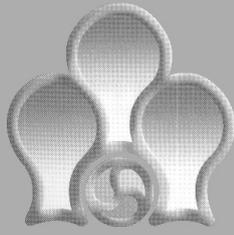
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### Message from Editor In Chief



### Greetings and *Selamat Datang* to Malaysia.

It is 18 years since the initiation of the Asian Academy of Preventive Dentistry in Seoul, Korea. With it comes the 9th International Conference of the Asian Academy of Preventive Dentistry (9th ICAAPD), this time held in the resplendent 5-star Hotel Istana in Kuala Lumpur, Malaysia hosted by one of Malaysia's established universities, Universiti Kebangsaan Malaysia.

The 9th ICAAPD theme "Towards Continuing Oral Health Improvement in Asia: Issues and Challenges" calls for a time to reflect on what Asia has achieved, the successes or the appropriateness of the interventions carried out to counter the many oral health problems on Asian communities. It is also a time to share knowledge or experiences acquired, a time to come together as a team as we move forward in this millennium.

Giving the above thoughts, the Local Organizing Committee alongside with the Board of Executives

of AAPD had tried to fulfill the objectives of this year's meeting. The program planned includes 9 Plenary Papers by our experts all over the world, as far as United States and as near as Singapore. Further discussions will be shared by our other 38 speakers in ten parallel symposiums. No meeting will be complete without a venue for sharing the research findings from our participants. This meeting saw an encouraging participation of more than 140 in all.

The International Journal of Oral Health (IJOH), published once a year, is the official voice of AAPD. The Editorial Board of IJOH would like to invite all scholars and practicing practitioners in Preventive Dentistry, Public Health Dentistry and other areas of Oral Health to contribute to our journal. To all who have contributed in this journal, my sincere thanks.

Sincerely

**Rahimah Abdul Kadir DDS, MDS, MPH, DrPH**  
**Editor in Chief**

## Original Article

# A Survey of Oral Health in Vientiane, Lao PDR

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## Abstract

The present study was conducted to assess oral health status among an adult population in Lao PDR and to investigate their knowledge, attitudes and practices (KAP) on oral health. A total of 193 (79 males and 114 females) subjects aged 20 to 59 years were selected as study subjects in Dongkhuwaai village. In the present analysis, 189 (75 males and 114 females) subjects were included and then classified into four age groups (20 to 24 years, 25 to 29 years, 30 to 34 years, and 35 to 44 years). Oral health examinations were performed using the WHO criteria. Smoking and KAP data were collected by an in-person interview using a 22-item questionnaire. Subjects aged 35 to 44 years had significantly more missing teeth (MT) and DMFT, as compared to subjects in the other age groups. The community periodontal index (CPI) mode was 2 (calculus) and a CPI score of 2 or higher was noted in 4 to 5 sextants among all age groups. In addition, 43.8% of males and 37.7% of females believed that eating and drinking sugary foods and drinks did not affect the risk of dental caries while there were no statistically significant correlations between oral health status and KAP pertaining to oral health. Poor oral health knowledge, attitude and practices may be a potential problem for the maintenance of oral health in Lao PDR.

**Keywords:** dental caries, DMFT, CPI, Laos, WHO criteria

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## Introduction

In the past few years several studies have reported that the burden of oral disease continues to spread in developing countries (Mosha *et al.*, 1994, Ogawa *et al.*, 2003, Uetani *et al.*, 2006, Agbelusi *et al.*, 2006, Chu *et al.*, 2008). In the Lao People's Democratic Republic (PDR), living conditions have developed rapidly during the last decade (World Bank, 2009). According to the WHO World Oral Health Report 2003 (World Health Organization, 2003), the increasing incidences of oral diseases such as dental caries and periodontal disease are due to changing living conditions and the adoption of Western lifestyle habits. Therefore, it is likely that the prevalence rates of dental caries and periodontal disease have increased in the last few years.

The DMFT (Decayed, Missing, and Filled teeth) Index among 12-year-old school children in the Lao PDR increased from 2.0 in 1991 to 4.6 in 2001 (WHO Oral Health Country/Area Profile Programme, 2009). The periodontal country profiles (2009) indicate

that calculus is the most common (83%) condition. In 1991, half of the sextants in dentate individuals were scored as 2 (calculus). However, few oral health surveys using internationally recognized criteria have been undertaken in the Lao PDR. Therefore, there is a lack of information necessary for the planning and implementation of a public oral health programme. Effective public health measures are also limited, and improved oral health practices such as primary health care have not yet been implemented in the country. Consequently, useful oral health care programs based on the principle of primary health care, including improved oral hygiene and effective use of fluorides, are urgently needed. A National Oral Health Survey of oral health knowledge, attitudes, and behaviors using internationally recognized criteria is needed to correct deficiencies in the Laotian oral health care programme. Therefore, the purpose of this survey was to assess oral health status among an adult population in the Lao PDR and to investigate their knowledge of and attitudes toward oral health.

## Subjects and Methods

### Study subjects

Geographically, the Lao PDR is landlocked and is one of the least developed countries in the world.

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The population of the Lao PDR was estimated at 5.62 million in 2005. The majority of the population, 82.9%, lives in rural and remote areas that have no access to basic infrastructure and services (United Nations in Lao PDR, 2009).

Dongkhuwaai village was chosen as the location of the survey. It is located about 30 km from Vientiane, the capital of the Lao PDR. The daily activities of villagers consist mainly of a combination of subsistence agriculture, fishing, hunting and gathering. A total of 193 (79 males and 114 females) village inhabitants aged 20 to 59 years were selected as study subjects. Written informed consent for participation in this survey was obtained from all subjects.

### Oral health examinations

To ensure the validity and reproducibility of assessments of oral status, dental examiners used the standard diagnostic criteria of the WHO Oral Health Survey: Basic Methods—Fourth edition (1997). Dental caries status was recorded using the DMFT Index, and periodontal health status was assessed by using the Community Periodontal Index (CPI). Calibration-training sessions were conducted for dental examiners before the survey. Experienced oral epidemiologists calibrated 8 dental surgeons before these surgeons assessed DMFT and CPI among volunteer patients from the Mahosot Hospital. By means of duplicate examination of 6 patients, interexaminer reliability

**Table 1.** Mean DMFT scores, by age and sex

	Age (yrs)	Total n	Mean±SD				
			DT	MT	FT	DMFT	
All		189	3.2±3.2	0.5±1.4	0	3.7±3.9	
Male	20-24	7	1.7±1.7	0.4±1.1	0	2.1±2.3	
	25-29	14	2.0±1.7	0.2±0.6	0	2.2±2.0	
	30-34	23	2.9±2.6	0.2±0.7	0	3.0±2.8	
	35-44	31	2.3±2.2	0.6±1.5	0	2.8±3.2	
Female	20-24	32	3.1±3.6	0.1±0.2	*b	3.2±3.8	**b
	25-29	25	3.8±3.6	0.4±1.0	**b	4.2±3.8	NS <sup>b</sup>
	30-34	33	3.5±3.7	0.4±0.9	*b	3.9±3.8	*b
	35-44	24	5.3±3.4	1.7±3.0	0	7.0±5.7	
Total	20-24	39	2.9±3.4	0.1±0.5	**b	3.0±3.6	
	25-29	39	3.2±3.2	0.3±0.8	NS <sup>b</sup>	3.5±3.4	
	30-34	56	3.2±3.3	0.3±0.9	*b	3.5±3.4	
	35-44	55	3.6±3.2	1.1±2.3	0	4.7±4.9	
			NS <sup>a</sup>	<i>p</i> =0.005 <sup>a</sup>		NS <sup>a</sup>	

a *p* value by ANOVA

b Tukey multiple comparison test for subjects aged 35-44 years

\* *p*<0.05, \*\* *p*<0.01

NS: Not significant

**Table 2.** Highest CPI score of subjects (%), by age and sex

	Age (yrs)	Total n	Percentage of persons who have as highest score				
			0	1	2	3	4
			No periodontal disease	Bleeding on probing	Calculus	Shallow pockets (4 or 5mm)	Deep pockets (6+ mm)
Male	20-24	7	0	0	100	0	0
	25-29	14	0	0	100	0	0
	30-34	23	0	0	87.0	13.0	0
	35-44	31	0	3.2	77.4	19.4	0
Female	20-24	32	3.1	0	96.9	0	0
	25-29	25	4.0	0	88.0	8.0	0
	30-34	33	0	0	81.8	18.2	0
	35-44	24	0	0	83.3	16.7	0
Total	20-24	39	2.6	0	97.4	0	0
	25-29	39	2.6	0	92.3	5.1	0
	30-34	56	0	0	83.9	16.1	0
	35-44	55	0	1.8	80.0	18.2	0

was assessed among the 3 dental surgeons who had been judged to be the most qualified examiners. The proportions of observed agreement between all pairs of examiners were as follows: 0.97 to 1.00 in the DMFT of the crown, 0.84 to 0.88 in the DMFT of the root, and 0.50 to 0.83 in the CPI. The 3 trained examiners assessed the subjects' oral condition with mirrors and ball-point periodontal probes under daylight. No radiographs were taken. Local dentists conducted an in-person interview using a 22-item questionnaire designed to obtain information regarding smoking status and betel quid chewing, oral health behaviors, and oral health-related quality of life.

### Statistical analysis

Of 193 individuals, 189 (75 males and 114 females; age range, 20 to 44 years) were included in the analysis: 4 persons older than 44 years were excluded. Subjects were then classified into 4 age groups (20 to 24 years, 25 to 29 years, 30 to 34 years, and 35 to 44 years).

The mean and standard deviation of the DMFT and CPI score in sextants were calculated for each age group and sex. Analysis of variance (ANOVA), and the Tukey multiple comparison test for subjects in the 35- to 44-yr-old group, were performed to evaluate differences in mean DMFT among age groups. Furthermore, the student's *t* test was used to examine sex differences in mean DMFT. The percentage of subjects for whom a particular CPI score was highest was calculated among each age group and sex.

In addition, for both sexes we calculated the percentages of responses to questionnaire items on oral health, including health of teeth and gums,

toothache, gum bleeding on tooth brushing or eating during the last 12 months, frequency of tooth brushing, use of a fluoride containing toothpaste, and knowledge of oral health.

All calculations and statistical analyses were performed with SPSS software (Version 15.0 J, SPSS Inc., Chicago, USA). Statistical significance was defined as  $p < 0.05$ .

### Results

All 189 study subjects were dentate. The mean age of subjects was  $30.7 \pm 5.8$  (male,  $32.7 \pm 5.2$ ; female,  $29.3 \pm 5.9$ ). The difference in age was statistically significant ( $p < 0.001$ ; *t* test). A total of 21.7% of subjects were current smokers, and 2.6% reported having a betel quid chewing habit.

Table 1 shows the mean DMFT scores of subjects. Subjects aged 35 to 44 years had significantly more missing teeth (MT) and DMFT, as compared to subjects in the other age groups ( $p < 0.01$  for MT,  $p < 0.01$  for DMFT). Mean number of MT in the 35- to 44-yr-old group was also significantly higher ( $p < 0.01$ ) than that in the other age groups, except for the 25- to 29-yr-old group. In the 35- to 44-yr-old group, female had significantly more DMFT than did male ( $p < 0.01$ ). The mean DMFT among 25- to 29-yr-old female was also significantly higher ( $p < 0.05$ ) than among male. In addition, female had significantly more decayed teeth (DT) than did male in the same 2 age groups ( $p < 0.05$  for the 25- to 29-yr-old group,  $p < 0.001$  for the 35- to 44-yr-old group). Among female, there was a steady increase in MT and mean DMFT with increasing age. There were no filled teeth (FT) in any study subject.

**Table 3.** Mean number of sextants with a particular CPI score per subject, by age and sex

	Age (yrs)	Total n	Mean number (Mean±SD) of sextants with					X Excluded fewer than 2 teeth
			0 No periodontal disease	1+2+3+4 Bleeding or higher score	2+3+4 Calculus or higher score	3+4 Shallow pockets or higher score	4 Deep pockets	
Male	20-24	7	0.29±0.48	5.71±0.49	5.43±0.79	0	0	0
	25-29	14	0.29±1.07	5.71±1.07	5.14±1.41	0	0	0
	30-34	23	0.30±0.56	5.70±0.56	5.35±0.71	0.26±0.75	0	0
	35-44	31	0.13±0.42	5.84±0.45	5.19±1.42	0.32±0.65	0	0.03±0.18
Female	20-24	32	1.13±1.50	4.88±1.50	4.28±1.65	0	0	0
	25-29	25	0.92±1.50	5.08±1.50	4.44±1.66	0.12±0.44	0	0
	30-34	33	0.58±0.79	5.42±0.79	4.88±0.96	0.27±0.67	0	0
	35-44	24	0.38±0.92	5.54±0.98	5.25±0.99	0.42±1.32	0	0.08±0.41
Total	20-24	39	0.97±1.41	5.03±1.40	4.49±1.59	0	0	0
	25-29	39	0.69±1.38	5.31±1.38	4.69±1.59	0.08±0.35	0	0
	30-34	56	0.46±0.71	5.54±0.71	5.07±0.89	0.27±0.70	0	0
	35-44	55	0.24±0.69	5.71±0.74	5.22±1.24	0.36±0.98	0	0.05±0.29

Table 2 shows the percentages of subjects for whom a particular CPI score was highest, by age and sex. The CPI mode was 2 (calculus) among all age groups.

The mean number of sextants with a particular CPI score per subject, by age and sex, is shown in Table 3. A score of 2 or higher was noted in 4 to 5 sextants among all age groups. Subjects in the 35- to 44-yr-old group had the lowest number of sextants with a score of 0 (no periodontal disease) among the 4 age groups. This indicates that subjects aged 35 to 44 years had the highest number of sextants with a 1+2+3+4 score (bleeding or worse) and with a 2+3+4 score (calculus or worse). There was a trend in which the number of sextants with a 1+2+3+4 and a 2+3+4 score increased with age.

The percentages of responses to questions regarding knowledge and attitude toward oral health by age and sex are shown in Table 4. Although no statistically significant differences by sex or age were noted, these findings show a large variation in oral health knowledge among the study subjects. A total of 48.9% of subjects were satisfied (very good or good) with the health condition of their teeth. Regarding

the frequency of tooth brushing, the majority of subjects cleaned their teeth more than twice a day. A total of 65.9% subjects brushed their teeth with a fluoride-containing toothpaste, and 98.8% of subjects acknowledged the importance of tooth brushing in the prevention of dental caries and periodontal disease. However, 43.8% of male and 37.7% of female believed that eating and drinking sugary foods and drinks did not affect the risk of dental caries (Table 5).

## Discussion

In the present study, the mean DMFs were 3.0, 3.5, 3.5, and 4.7 among subjects aged 20-24, 25-29, 30-34, and 35-44 years, respectively. These findings confirm those of previous reports (WHO Oral Health Country/Area Profile Programme, 2009), which observed a lower prevalence of dental caries in the Lao PDR. However, we observed a slight increase in mean DMFT, which was mostly due to the number of decayed teeth (DT): 2.9-3.6 among all age groups. Miyazaki *et al* (1996) suggested that the main reason for the increase in dental caries was the increase in per capita sugar consumption. Yabao *et al* (2005)

**Table 4a.** Responses to questions on oral health and oral health behavior (%), by age and sex

Question	Answer	Age (yrs)				p value	
		20-24	25-29	30-34	35-44		
Health of your teeth	Male	Very good	0	23.1	5.0	20.0	NS
		Good	66.7	38.5	40.0	24.0	
		Fair	0	7.7	20.0	32.0	
		Poor	33.3	30.8	35.0	24.0	
		Very poor	0	0	0	0	
	Female	Very good	20.0	12.5	19.4	19.0	NS
		Good	26.7	41.7	35.5	14.3	
		Fair	26.7	12.5	19.4	42.9	
		Poor	26.7	33.3	25.8	23.8	
		Very poor	0	0	0	0	
Health of your gums	Male	Very good	0	15.4	5.0	8.0	NS
		Good	33.3	30.8	45.0	40.0	
		Fair	16.7	38.5	25.0	16.0	
		Poor	50.0	15.4	25.0	32.0	
		Very poor	0	0	0	4.0	
	Female	Very good	6.7	4.2	9.7	9.5	NS
		Good	46.7	37.5	51.6	47.6	
		Fair	13.3	25.0	16.1	19.0	
		Poor	33.3	29.2	22.6	23.8	
		Very poor	0	4.2	0	0	
Toothache during the last 12 months	Male	Often	0	15.4	10.0	16.0	NS
		Occasionally	16.7	15.4	45.0	20.0	
		Rarely	16.7	0	0	0	
		Never	66.7	69.2	45.0	64.0	
		Often	20.0	16.7	16.1	23.8	
	Female	Occasionally	23.3	33.3	25.8	38.1	NS
		Rarely	3.3	4.2	3.2	9.5	
		Never	53.3	45.8	54.8	28.6	
		Often	0	0	0	0	
		Occasionally	0	0	0	0	

NS: Not significant

reported that dental caries increased with higher sugar consumption among children aged 6-12 years in the Philippines; Uetani *et al* (2006) also reported a high number of dental caries among children who frequently consumed sweets in southern Vietnam. In the Lao PDR, sugar consumption has recently increased, as is the case in other developing countries (WHO Oral Health Country/Area Profile Programme,

2009). Although recent information is not available, a twofold increase was observed over the 10-year-period from 1991 to 2000 (International Sugar Organization 1997, 2002).

With respect to the CPI results, calculus deposits were very frequent among the subjects. This finding is in accordance with a previous report on Savannakhet Province, (Chuckpaiwong *et al.*, 2000),

**Table 4b.** Responses to questions on oral health and oral health behavior (%), by age and sex

Question	Answer	Age (yrs)				p value		
		20-24	25-29	30-34	35-44			
Experience gum bleeding during the last 12 months	Male	Often	0	0	5.3	8.0	NS	
		Occasionally	66.7	46.2	47.4	20.0		
		Rarely	0	7.7	0	4.0		
		Never	33.3	46.2	47.4	68.0		
	Female	Often	0	4.2	6.7	9.5		NS
		Occasionally	34.5	50.0	36.7	28.6		
		Rarely	3.4	8.3	0	4.8		
		Never	62.1	37.5	56.7	57.1		
Frequency of tooth brushing	Male	Seldom	0	0	0	0	NS	
		Once a day	33.3	38.5	20.0	20.0		
		Twice a day	66.7	53.8	75.0	80.0		
		Three times of a day	0	7.7	5.0	0		
	Female	Seldom	0	0	0	0		NS
		Once a day	13.3	12.5	6.9	4.8		
		Twice a day	73.3	70.8	89.7	90.5		
		Three times of a day	13.3	16.7	3.4	4.8		
Use of fluoride containing tooth <b>paste</b>	Male	Yes	66.7	46.2	65.0	68.0	NS	
		No	0	0	0	4.0		
		Don't know	33.3	53.8	35.0	28.0		
		Female	Yes	72.4	56.5	70.0		71.4
	No	0	0	0	0			
	Don't know	27.6	43.5	30.0	28.6			

NS: Not significant

**Table 5.** Responses to questions on oral health knowledge (%), by age and sex

Question	Answer	Age (yrs)				p value		
		20-24	25-29	30-34	35-44			
Cleaning your teeth can prevent tooth decay	Male	Agree	100	100	100	96.0	NS	
		Disagree	0	0	0	4.0		
		Don't know	0	0	0	0		
	Female	Agree	100	100	100	95.2		NS
		Disagree	0	0	0	4.8		
		Don't know	0	0	0	0		
Tooth cleaning will prevent gum disease	Male	Agree	100	100	100	100	NS	
		Disagree	0	0	0	0		
		Don't know	0	0	0	0		
	Female	Agree	100	100	100	95.2		NS
		Disagree	0	0	0	4.8		
		Don't know	0	0	0	0		
Eating or drinking sweet things doesn't cause caries	Male	Agree	50.0	38.5	45.0	60.0	NS	
		Disagree	50.0	53.8	50.0	32.0		
		Don't know	0	7.7	5.0	8.0		
	Female	Agree	66.7	45.8	64.5	57.1		NS
		Disagree	33.3	50.0	35.5	33.3		
		Don't know	0	4.2	0	9.5		

NS: Not significant

which indicated that the most common periodontal problem was calculus deposits in 3-5 sextants. The CPI distribution has remained relatively unchanged since 2000. Several reports have noted that gingival condition was affected by calculus deposits among individuals who did not practice proper, regular oral hygiene (Rustogi *et al.*, 1991, Løe *et al.*, 1992 and Joshipura *et al.*, 1994). In addition, Gaare *et al.* (1990) suggested that instruction in tooth brushing improved gingival health in a population with a high level of supragingival calculus. To improve oral health status by preventing periodontal disease at an early stage, proper oral hygiene practice, especially among children, should be emphasized. In addition, primary oral health staff, including dentists and other health workers, should be trained to promote oral health and self-care in the community.

The mean number of mis+sing teeth (MT) was high among the 35- to 44-yr-old group, whereas the mean number of sextants with 3+4 (shallow pockets or worse) was low. However, no subjects had filled teeth (FT). This finding suggests that extraction of teeth is a routine treatment for pain relief, due to limited access to appropriate oral health care services (Petersen *et al.*, 1998, Chu *et al.*, 2008). Such basic treatment procedures were reported in other studies in developing countries where few dental personnel and resources were available (Ogawa *et al.*, 2003, Varenne *et al.*, 2006). In order to improve access to dental care for untreated teeth, which could be restored by means of appropriate treatment, it is necessary for the Lao PDR to develop a primary oral health care system that includes oral health education and promotion and use of atraumatic restorative treatment (ART).

The results of the oral health questionnaire showed that tooth brushing is common practice in the subjects. Brushing teeth twice a day or more in the Lao PDR is relatively similar to the frequency observed in Eastern Europe (Petersen *et al.*, 1997, Petersen *et al.*, 2000); however, oral health knowledge, practices, and attitudes were less related to the prevalence rates of dental caries and periodontal status in the present study group. We speculate that promoting oral health as part of a primary health care approach could be useful for oral disease prevention in a country where lifestyles are rapidly changing. Zhu *et al.* (2005) described a program of systematic community-based oral health promotion that stimulated the development of oral health awareness, dental attitudes, and personal skills—including promotion of additional self-care practices and the use of fluoridated toothpaste—among Chinese adults. Likewise, in the Lao PDR, effective community-based oral health promotion and the securing of primary oral health care resources

should be implemented to address the discrepancy between oral health knowledge and practice.

In conclusion, we observed that the most common oral health problem was calculus deposits, which were found in 4-5 sextants among all age groups. In addition, oral health knowledge, practice, and attitudes were limited among all age groups. This discrepancy between oral health knowledge and practice is a potential problem for the maintenance of oral health in the Lao PDR.

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## Original Article

# Oral health of older East Malaysian Indigenous in longhouses

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## ABSTRACT

The purpose of this study was to investigate the oral health status of a group of older indigenous Ibans, living in longhouses in Sarawak, Malaysia. A total of 259 subjects, 50 years and above from 11 longhouses consented to be examined for dental caries, periodontal diseases and oral lesions. Oral examination was carried out using mouth mirror and probe under natural lighting at each of the longhouse visited over a period of one month. Except for root caries, criteria used for the examination was as reported in the Oral Health Survey Basic Methods (1997). Root caries was measured using Katz' Root Caries Index. Results showed that edentulousness was observed in only a quarter (25.5%) of the total sample examined. Among those who were dentate, coronal caries and periodontal diseases were found to be high at 86.5% and 98.4%, respectively. Root caries affect only a small proportion of the sample examined (23%), while soft mucosal lesions was observed in 8.9% of all those examined.

**Keywords:** Older Indigenous, longhouses, edentulous, dental caries, periodontal diseases, oral tissue lesions.

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## Introduction

Sarawak, a Malaysian state located on Borneo island is the home of many indigenous groups, the largest being the Ibans (33%) (Dept. of Statistics Sarawak, 2004). They are famous for their communal lifestyle, maintain their traditional values and culture and lives in longhouses, a stilted structure comprising many rooms housing a whole community and moves around using the riverine transportation system. Each longhouse is headed by a *tuai rumah* (headman). Families live in separate apartments but share a common habitation. The younger Ibans work in small towns but the older folks are farmers and are observed to have a longer life span. They may need oral health care which is not easily accessible due to geographical terrains.

In Malaysia, information regarding oral health status, treatment needs and other oral health related issues among the older population is scarce and limited to those living in West Malaysia which is better developed. A nationwide survey of Malaysian adults in 1990 had shown that the prevalence of edentulousness was 30.7% for those 55-64 years-old and 56.6% for those 65 years and above (MOH 1993). In a more recent survey (NOHSA 2000), the

rate appeared to be decreasing to 26.1% and 41.5% for the same age groups, respectively (MOH 2004). Results of the survey also indicated that more rural (11%) than urban (6.2%) population were affected. The percentage of edentulousness among the Ibans in the study was 4%.

Coronal dental caries experience among the older and elderly population, on the other hand, was found to remain unchanged between the 1990 (DMFT= 12.9) and 2000 (DMFT = 11.3) national surveys (MOH 1993, 2004). Root caries, collected for the first time for 50 year olds and above was reported to be 18.4% with an average number of tooth affected to be 0.31.

While deep pockets (5.2%) as measured by CPI was reported to be low in the NOHSA 2000 study, nevertheless only 17.4% of the subjects examined had healthy gingival. Slightly more than half (57.6%) had calculus and a fifth had shallow pockets. Among the ethnic groups, the Ibans reported a low 12% of the population with healthy gingiva. The survey also reported the Ibans having one of the highest oral lesions (6.2%) occurrence. In an earlier study involving some 707 subjects aged 25 years and above, Zain et al (1997) found a similarly low prevalence of oral lesions (9.7%) but added that the prevalence was highest among the indigenous of Sabah and Sarawak. This study is a first known comprehensive report on the oral health status of the Sarawak indigenous Ibans who are residents of longhouses.

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## Materials and Method

### A) Sample selection

The sample frame was the small district of Kapit, accessible only by riverine transport or helicopter, where the majority of the Sarawak Ibans lived. There were 322 longhouses (Resident Office, 2005). However, the study focused only on longhouses located within 10 km radius of the Kapit Dental Clinic. Only older Iban adults aged 50 years and above who were lifetime residents of longhouses were invited to participate. The exclusion criteria included those living in longhouses but were of other ethnic groups or Ibans who did not live in longhouses. Approval for the study was given by University Malaya Faculty of Dentistry Research Ethics Committee. Consent for participation was obtained from each individual assisted by having the subject signing the form or putting their index finger markings on the consent form. The clarification of age, ethnicity and address of the subjects were obtained from their national identification card. Only eligible subjects in the selected longhouses who signed the consent form were included in the study.

### B) Oral Examination

Oral examination for coronal and root caries, periodontal diseases, dentition status and oral mucosal lesions was carried out with the subject seated on a portable chair and examined under natural light. The survey was based on the guidelines of the Basic Oral Health Survey (WHO, 1997). In addition, coronal caries was measured using the DMFT Index while Katz's Index was used for root caries. Periodontal status was measured using the CPITN-E periodontal probe and the Community Periodontal Index (CPI). Additional oral examination was carried out on the oral mucosa and screening for oral precancer, oral cancer and soft tissue lesions.

Prior to data collection, calibration was carried out on 10 subjects not included in the study against a 'gold standard' who had more than 15 years experience conducting surveys. The intra-examiner calibration was also carried out on the 10 subjects at a week's interval. Table 1 showed the percentage agreement for inter and intra oral examination for the respective oral conditions.

**Table 1.** Percentage agreement for inter- and intra examiner calibrations.

Oral Examination	Inter-examiner agreement (%)	Intra-examiner agreement (%)
Coronal caries	94.0	85.7
Root caries	86.7	100
Periodontal conditions	83.3	81.7
Oral mucosal lesions	100	100

### Data Analysis

Information was recorded in a specially prepared form, checked for completion before keyed into the Statistical Package of Social Sciences (SPSS) version 14. Data was checked for normality and descriptive statistics were generated for each of the four conditions. Student T-Test and Chi-square tests were conducted to look for associations. Significant level chosen was at  $p=0.05$ .

### C) Results

In all, 259 subjects participated in this study. Subjects' mean age was 63.7 years (S.D  $\pm$  9.7) and the age range was between 50-87 years. There was about 1.4 female to every male subject. Majority of them never attended school (76.1%). Only 19.7% had attained primary education and the remaining 4.2% had reached secondary education (Table 2).

**Table 2:** Sociodemographic profile of the sample

		n	%
Age group <sup>1</sup> (years)	50-59	105	40.5
	60 and above	154	59.5
Sex	Male	109	42.1
	Female	150	57.9
Education	No formal education	197	76.1
	Formal education	62	23.9

<sup>1</sup>Mean age (S.D) = 63.7 (9.7) years and age range = 50-87 years.

### Prevalence of Oral conditions in the sample

Table 3 showed the distribution of the different oral conditions of the sample. Analysis of the oral health status showed that in general, edentulousness occurred in only 25.5% of the sample examined. Those who were edentulous were mostly 60 years and above, females and living more than 10 kilometers away from the nearest government dental clinic. Chi square test showed there was an association between age group and dentition status which was statistically significant at  $p=0.001$ .

Of those who were dentate, majority had periodontal disease (98.4%) and coronal caries (91.3%). The latter was observed to be statistically significant when compared by the location of the longhouses ( $p=0.05$ ). Root caries and soft tissue lesions were also observed in approximately 23% and 9% of the sample, respectively. Findings also showed that less than a tenth examined had soft tissue lesions but the pattern showed the lesion to be increasing with age. The difference was observed to be statistically significant at  $p=0.05$  (Table 3)

**Table 3:** Oral health status of older Ibans living in Longhouses

	% Edentulous (n=66)	% Dentate (n = 193)			% Soft tissue lesions (n = 259)
		Coronal Caries	Root caries	Periodontal Disease	
<b>Age (Years)</b>					
50 – 59	7.6*	89.7	20.6	96.9	2.9**
60 - 69	20.9	94.1	23.4	88.3	9.3
70 -	58.8	89.3	28.6	67.9	17.6
<b>Gender</b>					
Male	21.1	93.0	27.9	94.2	6.4
Female	28.7	89.7	18.7	86.0	10.7
<b>Location</b>					
< 10 km	21.5	87.4**	24.2	90.5	7.4
>10km	29.0	94.9	21.4	88.8	10.1
<b>All</b>	<b>25.5</b>	<b>91.3</b>	<b>22.8</b>	<b>98.4</b>	<b>8.9</b>

\*Statistically significant at p = 0.001

\*\* statistically significant at p = 0.05

**Table 4.** Distribution of dental caries prevalence and experience by age

Age group	DT (s.d)	MT (s.d)	FT (s.d)	DMFT (s.d)
50 – 59	2.60 (2.82)	7.97 (7.89)	0.11 (0.72)	10.68 (8.51)
60 - 69	2.59 (3.28)	10.91 (9.41)	0.16 (0.70)	13.66(9.57)
70 -	3.43 (3.77)	10.64 (10.06)	0.25 (0.84)	14.31(11.23)
<b>All</b>	<b>2.72 (1.14)</b>	<b>9.39 (8.85)</b>	<b>0.15 (0.73)</b>	<b>12.26 (9.40)</b>

**Table 5.** Root Caries prevalence and experience of the dentate sample(N = 193)

	Mean (s.d)	% affected
D (Root decayed)	0.23 (0.04)	22.8
F (Root filled)	0.00 (0.00)	
D + F	0.24 (0.04)	

### Coronal and Root Caries

Findings also showed that among those who had coronal caries, mean caries experience as measured by DMFT was 12.3 (s.d 9.4). Coronal caries was also observed to be increasing with age. Missing teeth made up the largest component (9.4 s.d 8.8). On the average, each of the dentate subject had at least 2.7 (s.d 3.1) decayed teeth. Caries experience was also observed to be increasing with age. The difference however was not statistically significant (Table 4).

Root caries as assessed by Katz's Index (1980) showed less than a quarter (22.8%) of the dentate subjects being affected. In addition, the number of teeth affected was only 0.23 (s.d = 0.04) (Table 5).

### Periodontal status

Of the 98.4% dentate subjects affected with some form of periodontal problems, the highest proportion was observed to have moderate pocket (36.5%) and calculus (26.9%). Less than a fifth (17.6%) had pockets more than 6mm (Table 6).

### Soft tissue lesions

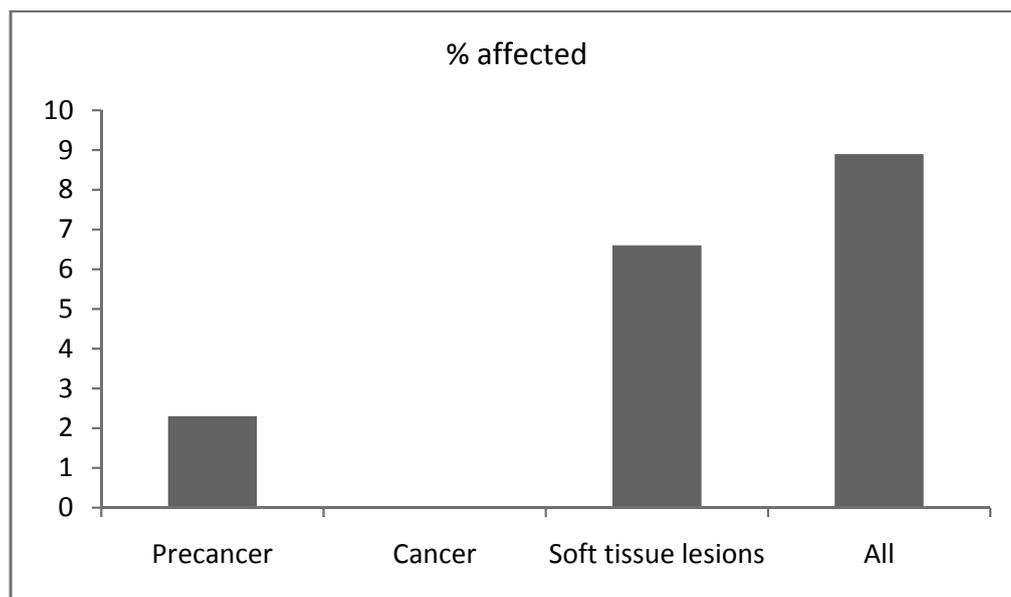
Figure 1 showed the distribution of oral mucosal lesions in those affected. Of these, majority were observed to have some form of soft tissue lesions. Precancerous lesions were observed in 2.3% of those affected but no oral cancer was observed in any of the 259 subjects examined.

### Discussion

Findings from the present study showed that edentulousness only affected approximately a quarter (25.5%) of the sample examined from 11 longhouses. This figure was much lower than the 36% reported in the National Oral Health Survey of Adults (NOHSA 2000) (MOH 2004). The latter study was however conducted in Peninsular Malaysia where physical development was more developed and lifestyle was relatively affluent. This could suggest that cultural and economic factors might have an influence on the oral health care outcomes (Cohen, 1997). The higher

**Table 6:** Number and percentage of dentate subjects with highest CPI score

CPI Codes	n (%)
Code ) (healthy)	3 (1.6)
Code 1 (bleeding on problem)	3 (1.6)
Code 2 A (calculus without bleeding)	13 (6.7)
Code 2 B (calculus with bleeding)	52 (26.9)
Code 3 ( 4-5 mm/moderate pockets)	71 (36.8)
Code 4 (≥ 6 mm/Deep pockets)	34 (17.6)
Code X (excluded sextants)	17 (8.8)

**Figure 1.** Distribution of soft tissue lesions in older Ibans

percentage of the condition observed among females was also consistent with other local studies (MOH, 2004; Latifah 1999) suggesting females tendency to extract their few remaining teeth for esthetic reasons (Latifah 1999; Bouma et al 1986).

Coronal caries prevalence observed in this study though slightly lower (91%), was consistent with that reported in the NOHSA 2000 studies conducted among the same age group in Peninsular Malaysia (95%). It was of interest to note that the 70 years-old group reported the lowest prevalence. This coincided with the high rate of edentulousness among them (58.8%). Given the longer life span among Malaysians today (average age 76 years old), this issue need to be addressed so that their quality of life would not be compromised. Although not statistically significant, finding showing more males than females having coronal caries was not in agreement with past local studies (MOH 2004; Razak & Jaafar, 1987). Coronal caries was also found to be higher among Ibans whose longhouses were located in more remote areas and further from towns. This observation was similar to the NOHSA 2000 findings whereby caries was found to be higher among elderly residing in rural areas. Root caries prevalence observed in this study although low (22%), but appeared to be slightly higher than that in the NOHSA 2000 report (18.4%). Given the small sample size, these findings should be interpreted with caution.

Petersen (2003) stated that periodontal diseases were one of the most important oral health problems globally. The present study reported a high prevalence of the periodontal diseases in this target group. This was concurrent with past population studies in this country (MOH, 1990, 2000). This was not surprising

as Kadir (1992) had projected that Malaysian adults would remain to have substantial problems more so in the future when the rate of edentulousness improved, more adults retained their teeth but oral hygiene awareness or practice did not improve. Apart from oral hygiene practices, dentition conditions, microflora and systemic diseases, Tomar & Asma (2000) reported that habit such as smoking was also a major risk factor for adult periodontal diseases to occur. The habit had been said to be responsible for more than half of the periodontitis cases observed in the United States. This also needed to be addressed as smoking remained to be highly prevalent among Malaysians.

This study also reported on a low prevalence of soft tissue lesions observed (8.9%), slightly lower than Zain's et al (1997) study (9.7%) but slightly higher than the NOHSA study (7.1%). The findings however must be addressed with caution given differences in measurement methods used and the small sample size in this study.

In conclusion, this study provided baseline information and an insight into the oral health of the older Sarawak indigenous, the Iban, who lived in longhouses. The high prevalence in dental caries and periodontal diseases are of concern and will need to be addressed so as to reduce the burden of illness particularly among today's younger adults but tomorrow's elderly. This became more critical as the longhouses are not easy to reach and the number of dentists are few in Sarawak.

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## Original Article

# Dental Attendance Pattern of Paediatric Patients With Special Health Care Needs

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## Abstract

Poor oral health has been found to affect the 'quality of life' of a child. It is important, especially in patients with special health care needs, to be made a priority group for dental care. However, the oral health of these children may be neglected since the primary attention of parents is usually focused on medical treatment. Objective: This study aimed to find out the dental attendance pattern among paediatric patients with special health care needs at Universiti Kebangsaan Malaysia Medical Centre (UKMMC), Kuala Lumpur. Methods: Clinical records of new patients attending the Paediatric Dental Specialist Clinic were collected. Relevant data from the history taking were recorded. Among these were the age of the patient, diagnosis of medical condition / disability, past dental history and reason for referral to the Paediatric Dental Specialist Clinic. Results: In total, 85 clinical records of new patients were included into the study. The mean age of the patients was 6.5 years. 76.5% of the patients were referred to the clinic by the Department of Paediatrics at UKMMC. 56.5% of the patients were referred to the clinic because of dental caries. 15.3% of the patients were already showing signs and symptoms of pulpal involvement. Only 23.5% of the study population had a history of previous dental visit. Conclusions: Majority of the child and young adult patients with special health care needs at PPUKM had never been to the dentist previously and the main reason they were referred to the Paediatric Dental Specialist Clinic was because of dental caries.

**Keywords:** special health care needs, oral health, caries

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## Introduction

Individuals with special health care needs are defined as those who have or are at increased risk for a chronic physical, mental, sensory, behavioural, cognitive, emotional, medical conditions which require healthcare-related services of a type or amount beyond that required by other individuals in general (Oredugba and Akindayomi, 2008; McPherson et al. 1998). Children with special health care needs have been identified as having an increased risk to developing dental diseases. Due to their physical, mental or sensory disabilities, they may face limitations in carrying out routine oral hygiene care and may also not understand or want to cooperate with preventive oral health practices (Nunn, 1987). Those with chronic childhood diseases, the disease itself or its treatment may render the child more prone to developing caries. For instance, the quantity and quality of saliva in these patients may be compromised (Foster and Fitzgerald, 2005). Treatment that comes in the form of radiotherapy to the head and neck

region or sweetened medications may also increase patient's caries risk (Foster and Fitzgerald, 2005; Kenny and Somaya, 1989; Maguire and Rugg-Gunn, 1994). Furthermore, in children with chronic diseases, the dietary habit may not be optimal. They are usually fed frequent meals in small quantities. Refined sugar consumption may also be high as they tend to receive sweet treats from well-meaning relatives (Foster and Fitzgerald, 2005). Children with special health care needs should be made a priority group for dental care. However, studies have shown that they are found to have more dental diseases and unmet treatment needs when compared to normal children (Reid et al. 2003; Oredugba, 2006).

Barriers to obtaining dental care among children with special health care needs have been reported in several studies (Oredugba, 2008; Nicopoulos et al. 2007; Kane et al. 2008). Quite often, the primary focus of the parents or carers is usually on the child's disability or medical condition. Oral health is seldom given any priority. They have poor understanding of their child's long term health risks and of how dental disease may aggravate the existing medical condition or incite negative behaviour (Oredugba, 2008). Children with special health care needs may not be able to express themselves, thus, problem may go unnoticed until the signs and symptoms are apparent. Another obstacle faced by these children

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especially those with chronic medical conditions is that not many general dental practitioners have the knowledge, expertise or expressed the desire to be routinely involved in providing them with dental care (Parry and Khan, 2000). Other barriers reported are the limited choices in appointment times to accommodate the patients and also difficulties in obtaining transportation to get to the dental clinic (Kane et al. 2008).

This study was thus carried out to determine the dental attendance pattern of children and young adults with special health care needs at Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

### Materials and Methods

The study was cross-sectional and descriptive in nature. It was carried out at the outpatient Paediatric Dental Specialist Clinic of Department of Oral and Maxillofacial Surgery, Universiti Kebangsaan Malaysia Medical Centre (UKMMC), which is a referral centre. Clinical records of patients who were new to the clinic for that year were collected. The inclusion criteria was records of new patients with previously diagnosed disabilities or chronic medical conditions. Records of healthy new patients or those who have attended the Paediatric Dental Specialist Clinic previously were excluded from the study. Specific information from the patient's personal history with regards to his/her age, diagnosis of medical condition / disability, when it was diagnosed, cause for referral to the Paediatric Dental Specialist Clinic and the referring department / person and history of previous dental attendance. The data collected were computed and analysed descriptively using Statistical Package for Social Package (SPSS) version 15.0.

### Results

The study was carried out over a period of 12 months in which, a total of 85 children and young adults with special health care needs attended the Paediatric Dental Specialist Clinic, UKMMC for the first time. The mean age of the patients was 6.5 years old, youngest patient being only 3 months old and oldest at 18 years of age. The study population was divided into several groups according to their disabilities / medical conditions (Table 1). The learning disability group which constituted of disorders such as autism, attention deficit hyperactivity disorder and mental retardation of various degrees formed the majority (23.5%, n=20). In the group marked "others", a few chronic medical conditions were categorised together as they appeared only once or twice in the overall study population (17.6%, n=15). Among these

**Table 1.** Distribution of patients with special health care needs according to various disabilities / chronic medical conditions

Types of disability / medical condition	Frequency (%)
Cerebral palsy	20
Learning disability	23.5
Down's syndrome	8.2
Cleft lip and palate	5.9
Congenital heart disease	8.2
Blood dyscrasias	11.8
Renal disorders	4.7
Others	17.6

**Table 2.** Source of patient referral to the Paediatric Dental Specialist Clinic

Departments	Frequency (%)
Paediatric	76.5
Oral and maxillofacial	7.1
Self	2.4
Plastic and reconstructive	3.5
Private dental practitioner	1.2
Others (e.g. ophthalmology, ENT)	9.4

**Table 3.** Reasons for patient referral to the Paediatric Dental Specialist Clinic

Reasons for referral	Frequency (%)
Caries	56.5
Toothache	8.2
Dental abscess	7.1
Oral assessment	9.4
Delayed tooth eruption	5.9
Others (e.g. gingivitis, mobile tooth)	12.9

**Table 4.** Patient's history of previous dental attendance

	Previous dental attendance	
	Yes	No
Patients with special health care needs (N=85)	23.5% (n=20)	76.5% (n=65)

**Table 5.** Mean of delay in time taken for the patients to see a paediatric dentist following the diagnosis of their medical condition

Types of disability / medical condition	Mean of time delay (years)
Cerebral palsy	7.9
Learning disability	6.6
Down's syndrome	7.1
Cleft lip and palate	3.7
Congenital heart disease	4.3
Blood dyscrasias	4.7
Renal disorders	2.4
Others	4.0

conditions were Goldenhar Syndrome, Kawasaki disease and panhypothyroidism.

The patients were mostly referred to the dental clinic by the other departments at UKMMC. Majority (76.5%, n=65) were referred by the Department of Paediatric and the overall source of patient referral is shown in Table 2. Only one patient (1.2%) was referred to the clinic by a private dental practitioner. On reasons for referring the patients to the dental clinic, 56.5% (n=48) of the study population cited caries as the main reason (Table 3). 8.2% (n=7) and 7.1% (n=6) of the patients were referred because of complaints of toothache and dental abscess respectively. With regards to previous dental experience, only 23.5% (n=20) of the study population had ever been to a dentist (Table 4).

The mean of the delay in time taken for the patients in the study population to see a paediatric dental specialist following the diagnosis of their medical condition was also determined (Table 5). The highest mean of the delay in time was found to be with the cerebral palsy group, with 7.9 years.

## Discussions

Paediatric Dental Specialist Clinic at the UKMMC is a referral centre for any dental cases concerning paediatric patients with special health care needs or healthy children who require behaviour management. The clinic was conducted one session per week. At the time the study was carried out, the clinic had only been running for less than six months which might explain the small number of new patient records included into the study (n=85). Majority of the patients referred to the clinic was from the Department of Paediatrics (76.5%, n=65) and this was expected since the paediatricians would have been involved in the care of these patients from the beginning. The self referred patients (2.4%, n=2) turned up at the clinic, one requesting for oral assessment and the other for treatment of dental caries. Only one patient was referred to the clinic by a private dental practitioner (1.2%). As the clinic had only been operational in the previous six months, it could also have been that many general dental practitioners were not aware of the clinic's existence and services it provided. The patient referred had learning disability, was 18 years of age and have never had any previous dental experience other than the time he had to be referred. The reason for failing to obtain dental care was not determined in this study. However, a study reported on dentists' readiness to treat children with disabilities found that even though 90% of them would treat these children, their willingness varied with the type of disability (Siegal, 1985). 9.4% (n=8) of the patients who attended the clinic was referred

for dental assessment. It was not recorded whether the patients had no existing dental problems or they or their parents were not aware if they had any. It was also not established whether the patients / parents had requested for the referral or the primary care givers thought they should have one. The rest of the study population had been referred to the clinic with some dental complaints (90.6%, n=77). It is alarming when 15.3% (n=13) were already experiencing some signs and symptoms of pulpal involvement (i.e. toothache and dental abscess). This finding is consistent with what have been reported before, whereby, for many children with untreated caries, their first dental visit would be at the emergency departments (Sheller et al. 1997). Such oversight may not be that detrimental in normal healthy children, but for those with special health care needs, poor oral health may predispose those with concomitant systemic disease to other opportunistic infection such as candida or to bacteraemia and septicaemia which can be life-threatening (Foster and Fitzgerald, 2005). Poor oral health in childhood also have long term consequences and these include nutritional deficiencies, failure to thrive, speech impediment, eating dysfunction, missed school and poor concentration, low self esteem and poor quality of life (Martin et al. 2009; Mouradian et al. 2000). Majority of the patients in the study (76.5%, n=65) had never been to a dentist previously and those who had, reported not to be regular attenders. In children, the responsibility of maintaining good oral health and seeking treatment to correct dental problems falls upon the parents or carers. However, parents themselves may lack oral health awareness or have dental fear that may result in avoidance in seeking dental treatment (Hagglin et al. 2000; Locker et al. 1999). Parents who perceive anything dentally related negatively may not place much importance in seeking regular dental care for their children. As the study was retrospective in nature, the level of parental anxiety towards dental treatment, their perception towards oral healthcare, or the reason for not bringing in their child for dental visit could not be determined.

Having a disabled or a child with chronic childhood illness adds burden to the family. The child may have to attend many and frequent appointments with his physician, physiotherapist, speech therapist, psychologist etc. Contemporary guidelines recommend that children are brought to the dentists for oral examination and risk assessment within six months of eruption of the first tooth or latest at the age of one (Oral Health Division, Ministry of Health Malaysia, 2008; American Academy of Pediatric Dentistry, 2003; American Academy of Pediatric Dentistry, 2004). Due to the nature of their disability,

dental treatment of children with special health care needs usually extends over long periods and requires expertise. They should have access to specialist dental care as soon as their condition is diagnosed. In our study, the clinical records showed that the group of cerebral palsy patients had the highest mean of delay in time taken (mean=7.9 years) to see a paediatric dentist following the diagnosis of their medical condition. The other two groups which had quite high mean values were the learning disability and Down syndrome groups with 6.6 and 7.1 years respectively. Patients from any of these three groups might not be able to express themselves well. Unless the signs and symptoms of dental problem are apparent to indicate an obvious treatment need, elective visits to the dentist may be missed. These children may also encounter greater limitations in obtaining dental care due to their disability. For instance, they may not be able to travel on public transportation to get to a dental clinic. Additional costs may be incurred to take them to a dental practitioner, which may be a burden to some parents.

Children with special health care needs are more likely to be in regular contact with their primary care providers such as paediatricians and other allied health professionals. It has been suggested to incorporate emphasis on importance of oral health in a child's medical care visit (Kane et al. 2008) as well as integrating oral health into paediatric medical training (Mouradian et al. 2000). The management of these children should have a multi-disciplinary approach where the primary care provider identifies those at risk and facilitate referral to dental service and in these children, mainly to a team of dental specialists (Foster and Fitzgerald, 2005).

## Conclusions

Children and young adults with special health care needs have poor dental attendance. A multidisciplinary approach between paediatricians and other allied health care professionals as primary care providers, and the dental team must be strengthened to facilitate referrals and encourage effective oral health disease prevention.

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## Original Article

# Oral Health Care Services and Utilization Among HIV-Positive Drug Addicts

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## Abstract

Unmet need for dental treatment is greater among HIV-positive individuals. Stigmatization, cost of treatment and attitude of dentists are among the reasons of unmet need. **Aim:** to identify the utilization and social related behaviour issues in seeking for oral health care services among HIV-positive drug addicts. **Methodology:** This study was a case-control study involving 917 drug addicts (509 HIV positive and 408 negative) from 20 national drug rehabilitation centres. A validated and pretested structured questionnaire was used to collect the relevant information on utilization of dental services and oral health care services perception. Statistical analyses was performed using SPSS software (Version 15.0 J, SPSS Inc., Chicago, USA). **Result:** Out of 917 subjects, 556 (60.6%) stated they had seen a dentist after becoming a drug addict. Of the 157 HIV-positive subjects who had visited a dentist, about half (50.3%) did not reveal their HIV status. When asked why they did not visit the dentists, some reasons cited were their beliefs that dentists would not keep their confidentiality (86.1%) and, dentists would refuse to provide treatment if they knew of their patients' HIV-positive status (77.2%). Slightly less HIV-positive subjects (61.8%) than the control group (71.4%) agreed that dentists conducted themselves professionally all of the time. However, only slightly more than half of those with HIV (57%) agreed that dentists showed professional respect all the time when treating them, as compared to 75% of those drug addicts who did not have HIV. HIV positive subjects were found to be satisfied with the service they received all (47.8%) or some (45.2%) of the time. The difference between the two groups of drug addicts was found to be statistically significant ( $p=0.000$ ). Almost all of the subjects (HIV-positive and non-HIV subjects) were of the opinion that HIV-positive individuals should be given scheduled dental treatment (99.8%) with lower fees if incurred (100%). **Conclusion:** This study concluded that destigmatization issues in the provision of oral care for marginalized groups such as HIV positive individuals need to be relooked and emphasized. This will encouraged them to want to declare their health status which can go a long way in developing mutual respect and safeguard safety and infection control for both patients and providers.

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## Introduction

There is a broad consensus that persons with HIV should see a dentist regularly (Weinert *et al.*, 1996). However, there is evidence to suggest that there are problems with acceptability of providing dental treatment for people with HIV. Some are put off going to the dentist, while others changed their dentist. A study on 102 British HIV-positive men by Robinson *et al.*, (1994) showed that before being diagnosed with HIV, 85.0% had been regular or occasional dental attendees. However, after being diagnosed as HIV-positive, 16.0% had not been to a dentist, while 51.0% had changed their dentist similarly, the same phenomenon was observed among those who sought

dental treatment, whereby 50.6% had changed their dentists. Among the reasons mentioned for changing their dentists was fear or rejection, referred by their previous dentists, and fear of loss of confidentiality (Coulter *et al.*, 2000; Greene *et al.*, 1997; McCarthy *et al.*, 1996; Robinson *et al.*, 1994).

Cost of dental treatment was also another factor found to influence the behavior of HIV-positive patients who sought dental treatment. Many could not afford to pay for the service because a majority of them came from marginalized groups, and as the result of discrimination were denied of jobs. (Fleishmen *et al.*, 1997; Schechter *et al.*, 1994; Mor *et al.*, 1992; Hayward *et al.*, 1989).

## Utilization of Dental Services among HIV-positive Persons

Unmet need for dental care was found to be substantially greater among those with HIV than in the general population (Muller *et al.*, 1998; Berk *et*

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*al.*, 1995). Marx *et al.* (1997) found that 41% of the male HIV-positive population in San Francisco had unmet oral health care in the previous one month prior to the study. The reason cited was fear and lack of information regarding available resources. In addition, unemployment and perception of poor oral health were also found to be important barriers. This study was supported by the study of Heslin *et al.*, (2001) who found that age of the patient, income, and employment status determined the unmet dental service need among these subjects.

### ***Subject's HIV Status Disclosure to Dentists***

People who are HIV-positive frequently suffer from pain, impeding normal eating, to infection or neoplasm disease (Greene *et al.*, 1997; Greenspan and Greenspan, 1993). For oral health, dentists as members of health care professionals are trained to prevent, diagnose and treat oral and dental diseases. Yet sharing this information with their dentists is not easy (Barnes *et al.*, 1996; McCarthy *et al.*, 1995; Robinson *et al.*, 1994; Perry *et al.*, 1993).

In a study by McCarthy *et al.*, (1996) of 101 HIV seropositive patients attending a London HIV Care Program in Southwest Ontario, 21% of the respondents were found to have not disclosed their HIV status. Of those, 29% believed that their dentist would be reluctant to treat them if they disclosed their status. This finding was supported by the study of Jacobson *et al.*, (1998) and Robinson *et al.*, (1994), which stated that disclosure of HIV status led to rejection and a break in confidentiality. The significant reason mentioned was that "it is not necessary to do so since dentists were obligated to take the same precaution with all his or her patients whether they were HIV-positive or not".

### ***Dentist's Attitude, Behavior, and Knowledge towards HIV-positive people***

Dentists had also been found to not universally be receptive to caring for persons with HIV (Weyant *et al.*, 1994; Kay *et al.*, 1990; Scheutz, 1990; Gerbert *et al.*, 1989a, 1989b; Hazelkon, 1989; Davis, 1989; Gerbert, 1987). In many communities, it was reported that finding a dentist willing to treat HIV patients was often very difficult. In the United States, about half of the dentists surveyed were reluctant to treat patients with HIV (Gerbert *et al.*, 1989b, Hazelkon, 1989; Verrusio, *et al.*, 1989).

The reasons behind the dentists' reluctance to treat HIV/AIDS could be obtained from surveys carried out by McCarthy (1995), McCarthy (1993), Sadowsky and Kunzel (1992), Kunzel and Sadowsky (1991), Dove (1990), Rydman *et al.*, (1990), Hazelkon

(1989), Moretti *et al.*, (1989), Gerbert *et al.*, (1988), Hardie (1987), Gerbert (1987). The most frequent reason cited for not treating HIV/AIDS patients was perceived stigma associated with treating such patients. The second most common reason was fear of transmission of HIV during dental procedures; other reasons included lack of knowledge of the oral manifestation of HIV and AIDS; lack of necessary skills to provide safe, effective treatment; personnel refusal to assist in treating HIV/AIDS patients; and the additional expense incurred often associated with necessary infection control procedures.

In the Malaysian scenario, no similar study on utilization issues of HIV-positive individuals has been reported. This study described the utilization and social related behavior issues in seeking for oral health care services among HIV-positive drug addicts.

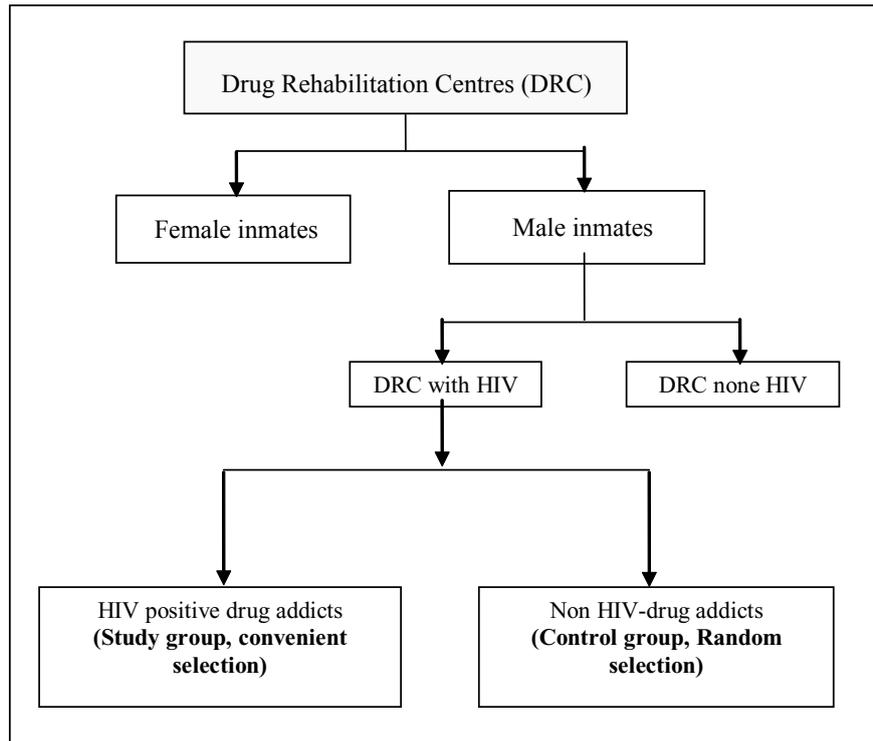
## **Materials and methods**

### ***Sample***

This is a cross-sectional, case-control study with HIV-positive drug addicts categorized as 'cases' and drug addicts without HIV as the 'control'. The sampling frame comprised of twenty seven rehabilitation centers located throughout Malaysia and had a total of 9,682 inmates with 670 diagnosed and medically confirmed to be HIV-positive individuals. One centre having only females were excluded from the study. Samples were only taken from centers with large HIV-positive cases. Convenient sampling was carried in the final sample selection with assistance from the Malaysian National Narcotic Agency. Matching for 'controls' was also carried out for each 'case' identified at the respective centre. The final sample comprised of 917 individuals from 20 Drug Rehabilitation Centers, 509 (55.5%) of who were HIV-positives and 408 (44.5%) individuals were categorized as "control". This study was approved by the Intensified Research Priority Area, Ministry of Science, technology and Environment Malaysia (Ref. No 06-05-01-0142). In addition only subjects who had signed consent forms were included in this study.

### **Measurement Instrument**

A structured questionnaire interview survey was used to collect the relevant information. The questionnaire formulated was a modification of the HAT-QoL instrument developed by Holmes (XXX). However, due to the presence of environment and cultural differences in the two study populations, the HAT-QoL instrument was modified for purposes of this study. The 42 item version of the original HAT-QoL questionnaire was translated into Bahasa Malaysia



(Malaysian National Language). The translation was done by a professional translator from the Institute of Language and Literature of Malaysia. The translated version of HAT-QoL was rechecked by the researcher to confirm that the meanings of the questions were the same as that of the English version. The completed version was then subjected to a Focus Group Technique process on ten HIV positive subjects from a centre not included in the study proper. The final questionnaire was then validated and pre-tested on a different group of HIV positive subjects. Domains included in the final questionnaire were oral health service utilization, provider’s attitude in providing oral health care services, treatment satisfaction, and need for scheduled oral health service.

**Data Management and Analysis**

Of 917 individuals, 509 HIV-positive and 408, non-HIV was included in the analysis. All calculations and statistical analyses were performed with SPSS software (Version 15.0 J, SPSS Inc., Chicago, USA). Description of central tendencies, distributions and dispersions of data were generated for both continuous and nominal data. Statistical significance was defined as  $p < 0.05$ .

Comparison between study and control groups were also carried out to determine for observed differences on any of the variables of concern. Independent sample t-test was used. Levene’s test was also used to determine homogeneity of variance and the p-values were determined corresponding to the assumed equality or non-equality of the variance.

**Table 1.** Distribution of the sample by socio-demographic profile

Selected items	Sample subjects		All subjects (N = 917)
	HIV-Positive (n = 509)	Non HIV positive (n = 408)	
Mean age (years)	31.3 (±6.54)	31.2 (6.38)	31.25± (6.49)
<b>Marital status</b>			
Bachelor	400 (78.6%)	316 (77.5)	716 (78%)
Ever married	109 (21.4%)	92 (22.5%)	201 (22%)
<b>Education</b>			
Formal education	498 (96.5%)	388 (95.1%)	879 (95.9%)
No formal education	18 (3.5%)	20 (4.9%)	38 (4.1%)

**Results**

Table 1 showed the demographic profile of the sample. Socio-demographic variables included were age, marital status, educational level and occupation. Analysis showed that the mean age of the sample was 31.3(s.d 6.49) years, majority being between 25-34 years old, not married (78%), was formally educated (95.9%) and employed (87.8%). There was however no statistical difference between the demographic variables of the ‘case’ and control groups.

**Oral Health Service Utilization**

Of the 917 subjects who participated in the survey, 556 (60.6%) stated they had seen a dentist since becoming a drug addict. Of these, 157 (28.2%) stated that they had been confirmed as HIV-positive at the time they made the visit. Further analysis carried out on the 157 HIV-positive subjects who had visited a dentist showed that about half (50.3%) did not reveal

their HIV status when asked by the dentists. The study also found that majority of the HIV-positive subjects (65.6%) visited the dentist within one month prior to the study. In addition, most (75.2%) of the non-HIV subjects were found to have visited the dentist more than one month prior to the study. The different trend in dental visit behavior between HIV-positive and non-HIV was found to be statistically significant at  $p = 0.000$  (Table 2). When asked as to the cases as to why they did not visit the dentists, some reasons cited were their beliefs that dentists would not keep their confidentiality (86.1%) and, that dentists would refuse to provide treatment if they knew of their patients' HIV-positive status (77.2%) (Table 3).

#### ***Provider's attitude in providing oral health care services***

For this section, analysis was carried out only on the proportion of subjects that had visited dental clinics. In measuring the dental staffs' attitude in providing care, aspects measured were, dentist's professionalism, dentist-patient respect, and dental staffs' attitude in helping to manage the drug addicts.

Findings indicated that in general, almost all drug addicts (96.2%) perceived that their dentists carried out all the needed procedures in a professional manner. However, slightly less HIV-positive subjects (61.8%) than the control group (71.4%) agreed that dentists conducted themselves professionally all of the time. The difference was found to be statistically significant at  $p=0.045$  (Table 4).

Similarly, a majority of the drug addicts (97%) agreed that their dentists showed professional respect (almost all or some of the time) when treating them. When analyzed by HIV status, only slightly more than half of those with HIV (57%) agreed that dentists showed professional respect all the time when treating them, as compared to 75% of those drug addicts who did not have HIV. The difference was observed to be statistically significant at  $p = 0.000$ .

A majority of the drug addicts (93%) also agreed that dental supporting staff attitude towards them was very positive. However, more non-HIV subjects (58.1%) agreed all the time that support staff were friendly and professional, compared to the HIV-positive group (45.9%). The difference was statistically significant at  $p=0.029$ .

#### ***Treatment satisfaction***

Findings showed that almost all drug addicts surveyed (all and some of the time = 93.7%) had positive perception towards their dentist's treatment services. They agreed that dentists were meticulous in performing dental procedures (Table 5). HIV positive subjects were found to be satisfied with the service

they received all (47.8%) or some (45.2%) of the time. However, findings among non-HIV subjects showed more of them were satisfied with the service all the time (66.4%), while another 30% were satisfied with the treatment some of the time. The difference between the two groups of drug addicts and satisfaction was found to be statistically significant ( $p=0.000$ ).

In terms of waiting time to receive treatment, almost all of the subjects (92.3%) agreed that they did not have to wait too long to see a dentist. Both groups of drug addicts also portrayed a similar picture across the board.

#### ***Need for scheduled oral health service***

Findings indicated that almost all of the subjects (HIV-positive and non-HIV subjects) were of the opinion that HIV-positive individuals should be given scheduled dental treatment (99.8%) with lower fees if incurred (100%) (Table 6).

#### **Discussion**

It is encouraging to note that almost two thirds of the drug addicts in this study had visited a dentist since they become one. This was much higher than that reported by McCarthy et al (1996) or Robinson et al (1994). Perhaps this was because the provision of oral health services in the country is very much public oriented and provided at minimal or no cost thus encouraging those who needed treatment to seek for one easily.

What is of concern is the fact that half of the HIV-positive (50.3%) subjects who visited dental clinic will only revealed their HIV positive status when asked for fear of being stigmatized or not receiving treatment if their HIV status was made known. The finding is however similar to that as reported by other researchers (Coulter et al., 2000, Greene et al, 1997; McCarthy et al., 1996 nd Robinson et al, 1994). This finding also suggests that confidentiality should be considered as top priority by dental professionals. Emphasis on this aspect must be relayed to all dentists so as to garner their patients' trust.

Although the proportion of those willing to disclose their HIV status in this study was relatively small, the prevalence of undisclosed HIV status among HIV-positive subjects in this study doubled the findings of other studies (Charbonneau *et al.*, 1999; McCarthy *et al.*, 1996, 1995). The small proportion of those who were willing to disclose their HIV status should be seen with concern. This becomes more so since dentists are also in the frontline of health care services and are easily exposed to needle pricks and the like. Although standard precaution procedures were practiced, nevertheless, disclosure could improve the quality of services provided, added

**Table 2:** Sample's dental visit to the dentist and HIV status

Duration of last visit	HIV status (N=556)		p-value
	HIV-positive (n=157) n (%)	Non-HIV (n=399) n (%)	
Within one month	103 (65.6)	99 (24.8)	0.000
Between one to 12 month	54 (34.4)	300 (75.2)	
Reveal HIV status ?			
Yes	79 (50.3)		
No	78 (49.7)		

**Table 3:** Reasons for not informing their HIV status to dentists

Item of interest*	Responses (N=79)		
	Almost all of the time n (%)	Some of the time n (%)	None of the time n (%)
The dentist will not be able to keep my secret safe	44 (55.7)	24 (30.4)	11 (13.9)
I was worried that the dentist would refuse to treat me	37 (46.8)	24 (30.4)	18 (22.8)

\*Responses per item are independent and do not add up to 100%

**Table 4:** Perception on provider's attitude in providing oral care services

Items		Responses			p-value
		almost all of the time n(%)	some of the time n(%)	none of the time n(%)	
Professionalism	HIV	97 (61.8)	55 (35.9)	5 (3.2)	0.045
	Non-HIV	285 (71.4)	98 (24.6)	16 (4.0)	
	All subjects	382 (68.7)	153 (27.5)	21 (3.8)	
Dentist's attitude	HIV	90 (57.3)	61 (38.9)	6 (3.8)	0.000
	Non-HIV	299 (74.9)	84 (21.1)	16 (4.0)	
	All subjects	389 (70.0)	145 (26.1)	22 (4.0)	
Dental supporting staffs' attitude	HIV	72 (45.9)	73 (46.5)	12 (7.6)	0.029
	Non-HIV	232 (58.1)	140 (35.1)	27 (6.8)	
	All subjects	304 (54.7)	213 (38.3)	39 (7.0)	

**Table 5:** Perception of subjects on treatment satisfaction

Item of interest		Responses			p-value
		almost all of the time n(%)	some of the time n(%)	none of the time n(%)	
Treatment received	HIV	75 (47.8)	71 (45.2)	11 (7.0)	0.000
	Non-HIV	257 (64.4)	118 (29.6)	24 (6.0)	
	All subjects	332 (59.7)	189 (34.0)	35 (6.3)	
Waiting time to see dentist	HIV	52 (33.1)	91 (58.0)	14 (8.9)	0.763
	Non-HIV	141 (35.3)	229 (57.4)	29 (7.3)	
	All subjects	193 (34.7)	320 (57.6)	43 (7.7)	

**Table 6:** Perception of subjects on special oral health service

Need for special service		Responses			p-value
		almost all of the time n(%)	some of the time n(%)	none of the time n(%)	
Scheduled appointment/ treatment	HIV	126 (80.3)	30 (19.1)	1 (0.6)	0.19
	Non-HIV	335 (84.0)	64 (16.0)	0 (0)	
	All subjects	461 (82.9)	94 (16.9)	1 (0.2)	
Lower fees	HIV	100 (63.7)	57 (36.3)	-	0.40
	Non-HIV	269 (67.4)	130 (32.6)	-	
	All subjects	369 (66.4)	130 (32.6)	-	

infection control precaution, safer services, reduced occupational exposure, and improve patient-provider management compliance and relationship. This will not only enhance the image of oral health services provided but also the quality of life of both patients and providers alike.

This study also showed that a majority of HIV-positive individuals had high respect and trust for their dentists. Similarly, they were also satisfied with treatment and attention given to them. These findings indicated the importance of professional and caring attitude that dentists should have when performing their duty regardless of their patients' HIV status. It was also good to observe that a caring attitude prevailed in non-HIV drug addicts, in that they supported the idea that their HIV-positive colleagues should be charged less fees and be provided scheduled regular check ups.

#### Acknowledgement:

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## Short Communication

# The Effect of Anchovy *Stolephorus baganensis* on Mutans Streptococci

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## Abstract

**Introduction:** Anchovy fish, a traditional food among Indonesians, contains fluoride and has health benefits and capable of preventing caries. A clinical trial was carried out to investigate the effect of Anchovy *Stolephorus baganensis* in inhibiting the growth of *Streptococcus mutans* in plaque after one week consumption. **Method:** Plaque samples from teeth surfaces of forty subjects equally divided into 'treatment' and 'control' groups were taken prior to and after the consumption of anchovy *Stolephorus baganensis*. The procedure was repeated three times a day for a period of one week. A serial dilution of the plaque sample was then prepared and inoculated into TYS20B medium (Schaeken, M.J.M, et al, 1986) and incubated in an anaerobic jar at 37°C for 24 hours. Data obtained from colony forming units of mutans of *Streptococcus mutans* in plaque which grew on the TYS20B medium before and after consumption of anchovy *Stolephorus baganensis* were analyzed. Descriptive statistics was generated and Student T-test of association was done to look for statistical significant differences. **Results:** Findings showed that there is no significance difference in the average amount of *Streptococcus mutans* colonies between before and after consumption of non-anchovy *Stolephorus baganensis*. However, significant difference was found in the before and after consumed anchovy *Stolephorus baganensis* sample. **Conclusion:** It is concluded that anchovy of *Stolephorus baganensis* has anti microbial activity against local strains of mutans of *Streptococcus mutans* isolated from human harbouring species. Consumption of anchovy, a traditional food of the Indonesians, has potential in systemic fluoride intervention programs. However further studies is needed before recommendations can be made.

**Key words:** Anchovy, *Stolephorus baganensis*, Mutans Streptococci, anti-caries

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## Introduction

Despite a decline in prevalence of dental caries observed in several industrial countries, dental caries remain one of the main dental health problems throughout the world (Van Palenstein Helderman WH, et al 1996). Dental caries and periodontal diseases is also a significant health problem in Indonesia affecting the majority of its population (Effendi I, 1996). As a consequence it remains a prominent target for the provision of dental health care in Indonesia. More recent information indicate that dental caries prevalence is increasing (Djojosingito Ahmad, 2000).

Overwhelming evidence had shown that *Streptococcus mutans* is the primary etiological agent in dental caries. The bacteria has the ability to form plaque on synthesized extra-cellular polysaccharide (dextran) causing this microorganisms to adhere to

hard surfaces of the teeth (Emilson CG., Lindquist.B and Krasse .B 1989). For this reason, early prevention is needed to maintain the oral health by rinsing through using mouthwash and regular brushing of teeth, both being the most widely used and socially accepted form of oral hygiene practice (Newbrun E 1989). Mouth rinsing and tooth brushing had also been shown to be effective in removing plaque mechanically as well as in preventing *Streptococcus mutans* from colonizing on the teeth (Newbrun E, 1989 and Erickson L, 1997).

Anchovy *Stolephorus baganensis* contains nutritional contents of carbohydrates, proteins, fats, vitamins and minerals. One of the important nutritional elements in Anchovy fish is fluoride. Previous studies had shown the fluoride level in this fish to be high, ranging from 5 to 18 ppm (Ayu Wulandary, Harun A Gunawan 2004). As anchovy is a staple form of protein for the population, regular consumption of the fish is therefore anticipated to be able to help maintain the oral health of the population.

This research is expected to contribute significantly to the world of science that Anchovy substrate of *Stolephorus baganensis* can inhibit the bacterial growth of mutants of *Streptococcus mutans*.

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Thus, consuming Anchovy fish of *Stolephorus baganensis* on a long-term basis can prevent caries.

### Materials and methods

This is a Quasi experimental laboratory study involving samples from human samples. The sample subjects were schoolchildren in Untung Jawa Island, Indonesia. A total of forty schoolchildren who had good oral health and had no evidence of progressive periodontal diseases or untreated caries were recruited into the study. The sample was equally distributed into treatment and control groups.

The analyzed unit was mutans of *Streptococci mutans* in plaque. Mutans of *Streptococcus mutans* were cultivated in Tryptose-Yeast Sucrose with Bacitracin (TYS20B) (Schaeke M.J.M., van der Hoeven J.S., Franken H.C.M 1986) and Brain Heart Infusion Broth (BHI). Diagnostic Sensitivity Test (DST) was also performed. The specimens were then incubated in an anaerobic jar at 37° Celsius degree for 24 hours.

Written consent was acquired prior to the start of the study. The samples' baseline oral hygiene was also taken. Plaque samples were then taken before consuming non-anchovy of *Stolephorus baganensis* (control group) and anchovy of *Stolephorus baganensis* (treated group). Two hours after consuming anchovy *Stolephorus baganensis*, plaque samples were again collected from the sample and analyzed. This was repeated for two other times in one day. The sample consumed 50g anchovy *Stolephorus baganensis* three times a day for a period of one week.

A serial dilution of plaque was prepared from one mg of plaque diluted with 9 ml sterile saline to make a serial dilution of 1000 fold dilution. Next, 0.1 ml of the solution was inoculated into the selective medium of TYS20B (Schaeke M.J.M., van der Hoeven J.S., Franken H.C.M 1986). All samples

**Table 1.** Mean and Standard Deviation (SD) of CFU *Streptococcus mutans* on treatment with anchovy substrate of *Stolephorus baganensis* and non-anchovy of *Stolephorus baganensis*.

N=20	Mean	SD
Before-non anchovy	440.50	266.90
After - non anchovy	339.00	311.19
Before - anchovy	379.50	300.45
After - anchovy	83.20	81.10

were incubated in an anaerobic jar at 37° Celsius for 24 hours. The colony forming units (CFU) of *Streptococcus mutans* which grew in the TYS20B medium were then counted and recorded. Data obtained from colony forming units of mutants streptococci in plaque that grew in TYS20B medium before and after treatment were then analyzed using a statistical package. Descriptive statistics were generated and Student's t-test was used to look at associations.

### Results

Results of the analyzed colony forming units (CFU) of *Streptococcus mutans* which grew on TYS20B media before and after consuming the non-anchovy *Stolephorus baganensis* and anchovy *Stolephorus baganensis* are shown in Table 1.

Table 1 shows that CFU of *Streptococcus mutans* after consuming the anchovy *Stolephorus baganensis* (X=83.20 +/- SD = 81.10) is lower than before consuming the anchovy *Stolephorus baganensis* (X=379.50 +/- SD=300.45). The CFU of *Streptococcus mutans* after consuming the anchovy of *Stolephorus baganensis* (X=83.20 +/- SD = 81.10) is also lower than after consuming the non-anchovy *Stolephorus baganensis* (X=339.00 +/- SD= 311.19).

The significance of the effectiveness of the anchovy *Stolephorus baganensis* is determined using "t" test analysis. The results can be seen in Table 2. Significant level accepted is when p – level at 5 % is lower than 05(p<0.05).

No significant difference was found between the CFU of *Streptococcus mutans* before and after consuming non-anchovy *Stolephorus baganensis* (p= 0.980 and t-value = 0.270). On the other hand, the amount of CFU of *Streptococcus mutans* in plaque showed a significant difference. The CFU of *Streptococcus mutans* before and after consuming anchovy showed a p-value of 0.005 (t = 3.59). When the CFU of *Streptococcus mutans* before and after consuming the non-anchovy was compared to the anchovy *Stolephorus baganensis* group, the difference was found not to be significant (p = 0.810). However, when results for post-consuming non-anchovy *Stolephorus baganensis* and post-consuming

**Table 2.** "t" test on treatment of anchovy *Stolephorus baganensis* and non-anchovy of *Stolephorus baganensis*

Difference of Treatment	Df	t	p	Significance
Before-After consuming (non-anchovy)	18	0.270	0.980	P<0.05
Before-After consuming (anchovy)	18	3.590	0.005	P<0.05
Before consuming(non -anchovy – anchovy )	18	0.430	0.810	P<0.05
After consuming (non - anchovy – anchovy)	18	2.860	0.010	P<0.05

anchovy *Stolephorus baganensis* was compared, a significance difference between the two groups was observed (t-value = 2.860 , p= 0.010).

### Discussion

The results of this study showed that the amount of CFU of *Streptococcus mutans* after consuming the anchovy *Stolephorus baganensis* is lower than the amount of CFU of *Streptococcus mutans* after consuming the non - anchovy of *Stolephorus baganensis*. This finding appeared to be consistent with the findings of earlier studies which showed that the Anchovy substrate of *Stolephorus commersonii* has anti microbial activity against standard strains of *Streptococcus mutans* LM 7 , *Streptococcus mutans* JC 2 ,*Streptococcus mutans* KPSK2 *Streptococcus mutans* Ing Britt and *Streptococcus sobrinus* B13 (Mangundjaja S., Yuni A., Andy S 2005) and local strains of mutans of *Streptococcus mutans* isolated from human harbouring species (Soekanto S.A and Mangundjaja 2005).

The results also showed that there was a high significance difference in the average amount of *Streptococcus mutans* colonies between the before and after consumption of anchovy *Stolephorus baganensis*. Based on the above findings it can be concluded that the anchovy *Stolephorus baganensis* could be effective in inhibiting the growth of mutans of *Streptococcus mutans* in plaque.

However, considering the very small need of systemic fluoride by human beings, about 1.7–3.3 ppm daily, caution is needed before any final conclusion can be made. More so as it is difficult to determine how much is the amount of anchovies to be recommended for daily consumption such that it will not cause harmful side effects.

### Conclusion

The positive findings suggest that anchovy *Stolephorus baganensis* has bactericide activity on mutants of *Streptococcus mutans*. Given that it is a traditional food of the Indonesian population and the fact that it is easily accessible and affordable, there is therefore potential as a form of systemic fluoride regiment. However, further studies are needed to look in depth at the issues at hand before recommendations can be made.

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**Proceedings of the  
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**9-11 November 2010  
Istana Hotel, Kuala Lumpur  
Malaysia**

**Towards Continuing Oral Health Improvement in Asia:  
Issues and Challenges**



## PLENARY ABSTRACTS

## PLENARY SPEAKERS

- 1 Professor Mark Wolff (New York University USA)  
***Dental caries: The Disease Starts Long Before Cavitation***

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- 2 Professor Roger Ellwood (University of Manchester, UK)  
***Understanding Dental Caries and the Opportunities for Prevention and Treatment Using Recent Advances in Therapeutic Interventions***

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- 3 Dr Waranuch Pitiphat (Khon Kaen University, Thailand)  
***Could periodontal treatment prevent adverse pregnancy outcomes?***

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- 4 Professor Jo Frencken (University of Nijmegen, Netherlands)  
***Minimal Intervention Dentistry: Evidence-based Caries Prevention***

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- 5 Professor Mohamad Hussain Habil (UMCAS, Malaysia)  
***Tobacco Use: Lifestyle or Addiction?***

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- 6 Professor Raman Bedi ((King's College London, University of London, UK)  
***Why can't we eliminate dental cavities in children - implementing effective dental caries management and prevention***

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- 7 Professor Lawrence Walsh (University of Brisbane, Australia)  
***Preventive Dentistry Management for the Special Needs Patient***

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- 8 Assoc Professor Hiroshi Ogawa (WHOCC, Niigata University, Japan)  
***Future Directions of Public Oral Health in Asia***

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- 9 Professor Hien Ngo (University of Queensland, Australia)  
***Clinical Diagnosis & Management of Caries : evidence vs prudence from a clinician's perspective***

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**PLENARY 1****Dental Caries: The Disease Starts Long Before Cavitation***Mark Wolff**New York University, USA*

Since the 19th century, dental caries was long judged as disease that was treated when cavitation existed and at best prevented prior to cavitation. Since that time, therapies primarily utilizing fluoride have proven effective at “preventing” dental caries. During the last decades of the twentieth century it became obvious that the process of demineralization that eventually resulted in cavitation could be modified to actually force the remineralization of teeth and repair of the teeth. This plenary session will discuss the physiologic conditions in the mouth that tip the balance in favor of either demineralization, and subsequent cavitation, or remineralization. The historic prospective on the caries disease allows a better understanding of why, today, dental caries is considered a disease continuum. The disease initiates with surface demineralization and sometimes ends in cavitation and the oral environment, in large part, determines why that occurs.

**PLENARY 2****Understanding Dental Caries and the Opportunities for Prevention and Treatment Using Recent Advances in Therapeutic Interventions***Roger Ellwood**University of Manchester, England*

Dental caries is a significant burden in many populations but it is a disease that is wholly preventable. Recent improvements in our understanding of dental caries open up the possibility of making further significant inroads into arresting and reversing caries lesions before they require surgical intervention.

This presentation will provide an overview of dental caries as a continuum of disease with the carious process a dynamic balance of demineralisation and remineralisation determining whether lesions progress reverse or arrest. The aetiology of dental caries within this process and opportunities for intervention at various stages will be highlighted.

The aetiology of dental caries will be discussed together with approaches to its prevention and treatment. Recent advances in therapeutic interventions based on toothpaste to arrest and remineralise early caries lesions will be highlighted and the opportunity to move from a surgical to therapeutic approaches to caries management will be discussed.

**PLENARY 3****Could Periodontal Treatment Prevent Adverse Pregnancy Outcomes?***Waranuch Pitiphat**Khon Kaen University, Thailand*

Cumulative evidence suggests the links between periodonal disease and pregnancy complications, particularly preterm birth, low birth weight, pre-eclampsia and gestational diabetes. Several biologically plausible mechanisms have been proposed to explain the associations and there is growing evidence in support of them, although insufficient to establish causality at present. Periodontal treatment, which decreases the intraoral bacterial burden and reduces

periodontal inflammation, may have a significant impact on systemic inflammatory state and thus reduce the risk for adverse pregnancy outcomes.

Treatment of periodontitis is shown to be safe and effective in improving oral health status of pregnant women. However, its beneficial effect on pregnancy outcomes remains unclear. Results from earlier studies were promising demonstrating a favorable effect of non-surgical treatments, while several recent large randomized trials revealed no benefit. This presentation will provide a current update on the contribution of periodontal disease and its treatment to adverse pregnancy outcomes, the possible mechanisms involved and the relevance of these for dental practitioners. Suggestions on the way forward to improve the understanding of the association between periodontal disease and adverse pregnancy outcomes will also be described.

**PLENARY 4****Minimal Intervention Dentistry: Evidence-based Caries Prevention***J.E. Frencken**University of Nijmegen, Netherlands*

Abstract: Minimal Intervention Dentistry (MID) for managing dental caries is a concept that, broadly speaking, consists of optimal diagnosis and evidence-based preventive and minimally invasive operative approaches. This presentation will discuss 1) recent developments in caries assessment using visual/tactile inspection and 2) evidence of the effectiveness of a variety of caries preventive agents using systematic reviews and meta-analyses. Particular attention will be given to latest developments in pits and fissure sealants.

**PLENARY 5****Tobacco Use: Lifestyle or Addiction?***Mohamad Hussain Habil**UMCAS, University of Malaya, Malaysia*

Smoking has been considered to be habit until it was discovered that tobacco contain active drug call nicotine. The property of nicotine is similar with the property of other hard drug of which it stimulate release of dopamine which is express as feeling good by smokers. Nicotine action in the mesolimbic dopaminergic system have its course toward addiction. Its lead to dopaminergic receptors changes which cause neuroadaptation . Once this process developed the smokers will need to increase amount of cigarette as to get the desired effects. This process is call tolerance which often seen among those who were addicted to any form of drugs of addiction. The changes in mesolimbic dopaminergic pathways will also lead to craving which often result to relapse among smokers who have desire to stop. Therefore smokers need help to stop smoking and this can be done through the used of medication which acts on the receptors responsible for making smokers to be addicted to nicotine.

**PLENARY 6****Why Can't We Eliminate Dental Cavities In Children- Implementing Effective Dental Caries Management and Prevention***Raman Bedi**King's College London, UK*

Competence in the management of dental caries within dentistry has been the focus of much debate and research over the past few decades. The evidence mapping differential health outcomes for specific procedures and materials is now well established. However, there is a growing sense that progress in this field is stalling. The Global child dental health taskforce was established in 2006 and aims to undertake three core activities; establishing and supporting national taskforces, leadership development and capacity building. Over the past few years it has become self evident that the assumption that dentists know how to manage and prevent dental caries is questionable. The aim of the presentation is to provide a background to the global project and update delegates on initiatives to build confidence and capability in dental caries management and prevention.

**PLENARY 7****Preventive Dentistry Management for the Special Needs Patient***Laurence J. Walsh**University of Queensland, Australia*

Patients with compromising medical conditions pose a major challenge for dental prevention, and suffer a high burden of oral disease. This lecture will summarize recent developments in clinical prevention for special needs patients, including chemical plaque control protocols for preventing inhalation pneumonia and upper respiratory tract infections in intellectually disabled individuals and patients on mechanical ventilation. Recent work on the impact of oral hygiene measures on reducing the oral complications of acute leukaemia will also be summarized. The lecture will outline current therapies to prevent mucositis during chemo- and radiotherapy and reduce the impact of radiation on salivary function. A novel light-enhanced fluoride therapy for making enamel and dentine more resistant to dental caries and dental erosion will be outlined. The concept of third generation (3G) prevention will be introduced, and clinical examples given of the effectiveness of leading edge remineralization therapies such as CPP-ACP in establishing and maintaining a healthy oral biofilm in compromised patients, and in arresting and reversing enamel and root surface caries in oncology patients.

**PLENARY 8****Future Directions of Public Oral Health in Asia***Hiroshi Ogawa**WHOCC, Niigata University, Japan*

While general improvements in oral health have been observed among people of industrialized countries over the past few decades, oral diseases remains a global problem, particularly among disadvantaged populations in Asian countries. Dental caries and periodontal diseases are among the most widespread conditions, and the prevalence of other conditions, such as

dental erosion, is on the increase. The effects of oral cancer and noma can be devastating. Tooth-loss, as a result of oral disease and trauma caused by accidents and injuries may have a profound impact on quality of life, nutritional intake and growth and development in children. Inequities in oral health remain widespread between and within countries, and often mirror inequities in general health. These inequities vary in magnitude and extent, and are becoming more marked in the Asian region.

The mechanism and pathways related to oral health are complex and interlinking, with economic, psychosocial and behavioural factors all playing a role, as well as more specific factors such as access to oral health services, provision of safe water and sanitation facilities, optimal exposure to fluorides, availability of oral health products and healthy food supply. Risk factors for oral disease are also relevant to general health, and equally, social determinants of other diseases and conditions have oral health significance.

Accordingly, the oral health strategy should be aimed at guiding a coordinated, multisectoral, public health action of regional countries, and increasing commitment towards the promotion of oral health and the prevention and control of oral diseases.

This presentation will highlight the current situation of oral health policies and the strategies required for setting up public health-oriented action including strengthening of oral health workforce and infrastructure in Asia based on the WHO Global Oral Health Strategy.

**PLENARY 9****Clinical Diagnosis & Management of Caries : evidence vs prudence from a clinician's perspective***Hien Ngo**University of Queensland, Australia*

Our current understanding of the cause of caries has changed to the extent that we need to design new ways to combat this disease. It is now known that caries is caused by oral biofilms rather than planktonic microorganisms. Biofilms that colonize the oral cavity are extremely complex in nature and a bacteria living in this environment express properties different from when it lives in planktonic culture. To control caries, clinicians have to approach at tooth, oral environment and behavioral levels. The translation between science and clinical practices is difficult and the challenge facing clinicians is still the delicate balance between evidence and prudence. This lecture will explore the above issues and possible solutions.

## SYMPOSIUM ABSTRACTS

	<b>SYMPOSIUM 1: Fluoride Usage in Asia</b>
1	Professor Emeritus Prathip Phantumvanit (Thammasat University, Thailand) <i>Effective use of fluoridated toothpaste in all age</i>
2	Professor Siego Kobayashi (Nihon University, Japan) <i>Tribulation and Challenge toward the Re-implementation of Community Water Fluoridation in Japan</i>
3	Professor Dato' Ishak Abdul Razak (University of Malaya, Malaysia) <i>Optimum Fluoride Concentration in drinking water in Malaysia: What evidence do we have?</i>
	<b>SYMPOSIUM 2: Measurements in Oral health</b>
4	Professor Seung-Chul Shin (Dankook University, Korea) <i>Prevention-Oriented Dental Care System by Use of Individual Oral Health Index</i>
5	Dr Allan Pau (King's College London, University of London, UK) <i>The Use of Social Marketing Model in Promoting Oral Health Messages</i>
6	Professor Rosnah Zain (University of Malaya, Malaysia) <i>Ensuring Credible Research Output for Oral Cancer Research – the Malaysian Oral Cancer Database and Tumour Bank System(MOCDTBS)</i>
	<b>SYMPOSIUM 3: Periodontal Disease Prevention</b>
7	Professor Wai Keung Leung (University of Hong Kong) <i>Periodontal Disease Management – Our Patients' Perspectives</i>
8	Professor Emeritus Tatsuo Watanabe (Okayama University, Japan) <i>A New Concept of Periodontal Disease Prevention</i>
9	Professor Tara Bai Taiyeb (University of Malaya, Malaysia) <i>Preventive Interventions in the Control of Periodontal Diseases</i>
10	Dr Honda Shunichi (Japan) <i>Bad Breath and Halitosis as Defined by The Japanese Academy of Malodor Syndrome(JAMS)</i>
	<b>SYMPOSIUM 4: Oral Health Care Product Evolution [LION Sponsored Symposium]</b>
11	Professor Masaki Kambara (Osaka Dental University, Japan) <i>Importance of Dentifrice In Future Dentistry</i>
12	Professor Yong-Duk Park (Kyung Hee University, Korea) <i>Role of Oral Care Products Containing IPMP and GK2 for Promotion of Oral Health</i>
13	Dr Armasatra Bahar (Universitas Indonesia, Indonesia) <i>Remineralisation of Enamel Lesions by Dentifrice Containing Nano-sized Calcium Carbonate</i>
14	Dr Shahida Mohd Said (Universiti Kebangsaan Malaysia) <i>Herbal Oral Product Usage and Research Development in Malaysia</i>
	<b>SYMPOSIUM 5: The Gray Population of Asia: Oral Health Issues</b>
15	Assoc Professor Tengku Aizan Hamid (Universiti Putra Malaysia) <i>Oral Health and Quality of Life of Older Persons in Asia: The Malaysian Experience</i>
16	Assoc Professor Hiroshi Ogawa (WHOCC for Translation of Oral Health Science, Niigata U, Japan) <i>Oral Health Promotion for the Asian Older Population - Challenges and Vision for the Future</i>
17	Assoc Professor Robert Yee (National University of Singapore) <i>Singapore's Silver Tsunami and Oral Health</i>
18	Assoc Professor Patchawarana Srisilapanan (University of Chiang Mai, Thailand) <i>What we have done to improve oral health and health of the Thai older people: a sharing of experiences.</i>

<b>SYMPOSIUM 6: Preventive Dentistry and Oral Health Literacy</b>	
19	Professor Yoko Kawaguchi (Tokyo Medical & Dental University, Japan) <i>Visual Oral Health Literacy For Effective Oral Health Promotion</i>
20	Professor Rahimah A Kadir (Universiti Kebangsaan Malaysia, Malaysia) <i>Does Preventive Dentistry have sufficient emphasis in our dental education Curriculum?</i>
21	Professor Keung Leung (South East Asia Association for Dental Education) <i>Enhancing Prevention via SEAADE Scientific Program</i>
22	Dr Nurul Asyikin Yahya (Universiti Kebangsaan Malaysia, Malaysia) <i>Tobacco Cessation Program: A Must in the Undergraduate Curriculum</i>
<b>SYMPOSIUM 7: Dental operating Clinicians: The Backbone of Dentistry</b>	
23	Winthrop Professor Marc Tennant (University of Western Australia) <i>Building a better workforce: A 10 year experience in Australia.</i>
24	Dr Chia Set Hoong (Oral Health Division, Ministry of Health, Malaysia) <i>Success of Incremental dental Care in Malaysia - The Role of Dental Nurses</i>
25	Professor Yeon-Sun Chang (Dankook University, Korea) <i>Role and Contributions of the Dental Auxiliaries in Improving Oral Health in Korea</i>
26	Professor Dato' Wan Nasir Wan Mohamed (Universiti Sains Islam Malaysia) <i>Enhancing Oral Healthcare Delivery Through Extended Role of Dental Nurses</i>
<b>SYMPOSIUM 8: Promoting Oral Health In The Communities</b>	
27	Dr Sunsanee Rajchagool (Intercountry Centre for Oral Health, Thailand) <i>Towards Achievement Indicators Of Community Oral Health Promotion Program</i>
28	Dato' Dr Norain Abu Talib (Oral Health Division, Ministry of Health, Malaysia) <i>Promoting Oral Health in The Communities: The Malaysian Experience</i>
29	Assoc Professor Zhuling (Peking University School of Stomatology, China) <i>Effects of Periodontal Health and Related Factors on the Oral Health-Related Quality of Life Acquired by GOHAI in Type 2 Diabetic Patients with Chronic Periodontitis</i>
30	Dr Zaura Anggraeini (Indonesian Dental Association, Indonesia ) <i>Promoting Oral Health In Communities: the Indonesian Experience</i>
<b>SYMPOSIUM 9: Oral Health for Special Needs</b>	
31	Assoc Professor Bazaar Amarsaikhan. (Health Sciences University of Mongolia, Mongolia) <i>Situation of Disabled Children's Oral Health Care in Mongolia</i>
32	Dr Noraini Nun Nahar (Institute of Paediatrics Kuala Lumpur, Malaysia) <i>Oral Health Care For Children With Special Needs In Malaysia : Issues And Challenges</i>
33	Professor Asyima Goyal (Oral Health Sciences Centre, PGIMER, Chandigarh, India) <i>Preventive Oral Health Care in Children with Cleft Lip &amp; Palate – Aiming the Target</i>
34	Dr Liza Centeno <i>Challenges in Preventive Clinical Practices for Patients with Disabilities</i>
<b>SYMPOSIUM 10: Addressing Concerns in Other Oral conditions</b>	
35	Dr Ida Ayu Astuti (Universitas Padjadjaran, Indonesia) <i>The Prevention of Stigma Formation in Cleft Surgery</i>
36	Assoc Professor Roszalina Ramli (Universiti Kebangsaan Malaysia) <i>Is the motorcycle helmet really effective?</i>
37	Dr Callum Durward (International University, Cambodia) <i>NGO-Prison-Student Smart-partnership in Oral health care for prisoners in Cambodia.</i>
38	Col Dr Sharifah Azlin Juliana Syed Zainal (Malaysian Arm Forces) <i>Deployment During Disaster: Who's Doing What?</i>

## SYMPOSIUM 1

### Effective Use of Fluoridated Toothpaste in All Age

*Prathip Phantumvanit*

*Thammasat University, Thailand*

Individuals can benefit from fluoridated toothpaste for caries control. Effective use of fluoridated toothpaste is an essential approach to prevent both dental caries and dental fluorosis. Based on the systemic reviews, the effectiveness of fluoridated toothpaste increases with higher fluoride content, higher frequency use and supervised tooth-brushing. In children, there is no conclusion that use of fluoridated toothpaste could cause dental fluorosis, should they use the proper amount of fluoridated toothpaste according to their age. Even in young children, there is no association between the frequency of tooth-brushing with fluoridated toothpaste used and fluorosis. It is concluded that fluoridated toothpaste is safe for the population whether living in low, normal or high natural fluoride areas. Tooth-brushing with fluoridated toothpaste in the Health –Promoting schools are the most appropriate and cost-effective environment which might lead to their family and community. Meanwhile, correct practice by tooth-brushing with fluoridated toothpaste for 2 minutes followed with minimal or no water mouth rinsing can provide higher fluoride on the tooth surfaces to counter demineralization and enhance remineralization and thus facilitate the effectiveness. However, tooth-brushing with fluoridated toothpaste twice a day, especially at night, is strongly recommended for keeping fluoride contacted with tooth surfaces for a long period of time during sleep. Effective fluoridated toothpaste must contain certain amount of free fluoride ion to be active for reaction in the oral cavity. Even though the accepted amount of fluoride in over-the counter toothpaste is up to 1,500 ppm but there is some high fluoride toothpastes recommended for high risk root caries in elderly. Fluoridated toothpaste should be considered as health product and therefore be tax exempted and cost affordable to everybody and elsewhere.

### Tribulation and Challenge toward the Re-implementation of Community Water Fluoridation in Japan

*Seigo Kobayashi*

*Nihon University, Japan*

In Japan, there were three past experiences of WF from 1952-1972. In spite of the world wide overwhelming evidence that show the benefits and safety of WF, there have been no adjusted fluoridated areas in Japan since the discontinuation of WF in Okinawa in 1972. A lack of knowledge about the fluoride science and the public health mind among not only the common people but also dental professions might be main reasons of the darkness of WF in Japan. Dental caries has been decreasing for decayed, and the topical uses of fluoride: tooth paste, topical application, and mouth rinse, are spreading gradually throughout Japan, though the prevalence of dental caries is still high compared with highly industrialized western countries. About 40 years ago, recognizing the fact that WF is the most powerful public health measure to prevent caries, it was the time when we decided never give up to implement WF in Japan. Real situation in Japanese Dentistry will be introduced, and to make our challenge true, how to build

the public policy, how to educate the common people, how to serve the technical support including the newly developed fluoride saturator to WF will be discussed.

### Optimum Fluoride Concentration in Drinking Water in Malaysia: What Evidence Do We Have?

*Ishak Abdul Razak<sup>1</sup>, Tan Bee Siew<sup>2</sup>*

*<sup>1</sup>University of Malaya Malaysia, <sup>2</sup>International Medical University, Malaysia*

Since the introduction of water fluoridation worldwide, the benefit and efficacy of water fluoridation has been well documented. In Malaysia water fluoridation was started in 1957 at a level of 0.7ppm through a Cabinet Committee decision. Following this the benefit of water fluoridation in terms of caries reduction has been proven in the Malaysian population. In spite of its proven benefits, several concerns have been raised regarding its efficacy and safety in Malaysia. An important concern among professionals is the issue of dental fluorosis. Several surveys that have been undertaken in Malaysia on the fluorosis status have found that it is of medium public health significance. The lack of comprehensive study on total fluoride intake in Malaysia has hampered the scientific determination of the optimal fluoride concentration for drinking water. One such study was undertaken to assess the total fluoride intake of subjects from a variety of sources in order to provide evidence based decision on the optimal concentration of fluoride in drinking water. This study found that the relative (%) contribution from the main sources to the total daily fluoride exposure was 37.7% from drinking water, 15.4% from ingested dentifrice and 47.0% from dietary sources. On the individual perspective there were significant association between total fluoride exposure and fluorosis. However when the data were analyzed separately for the various sources of fluoride, only fluoride exposure from drinking water showed significant association. This study found that the optimal concentration of fluoride in drinking water should be downgraded to 0.5 ppm to achieve its anti-carries benefit while limiting fluorosis to acceptable level.

## SYMPOSIUM 2

### Prevention Based Incremental Dental Care System by Use of Individual Oral Health Index

*Seung-Chul Shin*

*Dankook University, Korea*

Even though it has been emphasized the preventive dentistry in clinical, it is hard to be realized to change for the ideal dental care trends as prevention first, treatment back-up. In most capitalism countries. That is not due to the problem of dental ethics for dentists but for the system of dental payment under the fee per item of service system. The comprehensive fee or capitation fee system for preventive cares and the incremental dental care system are recommended to realize real promotion of the oral health for patients, through the contracting for patient's oral health management per year, with the individual oral health management fee.

Under the system, it is needed for the individual oral health index to be developed, in order to decide the annual management fee for each patient, with the evidence based and simple for apply in clinical. Such equipments as oral camera, panorama x-ray, phase-contrast microscope and some caries activity test units can be used in oral exam and computer program is developed for analyzing and calculating the data for estimation of the individual oral health index. The clinical application of the newly developed and prevention oriented dental care system with establishing the net-work system for the joining membership clinics, to change the dental care trends in Korea, will be introduced.

### The Use of Social Marketing Model in Promoting Oral Health Messages

*Allan Pau*

*King's College London, UK*

Social marketing is the use of commercial marketing principles to influence health behaviours. A key feature is audience segmentation to target people effectively. The MOSAIC market segmentation model divides the market into 15 groups, 67 household types, 141 person types based on socio-demographic/economic and lifestyle characteristics. Data base for the analysis was obtained from the Postal questionnaire survey of Medway, Kent (UK) residents. In all, 3101 (39%) questionnaires were returned. Analysis was carried out to confirm association between health behaviours, which were then mapped to the MOSAIC segmentation model. This presentation will explore the role of MOSAIC market segmentation model in the prevention of oral diseases; how the analysis was carried out and what can be learnt from the findings

### Ensuring Credible Research Output for Oral Cancer Research – the Malaysian Oral Cancer Database and Tumour Bank System(MOCDTBS)

*Rosnah Binti Zain*

*University of Malaya, Malaysia*

Cancers in general exhibits heterogeneity in behavior possibly due to its varied sociodemographic, clinicopathologic and risk factors in different geographical regions. Recent advances in genomics, proteomics and the need for validation of biomarkers study have led to the global development of diseased tissue banks with accompanying data banking of the sociodemographic, clinical, pathologic and management parameters. Many research areas are currently being pursued in all aspects of cancers and precursor lesions including epidemiology and clinical research towards the development of predictive/prognostic models and/or developing specific therapeutic targets for different type of cancers with an ultimate future of personalized management strategies and better quality of life. Thus, accurate data is important to ensure research findings reflect the actual situation. Other than the study designs, the related concerns in trying to have credible research output includes sample population characteristics; data acquisition including criteria set out; sample collection, transportation and storage; and laboratory sample preparation. This presentation will be describing the development of the MOCDTBS in a low-resource country stressing on selected issues pertaining to data collection and storage as part of the normal workflow of each participating dental centre. While there are shortcomings in the sustenance of such banks, some areas of success will be discussed further stressing on the importance of developing and maintaining the partnerships between clinicians, support staff, scientists and epidemiologists from these centres.

## SYMPOSIUM 3

### Periodontal Disease Management – Our Patients' Perspectives

*Wai Keung Leung*  
*University of Hong Kong*

Patient-centered approaches for health care are being advocated for more than half a century. The relationship between oral health and the quality of life was subject of interest for over 20 years. Complex chronic disease of the mouth like periodontitis affects oral health and hence impairs quality of life of a considerable portion of our population. This presentation summarizes our current appreciation of interactions between periodontitis and poor oral health-related life quality. A case series report on oral health-related quality of life change upon non-surgical periodontal therapy will also be reported.

### A New Concept of Periodontal Disease Prevention

*Tatsuo Watanabe*  
*Asahi Medical College Okayama, Japan*  
*Okayama University, Japan*

Periodontal diseases are the main cause of tooth extraction. Loss of teeth means not only reduction of chewing ability but decline in learning ability. There are a lot of dementias in the persons wearing full denture. The learning ability of old rats is reduced by grinding their teeth, and is not recovered after the restoration. Mechanoreceptors in periodontium do not function and it can explain this phenomenon. To keep our own teeth for whole life is a key to improving quality of life.

Unfortunately no preventive nor treatment methods of periodontal diseases had changed in the last 60 years. These are toothbrushing instruction, scaling and root planning, periodontal pocket elimination, etc. The conventional concept of periodontology is removal of periodontal pathogens and resection of the focus. However, infectious diseases happen because of mutual reaction of the host and the pathogens and, improving host resistance for the bacteria had been forgotten.

Gingival bleeding, an ulcer of periodontal pocket epithelium, is an external bleeding. When this happen, the basal cells should proliferate to cure the ulcer. Mechanical stimulation of toothbrushing on gingiva promotes not only basal cells proliferation but also fibroblasts and endothelial cells proliferation. The cell proliferation happens best when stimulated by 200 grams of force for 10-20 seconds with toothbrushing. The cell proliferation is observed only in the place where the tips of toothbrush are hitting. It does not proliferate when parting 0.5 mm. It is necessary for the toothbrush tip to reach into interdental gingiva to improve the gingival inflammation of all peripheries of a tooth. A new toothbrushing method, "Toothpick Method" to insert bristles into interdental area was developed. Toothpick method is extremely effective in the gingival bleeding. The number of periodontal pathogen decreases if gingival bleeding stops, because blood is an essential nutritional factor.

Toothpick method also improves mobile teeth and mal odor, and your mouth feel refreshed. Toothpick method is better to be handled by professionals who know a new recovery mechanism of periodontal diseases. Also an electric toothbrush is a good stimulator to gingiva, but it might be too strong.

### Preventive Interventions in the Control of Periodontal Diseases

*Tara B. Taiyeb-Ali*  
*University of Malaya*

The prevalence of periodontal disease remains high despite a decrease in other dental diseases especially dental caries. The prevalence of advanced periodontal diseases in many populations remain high (WHO 2004), there being considerable differences according to racial groups. Findings indicate the need for improvement in the management of periodontal diseases as these have implications on overall general health and wellbeing. Preventive and periodontal procedures are considered in primary and secondary prevention interventions. Professional mechanical plaque removal include scaling or polishing of teeth (or both) at supragingival surfaces, subgingival sites or a combination. Personally performed plaque control is also a vital aspect of this intervention. Subgingival instrumentation comprising scaling and root planing using hand or powered instruments is noted. Adjunctive use of oral antiseptics or chemotherapeutic agents as well as host modulating agents in the reduction of dental biofilm and gingival inflammation respectively particularly in the interproximal surfaces is recommended. The feasibility of surgical periodontal treatment options towards the control of periodontal diseases as secondary preventive approach is indicated.

### Bad Breath and The Halitosis Defined by The Japanese Academy of Malodor Syndrome (JAMS)

*Honda Shunichi*  
*Japanese Academy of Malodour Syndrom (JAMS)*  
*Japan*

Recently, the concern for bad breath has risen very much in Japan. The Japanese Academy of Malodor Syndrome (JAMS) was established by the doctor, the dentist, and researchers of pharmacology and engineering, etc. related to the bad breath research, in 2009. The establishment of the treatment method to the Halitosis is a pressing need with the research to bad breath and the mechanism of the generation of the bad breath gas simultaneously. Especially, an important thing for medical practitioner and patients is in the establishment of the method of treatment of the Halitosis with certain reproducibility. The prevention of bad breath, and the treatment for the Halitosis is quite different. One of the purposes of JAMS, the treatment guideline is made for the Halitosis. In JAMS, the committee of making the guideline of the treatment of the Halitosis that consisted of dentist, the otolaryngology medicine, the physician, and the psychiatrist was established, and the indicator came to be shown every year. Needs for the control of bad breath, and the treatment for the Halitosis are thought to rise by Asian nations with the rise of the concern to the preventative dentistry. The research of bad breath in Asia just started. A new concept to bad breath and the Halitosis defined by JAMS is announced.

## SYMPOSIUM 4

### Importance of Dentifrice in Future Dentistry

Masaki Kambara

Osaka Dental University, Japan

In 21st century, there has been a dramatic shift in oral health of populations in developed countries; people are living longer and retaining more natural teeth. Though dental caries in young people, for example 12 years of age, is decreasing, adults and the elderly have new dental problems like root caries, dentine hypersensitivity and erosion. And also, expectations of long-term oral health and aesthetics appear to be increasing. This means that dentistry must change from risk management for prevention to oral health management, and establish from etiology of oral disease to theory of oral health.

For these change in mouth, especially fluoride dentifrice has been playing an important role. The significant role is to keep the concentration (even few ppm) of fluoride in oral fluid, and to remineralize the incipient caries. However, it is clear that fluoride alone is insufficient to address the problems; a multi-functional formulation is needed. For example, calcium and micro-calcium are associated to reduce DMFT, erosive potential. Anti-bacterial agents like triclosan and IPMP, and anti-inflammatory agents like GK2 are beneficial for gingival health and anti-malodor.

The lifestyle with personal oral care products, daily oral hygiene routines and eating-habits become more important for sustainability of oral health.

### Role of Oral Care Products Containing IPMP & GK2 for Promotion of Oral Health

Yong-Duk Park

Kyung Hee University, Republic of Korea

It is widely agreed that current therapeutic oral care products had played an important role in prevention of oral diseases in addition to the fundamental functions such as cleaning tooth surfaces and providing refreshment in oral cavity. It also has been widely recognized as an efficient delivery system of active agents and its cost benefits in oral health promotion.

In 1999, FDI established a guidance on the assessment of the efficacy of toothpaste and listed 7 categories as the therapeutic toothpaste. And dental caries and periodontal diseases are not objected to be main targets in the prevention of oral diseases.

As for gingivitis, many anti-inflammatory agents are employed as active agents to improve gingival condition. For reducing the pathogenecity of plaque, anti-bacterial agents had been used. And recently, oral care products like dentifrices and mouthwash containing anti-bacterial agents in combination with promoting ingredients of them have been marketed claiming improving of gingivitis relating conditions; by penetrating bactericidal effect.

This presentation will also discuss on the appropriate selection depending upon each individual risk and the efficient usage of them in self-care and in corporate-care in association with dental professionals to achieve higher quality of oral health.

### Remineralization of Enamel Lesions by Dentifrice Containing nano-sized Calcium Carbonate

Armasastra Bahar

University of Indonesia, Indonesia

Enamel lesions happened due to the demineralization process that caused by loose calcium, phosphate, hydroxide and fluoride ions. The process followed by remineralization which will occur preferentially at the surface due to the increasing level of  $\text{Ca}^{2+}$  and  $\text{HPO}_4^{2-}$  ions, fluoride ions, and buffering effect of saliva products. Fluoride has been used in caries-preventive mechanism that could be explained by the increased driving force of the fluoridated apatite precipitation. Calcium compounds such as calcium glycerophosphat and calcium carbonate has been employed, especially in dentifrice formulation.  $\text{CaCO}_3$  abrasive could enhance the effect of fluoride that present in dentifrice in dental caries control. The dentifrice containing  $\text{CaCO}_3$  was more effective in reducing enamel demineralization and enhancing the enamel remineralization. The specific surface area of the nano-sized calcium would be extremely large because of its nano-sized particles compared with calcium carbonate powders for dentifrice abrasive. The rate of dissolution of nano-sized calcium would be much faster than any other calcium carbonate products. Dentifrice containing nano-sized calcium carbonate is potential in remineralizing the incipient enamel lesions due to the unique properties of nano-sized calcium carbonate, which is retained on oral surface, that cause releasing calcium ions into oral fluids.

### Herbal Oral Product Usage and Research Development in Malaysia

Shahida Mohd Said

Universiti Kebangsaan Malaysia, Malaysia

Malaysia, as a multicultural nation with various enduring medicinal practices has been using specific plants for health benefits for many generations. Medicinal herbs are naturally available and their rich biodiversity has spurred the usage of crude or manufactures herbal products, mostly as traditional and complimentary medicine. Based on proclaimed trust and safe traditional practices so far, there is an apparent demand by the consumers to obtain herbal oral products for their daily usage thus, supporting the sales of herbal oral products more recently. This also encourages the development of research to investigate the properties of specific local herbs to prove scientifically their effectiveness, mostly as anti-plaque and antibacterial agents. However, research advances are still young to conclude or recommend any clinical efficiency of these herbs for dental use. Furthermore, many dentists are still unaware and/or sceptical of the advantages. While safety, efficacy and quality remain the standard of measurement for all health products, more scientific evidence are needed to convince dental professionals of the added benefit of herbal medicine and herbal oral products in dental practice. This presentation will highlight the usage, perception of dental practitioners, advances and challenges of research in the development of herbal oral products in Malaysia.

## SYMPOSIUM 5

### Oral Health and Quality of Life of Older Persons in Asia: The Malaysian Experience

*Tengku Aizan Hamid*

*Universiti Putra Malaysia, Malaysia*

Many developing countries in Asia are experiencing demographic and epidemiological transitions driven by changes in the population. According to the United Nations (2009), the number of older persons aged 60 years or over in Asia will increase from 414 million in 2010 to 1 billion in 2040, and the proportion of older persons will double from 9.9% to 20.1% in the next three decades. With population ageing, the importance of oral health and dental care takes on a lifelong significance. Although oral health is an integral part of general health and a key determinant of well being in old age, it is often neglected and overlooked in many developing countries. Malaysia has a National Oral Health Plan (2002, 2010) which outlined specific goals for each age group and guidelines have been developed for the national oral health care program for the elderly which began in 1993. While the importance of geriatric oral health has been widely documented and rarely disputed, there has been very little empirical work to examine the impact of population ageing on dentistry as a whole. As oral health needs will increase with population ageing, the prevention and treatment of dental diseases require close collaboration with all stakeholders to achieve “a lifetime of healthy smiles”.

### Oral Health Promotion for the Asian Older Population - Challenges and Vision for the Future

*Hiroshi Ogawa*

*Niigata University, Japan*

By 2050, the population of those 65 years or older in Asian countries is increasing up to 17.5%. The WHO Global Oral Health Programme has emphasized that oral diseases are age related, that risk factors of chronic disease are common to most oral diseases. Oral health is an integral part of general health and an important component of QOL. Chronic diseases are more prevalent in the older population, whose age-associated physiological changes may deprive them of their mobility and independence. Clinical and public health research has shown that a number of individual, professional and community preventive measures are effective in preventing most oral diseases. However, advances in oral health science have not yet benefited the poor and disadvantaged populations, especially older people. The major challenges of the future will be to translate knowledge and experiences in oral disease prevention and health promotion into action programmes. This presentation will highlight the evidence on oral-general health relationship that is important to WHO in its efforts to strengthen integrated oral health promotion and disease prevention.

### Singapore's Silver Tsunami and Oral Health

*Robert Yee*

*Singapore National University, Singapore*

Singapore's population of the elderly (aged 65 years and older) has grown dramatically since the country gained independence in 1965. In 1970 the elderly comprised 3.4% of the population and this proportion has grown to 9% in 2010. By 2030 the proportion has been projected to be 20-23% of the population, placing Singapore with the second highest percentage in Asia lagging only behind Japan. One of the major concerns is that health care costs will increase as the proportion of elderly in Singapore also increases. At the same time one of the strategic thrusts of healthy ageing is to provide holistic and affordable eldercare. This presentation will highlight the demographic trends, the oral health problems, and the challenges to oral health care delivery for the elderly in Singapore.

### What we have done to Improve Oral Health and Health of the Thai Older People: A Sharing of Experiences

*Srisilapanan P*

*Chaing Mai University, Thailand*

Thailand is moving towards an ageing society. By the year 2025, 20 percent of the total population has been above sixty years old since 2004. This proportion will increase to 20 percent by the year 2025. 10.5 percent of people aged 60 and above were edentulous. This presentation will include the oral condition of the Thai elderly under the Thai cultural and socio-economic situation. Two case studies will be presented. The Royal Denture Project launched by the Thai Government to provide complete dentures or removable dentures to those who needed for free to commemorate his Majesty the King 80th Birthday. This project aimed to improve the inequity in accessing the oral care and to improve the oral health of the Thai elderly. The oral health related-quality of life of the recipients under this project will be presented. The second case study will illustrate the development of the area-based health care information system at the community health centre to monitor the key health indicators of the elderly at the village level. Oral health indicator has been integrated into this area-based health care information system. The community participation and the multidisciplinary approach were the main approach in this project.

## SYMPOSIUM 6

### Visual Oral Health Literacy for Effective Oral Health Promotion

*Yoko Kawaguchi*

*Tokyo Medical and Dental University, Japan*

Health promotion is the process of enabling people to increase control over, and to improve, their health. Therefore health education is an important and crucial component of health promotion. In the dental clinics and the communities, dental professionals spend a lot of time in educating their patients, and the public, on the value of good oral health. However a lack of consensus in knowledge and understanding between the patients/ people and dental professionals is often observed in the health communication.

Health literacy is defined as “the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.” Dental professionals must always take into account of health literacy of the target population, when they provide oral health education programs.

Unlike other diseases, people can directly see and recognize the symptoms of dental caries and periodontal diseases, two major oral diseases. Looking into the mirror, people can easily see the interdental caries region, white spots or colored grooves, and red and swollen gums. Therefore it is possible to detect the disease at an early stage. Because of these special characters, oral health promotion activities have the advantage in motivating people to stop unhealthy behaviors and to prevent development of oral health hazards.

Health literacy is a relatively new concept especially as it relates to oral health. There have been little reports on oral health literacy. To conduct effective oral health education and promotion programs, it is necessary prior to access the oral health literacy level of the people. I would like to introduce a simple and easy method for measuring “Visual Oral Health Literacy”, which we developed for schoolchildren.

### Does Preventive Dentistry have sufficient emphasis in our dental education Curriculum?

*Rahimah Abdul Kadir*

*Universiti Kebangsaan Malaysia, Malaysia*

The knowledge and practice of prevention goes as far back as ancient times. In dentistry, prevention concepts and applications have always been part and parcel of dental management. Unfortunately, emphasis on the preventive dentistry or/and dental public health modules varies from one dental education system to another or from one university to the other. In the Malaysian dental curriculum, preventive dentistry and dental public health components enjoyed an almost equal proportion of emphasis and allocation of teaching-learning scheduled slots as the other components (preclinical, clinical and hospital dentistry). This presentation will highlight on how this is done in the UKM dental curriculum throughout the five years.

### Enhancing Prevention via SEAADE Scientific Program

*Wai Keung Leung*

*South East Asia Association for Dental Education*

Successful oral health care delivery at individual and population levels relies heavily on ability of health care workers and related parties to communicate exactly the correct message to clients. The correct decoding of the messages given, however, relies heavily upon the appreciation of the literacy level of the receiver’s end. Dental educators and researchers gradually realize the challenges and complexities of this problem in the past decade. In culturally and politically diverse region like the Southeast Asia, such problem would be difficult to address yet the collective experiences in tackling the challenge shall be a great asset. This presentation attempts to review the challenges we are facing while showcasing the attempts of Southeast Association for Dental Education (SEAADE) in the past regarding contribution to oral health care literacy at this region.

### Tobacco Cessation Program: A Must in the Undergraduate Curriculum

*Nurul Asyikin Yahya*

*Universiti Kebangsaan Malaysia, Malaysia*

Since the early 1970s dental professionals have become increasingly aware of the damage that tobacco causes to tissues in and around the oral cavity. Dental professionals are in an ideal position to give their patients specific, authoritative information concerning the adverse oral effects of tobacco use. The effectiveness of tobacco cessation interventions may be influenced by a variety of patient characteristics, including level of nicotine addiction, barriers and readiness to change. As members of an important health profession, dentists have a duty to promote healthy lifestyles among their patients, and are increasingly being urged to use their contacts with the public to support tobacco cessation policies and prevent the uptake of tobacco habits by those not yet habituated, particularly children and adolescents.

This interactive lecture will cover the current global and local tobacco epidemic, understanding of the nicotine addiction and smoking behavior. Most importantly, this lecture will also discuss on the dentist’s role in helping their patients to quit smoking and ways to do it by the chair side through evidence-based dentistry

## SYMPOSIUM 7

### **Building a Better Workforce: A 10 year Experience in Australia**

*Winthrop Marc Tennant*

*University of Western Australia*

Over the last decade Australia has nearly double the number of dental schools. This has seen a very rapid evolution in the way dental personnel including dental auxiliaries are trained and the type of skills they enter the workforce with. This rapid educational evolution has been against a background of growing workforce shortages and a widening gap in social equity in dental health. Professor Tennant will talk about the extreme issues of geography and social inequality that impact Australia and how this has impacted on the changing face of dental workforce participation in Australia. In addition, he will discuss the predicted future directions and opportunities for further closing the gap in social equality in Australian oral health.

### **Success of Incremental Dental Care in Malaysia: Role of Dental Nurses**

*Set Hoong Chia*

*Oral Health Division, Ministry of Health Malaysia*

Malaysia has a good track record of wide coverage of schoolchildren by the public sector school dental service. Systematic and comprehensive oral healthcare is given to primary and secondary schoolchildren using the Incremental Dental Care (IDC) approach. This is defined by Dunning as "... periodic care so spaced that increments of dental diseases are treated at the earliest time consistent with proper diagnosis and operating efficiency, in such a way that there is no accumulation of oral health needs beyond the minimum." The outcome is towards achieving orally-fit status of all schoolchildren by the time they leave school. The school dental services reached 97% of primary and 75% of secondary school children in 2009. This was largely achieved through the outreach strategy which embodies patient-focused care by delivering care to where it is needed. Mobile teams utilising portable equipment, have brought oral healthcare to even the most remote schools. Complementing these are mobile dental clinics (MDC), which are self-contained dental clinics-on-wheels, fitted with the latest dental equipment. There are now 404 mobile dental teams and 20 MDCs. These strategies have led to significant improvements in oral health of schoolchildren. The latest 2007 national schoolchildren shows that about 60% of 12-year-olds and 40% of 16-year-olds are free from dental caries compared to 17% and 15% respectively that was reported in the first epidemiological survey of schoolchildren done in 1970-1971. Presently more than 4.5 million schoolchildren in about 9,500 primary and secondary schools all over the country benefit from the school dental service. All this has been made possible with the support of a team of about 2000 dental nurses who form the backbone of our outreach IDC programme for schoolchildren

### **Role and Contributions of the Dental Auxiliaries in Improving Oral Health in Korea**

*Yeon-Soo Chang*

*Dankook University, Korea*

Dental workforce is classified as dentist, main dental labor force and dental hygienist, laboratory dental technician, and dental assistant. In, Korea, about 25,000 of the dentists, 30,000 of the dental hygienists, 20,000

of the dental technicians and 15,000 assistant nurses are working at the dental clinics or dental hospitals at present. Such problems for each dental workforce as, 2 types of educational system in dental school for dentist, mainly focusing on dental assisting for roles of dental hygienist, trying for establishing the independent laboratory office for dental technician, and no system established in dental assistant for assistant nurse, are existence to be solved one by one in Korean dental society, even though they have been thought to contribute the promoting the oral health for peoples. The deficiency of the working numbers of dental auxiliaries except the dental technician has been shown for many years, because that a lots of them have stopped the works by improper roles for them. It should be suggested for the adequate roles for each of them as oral health education and the preventive dentistry for dental hygienist, focusing on preventive dental clinics as well as on public oral health programs and the chair side dental assisting works for dental assistant by establishing the system in legal, and should try to extend their roles gradually, in order to do with the co-operation together and got them pride in dental works, to contribute the real promotion of the oral health for community people.

### **Enhancing Oral Health Care Delivery through Expanded Function of Dental Nurses**

*Wan Mohamad Nasir WO*

*Universiti Sains Islam Malaysia*

The School Dental Service is the principal programme activity of the Oral Health Division, Ministry of Health Malaysia. It has ensured access to care for school children through a network of oral health care settings and the use of dental nurses. The objective of this presentation is to relate the use of dental nurses and their expanded functions with their impact on overall oral health care system. Dental nurse is a group of oral health care personnel that was introduced more than six decades ago to complement the work of dentists. There were very few dentists then, and the oral health conditions of the children were described as "appalling". Some of the simple and repetitive tasks of the dentists were delegated to the dental nurses but their scope of work was limited to children up to 12 years old and confined within public oral health care services. The effectiveness of dental nurses to address access to care has led to the increase in the scope of work to cover school children 17 years old and below but the array of procedures permitted to be carried out by them remain unchanged. It was only after the curriculum review of the dental nurses programme in mid-1990s that a few more procedures were added to their list of duties to commensurate with the level of qualification from certificate to diploma level. With this expanded function, they were able to provide a more comprehensive care to the school children without having to refer to the dentist. This provides the dentist with more opportunities to concentrate on more complex care in the overall public oral health care system. It was also about this period that their tasks were expanded to include "specialisation" in specific disciplines to assist dental specialists. It has shown to improve efficiency in provision of specialised oral health care. The policy to expand of the functions of dental nurses through delegation of duties at primary care and secondary care levels have enhanced delivery of oral health care through improved assess, efficiency, effectiveness and adequacy in oral health care for targeted populations.

## SYMPOSIUM 8

### TOWARDS ACHIEVEMENT INDICATORS OF COMMUNITY ORAL HEALTH PROMOTION PROGRAM

*Sunsanee Rajchagool<sup>1</sup>, Nonglak Pancharuniti<sup>2</sup>  
<sup>1</sup>ICOH, Chiang Mai, Thailand, <sup>2</sup>Mahidol University Thailand*

The reduction of oral disease prevalence is indisputably self-evident in oral health measurement. But what is disputable is that it is the sole achievement indicator of the community promotion program. If the oral health status of a community is to be on target, the clinical indication is insufficient.

Although to realize the desirable outcome of a target group in a community requires a long period of efforts, it is within a possible array of our health workers. During the period in question, it was necessary to employ a variety of means to implement the health promotion program. The health workers had to run it, "pull & push" actions had been judiciously applied. Faced by changes within and outside their control, the health promoting actions constantly needed modification. More input was necessarily called for when the program was to be extended to other communities. As the program progressed and the success seemed to be at hand, but, as it often happened, once we stopped everything stopped.

These experiences could well compel us to reconsider the question of achievement indicator of the community promotion program. There need to take into account the following variables, namely,

- If community health is dependent on a government-run program, the problem of self-reliance and of sustainability arise;
- Once the communities have been armed with 'why and how to' of oral healthcare, their adaptability to changed situations can be indicative of the program's success;
- The possibility of the extension of the program in other communities by their own initiatives is a viable testing criterion of the originally-initiated one;
- As the course of the program unfolds, 'whose roles (healthcare personnel's or community's) are more prominent' can be regarded as a judging question to gauge its success;
- The community's enthusiasm to the program is probably a key indicator of its success.

These considerations are an attempt to break away from the traditional public health approach. Additionally there is a real need to create mutual agreements among oral health promoting teamwork regarding the achievement indicators. So that a clearer vision of the outcome, the direction of the tasks, and related requirements could be carried out for good planning and for the making of key competency criteria.

The presentation will discuss these issues in the light of experiences from Thailand.

### Promoting Oral Health in the Communities: The Malaysian Experience

*Norain Abu Talib  
 Oral Health Division, Ministry of Health Malaysia*

Promoting oral health in the community is embedded in the mission of the Oral Health Division, Ministry of Health Malaysia in our effort to enhance quality of life for the population through the promotion of oral health with emphasis on patient-centred care and the building of partnerships for health. Oral health promotion activities are an integral part of primary oral healthcare. Oral health programmes are in place for various target groups which range from antenatal mothers, toddlers and schoolchildren, to the elderly and people with special needs. To support wider community participation we have moved from providing oral health training to trainee teachers to also conducting oral health seminars for preschool teachers, childcare providers and child health nurses. Using the common risk factor approach is given added emphasis by training oral health personnel in tobacco cessation and working closely with other agencies in campaigns to promote less sugar consumption. Activities

are targeted towards promoting individual responsibility and community participation so as to further encourage self-care for maintenance of good oral health.

### Effects of Periodontal Health and Related Factors on the Oral Health-Related Quality of Life Acquired by GOHAI in Type 2 Diabetic Patients with Chronic Periodontitis

*Zhu Ling  
 Peking University School of Stomatology, China*

**Objective:** evaluate the oral health-related quality of life (OHRQOL) acquired by geriatric oral health assessment index (GOHAI) in type 2 diabetic patients with chronic periodontitis, and to explore the effects of periodontal health and related factors on OHRQOL. **Methods:** A total of 80 type 2 diabetic patients with chronic periodontitis who had at least 16 teeth and never accept any periodontal therapy in latest one year were recruited. The clinical periodontal index such as probing depth (PD), attachment loss (AL), modified bleeding index (mBI), plaque index (PLI) were obtained with a Williams type periodontal probe. All accepted structured questionnaire interview including the evaluation of OHRQOL by GOHAI. **Results:** The GOHAI results in our study demonstrated good content validity, construct validity and responsibility. The periodontal index had positive correlation with the GOHAI scores ( $r=0.24-0.36$ ,  $P<0.05$ ). Individuals with self-unsatisfied of oral health status, using hypoglycemic drugs, accompanied with serious gingival inflammation and higher attachment loss had relatively poor OHRQOL. **Conclusion:** The OHRQOL of type 2 diabetes with chronic periodontitis and the negative experiences of items listed in GOHAI questionnaire were affected by self-conscious of oral health and periodontal inflammation status

### Promoting Oral Health In Communities: The Indonesian Experience

*Zaura Rini Anggraeni  
 Indonesian Dental Association, Universiti Indonesia*

**Introduction:** Oral diseases is still a major public health problem and its burden is growing in many countries. The importance of good oral health has been widely recognized and when neglected has shown strong correlation with negative impacts on daily performance, general well being, and quality of life. **Challenges:** Oral health as a basic human right as well as part of the millennium development goals calls for commitments of dental profession to improve equity and equality for access to promotive and preventive programs for the community. **Opportunity :** Organization such as AAPD (Asian Academy of Preventive Dentistry), APDF Commission on Public Dental Health, the FDI Development and Public Health Section are potential opportunity for partnership in building national capacities via partnership with the National Dental Association, government, and dental industries. **Indonesian Experience :** Based on National Oral Health survey data it is evident that oral health status in Indonesia showed a general trend of a slow but increasing caries rate while periodontal condition remained to be relatively high. Overcoming the problem should therefore be an integrated action. The first step was the process of synchronizing and harmonizing huge diversities of aims, vision and missions of all stakeholders involved. By building common determinations and with passion, local and national projects have been constantly growing. It earned unexpected positive side effect in that, the Oral Health Promotion Projects has gained supports and wide acceptance within the National Dental Association, Association of Dental Schools, government, industrial sectors and the community in general. Now it has become a trendy movement for endorsing other health promotional issues, and it becomes more effective and efficient compared to that of the conventional government "only" efforts. **Conclusion:** Promotion for Oral Health calls for seriousness in making efforts for building partnership, maintaining and building capacity continuously to ensure that beneficial outcome is sustained in long term.

## SYMPOSIUM 9

### **Situation of Disabled Children's Oral Health Care in Mongolia**

*Bazaar Amarsaikhan*

*University of Mongolia, Mongolia*

In every society children with disabilities are needed to be protected from discrimination, violence and abuse. They need particular attention and care from their families, health and education services as well as the government. According to official data the disabled population in Mongolia accounts for 69000 at present moment, and 12.7 percent of this figure constitutes children 0-19 years of age. Four thousand nine hundred ten (4910) disabled children are between ages 2-9 years. From this, 2436 and 2474 handicapped children are living in urban and rural areas, respectively. From the dental point of view, for the most of these disabled children accessibility to the dental services in our country are limited. Problem-oriented view of dental care for the disabled children in Mongolia urged dental professionals to create policy on the mentioned issue, establish basic dental facilities, conduct ongoing education, as well as to organize staff training as a beginning stage. Therefore, we established in 2008 a dental clinic with specific facilities which belong to School of Dentistry with care of special-needs child. For cleft lip and palate children (CL/P), where at the Mother and Children's Health Research Center, Department of Maxillo-Facial Surgery, provides nationwide team approach services, including CL/P surgeries, operative and orthodontics treatments, speech therapy as well as pediatrics and otolaryngologists services. Also we organized national conference of oral health and disability with leaders of special care dentistry of Asian country such as Japan, Taiwan and Korea These approaches will create positive psychosocial environment for the disabled children to be a part of integral member of society.

### **Oral Health Care for Children with Special Needs in Malaysia: Issues and Challenges**

*Noraini Nun Nahar Yunus*

*Institute of Paediatrics Kuala Lumpur Hospital, Malaysia*

Healthcare for special needs patients is beyond that considered routine and requires increased awareness and attention, specialised knowledge, and for certain cases, modified facilities. Dental care is medically necessary to prevent and eliminate orofacial disease, infection and pain, to restore the form and function of the dentition, and to correct facial disfiguration or dysfunction. It requires a holistic approach that is specialist led in order to meet the complex requirements of individuals with impairments.

In the past there has been a piecemeal approach to the provision of dental care for this group and this situation is reflected in the oral health needs. This piecemeal approach to the provision of dental care has been compounded by an ad hoc approach to the provision of training for dentists who are, or wish to be involved in, the provision of the oral health care of people with impairments or disabilities. Dental management of children with special needs has always been undertaken by the paediatric dentists but the problem lies in maintaining the oral health attained once these children comes of age into adulthood. The provision of comprehensive oral care to meet the complex individual

needs of these people cuts across a number of dental specialties and requires additional specialist knowledge and skills. Further, it requires a community approach in the primary care setting as well as access to a range of treatment facilities to ensure continuity of care in the best interests of the patients. Recognising the limitations, the Oral Health Division of the Ministry of Health Malaysia has taken steps in an effort to promote the highest possible standards of oral healthcare for individuals requiring special care.

This paper will present the background, process and future plans of the Ministry of Health in the provision of oral healthcare to these patients.

### **Preventive Oral Health Care in Children with Cleft Lip and Palate – Aiming the Target**

*Ashima Goyal*

*Oral Health Sciences Centre, PGIMER, Chandigarh India*

The members of the cleft lip and palate team have a single aim to achieve – the complete rehabilitation of the child with cleft. This comprehensive management of a child with cleft is a challenge as compared to routinely managed non-cleft children as these children are at risk of developing dental caries and gingivitis (gum diseases) to a much greater extent as compared to the normal population. This is because of the inherent problems of deformity, difficulty in performing oral hygiene measures, hypo-calcified and hypo-mineralized teeth, complete lack of or inadequate mucogingival fold and different biochemical & microbiological parameters in the oral cavity. A study in real life situation done at our center on 250 children with cleft lip/palate of different age groups over the last few years has revealed three times more dental caries (cavities) and an early onset of gingivitis (gum inflammation) in these children compared to age matched controls. The associated risk factors interestingly revealed that frequency of consumption of cariogenic diet was an important factor in causing dental caries in these children. A comprehensive primary preventive and interceptive oral health care program shall be presented for such children with scientific rationale.

### **Challenges in Preventive Clinical Practice for Patients with Disabilities**

*Maria Liza C. Centeno*

*Paediatric Dentistry Association of Asia*

In the realm of pediatric dentistry practice, clinicians are continually faced with patients having physical or neurologic disabilities. As such, dental practitioners are confronted with the challenges in their oral condition brought about by several factors. Aside from their limitations to physically care for their dentition themselves, oral problems are compounded by diet, masticatory habits and inability to have a good oral home care program. To overcome these challenges, a preventive home care program is their best protection against the incidence of dental caries, periodontal disease and cost of oral rehabilitation.

## SYMPOSIUM 10

### The Prevention of Stigma Formation in Cleft Surgery

Ida Ayu Astuti<sup>1</sup>, Eky Soeriasoemantri<sup>2</sup>

<sup>1</sup>Department of Oral and Maxillofacial Surgery, <sup>2</sup>Department of Orthodontics, Universiti Padjajaran Indonesia

The Indonesian Cleft Palate Foundation was established in Bandung in the year 1979 and the Padjadjaran University, Faculty of Dentistry and Faculty of Medicine were given the mandate to develop it. The foundation was deemed important as Cleft lip and/or palate (CLP) is the 4th most frequent congenital defect in Indonesia. The incidence rate was 1 in 600 – 1000 newborn and varied among races. It was estimated that 7500 cleft cases were born each year to Indonesian families in a country with a population of 230 million. In many cases the malformation affect not only the physical but also the psychology of the patient and the family members since it involved the face with its complex parts of lip, nose, jaw, palate and the function of many organs. Stigma left after primary cleft surgery could affect the physical and psychological quality of life. An accurate and careful handling of every tissue and organ involved in CLP is obligatory. Several particular surgical steps on the lip parts had to be carried out as perfect as possible to prevent further morbidity.

### Is the Motorcycle Helmet Really Effective?

Roszalina Ramli<sup>1,2</sup>, Jennifer Oxley<sup>2</sup>, Peter Hillard<sup>2</sup>, Ahmad Farhan Sadullah<sup>3</sup>, Rod McClure<sup>2</sup>

<sup>1</sup>Universiti Kebangsaan Malaysia, <sup>2</sup>Monash University Accident Research Centre (MUARC), <sup>3</sup>Malaysian Institute of Road Safety Research (MIROS)

Road traffic crash is the second leading cause of death in males in this country (Malaysian Department of Statistics, 2009). For the past ten years, motorcyclists have registered the highest road deaths compared with other road users. Head injuries had been shown to be the most frequent fatal injuries (Kraus, 1989) while facial injuries were shown to occur in one-fourth of all injured riders (Kraus et al, 2003). Despite wearing a helmet, a motorcyclist is still at risk of sustaining craniomaxillofacial injuries, sometimes in its most severe form.

This presentation looks at riding experience and helmet wearing behaviour by interviewing patients who had just been involved in motorcycle crashes. In addition, helmet damage examination and validation component involving full crash investigation on biomechanical test on selected helmets will also be discussed.

### NGO-Prison-Student Smart-Partnership in Oral Health Care for Prisoners in Cambodia.

Durward CS

International University, Cambodia.

Until 2008 prisoners in Cambodia had no access to dental care. Many endured dental pain and infections for months and years. A project to provide basic dental and medical care was introduced by an NGO to meet the needs, and now provides a weekly service in the five prisons close to Phnom Penh, and two-monthly one-week visits to provincial prisons. A recent survey of prisoners showed that most have significant dental needs, especially extractions, restorations and scaling. The prison dental and medical service relies on a large number of volunteer students, who provide most of the required treatment under supervision. This has proved to be a valuable part of their education, and has made the students more aware of marginalized groups in society, and how they can make a contribution to improving the health and quality of life of this neglected group. The Cambodian prison dental service is a good demonstration of how education and public health services can be brought together in a mutually beneficial way.

### Deployment During Disaster: Who's Doing What?

Sharifah Azlin Juliana Syed Zainal

Malaysian Arm Forces

As a health provider, there is a possibility of involvement as part of a humanitarian mission assisting an affected country in times of large scale disasters. Many medical/dental personnel may not be exposed to the "relief" environment and are ignorant of its existing mechanisms. The relief environment will consist of various local and international agencies all working towards the same goal. Therefore, co-operation and communication with the various agencies on the ground are crucial. So what is the co-ordinating mechanism? The function of the UNDAC team is emphasized. The UNDAC team (United Nations Disaster Assessment and Coordination) is a team of experienced emergency managers with varied skills deployed at short notice to a sudden onset emergency. It is requested by, and work under the authority of the United Nations Resident/ Humanitarian Coordinator and when requested, the national Government of an affected country. It serves to provide an international capacity to support cross-sectoral emergency assessment, relief coordination including coordinating international search and rescue teams and information management. By understanding how the relief environment works and especially utilizing information via the UNDAC team, deployed members of the medical/dental team will be better prepared to deliver more effectively.

## FREE COMMUNICATION ABSTRACTS

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1	Dental Computed Tomography for Diagnosis in Endodontics	Siotia J.
2	Osseointegration around Jaw Bone and Implant after Placement of Dental Implant with Ct-Scan	Barunawaty Y.
3	Calibration Trial of WHO Global Standard in Cambodia	Okuyama N.
4	Use of Audience-Response-System (Ars) Technology In Assessing Knowledge on Smoking Cessation among Malaysian Dental Practitioners.	Siti Arina B.
5	Systematic Reviews on Oral Health- Related Quality of Life Measurements for Children	Ismail A.
6	Caries Control Program for Kindergarten Children in Hong Kong	Chu C.H.
7	Microleakage of Nano Ionomer Restorative in Cervical Lesions	Gupta S.
8	Prevention of White Spot Lesion: A review	Urala A.S.
9	A Study on the Materials for Inducing Artificial Enamel Lesions	Jung E.J.
10	Evaluation of the Remineralizing Effect of Fluoride Varnish Using Micro-Computed Tomography	Oh H.N.
11	Nursing Caries in Relation to Child's Growth and Development	Hussien A.
12	Evaluation of Levels of Nitric Oxide and Glutathione in Saliva of Children according to Dental Caries Experience, Saliva and Microorganisms	Han D.H.
13	Can CPP-ACP become a Panacea for Remineralization of Incipient Caries?	Goval A.
14	Early Childhood Caries-Intercept or Regret?	Gaubia K.
15	The Effect of Dentifrice Containing Bamboo Salt on the Acid Resistance	Choi C. H.
16	Need of Pit and Fissure Sealants in Nepali School Children	Gurung S.
17	Dental Caries Status of Laos P.D.R	Jin B. H.
18	New Estimation Model for Food Cariogenic Potential	Bae K.H.
19	An Evaluation of Malaysian School-Based Fissure Sealant Programme	Tan E. H.
20	The Pattern of Sugar Consumption in Schoolchildren in Kelantan	Nurrul A. A.
21	Correlation of Oral Health Perception and Oral Care Practice with Caries Experience among Schoolchildren	Sia J.Y.
22	A Comparison of Sugar Consumption among Dental Staff and School Teachers in Kemaman District	Zakaria N. A.
23	Parental Kap towards Prevention of Early Childhood Caries in Kota Bharu, Malaysia	Mani S.A.
24	The Estimation of Fluoride Intake from Tea in Japanese Infants.	Kubota T.
25	The Influence of Fluoride Intake from Tea in Japanese Infants	Arakawa H.
26	The Effect of Anchovy of Stolephorus Baganensis on Mutans Streptococci	Agunawan H.
27	Evaluation of Dentinal Tubules Obstruction by Various Fluoride Applications Using Scanning Electron Microscopy	Lee J.R.
28	Calcium Fluoride Crystal Formation on Tooth Enamel from Various Types and Frequency of Fluoride Application	Lee J.I.
29	Most electronegative with positive results – “Fluorides”	Tiwari U.
30	The Use of Home Water Filtration Systems among Dental Personnel and Their Perceptions towards Water Fluoridation in Johor	Habibah Y.
31	Micromolar Fluoride Reduces Alveolar Bone Loss in Experimental Rat Periodontitis	Bhawal U. K.
32	A Study of the Effect of Home Water Filtration Systems on Fluoride Content of Drinking Water in Johor	Loh K.H.
33	Attitudes towards the Use of Fluorides among Imams (Islamic Clerics) in Kelantan	Nazita Y.
34	Post-Retirement Economic Plans and Demands for Social Support of Dentists	Kim J.H.
35	A Study on Recognition and Support of Long Term Care Insurance for the Aged	Seong J.M.
36	Association of Edentulism and Vegetable Intake in Community-Dwelling Older Adults.	Hirotoomi T.
37	Oral Function Promotion Program for the Independent Elderly in Japan	Hakuta C
38	Oral Health and Quality of Life in Elderly Thai	Samnieng P.
39	Oral Health Status and Prosthetic Needs of Indonesian Institutionalized Elderly.	Adiatman M.

40	Oral health-related quality of life in Thai elderly	Noisombut R.
41	Oral Health and Nutrient Intake in a Community-Based Older Adults	Rosli T.I
42	Oral Health Care in Nursing Homes: Practices, Knowledge and Awareness among the Staff	Rosli T.I
43	Locus of Control and Oral Health among Rural School Children.	Acharya S.
44	The Assessment of Influence of “Lunch Program” on a Caries Activity in Mongolian School Children	Delgertsetseg J
45	Public Health Cyber Management Supporting System on Dental Health Promotion	Syaefullah A.
46	Effectiveness of Tooth Brushing Program on Oral Health Promotion in Primary Schools	Jwa S. K.
47	Participatory Action in Oral Health Promotion in a School for Children with Disability	Preecha T.
48	Promoting Oral Self-Care Using Penscope in A Mobile Oral Health Team	Bualoy R.
49	Oral Health Status, Practice and Oral Health Related Quality of Life (OHRQOL) among Students in a Private School	Haslina R.
50	Effect of Oral Health Education on Oral Hygiene and Gingival Health of School Children.	D’Cruz A. M.
51	Level of Oral Health Knowledge, Attitudes and Practice among First Year Community Nursing Students and Its Correlation towards Dental Caries	Sarmilia S.
52	Level of Awareness towards the Importance of Deciduous Dentition among Preschool Teachers	Husna A. A.
53	Clinical Effects of Dentifrice with Using Dentifrice Containing IPMP and GK2 on Gingival Condition	Hwang J.M.
54	Gingival Response after Fixed Prosthesis Insertion	Karim A.
55	The Effect of Cervical End Preparation Design Collarless Metal Ceramic Crown to the Level of IL-1 B in Gingival Crevice Fluid	Jubhari E.H.
56	Self-care Behaviour and Periodontal Status of Diabetes Patients in ChiangMai	Prakhamsai S.
57	An Animal Study on Mastic Gel and Minocycline for Reduction of Inflammation in Gingivitis	Park J.H.
58	Oral Health Index for Periodontal Status	Seo D.H.
59	Relationship between Periodontitis and Serum C-Reactive Protein Levels in Patients with Head and Neck Cancers	Yamanaka R.
60	Gender Difference in Gingivitis and Oral Health Behavior.	Furuta M.
61	Combined Effects of Hydrogen Sulphide and Lipopolysaccharide in Rat Periodontium.	Irie K.
62	Periodontal Patients with Systemic Disorders and Its Correlation with Remaining Teeth.	Nurulhuda M.
63	Oral Health Behaviors, Periodontal Condition and Pathogens among Pregnant Women	Ha J.E.
64	Effects of the Perio Therapy System on Bleeding On Probing (BOP) in Periodontal Patients	Okada Y.
65	Patient’s Awareness between Smoking and Periodontal Diseases	Abdul Aziz H.
66	An Analysis of Social Economic/Psychological and Medical-Loss Cost in Dental Disease Caused by Smoking	Hwang J.M.
67	An Experience in Supporting Smoking Cessation Treatment	Watanabe E.
68	Antioxidant Suppression in Smokers with Chronic Periodontitis	Rupali A.
69	Opinion of Indian Dental Students about Tobacco Cessation Counselling & Its Practise in Dentistry.	Tiwari V.
70	Passive Smoking in Children as Risk for Future Periodontal Disease	Sumit G.
71	Enigma of Oral Health	Gauga A.
72	Research about Communication of Dental Medical Workers	Lee S.K.
73	Effects of Oral Health Care Education for Care Providers in a Nursing home	Park M. S.
74	Bridging the Gap in Preventive Clinical Practice: Lesson Learned	Nirunsittirat A.
75	Saving Smiles in Soe: Volunteer Placement for Dental Hygiene Students	Wallace L.G.
76	Parents Myths Regarding Their Children’s Teething in Urban and Rural Makassar City, South Sulawesi, Indonesia	Rasmidar S.

77	Strategies for Implementing Clinical Practice Guidelines by District Dental Officers In Malaysia	Jaapar M.
78	Level of Awareness on the Importance of Primary Dentition among Mothers with Toddlers	Mohamad Khairul Hafizan M.N.
79	Study of the Oral Habit, Oral Discomfort and Amount of Salivary Secretion in Halitosis and Psychiatric Patients.	Shimizu T.
80	Mouth Dryness and Oral Malodor Problems in Free Denture Delivery Program	Lee S.S.
81	The Effects of Mastic-Containing Dentifrice and Oral Rinse on Dental Plaque, Malodor	Lee C.H.
82	A Study on Oral Malodor Changes in a Day	Lee M.O.
83	Halitosis during Pregnancy	Otsuka W.
84	Clinical Significance of Halitosis Complaints from Patients	Furuta E.
85	Oral Breathing, Malocclusion and Malodor in Orthodontic Patients	Yamauchi E.
86	Subjective Strengths of Oral Malodor: Peculiar Circadian Variation and Reduction through Treatment	Higuchi K.
87	Associated Problems of Oral Malodor - Uncomfortable Intraoral Sensations and Behaviors of Other People	Higuchi K.
88	The Effects of Tongue Cleaning on Patients with Oral Malodor	Thuy P.A.V.
89	Social Anxiety Disorder in Halitosis Patients	Zaitso T.
90	Do Indonesians Receive The Dental Care Treatment They Need?	Bahar A.
91	Assessment of Current Situation and Supply of Dentists in Mongolia.	Amarsaikhan B.
92	Burden of Care in Mobile Dental Teams (Mdt), MOH Malaysia	Tan B.S.
93	Caries Experience in Three Ethnic Groups of Schoolchildren in Malaysia	Yusof N.
94	Fifteen-Years-Trends of Dental Specialists Proportion in Thailand	Korwanich N.
95	School Dental Service in Malaysia – A 5 Year Retrospective Review	Zainab S.
96	Factors Affecting Dental Visits in Kuala Terengganu	Yunus N.
97	Work-Related Musculoskeletal Pain among Indian Dental Students.	Singh A.
98	Barriers In Using Material Safety Data Sheet Among Dental Dent Dental Personnel	Law C.H.
99	Occupational Hazards in Dental Practice. Do We Know Enough? A Pilot Study	Deepti C.J.
100	Study of Ergonomic Aspect in Daily Practice Dentistry of Some Private Dental Clinics in Makassar	Mailoa E.
101	Effect of Using Mouthwashing Solutions Containing IPMP and GK2 on Oral Environment	Kang J.O.
102	Effect of Dentifrice Combined by Extracts Of DPG, BA and CA on Oral Conditions	Ahn J.H.
103	Clinical Efficacy of a Mouthwash Containing Extract of Flower Star Fruit (Averrhoa Bilimbil) against Healing of Aphthous Stomatitis	Burhanuddin P.
104	An Appraisal of an Oral Health Education Program through Use of Tooth-Brushing Facilities	An H.W.
105	Management of Talon Cusp using Mineral Trioxide Aggregate	Shetty P.
106	Latest Trends in Cancer Chemoprevention	Chhapparwal Y.
107	Solving Problems Before They Arise - Preventive Orthodontics	Marianayagam D.
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## POSTER NO:1

**Dental Computed Tomography for Diagnosis in Endodontics**

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Radiographic examination is essential in diagnosis and treatment planning in endodontics. Most commonly used radiographs for endodontics is intra oral periapical radiographs. The interpretation of an image can be confounded by the anatomy of both the teeth and surrounding structures. The ability to assess an area of interest in 3 dimensions eliminates the superimposition that is inherent in conventional radiographic imaging. The introduction of computerized tomography may bring new potentials for endodontic diagnosis and treatment planning. DentaScan is a computed tomography (CT) software program that allows the mandible and maxilla to be imaged in three planes. This poster presents two case reports in which DentaScan was used for endodontic diagnosis and treatment. The first case report depicts the management of crown root fracture. Film-based intraoral radiography has been the common method for diagnosing root fractures but with poor sensitivity. DentaScan was able to provide multi-planar format which helped in locating exactly the position and extent of longitudinal fracture. The second case report addresses the diagnosis and management of external and internal root resorption. Conventional radiography is often unable to identify the true extent, location, or the portal of entry of a resorptive lesion. DentaScan has been shown to help determine treatment complexity as well as aid the clinician in offering an accurate prognosis on the basis of the extent of the resorptive lesion.

## POSTER NO: 3

**Calibration Trial of WHO Global Standard in Cambodia**Okuyama N.<sup>1,2</sup>, Ogawa H.<sup>1,2</sup>, Vom V.<sup>3</sup>, Makino Y.<sup>1,2</sup>, Miyazaki H.<sup>1,2</sup>

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**Introduction:** Oral health surveys using internationally recognized criteria have not been undertaken for a long time in Cambodia. Information for current oral health status is unlikely comparable with global trend. Therefore, it will be useful to educate and train oral health personnel in the global standard method to collect adequate data for the oral health survey. **Aim:** This trial was aimed to standardize (calibrate) local dentists and measure if inter-examiner agreement can reach WHO global standard. **Method:** Four dentists from the Health Science University were enrolled as examiners to be calibrated. The calibration content consisted of lecture and practice components of the WHO Oral Health Survey Basic Methods. Crown status, root status and Community Periodontal Index (CPI) were utilized as key indices to standardize. In total, 48 volunteers were taken and assessed twice by each pair of examiners to assess inter-examiner agreement using Kappa statistics. **Results:** The percentages of observed agreement between all pairs of examiners were 82-92 % for crown status, 61-80 % for root status, and 40-67 % for CPI. Kappa values for crown status and root status ranged from 0.70 to 0.85 and from 0.42 to 0.69, respectively, while those for CPI were from 0.09 to 0.53. There was large discrepancy between CPI code 0 and 2, code 1 and 2 observed. Interpretation of criteria should be given more attention to achieve acceptable consistency. Moreover, CPI measurement depended on tactile sensation with a CPI probe, not on visual sensation. More cases for CPI training may also be needed. **Conclusion:** These results suggest that inter-examiner agreement for crown status seemed to be sufficient, however those for root status and CPI failed to be sufficient according to our calibration trial for Cambodian dentists.

## POSTER NO: 2

**Osseointegration around Jaw Bone and Implant after Placement of Dental Implant with Ct-Scan**Barunawaty Y.<sup>1</sup>, Rasmidar S.<sup>2</sup>, Burhanuddin P.<sup>2</sup>

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**Introduction:** Quality and quantity of jawbone is important to determine bone integrity that will be accomplished in implant placement. Many clinicians suggest use of CT-Scan due to importance and complications of anatomical measurements. **Aim:** The objectives of this research is to investigate how large the number of increased calcification (osseointegration) around the jawbone and implant after the placement of implant that will be assessed with CT-Scan Hounsfield Units. **Method:** Quasy Experimental, Pre and Post Test With Control Group Design. Evaluation is done with CT-Scan and implant placement in 30 human jawbone which have lost 1 posterior teeth in maxilla or mandible. After implant placement, another evaluation was done with CT-Scan to assess the osseointegration. **Results:** The mean average of jawbone calcification from 30 samples before implant placement was 590.67 HU, and after implant placement it reached 1035.68 HU. For males, the mean average of jawbone calcification before implant placement was 629.59 HU, and after implant placement it reached 1129.42 HU (79.39%). For females, the mean average of jawbone calcification before implant placement was 551.75, and after implant placement it reached 941.94 HU (70.72%). The mean average of calcification for experimental group was 75.34% and for control group was 0% (t-test, p<0.05). **Conclusions:** The indicator of osseointegration in implant placement was the presence of direct contact between bone and implant or the increased calcification around implant surface and jawbone in CT-Scan. CT-Scan Hounsfield Units could be used to see the osseointegration around jawbone and implant after the placement of dental implant.

## POSTER NO: 4

**Use of Audience-Response-System (Ars) Technology In Assessing Knowledge on Smoking Cessation among Malaysian Dental Practitioners**Abdul Kadir R.<sup>1</sup>, Yahya N.A.<sup>1</sup>, Amer Siddiq A.N.<sup>2</sup>, Zul-Izzat I.Z.<sup>2</sup>, Hazli Z.<sup>1</sup>, Rusdi A.R.<sup>2</sup>, Aisah A.R.<sup>2</sup>, Siti Arina B.<sup>2</sup>, Hussain H.<sup>2</sup>

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**Introduction:** Audience-response-system (ARS) is a data collection tool that focuses on establishing communication between a presenter and the audience. It is an alternative approach to garner and collect information in group settings using wireless handheld individual keypad devices. **Aim:** The objective of this study is to describe the potential use of ARS technology in increasing the interest of Malaysian dental practitioners in attending and completing smoking cessation workshops. **Method:** The ARS system was used to collect data from a group of dentists who participated in two specially designed workshops on Smoking Cessation in Malaysia. The workshop had four modules; namely smoking as a public health problem, smoking as an addiction, the role of dentist in the program and options of treatment. Data was collected prior to all four modules and at the end of the workshop. Each participant was provided with the response pad which they had to use to answer the questions showed on the screen before a 30 minute related talk was given. The group responses for each question answered was immediately shown on the screen after the talk to show how close were their opinion relative to the current findings as given in the talks. Effective use of ARS was measured based on the number of dentists who remained to participate until the end of the workshop and their subjective opinion on the ease of using the ARS pad. **Results:** A total of 75 dentists participated in the two separate workshops. All of them were first time attendees of a smoking cessation workshop or the use of ARS. A total of 61 dentists (81.3%) completed the whole day workshop sessions. **Conclusion:** ARS was found to be able to maintain interest among dentists. It also improves the feedback process not only by guaranteeing participants' anonymity but also in terms of quicker and more efficient method in collecting and summarizing responses, as well as preventing respondents from copying their peers' answers.

POSTER NO: 5

**Systematic Reviews on Oral Health- Related Quality of Life Measurements for Children**

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**Aim:** The aim of the study is to systematically locate, assemble and assess the previous studies in order to obtain a reliable overview of the child Oral Health-Related Quality of Life (OHRQoL) measures. Objectives is to assess the methodology, development and evaluation of OHRQoL measures for children. In addition to review the attributes and assess the implication for future development and application of OHRQoL measures for children. **Method:** A methodological systematic reviews was carried out for the period 1985 – July 2008 in accord with the Centre of Reviews and Dissemination (CRD) guidelines on systematic reviews, Report 4 (CRD, 2001). Literature search via electronic databases, hand-searching journal, reference list search and citation/author search of the English language publication was conducted. Information was also sought from the key workers in this field. All OHRQoL measures (self-reported and/or proxy-reported) for use in children below 15 years of age (with some reliability and validity data) were included. Single dimension measures were excluded. **Results:** 6 generic measures of OHRQoL measures for children were identified from 48 papers which met the inclusion criteria. The majority of the measures were developed in USA (n=4), with child self-reported questionnaires (n=4). Likert scales were use most frequently to represent response choices (n=5). Item were all presented in written format (n=6), but child-OIDP has picture-aids. All measures reported internal reliability (Cronbach's alpha) and reproducibility (ICC or kappa) above 0.70. Responsiveness testing was reported by the ECOHIS (n=1). **Conclusion:** All currently available measures have shortcomings such as unclear theoretical framework, lengthy and solely proxy-reported. There is limited number of OHRQoL measures to assess the child's perception and no validated OHRQoL instrument to assess the children's perception below 8 years-old. Therefore, there is a need to develop a generic OHRQoL measure which is age-specific for 5 to 6 years-old children and is both self-reported and proxy-rated. In addition, the development of condition specific OHRQoL measures for children to be used as evaluative instruments in clinical trials will provide information of the effectiveness of the intervention.

POSTER NO: 7

**Microleakage of Nano Ionomer Restorative in Cervical Lesions**

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**Introduction:** Modern approach to prevent dental caries requires dental materials which possess both restorative and prophylactic characteristics. Nano Ionomer Restorative is a new development that combines the benefits of a resin modified glass ionomer and bonded nanofiller technology. It has improved esthetics and provides the benefits of glass ionomer, such as fluoride release. Cervical lesions due to caries, erosion, or abrasion often have both enamel and dentin or cementum margins. **Aim:** This in vitro study was to evaluate the microleakage of Class V cavity restored with Conventional Glass Ionomer, Resin modified Glass Ionomer and Nano ionomer restorative. **Methods:** 45 standardized Class V cavity preparations were prepared on sound extracted human molar teeth. Teeth were randomly assigned to 3 experimental groups of 15 teeth each and restored as follows: Group 1 - Conventional Glass Ionomer Cement, Group 2 - Resin-modified glass ionomer cement, Group 3 - Nano ionomer. After finishing and polishing the restorations, the teeth were thermocycled. The specimens were placed in a solution of 2% Rhodamine-B dye for 24 hours at room temperature under vacuum. Staining along the tooth restoration interface was recorded. Results were analyzed using Kruskal-Wallis and Wilcoxon test. **Results:** There were no statistically significant differences in dye leakage between all the three restorative materials for occlusal margins (p=0.464). But at the gingival margins, there was statistically significant differences

between the three restorative materials (p=0.007). Group 3 showed significantly less microleakage compared to Group 1 (p=.007) and Group 2 (p=.040) at gingival margins. The degree of microleakage in the gingival margins of each group was more than that found in occlusal margins. **Conclusion:** No material was able to completely eliminate microleakage at enamel, dentine or cementum margin. Nano ionomer showed least microleakage compared to other two cements at gingival margins.

POSTER NO: 6

**Caries Control Program for Kindergarten Children in Hong Kong**

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**Aim:** To set up an outreach dental service to prevent and to control dental caries of kindergarten children in Hong Kong. **Methods:** Invitation letters describing this project aims and procedures were sent to parents of kindergarten children. Parental consents and parental questionnaire were collected. Dental health education was provided and oral examination was performed in kindergarten. Silver diamine fluoride (SDF) was applied to decayed teeth to arrest caries progression. Children who required extraction were referred to community dental clinics. Kindergarten teachers were trained to deliver oral health education. Follow up will be performed biannually until the children enter primary schools where they can join the government school dental care service. **Results:** Twenty kindergartens were recruited. We provided oral health education to and screened a total of 1,954 kindergarten children with parental consent. Among them there were 860 children with dental decay and the maximum number of decayed teeth was 19 out of the 20 primary teeth. The caries prevalence was 44%. They all received SDF applications to arrest the caries progression. No complication or adverse side-effect has been reported so far. Training of kindergarten teachers were provided so that they could reinforce the message of oral hygiene in their teaching. The oral health education to preschool children and the training of Kindergarten teachers were well received by the children and teachers respectively. **Conclusion:** An outreach dental caries control service has been successfully set up. It has been well received by the kindergarten teachers, and children and their parents.

POSTER NO: 8

**Prevention of White Spot Lesion: A Review**

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Improper oral hygiene maintenance during the course of fixed orthodontic treatment is not an uncommon clinical situation. This can lead to development of an environment conducive for demineralization of the enamel in the form of White Spot Lesions especially around the orthodontic attachments. Appearance of white spot lesions varies from small discrete lines in the enamel in the initial phases to chipping or cavitations of the enamel in the severe form. White spot lesions if left unchecked can progress to carious cavitations or as present as an esthetic problem. Thus prevention of white spot lesions becomes crucial. Measures that have been found to be very effective in preventing such lesions range from education on proper oral hygiene measure with a dentifrice, fluorides in various forms such as sealants, vanishes, primers, mouth rinses, Antimicrobial agents and dental laser. The poster reviews the current trends in prevention of white spot lesions. Poor oral hygiene maintenance around orthodontic appliances lowers the pH in the plaque, leading to increased risk of demineralization of enamel and reducing the cariostatic properties of adjunctive fluoride therapy. A good oral hygiene and routine use of fluoride paste/mouth rinses is vital in prevention of white spot lesions.

POSTER NO: 9

**A Study on the Materials for Inducing Artificial Enamel Lesions**Jung E.J.<sup>1,5</sup>, Choi C.H.<sup>1,2,3,4</sup>, Oh H.N.<sup>1,2</sup>, Lee H.J.<sup>1</sup>, Jeong S.S.<sup>1,2,3</sup>, Ko S.J.<sup>1</sup>, Hong S.J.<sup>1,3</sup><sup>1</sup>Department of Preventive and Public Health Dentistry, <sup>2</sup>Brain Korea 21 Project, <sup>3</sup>Dental Science Research Institute, <sup>4</sup>Department of Dental Education, Chonnam National University, Korea, <sup>5</sup>Department of Dental Hygiene, Cheongam College University, South Korea

**Introduction:** The production of Carbopol 907, one of the reagents inducing artificial caries lesion, was discontinued. Therefore, the development of a substitute of Carbopol 907 has become necessary. This study examined whether Carbopol 980 (0.2%), 941 (0.2%), Carbopol ETD 2050 (0.2, 0.5 %) and carboxymethyl cellulose (0.2%) can be used as a substitute for Carbopol 907 or not. **Method:** A demineralization effect of Carbopol 980 (0.2%), 941 (0.2%), Carbopol ETD 2050 (0.2, 0.5 %) and carboxymethyl cellulose (0.2%) were compared to that of Carbopol 907. The specimens of bovine teeth enamel were embedded in resin, polished with grinding papers (# 60, 240, 600, 4000 grit) and randomly divided into 6 groups. Each group has 12 specimens that was standardized according to Vickers hardness number (VHN). Specimens were immersed in each demineralization solution for 72 hrs. Surface microhardness was measured using Vickers hardness tester. The lesion depth and fluorescent intensity were also measured in enamel using a confocal laser scanning microscopy (CLSM). **Results:** The results showed that Carbopol 907 (0.2%) had the largest demineralization effect among the groups. However, there was no significant difference between Carbopol 907 and Carbopol 980 (0.2%). It was found that Carbopol 941 (0.2%), Carbopol ETD 2050 (0.2, 0.5%) and carboxymethyl cellulose (0.2%) were not as effective as Carbopol 907 (0.2%) and Carbopol 980 (0.2%). **Conclusion:** This study suggests that Carbopol 980 (0.2%) could be used as a substitute for Carbopol 907 (0.2%) for inducing artificial enamel carious lesions.

POSTER NO: 11

**Nursing Caries in Relation to Child's Growth and Development**

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**Introduction:** Nursing caries is a severe form of tooth decay usually affects infant's teeth, especially the maxillary anterior dentition. The health of deciduous teeth is well integrated with the growth and development of children. The early loss of primary dentition may create functional and esthetic impairments and unfavorable speech habits. **Aim:** This study was to assess the relationship between the child's body weight and height, eruption time of primary teeth and walking time with the development of nursing caries. **Methods:** This study was conducted on one hundred fifty kindergarten children, aged 4-5 years old. Sixty of the children had nursing caries (study group) and the remaining ninety of them were caries free (control group). Child's body weight and height were measured and the information about eruption time of primary teeth and walking time were assessed from questionnaire answered by the parents. **Results:** The result showed that there were no significant differences between nursing caries and the child's body weight and height, eruption time of primary teeth and walking time (t-test,  $p > 0.05$ ). **Conclusion:** The development of nursing caries was not associated with adversely affected growth of children.

POSTER NO: 10

**Evaluation of the Remineralizing Effect of Fluoride Varnish Using Micro-Computed Tomography**Oh H.N.<sup>1,2</sup>, Choi C.H.<sup>2,3,4</sup>, Jung E.J.<sup>1,2</sup>, Lee H.J.<sup>1</sup>, Jeong S.S.<sup>1,2,3</sup>, Park Y.N.<sup>1,5</sup>, Hong S.J.<sup>1,3</sup><sup>1</sup>Department of Preventive and Public Health Dentistry, <sup>2</sup>Brain Korea 21 Project, <sup>3</sup>Dental Science Research Institute, <sup>4</sup>Department of Dental Education, Chonnam National University, <sup>5</sup>Department of Dental Hygiene, Jeonbuk science college, South Korea

**Introduction:** Micro-computed tomography (micro CT) allows the imaging and measuring of complete three-dimensional object structures without sample preparation or chemical fixation. **Aim:** This study was to evaluate the remineralizing effect of a fluoride varnish by micro CT. **Methods:** Specimens of bovine teeth enamel were embedded in resin, polished and randomly divided into 3 groups (a control group, a NaF solution group, a fluoride varnish group). Each group has 3 specimens that was standardized according to Vickers hardness number (VHN). Specimens were immersed in each demineralization solution for 72 hrs. A control group had no treatment, and a NaF solution group was treated by a 5% NaF solution for 4 minutes, and a fluoride varnish group was treated by a fluoride varnish for one hour. After this, all specimens were subjected to a chemical pH cycling method for 14 days. After the cycling, the density of remineralized artificial enamel caries lesion was measured using micro CT. **Results:** The density was significantly higher in the fluoride varnish and 5% NaF solution group than that of the control group after 14 days cycling ( $p < 0.05$ ). And the density value of the fluoride varnish group was higher than that of the 5% NaF solution, with no significant difference. **Conclusion:** The results of this study suggest that fluoride varnish showed the remineralizing effect on artificial enamel caries lesion, and micro CT could be used to evaluate the change of enamel lesion.

POSTER NO: 12

**Evaluation of Levels of Nitric Oxide and Glutathione in Saliva of Children according to Dental Caries Experience, Saliva and Microorganisms**

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**Introduction:** Dental caries is a multifactorial local disease which involves destruction of the hard tissues of the teeth by metabolites produced by oral microorganisms. Recently, there has been growing interest in the role of reactive oxygen species (ROS) in caries incidence. **Aim:** The study was to determine the levels of nitric oxide and glutathione in saliva of children in relation to caries experience.

**Method:** The subjects of this study were selected by stratified cluster sampling. Finally, a total of 257 children in Busan, Korea were surveyed from April 2009 to August 2009. This study was approved by the Institutional Review Board for Human Subjects at the Pusan National University Hospital at Yangsan Campus (approval number: 2009016). Oral health status was recorded using a WHO format by the same examiner. Caries was measured using DMFT index. Estimation of salivary nitric oxide and glutathione was measured by the concentration of its stable metabolite nitrite and total/oxidized glutathione using Classical Griess Reaction. Dependent variable was salivary nitric oxide and glutathione concentrations. Independent variables were DMFT index, salivary flow rate and buffering capacity, and degree of lactobacillus and S. mutans counts. The results were statistically evaluated using ANOVA and Pearson's coefficient of correlation with SPSS data processing software version 14.0. **Results:** The concentration of total glutathione and reduced glutathione were significantly associated with buffering capacity and number of decayed tooth. Nitric oxide and reduced glutathione were significantly associated with number of lactobacillus. **Conclusion:** Nitric oxide production might be a host defense mechanism when dental caries increases whereas total and reduced glutathione production might be a host destructive mechanism.

POSTER NO: 13

**Can CPP-ACP become a Panacea for Remineralization of Incipient Caries?**

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**Introduction:** Dental caries is chronic, slowly progressive disease with multifactorial etiology. Early diagnosis of the non cavitated lesions and provision of favourable intra oral environment for remineralization of the tooth will reduce the morbidity related to dental caries. Casein Phospho Peptide – Amorphous Calcium Phosphate (CPP –ACP) has shown promising results as one of the remineralizing agents with additional benefits like ease of application, can be used in younger patients where fluoride is not indicated and with added advantage of being a home care measure.

**Aim:** This study aimed to compare the remineralizing efficacy of CPP - ACP based cream and fluoride varnish on artificially produced carious lesions in human enamel mounted in an in vivo intra oral appliance. **Methods:** A total of 30 participants of aged 8-24 years, served as carriers for human enamel slabs during the study period. Artificial demineralization was produced in the enamel slabs before mounting them in the appliances. CPP-ACP, Fluoride Varnish and Fluoride Dentifrices were used for remineralization of the artificially produced lesions. The extent of remineralization was evaluated at 15 days, 1 month and 3 months by using Scanning Electron Microscope (SEM) and Energy Dispersive Spectroscopy (EDS). **Result:** CPP-ACP showed maximum remineralization score after 15 days as compared to fluoride varnish and fluoride dentifrice. Remineralization after 1 month showed no further increase for CPP-ACP, where as statistically significant difference ( $p < 0.01$ ) was found in the varnish and dentifrice group. Similarly 3 month evaluation of the remineralization showed a further increase in all the three groups but it was least in the CPP –ACP group. **Conclusion:** Maximum remineralization occurred by twice daily use of CPP-ACP cream within 15 days after which it reached a plateau phase.

POSTER NO: 15

**The Effect of Dentifrice Containing Bamboo Salt on the Acid Resistance**Ha M. O.<sup>5</sup>, Choi C. H.<sup>1,2,3,4</sup>, Youn H. J.<sup>1</sup>, Iijima Y.<sup>6</sup>, Hong S. J.<sup>1,3</sup>

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**Introduction:** The aim of this study was to investigate the effect on the acid resistance of enamel after use dentifrice containing bamboo salt. **Method:** Incipient caries lesion of bovine enamel was formed in pH 5.0 lactate carbopol buffer system for 60 hours. Then, experiment groups were divided (n=12/group) into four groups without statistical difference of Vickers hardness number (VHN) and were carried out under pH cycling model for 20 days as follows; fluoride free dentifrice (negative control), 1000 ppm NaF dentifrice (positive control), 1100 ppm NaF dentifrice (P&G Crest Cavity Protection) and 3.0% bamboo salt with 1000 ppm NaF dentifrice (test dentifrice). Then, all specimens were immersed in acid solution which used incipient caries formation for 60 hours. Mineral loss value ( $\Delta Z$ :vol%□□) and lesion depth (Ld: □) of specimens were assessed by transversal microradiography (TMR). **Results:** After chemical pH cycling, the  $\Delta Z$  of test dentifrice showed lower value than other groups but there was no significant difference among groups. The Ld of test dentifrice (61.59±6.58), P&G Crest Cavity Protection (64.56±6.31) and positive control (67.94±8.46) showed statistically significant lower than negative control (74.68±10.62) ( $p < 0.05$ ). After acid treatment,  $\Delta Z$  of test dentifrice (2403.62±448.10), P&G Crest Cavity Protection (2459.24±412.22) and positive control (2782.54±535.12) showed statistically significant lower than negative control (3421.45±582.80) ( $p < 0.05$ ). Also, Ld of test dentifrice (66.51±9.86), P&G Crest Cavity Protection (69.43±10.23) and positive control (79.69±14.59) showed statistically significant lower than negative control (113.41±9.65) ( $p < 0.05$ ). **Conclusion:** The dentifrice containing NaF and bamboo salt showed acid resistance effect, thus it could be useful agent for prevention of dental caries.

POSTER NO: 14

**Early Childhood Caries-Intercept or Regret?**

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**Introduction:** Despite advances in the oral health of children in recent decades, early childhood caries, a particularly virulent form of caries continues to pose a serious threat to child welfare. The absence of any standardized diagnostic criteria has made the risk assessment of the disease difficult for application in Public Health setting. Emerging evidence indicates that a complex interaction of socio-demographic, behavioral and microbiological factors is responsible for occurrence of dental caries in general and early childhood caries in particular. However, practical tool for development of caries risk assessment predictive model in infants and young children has been largely lacking. **Aim:** To assess the risk factors and their correlation with development of Early Childhood Caries in young toddlers. **Methods:** The study was conducted on 100 children in the age range of 12-18 months who were evaluated at baseline for the presence of various risk factors along with a clinical examination to assess dental caries. The children were followed up longitudinally for a period of 1 ½ year for assessing the development of ECC. **Results:** History of bottle feeding at night and “at will” breast feeding, presence of enamel hypoplasia high levels of mutans streptococci, were potential risk factors for development of ECC. **Conclusion:** The study revealed important risk factors that can be utilized to prepare a risk assessment levels for pediatric population.

POSTER NO: 16

**Need of Pit and Fissure Sealants in Nepali School Children**

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**Introduction:** The placement of sealants is a highly effective means of preventing pit and fissure caries. **Aim:** The objective of this study is to determine the need of pit and fissure sealants among Nepali school children. **Method:** Two different schools from Kathmandu Valley were selected. Five hundred and fifty students of age group 6 to 14 years with mixed dentition were examined. In skeptic cases, transilluminator was used. The examination of maxillary and mandibular permanent first molars and incisors was done based on the criteria: presence of deep pits and fissures, incipient carious lesion with no cavitation and completely erupted teeth. Premolars and canines are not included in the study. Data analysis was done using SPSS 14.0. **Result:** The prevalence of pits and fissures requiring sealants in mandibular first molars was 70.73%; higher in occlusal surfaces compared to buccal and followed by lingual. In maxillary first molars, 67.64% cases were detected; occlusal surface required more sealant application followed by palatal and buccal. Maxillary central and lateral incisors had 0.6% and 6.5% palatal pits respectively. There were no recorded cases in mandibular incisors. **Conclusion:** The need of pit and fissure sealants in Nepali school children in the capital city was found to be higher in permanent first molars. Palatal pits found in maxillary incisors are also indicated for sealant application.

POSTER NO: 17

**Dental Caries Status of Laos P.D.R**Jin B. H.<sup>1</sup>, Khounsiri V.<sup>2</sup>, Sensombath S.<sup>3</sup>, Jung J.I., Songpaisan Y.<sup>4</sup>, Phommavongsa K.<sup>3</sup>, Phantumvanit P.<sup>4</sup>, Petersen P. E.<sup>5</sup>, Paik D. I.<sup>1</sup><sup>1</sup>Dept. of Preventive & Social Dentistry, Seoul National University, Seoul, Korea, <sup>2</sup>Dept. of Dentistry, University of Health Sciences, Vientiane Capital City, Lao.P.D.R., <sup>3</sup>Mahosoth Hospital, Dental Clinic, Vientiane Capital City, Lao.P.D.R., <sup>4</sup>Thammasat University, Bangkok, Thailand, <sup>5</sup>University of Copenhagen, Centre for Health and Society, Denmark; World Health Organization, Geneva

**Introduction:** Lack of information about oral health status of Laos's people is a major barrier to planning of national oral health programmes. To prepare the national oral health plan in Laos, a systematic assessment of the major oral health problems are needed. To achieve this goal a nationwide oral health survey was implemented. **Method:** A cross sectional study was conducted in 2010; participants were chosen by cluster sampling using age stratification in 5 provinces: 2 provinces in Northern (Luangprabang and Bokeo), 2 provinces in Central (Vientiane and Savanakheth), 1 provinces in Southern (Champasak). In each province one urban and one rural area was selected. The final study population covered 6 age groups: 3 years (n=427), 6 years (n=499), 12 years (n=479), 15-18 years (n=502), 35-44 years (n=469) and over 60 years (n=379). Clinical oral health data were collected according to modified WHO methodology and criteria (2010). Four trained dentists took part in the survey (2 Laotian, 1 Thai, and 1 Korean) and intra- and inter-examiner reliability was evaluated before and during the survey. **Results:** At age 3, mean dft was 4.3 while caries free rate was 26.9%, with prevalence higher in urban than rural area. At age 6, the dft was 6.3 and only 15.0% of the children were caries free, with prevalence relatively high in urban areas. At age 12, the mean DMFT was 0.99(SEM = 1.58) while caries free rate was 56.9%. Mean DMFT was 1.5 in 15-18 -year-olds, 3.2 in 35-44 -year-olds and 7.3 among people over the age of 60 years. The mean DMFT was increased with aging. But the prevalence rate of younger population showed high. **Conclusion:** Although the caries level is low in some age groups, however younger children have a high rate of dental caries. Considering the changes of economic status of Laos, health promotion programmes should be implemented.

POSTER NO: 19

**An Evaluation of Malaysian School-Based Fissure Sealant Programme**Tan E. H., Khairiyah A. M., Norlida A., Norain A. T.  
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**Introduction:** This study is to evaluate the implementation of Malaysian school-based fissure sealant (FS) programme. The objectives were to determine the retention rates and caries outcome of FS-rendered first permanent molars (FPM) from baseline application, to compare FS retention rates and caries status of the FPM by material (resin/glass ionomer cement), operator (dental officer/dental nurse) and facility (clinics/mobile settings). **Method:** This was a 5-year prospective longitudinal study involving 4,180 eight-year-old schoolchildren rendered FS in 2003. Annual clinical assessment of FS, caries and treatment status of FS-rendered FPM were done. Examiners were standardised. **Results:** The FS retention rate decreased from 61.7% (2004) to 30.0% (2007). The retention rates were higher for resin-based FS compared to GIC (p<0.001), for dental nurses compared to dental officers (p<0.001); and for dental clinics compared to mobile settings (p<0.001). FPM with 'failed FS' (defined as carious and/or restored) increased from 3.8% (2004) to 13.8% (2007). Caries status was not different by operator or by facility; and was equivocal by material. **Conclusions:** Findings support the school FS programme guidelines to train and utilise dental nurses, to add GIC use to resin-based material, and to undertake FS application on an 'outreach' basis. However, the relatively high loss of FS one year after application indicates a continuing training need in FS selection criteria for children and teeth and in the FS application process. GIC is confirmed a viable alternative to resin-based FS if its higher rate of loss is traded off for its ease of use and equivocal caries outcome. It is strongly recommended that school-based FS programmes continue as an integral part of the community strategy for caries prevention and control.

POSTER NO: 18

**New Estimation Model for Food Cariogenic Potential**

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**Aim:** The aim of this study is to develop a simple measurement model for food cariogenic potential that has high validity and reliability. **Method:** This study involved an in vitro experiment that measures the physicochemical properties of snack foods and an in situ experiment that determines effects of the food on demineralization of tooth enamel. Two liquid and two solid snacks that were frequently consumed in Korea were tested, and for control group, 10% sucrose was used. Type of food, total sugar, reduced sugar, total starch, pH, viscosity, texture, fluoride content, calcium content were measured for the five food groups. In situ study was performed single-blinded, using 5×5 mm square, randomized crossover design. Five volunteers wearing intra-oral appliance with two enamel slabs were subjected to biofilm formation period for 2days, and demineralization period for 5 days in each cycle. Enamel demineralization was determined by Vickers Hardness Number (VHN), Quantitative Light-Induced Fluorescence (QLF), and Confocal Laser Scanning Microscopy (CLSM). Two-way analysis of variance and Tukey HSD were used to assess the differences of demineralization. Correlation analysis was used to assess the tooth demineralization of snacks according to the physicochemical properties. **Results:** Yogurt was shown to have the highest in total sugar content and lowest in pH. For solid snack foods, cham-cracker has higher total starch than chocolate-pie, but adhesiveness was higher in chocolate-pie. For liquid snack foods, the viscosity was higher in both chocolate-milk and yogurt than 10% sucrose solution. The VHN value of Chocolate-milk increased after the test period compared to cham-cracker. Only viscosity showed a significant association with microhardness of enamel. **Conclusion:** It can be suggested that viscosity may be the strongest indicator of demineralization of tooth enamel induced by snack foods.

POSTER NO: 20

**The Pattern of Sugar Consumption in Schoolchildren in Kelantan**

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**Introduction:** The consumption of sugar in its various forms has long been associated with the development of caries and a number of systemic diseases such as diabetes and cardiovascular. **Aim:** To assess sugar consumption among schoolchildren in Kelantan, Malaysia. Hypotheses were that there were any significant differences or association between sugar consumption and school location area. **Method:** A cross-sectional study was used. The subjects involved were 12 years old schoolchildren from 2 urban and 2 rural schools in the district of Pasir Mas, Kelantan. Of the 475 subjects selected in the sample, 349 responded. A blank diet diary form was constructed as a tool for data collection. Each subject was given a diet diary form, to record all dietary intakes for 7 consecutive days from 6.00 am to 10.00 pm daily. **Results:** The total frequency and total amount of sugar consumed among the schoolchildren is 4.4 times/person/day and 93 grams/person/day respectively. There was a significant association between sugar consumption and school location (P < 0.001). Almost all of the pocket money spent in school (97%) was used to purchase sugary foods and drinks. **Conclusion:** The amount and frequency of sugar consumption of the schoolchildren in Pasir Mas was higher than the recommended level of WHO (below 50 grams/person/day; below 4 times/person/day) and BASCD (below 60 gram/person/day). Children from schools in rural location consumed more sugar and consumed it more frequently. This is due to sugary foods and drinks being readily available in the school environment and also probably due to the high sweet preference among the subjects.

POSTER NO: 21

**Correlation of Oral Health Perception and Oral Care Practice with Caries Experience among Schoolchildren**

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**Introduction:** Oral health means more than good teeth; it is integral to general health and essential for well-being. The key challenges of dental health in rural or remote areas are ensuring access for people in need and providing people, wherever they live, with options which suit their particular circumstances. **Aim:** To correlate oral health perception and oral care practices with caries experience among primary schoolchildren in Ulu Tembeling, Jerantut and to correlate interest of profession with caries experience. **Methods:** Cross-sectional survey using guided questionnaire was conducted. Universal sampling of 5 schools in Ulu Tembeling with 70 study subjects and their respective annual dental record (LP8 card) were retrieved to assess dental caries. **Results:** Around half of the study subjects (49%) have good oral health perception, 37% with good oral care practices. 96% of them have DMFT and dft less than 3. 70% of them were unsure whether they are interested in dental profession. **Conclusion:** No statistically significant correlations between oral health perception, oral care practices and interest with caries experience were found. Collaborative efforts involving all parties to improve oral health for the community in rural areas were recommended

POSTER NO: 22

**Parental Kap towards Prevention of Early Childhood Caries in Kota Bharu, Malaysia**Mani S.A.<sup>1</sup>, Wei Y.P.<sup>1</sup>, John J.<sup>2</sup>, Ismail N.M.<sup>1</sup><sup>1</sup>School of Dental Sciences, Universiti Sains Malaysia, 16150 Kota Bharu, Kelantan, <sup>2</sup>Faculty of Dentistry, Universiti Malaya, 50603 Kuala Lumpur

**Introduction:** The caries prevalence in Malaysia has been found to be 74.5% among 6-year-olds, the highest prevalence being in Kelantan (95.6%). While the creation of a dental home is being encouraged in developed countries, prevention is still the key to achieving optimal dental health in other countries. The aim of this study is to assess parental knowledge, attitude and practice towards prevention of early childhood caries in Kota Bharu, Malaysia. **Method:** In this cross sectional study, 120 parents of infants and toddlers aged 6 months-2 years attending four Maternal and child health clinics in the state of Kelantan, Malaysia were randomly selected and invited to participate in the study. Parents were asked to complete a 30-item questionnaire encompassing all aspects of prevention of ECC. **Results:** Out of 120 parents, 102 completed questionnaires were analysed. About half of them (52%) knew that they should start using toothpaste with fluoride for cleaning their child's teeth when the child learns to spit. Most parents (73%) thought that tooth decay is not caused by bacteria that are transmitted by sharing feeding utensils and 49% of them thought that night time bottle/breast feeding cannot cause tooth decay. A considerable number of parents (67.6%) practiced biting food into small pieces before giving the child. **Conclusion:** We concluded that parents showed relatively better knowledge, but poorer attitude and practice towards the oral health of their children. Consequently, more effort is required to improve knowledge, attitude and practice of oral health among parents and caretakers. Health education should focus on parental responsibilities for oral health and mothers should be encouraged to give practical and emotional support to their children with regard to oral hygiene habits.

POSTER NO: 22

**A Comparison of Sugar Consumption among Dental Staff and School Teachers in Kemaman District**

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**Introduction:** There is considerable scientific evidence of the relationship between dental caries and sugar consumption. However, data on the pattern of sugar consumption is limited and not much has been documented regarding the frequency, quantity and types of sugar consumption among population in Kemaman District. This study investigates the frequency, quantity and types of sugar consumption among dental staff and school teachers in the district. **Method:** This was a comparative cross-sectional study involving dental staff and school teachers, aged 25 years and above. Oral examination and followed by questionnaire interview on the subjects was carried out by a trained dental officer. Only subjects who consented to the oral examination and interview were included. **Results:** In all, 148 subjects, involving 55 dental staff and 93 school teachers participated in this study. Subject's mean age was  $35.2 \pm 6.3$  years and the age range was 25-56 years. There was no significant difference of frequency and quantity of sugar consumption between dental staff and school teachers ( $p > 0.05$ ). The type of sugar consumption between the two groups was significant ( $p = 0.004$ ). There was also statistically significant difference between subject's age group and mean DMFT ( $p < 0.001$ ). **Conclusion:** There is perhaps a need to enhance oral health education particularly on diet counseling in the population.

POSTER NO: 24

**The Estimation of Fluoride Intake from Tea in Japanese Infants.**Kubota T.<sup>1</sup> Arakawa H.<sup>1</sup> Sakamoto T.<sup>2</sup>, Ishikawa A.<sup>2</sup><sup>1</sup>Division of Oral Health, Department of Health Science, Kanagawa Dental College. <sup>2</sup>Hamamatsu-city Oral Health and Care Center. Japan

**Introduction:** Japanese people like tea, especially green tea, and start to drink it comparatively early in their childhood. When systemic fluoride application is introduced in Japan in the near future, it will be necessary to consider the fluoride intake from daily tea-drinking in the childhood period. **Method:** In 2009, we carried out a survey through questionnaire on three-year-old children in a city where a lot of tea is produced. 237 people (114 boys and 123 girls) participated in the survey. The amounts of fluoride intake from drinking tea were estimated by a method developed by Uematsu. **Results:** When we asked the subjects whether or not they liked Japanese green tea, 157 children (66.2%) said that they liked it. The average months of children beginning to drink Japanese green tea was 13.8 months after birth. The average fluoride intake from daily tea-drinking was 111.1  $\mu\text{g F}$ . **Conclusion:** The adequate daily fluoride intake is considered to be 0.05mg F / kg b.w. The adequate daily fluoride intake is estimated to be 0.725 mg because the average weight of subject in this study was 14.5kg. The average fluoride intake from daily drinking tea was 111.1  $\mu\text{g F}$ , so it is equivalent to 15.3% of 0.725 mg. In addition, there is an individual who is taking 1.15mg F every day from drinking tea, therefore, it is necessary to consider the amount of fluoride from tea-drinking that when systemic fluoride application is introduced in Japan.

## POSTER NO:25

**The Influence of Fluoride Intake from Tea in Japanese Infants**  
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**Aims:** We investigated the oral health behavior and oral health status of the same people from the previous report and examined the influence of fluoride intake from tea. We judged the side effects of excessive intake of fluoride by checking enamel opacity and benefit to dental caries. **Methods:** As in the previous report (The estimation of fluoride intake from tea in Japanese infants, Kubota *et al*), 237 people participated in the study, 114 boys and 123 girls. We investigated oral health behavior using questionnaire, and a co-worker carried out the oral examinations. In addition, we divided the subjects into two groups, one who took fluoride from tea more than the average and another into less than average. The status of dental caries and enamel opacities were analyzed among the subjects. **Results:** 96.6% of subjects had finished lactation, and the average finishing time was 16.4 months from birth. 92.8 % of subject had snacks less than three times a day and 7.2 % had snacks more than twice a day. 51.1% of people receive professional topical fluoride application regularly. The average dft was 0.34 and df prevalence rate was 10.5 %. CO-stage that did not form any cavity was seen in 27.8% and the average number of the CO teeth was 0.96. The enamel opacity was seen in 6.3% and the average enamel opacity was 0.12. The results of dft and enamel opacity prevalence rate were 0.29 and 6.2% in subject who took fluoride more than average and 0.45 and 6.7% in subject less, respectively (No statistical significant difference). There was no enamel opacity with the characteristic change of the excessive fluoride intake. **Conclusion:** No correlation was found between the quantity of dental caries or appearance of the enamel opacity and the quantity of fluoride intake from tea.

## POSTER NO: 27

**Evaluation of Dentinal Tubules Obstruction by Various Fluoride Applications Using Scanning Electron Microscopy**  
Lee J.R.<sup>1</sup>, Cho J.W.<sup>1</sup>, Jung K.Y.<sup>1</sup>, Lee S.Y.<sup>2</sup><sup>1</sup>Dept. of Preventive Dentistry, College of Dentistry, Dankook University, Korea, <sup>2</sup>Dept. of Oral Health, Graduate School of Policy and Business Administration, Dankook University, Korea

**Objectives:** To determine the effect of fluoride on dentinal tubules following various types of fluoride application using scanning electron microscopy (SEM). **Methods:** 15 healthy human 1<sup>st</sup> and 2<sup>nd</sup> molar teeth were sectioned into 6 pieces to produce 90 specimens in total. The specimens were later divided into 6 groups. Group 1- control group with no treatment at all, and specimens in the remaining groups were treated with: Group 2- topical NaF solution, Group 3- NaF iontophoresis, Group 4- APF gel, Group 5- neutral gel, Group 6- fluoride varnish. After the treatment, the surface of each group was observed with SEM and the obstruction level of the dentinal tubules was calculated. **Results:** The obstruction level of Group 2 with topical application of NaF solution is  $2.85 \pm 0.84$  while that of Group 3 with NaF iontophoresis is  $3.69 \pm 0.23$ . Therefore, the obstruction level of iontophoresis is significantly higher than NaF solution ( $p < 0.05$ ). The obstruction level of the specimens in Group 6 with fluoride varnish was also found to be significantly higher than the APF gel, iontophoresis and neutral gel groups ( $p < 0.05$ ). **Conclusion:** In conclusion, for desensitization treatment, the application of fluoride varnish, iontophoresis and APF gel can be useful as they provide high obstruction of dentinal tubules

## POSTER NO: 26

**The Effect of Anchovy of *Stolephorus Baganensis* on Mutans Streptococci**Agunawan H.<sup>1</sup>, Mangundjaja S.<sup>1</sup>, Darwita R. R.<sup>2</sup><sup>1</sup>Department of Oral Biology, <sup>2</sup>Department of Dental Public Health and Preventive Dentistry Universitas Indonesia

**Introduction:** Anchovies are commonly consumed as traditional food. They are considered beneficial for health, including potential capability to prevent dental caries because of the active substance of fluoride. A clinical trial was carried out to investigate the effect of Anchovy of *Stolephorus baganensis* on mutans of *Streptococcus mutans* inhibiting the growth of the mutans of *Streptococcus mutans* in plaque. **Methods:** Before enrolling in the study, respondents provided informed consent. Twenty respondents participated as the subjects on the clinical trial, conducted two times of treatment as follows: twenty as treatment groups before and after consuming anchovy and twenty subjects as control groups before and after consuming non-anchovy fish. Plaque samples were collected before and after consuming anchovy and non-anchovy. A serial dilution was made, followed by inoculating on TYS20B medium (Schaeken, M.J.M, *et al*, 1986). Data which were obtained from colony forming units of *Streptococcus mutans* in plaque grew on the TYS20B medium before and after consuming anchovy were analyzed in a descriptive and t-test. **Results:** There was no significance in the average amount of *Streptococcus mutans* colonies between before and after consuming non-anchovy of *Stolephorus baganensis*. However, a significant difference was found respectively as results before and after consuming anchovy of *Stolephorus baganensis*. **Conclusion:** Anchovy of *Stolephorus baganensis* was seen to have antimicrobial activity against local strains of *Streptococcus mutans* isolated from human harbouring species. Therefore in a long term of consuming Anchovy fish of *Stolephorus baganensis* caries may be prevented.

0 magnification. **Results:** The group which had the most frequent fluoride application (D) has the highest level of CaF<sub>2</sub> crystals formed. Iontophoresis method produced the most CaF<sub>2</sub> crystals followed by fluoride varnish. **Conclusions:** In clinical practice, fluoride varnish is recommended after the iontophoresis method for topical fluoride application for prevention of dental caries.

## POSTER NO: 28

**Calcium Fluoride Crystal Formation on Tooth Enamel from Various Types and Frequency of Fluoride Application**

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**Aim:** To assess the level of calcium fluoride (CaF<sub>2</sub>) formed on tooth enamel from various types and frequency of topical fluoride application. **Methods:** 10 extracted molar teeth were divided into two groups according to frequency of applying topical fluoride (Group 1) and type of topical fluoride applied (Group 2). Each tooth was sectioned into four specimens, which were then mounted on resin moulds, 0.5mm in diameter. Group 1 consisted of a control group with no fluoride application (A), one time application (B), two times application (C) and four times application (D). Fluoride was applied onto these specimens using the iontophoresis method. Platinum wire was inserted into the apex of the tooth specimen to allow the flow of 400mA electric current for four minutes. In Group 2, the specimens were exposed to different types of topical fluoride application. There were a control group (E), iontophoresis method (F), fluoride gel (4 times application) (G) and fluoride varnish (H). All samples were examined using scanning electron microscope (SEM) with x1000 magnification. **Results:** The group which had the most frequent fluoride application (D) has the highest level of CaF<sub>2</sub> crystals formed. Iontophoresis method produced the most CaF<sub>2</sub> crystals followed by fluoride varnish. **Conclusions:** In clinical practice, fluoride varnish is recommended after the iontophoresis method for topical fluoride application for prevention of dental caries.

POSTER NO:29

**Most electronegative with positive results – “Fluorides”**

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**Introduction:** Dental caries is a multifactorial and most prevalent chronic disease affecting the human race. Children are affected more because of improper cleaning habits, neglected oral hygiene and change in dietary pattern, due to change in modern life style. In many ways it is considered a disease of modern time as the occurrence of caries is much higher in the last few generations. Prevention and management of dental caries is a long standing debatable topic. **Method:** Fluoride is applied topically for greater beneficiary result. **Result:** Fluorides has been used in dentistry since decades and proven to be an effective anti-cariogenic agent. Studies have shown that fluoride is not only an appropriate therapeutic agent for use in community dental health services but also an effective agent in preventing new caries in primary tooth of children. Nowadays health professionals have an opportunity to help prevent tooth decay in young children by use of these fluorides. **Discussion:** Fluoride is the most electro negative element which naturally never exists in free state. It combines chemically with other elements as fluoride compound. Various mechanisms of action and fluoride have been studied including the remineralisation potential, antimicrobial effects on dental plaque following use in vivo without complications. **Conclusion:** The purpose of this poster is to present various newly available topical fluoride agents like Silver diamine fluoride(SDF) which has got dual impact including the antimicrobial effect of silver and slow releasing fluoride devices which raise intra oral fluoride concentration at constant rates.

POSTER NO: 31

**Micromolar Fluoride Reduces Alveolar Bone Loss in Experimental Rat Periodontitis**

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**Introduction:** The surface of oral mucosa can be served as a long-term fluoride reservoir following topical fluoride application. A small amount of fluoride in oral environment is useful for prevention of dental caries. Fluoride has also been recognized for prevention of osteoporosis. This study aims to investigate the effect of systemic fluoride application on alveolar bone loss induced by Porphyromonas gingivalis infection. **Method:** Sprague-Dawley Rats (3 weeks old) were given sulfamethoxazole (1 mg/ml) and trimethoprim (200 ug/ml) in drinking water, ad libitum, for 4-d to reduce the original oral flora, followed by a 4-d antibiotic-free period before being challenged with P. gingivalis. Rats were orally challenged with P. gingivalis ATCC 33277, which were suspended in 5% carboxymethylcellulose, and each rat received through oral gavage (three times) at 48-h interval. At the end of the experimental period, all animals were sacrificed under anesthesia. Tissue blocks containing all three maxillary molars, and surrounding soft tissues were removed from the right side of the maxilla. The left side of the maxilla was used as a dry specimen for measurement of horizontal alveolar bone loss. All three mandibular molars were evaluated by micro CT analysis. Horizontal alveolar bone loss was evaluated by measuring the distance between the cemento-enamel junction and the alveolar bone crest. Specimens from periodontal tissue were evaluated by staining with hematoxylin-eosin and tartrate-resistant acid phosphatase. **Results:** The amount of bone loss in oral challenged with P. gingivalis group was markedly increased than that of control group. In oral challenged with P. gingivalis and fluoride group, bone loss was significantly reduced. **Conclusion:** These results suggest that low level fluoride in oral environment prevents the progression of P. gingivalis-challenged periodontitis in rats.

POSTER NO: 30

**The Use of Home Water Filtration Systems among Dental Personnel and Their Perceptions towards Water Fluoridation in Johor**

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**Aim:** To determine the types of water filtration systems (WFS) commonly used, to find the reasons for using water filtration systems and also to gauge the perception of Johor Oral Health Personnel on water fluoridation. **Method:** It was a cross sectional study. A questionnaire was designed to identify the households using water filtration devices. Information is also gathered on location of residence, their concern/type of complaint about quality of water, the type of water filtration system (WFS) used, duration of use and maintenance regime, if any. The questionnaire also explored the perception of the fluoridation programme and the effect of water filtration on fluoride content. Data entry and analysis was done using SPSS software. **Results:** Muar district (45.7%) recorded the highest proportion using WFS, followed by Johor Bahru (30.8%) and Mersing (22.0%). The most popular system used is the activated carbon system (39.3%), followed by reverse osmosis system (37.6%) and distillation (14.5%). 81% had them installed in the last 5 years and almost half of these were installed in the last one year. Among the users of WFS, more than 80% had their devices serviced in the last two years and only 12.8% of systems had never been serviced before. The overall reasons for using WFS are for health benefits (98.0%) and quality of water (93.2%). However, only 36.4% of respondents know about the effect WFS on fluoride content in water, while 63.6% are not aware or are not sure. **Conclusion:** About 34% of the oral health personnel in Johor use water filtration systems in their homes; with activated carbon systems being the most popular. It was estimated 2 in 10 personnel do not know that WFS can remove fluoride in drinking water.

POSTER NO: 32

**A Study of the Effect of Home Water Filtration Systems on Fluoride Content of Drinking Water in Johor**

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**Introduction:** With the general population concerned with polluted water, tendencies toward purchasing bottled water and filtration system is at a high. This poses a challenge to the water fluoridation programme as questions are being raised as to whether fluoride content in public water supplies is affected by these filters. **Objectives:** To compare fluoride content of drinking water before and after passing through various water filtration devices and also to compare difference in fluoride content of drinking water between various water filtration devices. **Methodology:** A total of 49 water filters were included in this study. Fluoride levels were analyzed using the Hach's colorimeter. Statistical analysis was done with SPSS software. All procedures were computed to within the 95% confidence level. **Results:** Of the 49 filters, 29 were carbon activated (CA), 11 reverse osmosis (RO) and 9 using other technologies. Fluoride levels before and after filtration through CA systems were not significantly different ( $p>0.05$ ); while those through RO systems were significantly different ( $p<0.05$ ). Similarly, fluoride levels were significantly different before and after going through other systems ( $p<0.05$ ). Fluoride levels between different filtration systems were found to be significantly different ( $p<0.05$ ); with CA systems being significantly higher than RO and others. **Conclusions:** The use of carbon activated WFS has no effect on fluoride levels in drinking water ( $p>0.05$ ). Reverse Osmosis WFS significantly lower the fluoride level of drinking water ( $p<0.05$ ). WFS using technologies other than CA and RO significantly lower the fluoride level of drinking water ( $p<0.05$ ). Water filtered through CA systems has significantly higher fluoride levels than those filtered through RO ( $p<0.05$ ) and WFS using other technologies ( $p<0.05$ ). Water filtered through RO systems has same fluoride levels than those filtered through WFS using other technologies ( $p>0.05$ ).

POSTER NO: 33

**Attitudes towards the Use of Fluorides among Imams (Islamic Clerics) in Kelantan**Nazita Y., Jaafar N., Doss, J.G..

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**Introduction:** Islamic values affect the attitudes and practices among Muslims. Recently, there is growing hesitation in choosing fluoridated products among Muslims community. One of their reasons for this is the uncertainty about the use of fluoride from the perspective of the Islam religion. **Aim:** The study assessed the knowledge, attitudes and practices of Imams (Islamic clerics) concerning fluoride toothpaste and fluoridated water supply usage in Kelantan. **Methods:** A cross sectional study was carried out on Imams in 65 registered mosques in Pasir Puteh district, through face to face interviews, using a structured questionnaire and open ended questions. **Results:** The Imam response rate was 82.2%. Almost two-thirds (63.9%) were not sure of their toothpaste content. Only 25.3% knew that they were using fluoridated toothpaste. Slightly more than one-third (37.3%) were using fluoridated piped water supply. The majority (86.7%) had inadequate knowledge and more than two-thirds (68.7%) had poor attitudes towards fluorides. Television was the most common (54.3%) source of information about fluorides among Imams, followed by newspapers (8.6%) and both (8.6%). The reasons for disagreement about fluoride; i) the uncertain of the halal status of fluoride (2.4%) and ii) the fear of dangerous side effects (3.6%). The attitudes were significantly associated ( $p=0.010$ ) with fluoridated toothpaste usage. Nevertheless, it was not significantly associated with the usage of fluoridated piped water supply ( $p=0.185$ ) and socio-demographic variables. **Conclusions:** Majority of Imams had inadequate knowledge and poor attitudes towards the benefits and risks of fluoride in toothpaste and public water supply.

POSTER NO: 35

**A Study on Recognition and Support of Long Term Care Insurance for the Aged**Seong J.M., Hwang J.M., Park Y.D.

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**Aim:** To investigate dentists' recognition and support on the Senior Long-term Care Insurance System 'SLCI system'. Survey targets were dentists who worked in Seoul, Incheon and Gyeonggi-do. **Methods:** A survey was conducted for four month from January 2009, on 207 dentists. Data was analyzed using SPSS ver. 12.0 for frequency, cross tabulation, one-way ANOVA and Pearson's correlation coefficient. **Results:** About 44.0% of respondents knew just the name of the SLCI system, and only 3.9% knew about the detailed coverage of the SLCI system. Only 15.9% of dentists of respondents knew that dentist was included as a Long-Term Care Committee Grading for adjudications, and 35.3% knew that dentist's instructions was compelled by law when dental hygienists visit homes that need care. They actively supported SLCI system when having disabled person among their family. **Conclusions:** The dentist's perception of elderly in long-term care insurance system was low. Overall, dentists' awareness was affirmative for SLCI system including an extra charge to their premium insurance. Dentists need to consider the contribution of SLCI system for the elderly in the further.

POSTER NO: 34

**Post-Retirement Economic Plans and Demands for Social Support of Dentists**Kim J.H., Lee Y.H., Park Y.D.

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**Aim:** The purpose of this study was to examine potential post-retirement economic plans for dentists and their demands for social support, and was also to provide reference materials for exploring into possible routes to develop their post-retirement economic plans and set a favorable direction of social supports for them. **Methods:** In order to achieve the above goals, this study adopted stratified sampling method in proportion to the number of logical practicing institutions. Next, 485, 120 and 250 dental hospitals or clinics were selected in Seoul city, Incheon city and Gyeonggi province respectively. And this study used a self-administered questionnaire to survey practicing dentists by mail, fax or interview. Then, total 486 valid questionnaires were collected from respondents from Feb. 22 to Apr. 22, 2010 for data analysis. **Results:** it was found that 76.5% respondents answered 'Yes' to a question item on 'making post-retirement economic plans', but 23.5% respondents answered 'No' to the same question item. For a question item about possible ways to make post-retirement economic plans, it was found that relatively many of all respondents, whether married or unmarried, were likely to rely on 'private insurance plan'. For a question item on such desired policies for post-retirement economic plan of dentists as initiated by Korean Dental Association (KDA), it was found that largest number (31.2%) of respondents preferred 'regular post-retirement orientations' to others. **Conclusions:** It will be required for relevant authorities to develop and provide a regular formulated orientation program on post-retirement economic plans for dentists, and campaign for positive participation of dentists in the program.

POSTER NO: 36

**Association of Edentulism and Vegetable Intake in Community-Dwelling Older Adults.**Hirotsu T., Yoshihara A., Miyazaki H.

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**Aim:** Edentulism affects intake of food groups in older adults, but this association is not completely understood. The purpose of this community-based study was to compare intake of food groups between edentulous and dentate subjects in an elderly population aged 65+ years. **Methods:** This study included 125 edentate and 552 dentate elderly. We used a dataset of the Health and Nutrition Survey in Niigata Prefecture. The Nutrition Survey was conducted on a single day of the survey. Survey forms were previously sent and the type and amount of food consumed were recorded on a household basis. The records were confirmed and retrieved by dietitians. Data regarding the number of teeth and smoking status were collected from a mailed questionnaire and subjects were divided into four groups according to number of teeth (0/1-9/10-19/20+) and three groups (current/former/non-smokers), respectively. Mean energy intake was calculated from a multiple linear regression analysis controlled for age, gender, and smoking status. Other adjusted mean intake of food groups was calculated similarly, including total energy intake as an additional confounder. **Results:** Although daily energy intake was lowest in edentulous subjects and highest in those with 20+ teeth ( $1747.3 \pm 44.6$  kcal vs.  $1842.4 \pm 29.5$  kcal), there was no significant difference. Subjects with 20+ teeth consumed significantly more vegetable compared to their edentate counterparts ( $394.9 \pm 11.3$  g vs.  $351.6 \pm 17.1$  g,  $p<0.05$ ). Although no significant association was found between fruit consumption and the number of teeth, edentulous subjects may avoid hard-to-chew fruits including apples. Additionally, edentulous subjects ate significantly more sweet snacks compared to those with 20+ teeth ( $32.6 \pm 3.7$  g vs.  $22.8 \pm 2.4$  g,  $p<0.05$ ). **Conclusion:** This study showed that edentate elderly, even though most wore dentures, consumed less vegetable. However, the amount of vegetable consumed seems marginally.

POSTER NO:37

**Oral Function Promotion Program for the Independent Elderly in Japa**Hakuta C<sup>1</sup>, Shinada K<sup>1</sup>, Ueno M<sup>2</sup>, Kawaguchi Y<sup>2</sup>.<sup>1</sup>School of Oral Health Care Sciences, <sup>2</sup>Department of Oral Health Promotion, Tokyo Medical and Dental University, Japan

**Introduction:** Oral function enhancement along with dental prostheses and better oral hygiene has been reported to be effective in preventing swallowing difficulties on the dependent elderly. **Aim:** The purpose of this study was to provide an oral function promotion program for the independent elderly and evaluate the changes of oral health status and oral function between the intervention and control groups. **Method:** The subjects were 131 independent elderly females recruited from senior citizens' centers in Tokyo (mean age: 74.6). The intervention group (n=79) received a 3-month oral function promotion program by dental hygienists. The control group (n=62) did not receive this program. The contents of the program were education of oral health and oral function, face muscle exercises, tongue exercises and salivary gland massages. At baseline, a self-administered questionnaire was conducted for all the participants. At baseline and 3-month follow up, the same dentist examined oral status and assessed oral function of the elderly. **Results:** In the intervention group, the tongue coating scores decreased and the organoleptic score of oral malodor fell. The amount of food debris in the oral cavity decreased and the tongue dryness improved. Furthermore, the salivary flow rate increased. The length of time of keeping tongue in the forward position increased from 11.2 seconds to 18.7 seconds, and the number of times of moving tongue tip with a clockwise circle motion, counterclockwise circle motion and side to side motion within 30 seconds increased from 14.5 to 20.6, 14.5 to 20.2, and 17.2 to 23.3, respectively. The number of times of lips motion significantly improved from 23.0 to 28.8 and the pronunciation of words was observed to be clearer. **Conclusion:** An oral function promotion program was effective in improving the oral health status and oral function of an independent elderly population.

POSTER NO: 39

**Oral Health Status and Prosthetic Needs of Indonesian Institutionalized Elderly.**Adiatman M.<sup>1,2</sup>, Ohnuki M.<sup>1</sup>, Ueno M.<sup>1</sup>, Shinada K.<sup>1</sup>, Kawaguchi Y.<sup>1</sup><sup>1</sup>Dept. of Oral Health Promotion, Tokyo Medical and Dental University Japan, <sup>2</sup>Dept. of Dental Public Health and Preventive Dentistry, University of Indonesia

**Introduction:** In Indonesia there are few studies regarding the oral health of the elderly, especially those living in institutions. The present study was conducted to investigate the oral health status and prosthetic needs of the Indonesian institutionalized elderly. **Method:** Clinical dental examinations and questionnaire survey were conducted among 163 elderly subjects (29 males, 134 females); resided in 5 private nursing homes in Jakarta, Indonesia. Clinical dental examinations were performed mainly to investigate number of teeth present, denture status and condition. A questionnaire collecting demographic information including oral health behavior and frequency of dental visit, was completed through an interview. **Result:** The mean age of subjects was 74.1±8.6. Nineteen percent were completely edentulous. Among these edentulous subjects almost half had no dentures, 16% wore only upper denture; and 32% had upper and lower complete dentures. Within the 132 dentate subjects, the mean number of teeth was 17.1 ± 9.9, 81% had missing teeth but no denture replacement. Among the 131 subjects who need dentures, 72 subjects (55%) were reluctant to make any dentures because of various reasons; 51% of subjects thought denture would not be comfortable to use, 18% had fear and anxiety to visit dentist, 18% thought denture was expensive; others had no caregiver to accompany them to visit dental office. Questionnaire results also revealed that 26% of subjects did not brush their teeth regularly and 32% of subjects never visited a dentist in their entire lifespan. **Conclusion:** The results showed that the Indonesian elderly had poor dental health and high prosthetic needs. Most of elderly subjects with missing teeth had no denture replacement, due to various reasons such as the lack of awareness and barriers against seeking treatment. Oral health education and improvement of accessibility to dental treatment are necessary to promote oral health of the institutionalized elderly in Indonesia.

POSTER NO:38

**Oral Health and Quality of Life in Elderly Thai**Sammieng P.<sup>1,2</sup>, Ueno M.<sup>1</sup>, Shinada K.<sup>1</sup>, Zaitu T.<sup>1</sup>, Kawaguchi Y.<sup>1</sup>.<sup>1</sup>Dept. of Oral Health Promotion, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Japan. <sup>2</sup>Dept. of Preventive Dentistry, Faculty of Dentistry, Naresuan University, Thailand

**Introduction:** Many studies show that Quality of Life (QOL) is an important element of health. Oral health status is also closely related with the QOL. The aim of this study was to investigate the relationship of oral health status with oral health related and general QOL in community dwelling elderly Thai. **Methods:** Subjects in this cross-sectional study were 612 community dwelling Thai aged 60 years or older. A structured questionnaire was administered to evaluate sociodemographics, general oral health assessment index (GOHAI) and world health organization quality of life (WHOQOL). Oral examinations assessed teeth present, decayed teeth, gingival bleeding, pocket depth, functional tooth units (FTUs) and salivary flow rate. Association of GOHAI and WHOQOL with oral health status was analyzed by logistic regressions for dentate (n=428) and edentulous subjects (n=184), adjusted by age, gender, education, income and status of systemic disease. **Results:** For dentate subjects, logistic regression analysis showed that teeth present, decayed teeth, gingival bleeding, pocket depth, FTUs and saliva flow rate were significantly associated with GOHAI. Regarding WHOQOL, QOL in the physical domain was significantly associated with teeth present, gingival bleeding and FTUs. The psychological domain was significantly related with teeth present, decayed teeth, gingival bleeding and FTUs. The environment domain and the social domain were significantly associated with teeth present and FTUs. For edentulous subjects, denture wearing was significantly associated with GOHAI and all domains of WHOQOL. **Conclusion:** The number of teeth present, denture wearing and FTUs strongly affected the oral health related and general QOL. Dental caries, periodontal status and salivary flow rate also affected oral health related QOL and some domains of general QOL. Therefore, it is considered that an improvement in oral health status would promote QOL of older Thai.

POSTER NO: 40

**Oral health-related quality of life in Thai elderly**

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**Introduction:** Clinical measures reflect only one aspect of oral health status thus a socio-dental indicator has been used to assess the oral impacts on several aspects related to quality of life. However, there is limited information regarding the oral impacts on quality of life among the elderly in Thailand. This study aimed to assess the prevalence of oral related impacts on the quality of daily life in older Thais. **Methods:** A cross-sectional survey was conducted in Khon Kaen municipality, Thailand. A stratified cluster random sampling was utilized. Four hundred and two older individuals aged 60 to 74 living independently in 14 communities were selected to participate in this study. A structured interview was conducted to identify normal patterns of health behavior, oral care and dental attendance. The Oral Impacts on Daily Performances (OIDP) was administered prior to an oral examination. **Results:** About one half of the elderly interviewed (49.3%) had at least one OIDP oral impact. The most common performance affected was eating (39.8%) and two main symptoms that caused oral impacts in the total sample were pain and discomfort. There were statistically significant differences among prevalence of impacts on daily performance and mean DMFT, frequency of dental service attendance, the amount of tobacco use and chewing betel nut (p<0.05). **Conclusion:** Oral impacts that affected quality of life of older people were relatively common but not severe. The impacts were related to some social and clinical variables.

POSTER NO: 41

**Oral Health and Nutrient Intake in a Community-Based Older Adults**Shareena Delaila M.S<sup>1</sup>, Zaituny<sup>1</sup>, Rosli T.I.<sup>2</sup><sup>1</sup>Faculty of Medicine and Health Sciences, <sup>2</sup>Institute of Gerontology, Universiti Putra Malaysia, Malaysia

**Introduction:** Oral health condition has been commonly associated with poor eating habit and nutritional status of the elderly. This study aims to determine the association between oral health and nutritional status among older adults aged 55 years and above of the Dewan Bandaraya Kuala Lumpur (DBKL) Senior Citizens' Club. **Method:** Information on socio-demographic background was obtained through face-to-face interview. Weight, height, mid-upper arm circumference (MUAC), calf-circumference (CC) and total body fat (TBF) were also measured. Dietary intake was assessed through a 24-hour dietary recall and the oral health status (presence of remaining teeth, total of posterior occluding pairs, dental caries, periodontal status, use of dentures) was examined by a trained dentist. **Results:** A total of 85 older adults (mean age 63.9±6.5) participated in this study. The mean body mass index (BMI) was 26.48±4.06 kg/m<sup>2</sup> and majority of the respondents (48.3%) were overweight. More than half (54.1%) of the respondents consumed more than 2000 kcal per day. Majority of them (75.3%) consumed less than 400g carbohydrate, 73% consumed less than 5g of dietary fiber, 92.9% did not meet the recommended intake for calcium and 70.6% consumed less than 70mg of vitamin C. The mean of remaining teeth was 14.01 ± 9.28 and posterior occluding pairs were 1.19 ± 1.80. Only 7.1% were edentulous. Majority of the respondents (65.2%) with BMI of more than 25kg/m<sup>2</sup> had less than 20 remaining natural teeth. Almost half of the respondents (49.2%) with less than 5 posterior occluding pairs (POP) of teeth consumed calorie less the Recommended Nutrient Intake (RNI). **Conclusions:** Findings from this study showed that older adults with reduced number of teeth consumed lower intake of nutrients. Older adults with reduced number and POP of teeth also tend to be overweight or obese.

POSTER NO: 43

**Locus of Control and Oral Health among Rural School Children.**

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**Introduction:** Human behaviors are often studied through measurement of people's attitudes. These are based on theories, which presume that attitudes are relevant determinants of a person's behavior and vice versa. One of the theories explaining behavioral patterns is Locus of Control. Previous studies have shown a relationship between locus of control and oral health. While most of the studies among children have concentrated on the early childhood, few studies have sought to investigate the relationship between LoC and oral health among the adolescent age group. **Aims:** The objectives of this study were to assess the relationship between locus of control (LoC) and oral health among a group of rural adolescent school children and to examine the influence of socioeconomic status (SES) on the association between health locus of control and oral health status. **Methods:** A total of 318 children of 15 years age from a public and private school formed the study population. The children were administered the Indian translation of the 18 item Multidimensional Health Locus of Control scale and were subsequently examined for caries and oral hygiene. **Results:** T-tests and correlation analyses showed a significant relationship between higher 'Internal' Locus of control and dental caries. Hierarchical multiple regression analysis was done to assess the effect of socioeconomic status on LoC and oral health using three interaction models which showed a statistically significant interaction between 'Internal' LoC and socioeconomic status on caries. Socioeconomic stratum specific estimates of the relationship between the LoC and caries revealed a positive association between Internal LoC and caries in the middle socioeconomic group. **Conclusions:** The results demonstrated the relationship between locus of control and oral health and the role of socioeconomic status having a strong bearing on this relationship. These factors have to be taken into consideration when planning any oral health intervention for this important population.

POSTER NO: 42

**Oral Health Care in Nursing Homes: Practices, Knowledge and Awareness among the Staff**

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**Introduction:** Nursing home staff can play a major role in assisting institutionalized elderly improve their oral health status. This study aims to identify the practices of oral health care in selected nursing homes in Selangor and Kuala Lumpur, and assess the knowledge and awareness of their staff on oral health care of elderly. **Method:** Thirty-nine private nursing homes were identified for this study. Questionnaire that comprised of questions on staff's working experience and knowledge on dental care were designed, pre-tested and mailed to all the homes. The staff who agreed to participate in the study was requested to complete and return the questionnaire. **Results:** Completed questionnaire forms from 25 nursing homes were retrieved. Sixty-five percent of the staff had more than 10 years of working experience in nursing homes. Only 26% was trained on management and prevention of dental disease. Sixty-five percent reported that they supervised the residents cleaning the oral cavity and 91% took them to nearby clinic whenever in pain. More than three-quarter knew the causes of tooth decay and ways to prevent it. Bacteria in dental plaque were identified as the main cause of tooth decay by 70% of the staff. Ninety-two percent felt the importance of oral care among elderly residents and agreed that training on oral health care was useful in helping them to manage dental problems. **Conclusions:** The nursing home staff in this study demonstrated good knowledge on tooth decay. They were also aware of the importance of oral care for the elderly in the institutions. However, frequent support and assistance from dental teams should be given to the staff so as to improve the oral health of the residents.

POSTER NO: 44

**The Assessment of Influence of "Lunch Program" on a Caries Activity in Mongolian School Children**Delgertsetseg.J<sup>1</sup>, Oyuntsetseg.B<sup>1</sup>, Tseregmaa.Ts<sup>2</sup>, Amarsaikhan.B<sup>1</sup><sup>1</sup>School of Dentistry, Health Sciences University of Mongolia,<sup>2</sup>School of Biomedicine, Health Sciences University of Mongolia

**Introduction:** In Mongolia dental caries and its complications are very widespread, followed by clinical and economical difficulties. In 2006, the "Lunch program", launched by the Mongolian President, went into effect in primary schools. **Aim:** Our study was to investigate influence of "Lunch program" on caries activity of pupils. **Methods:** The study population consisted of 75 pupils. 1. A dental examination and plaque index were done by using a mouth mirror and explorer under natural light. Oral health condition was evaluated by Green and Vermillion, 1964. 2. Plaque pH was determined for each pupil by Shimono's method, 1974, using CAT21 test. 3. The study procedure was done by 2 stages, 2007. **Results:** 1. The caries prevalence and mean of dmft of pupils were 78.5% and 3.23±0.31 for the first time and 88.6% and 4.47±0.37 in the second time, respectively (p<0.01). 2. For the first procedures result of plaque pH consisted of low risk group 64.4% and high risk group 35.6% before lunch, and after lunch the low came down to 53.6% and high got up to 46.4%. For the second procedure before lunch, low risk group was 70.3% and high 29.7%, but after the lunch it changed to 46.9% and 53.1%, respectively (p<0.01) 3. In the first time, the oral hygiene index consisted of 91% "good" and 9% "poor" of pupils of 76<sup>th</sup> school but 97% "good" and 3% "poor" of pupils of 67<sup>th</sup> school. Then in the second time, it was 86%, 14%, 92% and 8%, respectively (p<0.05). **Conclusion:** Study results showed that the foodstuffs used at lunch is one of the risk factors of caries process. So to reduce plaque derived after lunch, we must try to use some simple methods such as tooth brushing, chewing sugar free gum and rinsing the mouth by water after lunch.

POSTER NO: 45

**Public Health Cyber Management Supporting System on Dental Health Promotion**Syaefullah A.<sup>1</sup>, Sri S<sup>1</sup>, Grace V<sup>2</sup>.<sup>1</sup>Public Health Department, <sup>2</sup>Dental Hospital, Faculty of Dentistry, Padjajaran University, Bandung Indonesia

Concerning the WSIS on Geneva Declaration of Principles on ICT applications, the Health Ministry and the Communication & Information Ministry of Indonesia have created general guide lines on ICT applications on "Healthy Indonesia. In line with the mission and goal of "Healthy Indonesia" through e Health, one relevant effort should be taken into action in Dental Health is the implementation of Dental Public Health Cyber Management Supporting System (DHCMS) on dental health service delivery system and dental health promotion program. The benefit of DHCMS is to improve poor caries prevalence and oral health condition of the Indonesian population; through its particular application into the system available in each dental hospitals and dental health centers. A qualitative study has been performed to 10 dental hospitals in Indonesia and 5 health centers, and 50 participants of dental health providers in Bandung city as purposive samples; to identify the common constraint in the effectiveness of e-Health program. The qualitative data are collected through interviews carried out by surveyors concerning; (1) the role of public governance authorities and all stakeholders in the implementation of e-health; (2) the usage of information and communication infrastructure; (3) the accessibility to information and knowledge on Dental Health Program; (4) the capacity building; (5) the confidence and security protection on the usage of ICTs on Dental Health Promotion; (6) the conducive working environment; (7) the cultural diversity and identity of local content; (8) the media; (9) the ethical dimensions of the information society; (10) the international and regional cooperation. Result of this study was that the providers in dental health delivery system agreed that the DHCMS is needed to be implemented into the dental health delivery system and able to promote Dental Health Promotion Program.

POSTER NO: 47

**Participatory Action in Oral Health Promotion in a School for Children with Disability**Preecha T.<sup>1</sup>, Srisilapanan P.<sup>2</sup>, Bualoy R.<sup>1</sup><sup>1</sup>Preventive Clinic, Dental Hospital, Chiang Mai University, <sup>2</sup>Dept. of Family and Community Dentistry, Faculty of Dentistry, Chiang Mai University, Thailand

**Introduction:** Srisangwan Chiang Mai School provided education for children with physical and mental disability. Children attending this school have difficulty performing oral self-care. A joint oral health promotion programme was established between the school and the Dental Hospital. **Aim:** This study aimed to formulate an oral health care programme with participatory action from key leaders in school. **Method:** This was a qualitative study. The key leader groups were school teachers, student's leaders in Grade 5 and 6, and oral health educators from the Dental Hospital. Informal participatory observation was done by the researchers. Four stages participatory processes were designed; investigation for the common needs and set the goals, planning, implementation and evaluation. **Results:** Initial meeting was organised to advocate all parties on the importance of oral health. All key leaders participated actively and an active brainstorming session among all parties was observed. The common goal was the cooperative action between the schools and the oral health educators to promote the oral health of all students. They emphasised the need to provide more oral health care knowledge to students, develop a more appropriate home oral care products. Multimedia specially designed for these special students was urgently needed. A year plan was formulated. Many activities were proposed. For example brushing at lunch time, producing a video clip for classroom teaching, etc. Producing appropriate multimedia was chosen to implement as the first priority. Several meeting and activities were organised to meet the set goals. **Conclusion:** The school teachers and students shown high responsible and active participation to organise the oral health activity. Provision of oral health care for children with special health care needs requires specialised knowledge. Increased awareness, attention and participation from the school teachers and the students themselves should be a good approach and should lead to improving oral health for these special students.

POSTER NO: 46

**Effectiveness of Tooth Brushing Program on Oral Health Promotion in Primary Schools**

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**Aim:** This study was to assess the variations in caries, oral health and oral hygiene before and six months after tooth brushing program in schoolchildren. **Methods:** Children in the 1st and 6th grade of three schools were included as experimental groups and another school for control. Oral examination and questionnaire survey were carried out on these children before and after the program. The questionnaire included questions on tooth brushing habits. **Results:** The highest frequency of tooth brushing was found at Bong-rae School, followed by Nam-san School. Both schools utilized the floor-type tooth brushing unit. The latter was also found to have the highest frequency of tooth brushing exercise after lunch ( $p < 0.05$ ). **Conclusion:** It is recommended that tooth brushing of room type unit should be established and tooth brushing instruction should be supervised by the school teacher or nurse in order to promote oral health.

POSTER NO: 48

**Promoting Oral Self-Care Using Penscope in A Mobile Oral Health Team**Bualoy R.<sup>1</sup>, Srisilapanan P.<sup>2</sup>, Preecha T.<sup>1</sup><sup>1</sup>Preventive Clinic, Dental Hospital, Chiang Mai University, <sup>2</sup>Dept. of Family and Community Dentistry, Faculty of Dentistry, Chiang Mai University, Thailand

**Introduction:** Oral health has been acknowledged as an important health problem. Although it is not life-threatening but oral health problems have several impacts such as pain and discomfort. The oral health examination given in most mobile dental clinic was only a one-way information given process which could not attract attention from the patient. Penscope is an advanced technology equipment normally used in a dental clinic. **Aim:** This study aimed to integrate high technology into the oral examination process using penscope to increase oral self-care awareness in patients. **Methods:** An assessment on the response after using penscope (VIS-27, J.Morita) was done in 198 subjects aged 10-16 years. All patients were undergone the oral examination using penscope to illustrate their oral health condition. Explanation using their own oral image on the screen was done by the oral health educator. Main questions and responses from the patients were recorded. **Results** Most patients expressed more enthusiastic to learn about their own oral health condition. They asked for more information about their oral health status. Most common questions asked were; what was my problem, would the red gum disappeared, what should I do to eliminate the swollen gum, why I had the black stain, how could I eliminated the black deposit, why I had the white spot, etc. When the patients received the explanation from the dental personnels, they were more likely to go back and took more care for themselves. **Conclusion:** Integrated the high technology by using penscope in a mobile dental team attracted the interest of adolescent patients. It increased their concern over their oral health as they could visualise their own oral condition. This equipment was portable and easy to implement in a mobile team. Therefore, it would be more appropriate to use as an oral health promotion tool.

POSTER NO: 49

**Oral Health Status, Practice and Oral Health Related Quality of Life (OHRQOL) among Students in a Private School**Haslina R., Nurulhuda M., Alsagoff Z., Yahya N.A., Abdul Kadir R.

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**Introduction:** In Malaysia, school dental service that provides oral health education and incremental dental care is only available for government dental schools. Oral health status, practice and OHRQOL among children of privately managed schools remain unexplored. **Aim:** This is a preliminary study that looks at the oral health status, practice and perceived oral health related quality of life among the school children in a private school with no school dental service. **Method:** This cross-sectional study involved 61 students at a selected school in Ampang, Selangor. Oral health practice and OHRQOL survey was done through a self-administered questionnaire. The questionnaire was modified from Oral Health survey guidelines by the European Global Oral Health Indicators Development. Caries experiences as measured by mean number of decayed, missing and filled permanent teeth (DMFT) were recorded. Information gathered were statistically analysed using SPSS version 16.0. **Findings:** Mean age of respondents was 12.73 (s.d 1.92). Thirty nine (63.9%) were female. The mean DMFT score (0.64, s.d. 1.1) was lower than the national average reported by the National Oral Health Survey of School Children (NOHSS) 1997 (1.9). Less than half (39.3%) claimed to brush their teeth two or more times a day. Knowledge on fluoride was low with 55 (90.2%) not knowing whether fluoride was beneficial to oral health or not. No significant difference was shown between toothache experience and difficulty doing school work. **Conclusion:** Caries status of the children attending this school was not high despite the low level of awareness and infrequency in daily oral hygiene practice. However, a larger sample size with guardians' economic background and education status variables are needed to further assess the associations between oral health status, practices and oral health related quality of life

POSTER NO: 51

**Level of Oral Health Knowledge, Attitudes and Practice among First Year Community Nursing Students and Its Correlation towards Dental Caries**Sarmilia S., Nur Hafizam H., Siti Nasmah C.S., Jerantut Dental Clinic, Pahang

**Introduction:** Dental caries have historically been considered the most important global oral health burden. The impact of this disease to individuals and communities often significantly diminishes quality of life. The aim of this study is to determine level of oral health knowledge, attitudes and practice among first year community nursing students at Community Nurse Training College (*Kolej Jururawat Masyarakat Pelatih Jerantut*) and its correlation towards dental caries. **Methods:** A cross sectional study was conducted. The total numbers of 107 first year community nursing students were selected and data were collected by self-administered questionnaire and clinical examination. Data was analysed using 'Pearson correlation coefficient test'. **Results:** The results of this study indicated that the mean level of knowledge 73.9%, attitudes 70.4% and practice 72.4% are moderate. Mean DMFT, meanwhile was quite high (3.81). **Conclusion:** The study found that, level of knowledge, attitudes and practice are moderate and no significant correlation towards dental caries.

POSTER NO: 50

**Effect of Oral Health Education on Oral Hygiene and Gingival Health of School Children**D'Cruz A. M.

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**Introduction:** Oral health education aims to improve knowledge and awareness for adoption of a healthier lifestyle and behavior in promoting oral health. This study aims to assess the effectiveness of an oral health education programme on: i) oral hygiene knowledge and practices, and ii) plaque control and gingival health of 13-15 years old school children in Bangalore, India. **Methods:** A hundred and forty-three subjects in experimental group and 284 in control group from 3 schools in Bangalore completed the study. At baseline, a pre-tested 20-item questionnaire was used to assess the subjects' oral hygiene knowledge and practices. Clinical examination (Turesky – Gilmore – Glickman modification of Quigley Hein plaque index; Loe and Silness Gingival index) was performed by 2 pre-calibrated examiners who were blinded to the study. Oral health education was provided for the experimental group only. Reinforcement was provided for the experimental group after 3 and 6 months. The questionnaire was administered to both groups and clinical examination was performed at the end of 9 months. Data was analysed using Chi-square, Analysis of variance (ANOVA) and Post-Hoc Tukey test. **Results:** Nine months following intervention, there was 132.3% and 28.1% change in oral hygiene knowledge in experimental and control group respectively ( $P < 0.001$ ). There was 37.2% change in oral hygiene practices in experimental group ( $P < 0.001$ ) and 5.9% change in control group. The mean plaque and gingival index showed a reduction of 28.5% and 25.7% respectively for the experimental group ( $p < 0.001$ ) but no significant difference for the control group 9 months after intervention. **Conclusion:** Oral health education programme with reinforcement of every 3 months can effectively improve oral hygiene knowledge and practices, leading to decrease in plaque levels and improvement in gingival health of school children.

POSTER NO: 52

**Level of Awareness towards the Importance of Deciduous Dentition among Preschool Teachers**Husna A. A.

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**Introduction:** The aim of this study was to assess the level of awareness towards the importance of deciduous dentition among preschool teachers in the district of Pekan, Pahang. A survey was carried out to determine the relationship between level of awareness on the importance of primary dentition among preschool teachers and socio-demographic factors such as age, marital status, educational level, family economical status, housing area, number of children and exposure to dental talk. **Methods:** A validated self-administered questionnaire, contained 14 questions with a 5-Likert scale was distributed to 155 samples involving all the government preschool teachers from Tabika KEMAS and Perpaduan. Data were entered and analyzed using independent sample t-test and 'one-way ANOVA'. **Results:** A hundred and forty seven respondents involved in the study were female with mean age of 38.3 (8.8) years-old. Majorities were married (80.1 %) and at least finished their secondary level of education. 88.4 % had mean income of below RM4000 and 68 % lived in the rural area. Majority (95.2 %) of the teachers had an exposure to dental talk. The mean level of the awareness was 79.1%. No significant correlation was found between the level of awareness towards deciduous teeth among preschool teachers and socio-demographic factors. **Conclusion:** The study found that, all of the respondents had a good level of awareness regarding deciduous dentition.

POSTER NO: 53

**Clinical Effects of Dentifrice with Using Dentifrice Containing IPMP and GK2 on Gingival Condition**Hwang J.M.<sup>1</sup>, Bahng K.H.<sup>1</sup>, Park H.H.<sup>2</sup>, Sano H.<sup>3</sup>, Kambara M.<sup>4</sup>, Park Y.D.<sup>1</sup>

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**Aim:** The purpose of this clinical study is to determine the effect of dentifrice containing 0.05% isopropyl methylphenol (IPMP) and 0.05% dipotassium glycyrrhizinate (GK2) on improvement of gingivitis related symptoms. **Methods:** A double blind clinical study was carried out on 120 healthy Korean adults to evaluate the improvement effect of test dentifrices for 3 months. All subjects (range of age: 23 – 35 years) were randomly assigned into 4 groups, 1) control (without both IPMP and GK2), 2) 0.05% IPMP/ 0.05% GK2 group, 3) 0.05% IPMP group and 4) 0.05% GK2 group. All subjects were provided with their assigned test dentifrice and flat-type nylon toothbrush for home use. Subjects were instructed to brush their teeth for 3 minutes three times daily using only the dentifrice and toothbrush provided. **Results:** After 3 month test period, IPMP/GK2 group showed statistically significant ( $p < 0.05$ ) reductions for halitosis (17.5%), plaque index (36.5%), gingival crevicular fluid (34.7%), periodontal pocket depth (13.1%), and gingival index (16.0%) compared to control group. **Conclusions:** The dentifrice containing of 0.05% IPMP and 0.05% GK2 showed to be the most efficient in improving the gingivitis related symptoms. These findings might suggest that a combination of IPMP and GK2 showed a synergistic effect or special mode of action.

POSTER NO: 55

**The Effect of Cervical End Preparation Design Collarless Metal Ceramic Crown to the Level of IL-1 B in Gingival Crevice Fluid**

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**Introduction:** Cervical end preparation is an important procedure in fixed prosthesis, if the cervical end is inadequate it will promote dental plaque accumulation, the result of this condition is the beginning of periodontal disease. **Aim:** The aim of this study is to analyze the effect of cervical end preparation design on collarless metal ceramic crown to the level of IL-1 B in gingival crevice fluid. **Method:** The study performed by quasi experimental with pre and post test with control group design involving 48 subjects. The tooth preparation and the cervical end preparation are made with shoulder, bevel shoulder, and deep chamfer cervical end preparation. The assessment of IL-1 B in gingival crevice fluid was measured before and after insertion 1, 7, 21 days of collarless metal ceramic crown. **Result:** The result of this study showed that increase of level IL-1B in gingival crevice fluid on bevel shoulder and deep chamfer was significant different compared with control group ( $p < 0.05$ ). **Conclusion:** Shoulder is a better preparation design for collarless metal ceramic crown restoration.

POSTER NO: 54

**Gingival Response after Fixed Prosthesis Insertion**

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**Introduction:** The use of esthetic restorative materials such as acrylic and porcelain help to get what patient want in esthetic factor. However, for posterior teeth, the need for a strong restorative material to hold on to the mastication forces is necessary. The material of choice in the prosthodontic laboratory at the dental faculty of Hasanuddin University for restoration posterior teeth is silver metal. **Aim :** This study was to know the effect of used of acrylic, porcelain, and silver metal restoration to gingival inflammation. **Method:** This was an experimental study by using pre- and post test to 15 jacket crowns (5 acrylic crowns, 5 metal crowns and 5 ceramic crown) patients. Assessment of IL-1 B and TNF- $\alpha$  levels were carried out before tooth preparation was made and again, 30 days after the insertion of the crowns. **Results:** Gingivae below of the silver metal and acrylic crowns were inflammation but none with the porcelain crowns. **Conclusion :** Silver metal and acrylic crowns can cause inflammation on gingival tissue compared with porcelain crowns.

POSTER NO: 56

**Self-care Behaviour and Periodontal Status of Diabetes Patients in ChiangMai**

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**Introduction:** The prevalence of diabetes mellitus (DM) and periodontal disease (PD) is high. The association of these two factors as well as their influence to one another has been recognized and extensively documented. The aim of this study was to evaluate differences in oral health behavior and periodontal status between members and non-members of diabetes mellitus patient society at Sansai District, Chiangmai. **Methods:** Oral health status and oral health behavior of two groups of type II diabetics patients including 44 members and 37 non members of DM patient society who were 43-79-year of age, both sexes (57 females, 24 males) were evaluated. Past oral health behavior (data obtained from the questionnaire), periodontal status (performed by measuring bleeding index, plaque index, clinical attachment loss) and fasting blood sugar were recorded at the time of examination, 1 month and 2 months before. Statistical analysis was conducted by Mann-Whitney and t-test. **Results:** DM subjects had fair diabetic control in both groups. There were no statistical differences in age, plaque index, overall clinical attachment loss, and fasting blood sugar at the time of, and 1 month before the examination. Contrarily, posterior teeth clinical attachment loss and bleeding index were significantly different between 2 groups. **Conclusion:** Even though most parameters in both groups were not different statistically, oral health behavior and periodontal status of DM society members seem to be worse than those of the others. More interventions are needed such as oral health education and motivation, periodontal treatment, and maintenance care in order to develop better oral health and DM status.

POSTER NO: 57

**An Animal Study on Mastic Gel and Minocycline for Reduction of Inflammation in Gingivitis**Park J.H.

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**Objective:** To investigate the reduction of gingival inflammation with different concentrations of Mastic gel and Minocycline. **Methods:** The experiment on the inflammation in gingivitis was carried out in rabbits, which were divided into four groups. Groups 1 and 2 had 3% and 7% Mastic applied to the gingival respectively, whereas, the third group had an application of Minocycline. The last group was left to heal naturally to act as a control. The agent was in gel form and applied on the gingival for 14 days. The rabbits were then sacrificed. Clinically, the level of gingival inflammation was determined using gingival index. Gingival tissues were then sectioned and stained. The pathological sections were examined using a light microscope. **Results:** The lowest gingival index on the third day was found in the group of 7% Mastic. On seventh day of treatment, the Minocycline group had the lowest gingival index. On fourteenth day of treatment, all experimental groups showed lower gingival index than the control group. Reduction of inflammation was seen more in the Minocycline group, whereas, higher anti-proliferative effect of basal cells was seen more in the Mastic group. **Conclusions:** It is recommended that 7% and 3% Mastic gel are used in early and chronic gingivitis respectively. Minocycline is also recommended as it also reduces gingival inflammation.

POSTER NO: 59

**Relationship between Periodontitis and Serum C-Reactive Protein Levels in Patients with Head and Neck Cancers**Yamanaka R., Maruyama T., Tamaki N., Yokoi A., Morita M.

Dept. of Preventive Dentistry, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Japan

**Introduction:** Serum C-reactive protein (CRP) levels are independent prognostic indicators for survival of patients with many types of cancers. In patients with head and neck cancers also, it is important to clarify factors which elevate the levels of CRP. We hypothesized that periodontitis increase the levels of serum CRP in patients with head and neck cancers. **Aim:** The aim of this cross-sectional study is to investigate the relationship between the levels of serum CRP and periodontal parameters in patients with head and neck cancers. **Methods:** 19 patients (14 male, 5 female) with newly diagnosed as those with head and neck cancers were included in this study. The mean age was 65.6±16.2 years. Cancer localizations were as follows; oral cavity: 7 patients, oropharynx: 3 patients, hypopharynx: 3 patients, larynx: 5 patients, and tonsil: 1 patient. The number of teeth present (PT), percentage of sites with bleeding on probing (BOP %), probing pocket depth (PPD) and clinical attachment levels (CAL) were examined. These parameters were compared between the two groups; normal ( $\leq 0.2$  mg/dl) and high ( $> 0.2$  mg/dl) levels of serum CRP groups, because normal value of levels of serum CRP is less than 0.2 mg/dl. The data was analyzed using  $\chi^2$  test and Mann-Whitney *U* test. **Results:** The percentage of patients with high levels of serum CRP ( $> 0.2$  mg/dl) were 47.4%. The normal CRP group had significantly more PT ( $p = 0.04$ ) and lower BOP % ( $p = 0.03$ ) and CAL ( $p = 0.04$ ) than the high CRP group. There were not significant differences in mean age, gender distribution, % of smoking habit, localization and stage of the cancers between high and low levels of serum CRP. **Conclusion:** This study raised the possibility that periodontitis induce higher levels of serum CRP in the patients with head and neck cancers.

POSTER NO: 58

**Oral Health Index for Periodontal Status**Seo D.H.

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**Objectives:** To determine the factors that influences the state of periodontal health by regression model. **Methods:** The study population was recruited from volunteers, aged 13 and above. Various parameters relating to periodontal health were measured or examined using orthopantomogram, phase-contrast microscope and moisturized paper strips. The parameters were plaque and calculus index, oral micro-organisms, gingival inflammation index, tooth mobility, alveolar bone level and CPITN. The existence of any co-existing systemic diseases was also noted down. **Result:** Some factors were significant for each group distributed by age, as adolescent, young adults, prime of manhood, and senile group. **Conclusion:** The various factors could be influenced to periodontal state each aged group. This model can be used to establish the individual oral health index, in clinical.

REF 090, POSTER NO: 60

**Gender Difference in Gingivitis and Oral Health Behavior.**Furuta M., Ekuni D., Irie K., Azuma T., Kato T., Yamada S., Tomofuji T., Morita M.

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**Introduction:** Epidemiological surveys have consistently shown that periodontal disease is more prevalent in males than in females. There is no clear explanation about what causes the gender difference in the prevalence of gingivitis. The objective of this study was to explain the gender difference in the prevalence of gingivitis based on the interaction between oral health behavior and related factors such as knowledge, attitude and lifestyle in young people. **Method:** The study comprised of 838 subjects (440 males, 398 females), aged 18 and 19 years. Gingivitis was assessed by the percentage of bleeding on probing (%BoP). Information was also collected regarding oral hygiene status, oral health behaviors and related factors. Structural equation modeling was employed to test pathways from these factors to %BOP. Multiple-group modeling was also conducted to test for gender difference. **Results:** Females had greater knowledge about oral health, a more positive attitude to dental visits, a healthier lifestyle, and higher level of oral health behaviors than males. The multiple-group modeling suggested that the gender difference depended on significant differences in paths; lifestyle, knowledge and attitude to oral health behaviors, oral health behaviors to oral hygiene status, and oral hygiene status to %BOP. **Conclusion:** Gender difference in gingivitis in young people may be explained by oral health behavior and hygiene status, which are influenced by lifestyle, dental knowledge and attitude to dental visit. To prevent gingivitis, different approach to males and females may be required.

POSTER NO: 61

**Combined Effects of Hydrogen Sulphide and Lipopolysaccharide in Rat Periodontium.**Irie K.<sup>1</sup>, Ekuni D.<sup>1</sup>, Tomofuji T.<sup>1</sup>, Endo Y.<sup>1</sup>, Kasuyama K.<sup>1</sup>, Morita M.<sup>1</sup>, Yaegaki K.<sup>2</sup>, Ii H.<sup>2</sup>, Imai T.<sup>2</sup>.<sup>1</sup>Department of Preventive Dentistry, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama, Japan, <sup>2</sup>Department of Oral Health, School of Life Dentistry, Nippon Dental University, Tokyo, Japan

**Introduction:** Oral malodorous compounds, including hydrogen sulphide (H<sub>2</sub>S), are highly toxic for oral tissue. H<sub>2</sub>S, which can progress periodontal diseases, induces osteoclast differentiation through RANKL expression. Lipopolysaccharide (LPS) is also known as the contributing factors in initiation and progression of periodontal diseases, and it stimulates RANKL expression through toll-like receptor (TLR) 2 and 4. However, there is few information about combined effects of H<sub>2</sub>S and LPS on periodontal lesion. The purpose of the present study was to examine the combined effects of sodium hydrogen sulphide (NaHS, H<sub>2</sub>S donor drug) and LPS on periodontal tissue in rats. **Method:** Thirty-two male Wistar rats (8 weeks old) were divided into four groups: a control group and three experimental groups; NaHS group (treated with topical application of 1.0 mM NaHS in physiological saline into the gingival sulcus of rat molar), LPS group (treated with 5 µg/µl LPS of *Porphyromonas gingivalis*), and Combination group (treated with both NaHS and LPS). After one day, gingival biopsy samples were used for quantitative real-time PCR analysis to evaluate the expression of tumor necrosis factor (TNF)-α, RANKL, TLR 2 and TLR4 mRNA. **Results:** The NaHS, LPS and Combination groups respectively showed 1.5, 2.1 and 3.9 times higher gene expression of TNF-α; 8.8, 8.9 and 11.3 times higher gene expression of RANKL and 6.8, 7.8 and 11.0 times higher gene expression of TLR4 compared to the control group. On the other hand, there were no differences in the gene expression of TLR2 between NaHS and control groups. **Conclusion:** The combined effect of NaHS and LPS increased the expression of TNF-α and RANKL expression via TLR4. The combined effect of gene expression of TNF-α was greater than that of RANKL and TLR2, 4.

POSTER NO: 62

**Oral Health Behaviors, Periodontal Condition and Pathogens among Pregnant Women**

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**Introduction:** Preterm birth which has high risks of respiratory disease, cardiovascular problems, epilepsy and severe learning disorders is main risk factor of infant mortality and a major public health problem. Because periodontal infection may be a risk factor for preterm birth, adequate oral health care is needed in pregnancy period. The objective of this study was to confirm the association between oral health behaviors and periodontal condition and periodontal pathogens among pregnant women for development of oral health promotion program for pregnant women which may be able to prevent the preterm birth. **Methods:** This study was designed as a hospital-based cross-sectional study. Pregnant women were recruited at about 24 weeks gestation from March 2009 to April 2010 at the obstetrics clinic of general hospital located in Seoul, South Korea. The information of demographics, health behavior and systemic disease that may influence periodontitis was collected. Full mouth periodontal probing was taken by one trained examiner for the diagnosis of periodontitis. The periodontitis was defined as periodontal attachment loss of 3.5 mm and over on 2 or more sites not on same tooth. Subgingival biofilm and gingival crevicular fluid were collected using sterilized paper point (#20) for quantitative analysis of *Prevotella intermedia* (PI), *Porphyromonas gingivalis* (PG), and *Treponema denticola* (TD). **Results:** One hundred seventeen pregnant women were included. Adjusted odds ratio of use the floss or interdental brush was 0.29 (0.10-0.79) for periodontitis. Pregnant women using the floss or interdental brush, and receiving the scaling before pregnancy had the significant lower level of TD, PI, and PG than pregnant women who didn't. **Conclusion:** Oral health behaviors such as use the floss or interdental brush may be able to promote the pregnant women's oral health and to prevent the preterm birth.

POSTER NO: 62

**Periodontal Patients with Systemic Disorders and Its Correlation with Remaining Teeth.**

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**Aims:** To investigate the occurrence of self-reported systemic disorders in patients referred to the Department of Periodontology, Universiti Kebangsaan Malaysia and to explore possible relationship between general health and remaining teeth in this population. **Method:** Data were collected from the dental records of 663 subjects, of which only 609 periodontal patients met all the criteria. These records were examined to determine patients' self reported systemic conditions and smoking history. The number of remaining teeth and the number of periodontal disease sites with a probing depth of 5mm or more were also recorded. **Results:** Fifty two per cent of the subjects were found to have self reported systemic diseases. Hypertension and diabetes mellitus were among the most frequent medical conditions noted in this study which were 22.5% and 15.9% respectively. There was significant difference in the remaining teeth in patients with diabetes mellitus (p=0.014), cardiovascular disease (p=0.016) and hypertension (p=0.011). **Conclusion:** Diabetes mellitus and hypertension were the highly occurring systemic diseases among periodontal patients. Patients with diabetes mellitus, cardiovascular disease and hypertension were also found to have fewer remaining teeth. Dental practitioners should be aware of these systemic diseases and their impact to the periodontal health.

POSTER NO: 64

**Effects of the Perio Therapy System on Bleeding On Probing (BOP) in Periodontal Patients**Okada Y.<sup>1</sup>, Okada E.<sup>1</sup>, Masaichi-Chang-il L.<sup>2</sup>, Honda S.I.<sup>3</sup><sup>1</sup>Okada Dental Clinic, <sup>2</sup>Department of Clinical Care Medicine, Division of Pharmacology, Kanagawa Dental College, <sup>3</sup>Honda Dental Clinic Med. Co., Excellent Breath Alliance Clinics (Chief Manager: Shun-Ichi Honda DDS, PhD)

**Introduction:** The Perio Therapy system is one of the American oral care systems which pH balanced to neutralize acid. **Aim:** The aim of the present study was to investigate the effects of The Perio Therapy System on bleeding on probing (BOP) in periodontal patients. In addition, we also evaluated the effect of introduction method of the Perio Therapy System in our dental clinic. **Methods:** The subjects in this study were patients between the age of 38 and 50 years who visited Okada dental clinic (n=6). BOP was recorded after the use of The Perio Therapy System one month later. They results were compared with the control group which is treated with only professional dental care (n=6). **Results:** After one month, BOP value of the patients using by The Perio Therapy System was averaged 12.8 (Improvement rate 54.5%), and it was significantly higher than the control group (BOP 3.6; Improvement rate 18.2%). **Conclusion:** These results suggested that The Perio Therapy System improves the condition of gingival tissues and it would be effective to introduce this system to the patients with the onset of periodontal disease.

POSTER NO: 65

**Patient's Awareness between Smoking and Periodontal Diseases**Abdul Aziz H., Zakaria S.,  
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**Introduction:** Periodontal disease is an inflammatory process that occurs in the surrounding tissues of the teeth in response to bacterial plaque accumulation at the crevices of teeth. There is considerable scientific evidence of smoking's harmful long term effects on periodontal diseases. **Aim:** This study investigates factors affecting patients' awareness between smoking and periodontal diseases at Air Jernih Dental Clinic (AJDC), Kuala Terengganu. **Method:** This is a cross-sectional study involving newly registered adult patients at AJDC. A survey questionnaire was distributed to all eligible subjects from April to September 2007. A total of 381 questionnaires were filled and returned during stipulated period. In all, 290 (76.1%) questionnaires were complete and 91 (23.9%) were incomplete. Data were analyzed using SPSS 13.0. **Results:** Of all subjects, female (55.9%) was slightly higher than male (44.1%). The proportion of primary school leavers, secondary school leavers and those with tertiary education were 9.0%, 56.2% and 34.8% respectively. Majority of subjects were non smokers (73.8%), followed by smokers (19%) and ex smokers (7.2%). Subjects with knowledge of effects of smoking on periodontal health were 36.9%. There was a significant difference between smoking status and knowledge of effects of smoking on periodontal health ( $P=0.012$ ). There was also a significant difference between gender and knowledge of effects of smoking on periodontal health ( $P=0.003$ ). A marginal statistical difference was also noticed between education level and knowledge of effects of smoking on periodontal health ( $P=0.043$ ). **Conclusion:** This study suggests that smoking, male and less educated individual have lower awareness and knowledge of the effects of smoking on periodontal health.

POSTER NO: 67

**An Experience in Supporting Smoking Cessation Treatment**Watanabe E.<sup>1</sup>, Yoshii K.<sup>1</sup>, Emi Y.<sup>1</sup>, Watanabe T.<sup>1</sup>, Honda S.<sup>2</sup>  
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**Aim:** The aim of this report is to discuss the usefulness and effect of smoking cessation treatment in dental clinic. **Material and method:** Seven patients (6 males, 1 female) aged between 27 -65 years (mean= 50 years) who visited Kosei dental clinic from September 2009 to May 2010 took part in the smoking cessation treatment. The level of smoking was measured using the TDS (Tobacco Dependence Screener) and Brinkmann Index. Varenicline Tartrate was used for a recommended treatment period: The treatment period of three months. Non smoking confirmation was determined by subjects' diary records, personal interview and measurement of the Carbon Monoxide level. Success criteria of the treatment was subject abstain from smoking for one month after treatment. The non smoking follow-up support followed the original clinical schedule under the guidance of the dentist. **Result:** Six of the seven who stopped smoking succeeded by using this medicine. The main motivations for stopping were: three people wanted the implant to be successful, two gave health reasons and, two other for family reasons. Findings also suggested that the treatment difficulty did not agree with the degree of dependence and the level of the smoking. Three people stopped taking the medicine because of nausea and stomach aches. Despite stopping in taking the medicine, they did not continue smoking. **Discussion and Conclusion:** This study showed that dental problems can be effective in motivating subjects to cease smoking. In addition preventive dentistry procedures which included smoking cessation program were useful in supporting patients opting for cessation smoking. Dental hygienist was also recognized to be meaningful in conducting smoking cessation program.

POSTER NO: 66

**An Analysis of Social Economic/Psychological and Medical-Loss Cost in Dental Disease Caused by Smoking**Hwang J.M., Kim C.W., Park Y.D.  
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**Introduction:** Estimates of economic loss due to smoking has been performed in the past. However, the estimation of cost of dental diseases caused by smoking is still scarce. **Aim:** The purpose of this study is to perform the analysis of social economic/psychological and medical-loss cost in dental disease caused by smoking. **Methods:** This study selected 6 dental hospitals in Seoul and metropolitan areas, and targeted a total of 138 clinical patients identified by dentists as having oral-disease caused by smoking from January 2010 to March. **Results:** As a result of giving weightage to direct and indirect expenses (social economic/psychological and medical-loss cost included), which were calculated by each disease, the periodontal disease were indicated to have the highest cost with 4,434,777won. The cost was shown to be taken in order of tooth stains, scaling, decayed tooth, malocclusion, and oral cancer. **Conclusions:** Average annual direct-loss medical cost in patients with oral disease caused by smoking was 3,373,893 won, 6,533,190 won for the average annual business-loss medical cost in patients with oral disease caused by smoking, and 2,527,921 won for the psychologically future-value loss cost in patients with oral disease caused by smoking. Accordingly, the direct, indirect and future-value cost per person per year was 9,907,083 won.

POSTER NO: 68

**Antioxidant Suppression in Smokers with Chronic Periodontitis**Rupali A.  
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**Introduction:** The role of smoking in periodontitis has been attributed to increased levels of reactive oxygen species (ROS). The oxidative stress thus induced is neutralized by antioxidants. **Aim:** The purpose of the present study was to evaluate the influence of smoking on the periodontium by estimating the levels of total thiols and total antioxidant activity (TAA) in light and heavy smokers with periodontitis. **Methods:** 70 subjects aged 20-55 years, including 60 smokers and 10 non - smokers (controls), were evaluated. Smokers were divided into 2 main groups of light (smoking <10 cigarettes/day) and heavy (smoking  $\geq 10$  cigarettes/ day) smokers and three subgroups-healthy, mild and moderate periodontitis. Clinical parameters recorded were plaque Index (PI), probing pocket depth (PD) and attachment loss (AL). Gingival crevicular fluid (GCF) and saliva samples were collected for estimation of total thiol and TAA using spectrophotometric assay. **Results:** The mean values of the levels of total thiol and TAA in GCF and saliva of smokers were reduced as compared to the controls. Intragroup and intergroup analysis of the smokers showed a significant reduction in the levels of total thiols and TAA in both GCF and saliva of heavy smokers as compared to light smokers and the controls. **Conclusion:** There was a progressive reduction in the antioxidant levels from controls to light smokers and from light to heavy smokers. The results of this study re-affirm that depleted antioxidant capacity in GCF and saliva of smokers may be one of the important factors involved in the progression of chronic periodontitis.

POSTER NO: 69

**Opinion of Indian Dental Students about Tobacco Cessation Counseling & Its Practise in Dentistry.**

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**Introduction:** Tobacco use is the leading cause of death in Asia. Health care provider plays an important role in educating patient about the risk of tobacco and promoting tobacco cessation. However, evidence suggested that not all dentists carried out the counseling or that they do it on a limited extent. **Aim:** To assess the awareness of dental students on tobacco cessation counseling. **Method:** A Likert scale questionnaire was distributed among 250 final year and internship students in the academic year 2009-2010 of Barkatullah University Bhopal India. Data was analysed using SPSS version 17. **Result:** About 22.8% respondents agreed that dental professional could do other procedures than trying to reduce tobacco use in patients. About half of them agreed that tobacco cessation education taught during college was efficient to adopt the practice in their clinics. **Conclusion:** Findings of this study suggest that there are variations in dental students' attitude towards tobacco cessation practice. Most of them agree that it is the dental professionals' responsibility, and one of the barriers faced is the inadequacy of tobacco cessation training in their curriculum. There is a need to incorporate tobacco cessation education in the dental curriculum and students need to develop good health promotion skills for effective clinical practice

POSTER NO: 71

**Enigma of Oral Health**

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Oral health is an integral and essential component of general health. The relationship between poor oral health and systemic diseases has been increasingly recognized over the past two decades. A large number of epidemiological studies have now linked poor oral health with cardiovascular diseases, poor glycaemia control in diabetics, low birth weight preterm babies and a variety of other conditions. Cardiovascular disease, obesity and diabetes, in particular, are significant public health problems worldwide and are rising alarmingly in South East Asian Countries (SEA). The World Health Report 2001 had indicated that NCDs account for almost 60% of deaths and 46% of the global burden of disease. Seventy-five per cent of the total deaths due to NCDs occur in developing countries. The countries of the South-East Asia Region are thus facing a double burden, with a heavy load of infectious diseases and an increasing burden due to NCDs. Cardiovascular diseases, diabetes mellitus, cancers, chronic obstructive pulmonary disease, and injuries are the major NCDs in this Region, with high morbidity and mortality. Therefore public awareness needs to be raised by encouraging individuals to make lifestyle changes to have a good oral health related quality of life.

POSTER NO: 70

**Passive Smoking in Children as Risk for Future Periodontal Disease**

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**Introduction:** Passive smoking is an important environmental risk factor for various chronic diseases. Recently, it has been postulated that reduced levels of antioxidants have a role in the pathogenesis of destructive periodontal disease. Children of parents who are cigarette smokers are exposed to increased levels of free radicals. Excessive accumulation of these species may cause depletion of antioxidants and direct oxidative damage to the cells and tissues of the body. This vicious cycle, if continued over a prolonged period, may increase the risk for chronic illnesses including periodontitis. **Aim:** The study aims to evaluate the influence of passive smoking on periodontal tissues of children through estimation of salivary antioxidants. **Methods:** Fifty children aged 9-12 years were divided into 2 main groups of passive smokers and non passive smokers based on their exposure to cigarette smoked by parents. Plaque Index (PI), gingival index (GI), probing pocket depth (PD) and clinical attachment levels (CAL) were measured. Levels of superoxide dismutase (SOD) enzyme and total antioxidant activity (TAA) were estimated in unstimulated saliva samples. **Results:** Antioxidants and CAL were reduced with increased passive smoking status. **Conclusion:** The present study suggested that suppression of antioxidants caused by passive smoking may increase the risk for future periodontitis.

POSTER NO: 72

**Research about Communication of Dental Medical Workers**

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**Aim:** The purpose of this study was to investigate about communication of dental medical workers. Proper mutual communication among dental medical workers can heighten satisfaction of patients. **Methods:** A survey was performed on 543 subjects (dentist, dental technician, dental hygienist) living in a capital area from January to April in 2009. The research tool was a structured questionnaire. The collected data were analyzed by frequency, descriptive, chi-square test, Pearson's correlation coefficient and multiple logistic regression by Statistical Package for the Social Sciences version 12.0. **Results:** 'Communication of dental medical workers has effect in patient satisfaction' appeared Likert's 5 scale more than 4 points ( $p=.005$ ). Communication of dental medical workers and communication with dental clinic-dental laboratory influenced in patient satisfaction ( $p<.05$ ). When communication with companions were smooth, there was decrease of dental prosthesis ( $p=.000$ ). A remake of dental prosthesis influenced patient satisfaction ( $p=.023$ ). When the mutual communication of dental clinic-dental laboratory was smooth, it will influence on the remake decrease of dental prosthesis ( $p=.041$ ). **Conclusions:** Proper communication among dental workers heightens patient satisfaction by reducing the remake of dental prosthesis. Therefore dental workers must share information with patients, and try to heighten satisfaction of patient.

POSTER NO: 73

**Effects of Oral Health Care Education for Care Providers in a Nursing home**

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**Introduction.** Nursing home residents are functionally dependent and their oral hygiene status have been reported as poorer than that of community residents. Poor oral hygiene results in not only oral health problems but also general systematic diseases. **Aim.** The purpose of this study is to investigate the effect of oral care education program for care providers on their knowledge, attitude & behavioral change in oral care, and on oral hygiene status, plaque index and halitosis of the nursing home residents. **Methods.** 54 care providers & 54 residents recruited from a 200 bed long-term care facility located in K metropolitan city were randomly allocated to two groups. The intervention group ( $n=28$ ) care providers received 6weeks-oral care education. Data on care providers' knowledge, attitude, and behavioral change about oral health care & the nursing home residents' plaque index & halitosis were collected from a both group at baseline, 6<sup>th</sup> week, and 12<sup>th</sup> week. Data were analyzed using SPSS window 16.0. **Results.** Care providers' knowledge score ( $p<.001$ ) & behavioral change ( $p<.001$ ) on oral care was higher in the intervention group than the control group after 6weeks & 12weeks. Attitude score ( $p<.001$ ) on oral health care were higher in the intervention group than the control group after 12weeks. Plaque index ( $p=.005$ ) and halitosis ( $p<.001$ ) of nursing home residents were lower in the intervention group than the control group after 12weeks. **Conclusion:** Oral health care education program for care providers was effective for improving oral hygiene of nursing home residents through the enhancement of care providers' knowledge, attitude, and behavioral change

POSTER NO: 75

**Saving Smiles in Soe: Volunteer Placement for Dental Hygiene Students**

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**Introduction:** In 2008 The University of Newcastle was approached by a local organisation with a proposal to involve Bachelor of Oral Health students in their regular visits to Soe, West Timor, Indonesia. The proposal was presented as a valuable learning experience for the students and the opportunity to provide a much needed service to the local community. **Methods:** In 2009, two university staff members travelled to Soe to investigate the educational potential and safety aspects of implementing a student placement project. A number of community settings were visited. Baseline data were collected at a local primary school where children received a toothbrush and toothbrushing instruction. The first student placement visit was completed in 2010. Data was again obtained from the local primary school. Treatment included plaque disclosing, toothbrushing instruction, fluoride applications and debridement. A prevention program in line with the principles of the Ottawa Charter was implemented and reinforced on both visits. **Results:** 2009 data revealed an overall high rate of tooth decay and poor oral hygiene. 83% of 5 to 6 year old children required some form of dental treatment, 56% required extraction with an average of 7.1 teeth. The decay rates reduced as the children aged with 41.1% of 10-12 year olds requiring some treatment. Only 3% of children seen ( $n=215$ ) were plaque free. 2010 results revealed little or no change to the decay rate or treatment needs but the number of children ( $n=267$ ) assessed as plaque free had increased to 40%. **Conclusion:** Initial results demonstrate the oral health benefits of a preventive program. Ongoing studies will determine the long term impact of the project.

POSTER NO: 74

**Bridging the Gap in Preventive Clinical Practice: Lesson Learned**

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**Introduction:** In clinical practice of preventive dentistry, integration of knowledge and skills concerning bio-medical, behavioral and socio-cultural perspectives can produce successful results in both preventing diseases and promoting health. **Aim:** This presentation aims to share experiences in conducting learning activities that impart the preventive dentistry concept to future dentists. **Methods:** Fifth year students were assigned to practice with an individual patient in a dental preventive clinic. To assess caries risk, various assessment methods were used to gather essential data from all three perspectives. Information derived from clinical examination and laboratory tests represented the bio-medical perspective. Information on risk and health behaviors was collected from a questionnaire, a structured interview, an in-depth interview, and a food diary used to represent the behavioral perspective. Information on lifestyle and life circumstances related to those behaviors represented the socio-cultural perspective. Cariograms were used to illustrate the association of the risk factors, not only in bio-medical perspective but also in behavioral and socio-cultural perspectives. Preventive measures were planned and implemented under the consideration of those perspectives. At the end of our course in clinical preventive practice, students were assigned to write a summary report to reflect their learning experiences. **Results and conclusions:** From content analysis of students' reports, it was found that to practice clinical prevention in patients by concerning with bio-medical, behavioral and socio-cultural perspectives can nurture students to understand the association of the message from professional and patient's point of view. Students carefully planned and implemented preventive measures which were properly matched to the patients. In addition, the learning activity can help students to develop interpersonal and communication skills.

POSTER NO: 76

**Parents Myths Regarding Their Children's Teething in Urban and Rural Makassar City, South Sulawesi, Indonesia**

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**Introduction:** Makassar is a metropolitan city with urban and rural areas that have various myths. Parents' 'false' myths about signs and symptoms of children's teething could distract the diagnosis and management of the teeth. Hence, it is necessary to draw a line between facts and myths of children's teething. **Aim:** The aim of this study is to observe knowledge and myths of the parents about signs and symptoms of children's teething in rural and urban areas in Makassar. **Methods:** This study used a cross sectional study design. One hundred and sixty three parents (114 in urban areas and 59 in rural areas) with children aged between 6-36 months old participated in this study. Each parents filled a questionnaire consisted of three sections: Section I surveyed parents' and children's demographic characteristic, Section II assessed the general knowledge and beliefs of parents regarding their children's teething and Section III investigated the practices that parents would do to manage teething problems and relieve pain. Data analysis use SPSS version 12 with *chi-square test*. **Result:** The study showed approximately 48.2% of parents in the urban area and 39.0% in rural area had good knowledge. A 'true' myth or beliefs of parents related to signs and symptoms of children's teething in urban area was 57.0% and 57.5% in rural area, while a true manners habit of parents in urban area was 30.7% and 22.6% in rural area respectively. No differences of general knowledge and myths or belief according to signs and symptoms of children's teething in urban and rural areas ( $p>0.05$ ). While there was a differences between general manners habit of parent's related to their children's teething in urban and rural areas ( $p<0.05$ ). **Conclusion:** Only half of the community in urban and rural areas in Makassar city, South Sulawesi, Indonesia have true myth or belief related to children's teething.

POSTER NO: 77

**Strategies for Implementing Clinical Practice Guidelines by District Dental Officers In Malaysia**Jaapar M.<sup>1</sup>, Sheiham A.<sup>2</sup>, Watt R.G.<sup>2</sup><sup>1</sup>Oral Health Division, Ministry of Health, Malaysia, <sup>2</sup>Department of Epidemiology and Public Health, University College London.

**Introduction:** In Malaysia, District Dental Officers (DDOs) play a vital role in disseminating and implementing evidence-based Clinical Practice Guidelines (CPGs) to dental officers and dental auxiliaries in their respective districts. **Aim:** The objectives of this study was to evaluate the general implementation strategy used by District Dental Officers in Malaysia in relation to the Ministry of Health's (MOH) CPGs on oral health. **Method:** A cross-sectional survey using an anonymous self-administered semi-structured postal questionnaires was sent to all 106 DDOs and acting DDOs working for the MOH. It had 2 sections: Section A: socio-demographic background of DDO; and Section B: Questions on strategies used on how CPGs were disseminated and implemented by the DDOs. Questions were objective as well as subjective. Responses were analysed using SPSS version 13. **Results:** Seventy six (71.8%) of the 106 DDOs and acting DDOs responded. Of the respondents, 72% had a dissemination strategy for CPGs; 40% relied on lead clinicians or a person in charge of guidelines to oversee implementation; 47% had a strategy for implementing guidelines after dissemination; less than 34.7% monitored introduction, implementation, evaluation and recommendations of the CPGs; 71% incorporated guidelines as part of their regular clinical audit programme and 16% produced local district protocols based on guidelines. **Conclusions:** The dissemination strategies and levels of implementation of CPGs varied considerably between districts. Hence MOH needs to develop better strategies to strengthen the dissemination, implementation and monitoring framework of CPGs on oral health at national, state, district and local levels. In addition implementing CPGs should be integrated with the clinical audit programme thereby strengthening evidence-based dental practice in Malaysia.

POSTER NO: 79

**Study of the Oral Habit, Oral Discomfort and Amount of Salivary Secretion in Halitosis and Psychiatric Patients.**Shimizu T.<sup>1,3</sup>, Matsuura M.<sup>2,3</sup>, Shintani S.<sup>2</sup>, Takahashi K.<sup>3</sup>, Honda S.<sup>1</sup>Excellent Breath Alliance Clinics, <sup>2</sup>Department of Maxillofacial surgery, School of Dentistry, Showa University, <sup>3</sup>Department of Oral Rehabilitation, School of Dentistry, Showa University.

**Aim:** Purpose of this study was to clarify the relationships of the oral discomfort, oral habit and the amount of salivary secretion among the control group, halitosis patients and patients under psychiatric treatment. **Methods:** One hundred forty halitosis patients who have visited Shimizu dental Clinic were compared with control group who did not have complaints about halitosis (n=56) and patient under Psychiatric treatment at Karasuyama Hospital(n=21). An amount of saliva secretion (Each saliva was obtained in three minutes), oral habits and oral discomfort (such as sensation of dry mouth and discomfort of the tongue) were analyzed among these groups. **Results:** The amount of unstimulated saliva secretion of halitosis patients (mean: 1.0ml) was significantly lower than control group (mean: 1.4ml) and psychiatric patients (mean: 1.4ml). There were no significant differences among three groups (control group: 3.8ml, halitosis patient: 3.4ml, psychiatric patient:3.4ml) in the amount of stimulated saliva secretion. Oral discomfort was observed at 10.5% in control group, 63% in halitosis patient and 52% in psychiatric patient. Oral habit was observed at 37.5% in control group, 62% in halitosis patient and 66% in psychiatric patient.

**Conclusion:** These results suggested that the presence of oral discomfort and oral habits would be associated with halitosis and psychiatric problem. An amount of unstimulated saliva did not necessarily reflect a psychiatric factor but symptoms of oral cavity might be a concern for those patients.

POSTER NO: 78

**Level of Awareness on the Importance of Primary Dentition among Mothers with Toddlers**

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**Introduction:** National Oral Health Plan for 2010 targets 30% of all 6 year olds with caries free dentition by 2010. In order to achieve this target, early prevention especially at toddler stage is needed. The authors would like to focus on the level of awareness on the importance of primary dentition among mothers with toddlers in the district of Raub. **Methods:** A cross sectional study was conducted for 2 months. Self administered questionnaire were distributed among the 7 KKIA in the district of Raub after necessary approvals obtained. Respondents were Malaysian mothers and sampling was done in which every 2<sup>nd</sup> mother was chosen as a respondent. Level of awareness is calculated by proxy from responses from section B of the questionnaire and expressed in percentages. Data were analyzed by SPSS v 15. **Results:** The mean level of awareness among respondents is 73.1%. Maternal level of education, occupation of the mother and the manner of which the mother was exposed to oral health information were significantly associated with the level of awareness. Statements regarding functions of primary dentition had poor responses while statements regarding primary dentition care scores highly. Exposure to oral health information via mass media has no significant correlation with level of awareness. **Conclusion:** The mean level of awareness among respondents is 73.1%. Maternal level of education, occupation of the mother and the manner of which the mother was exposed to oral health information are the factors affecting the level of awareness.

POSTER NO: 80

**Mouth Dryness and Oral Malodor Problems in Free Denture Delivery Program**Lee S.S.<sup>1</sup>, Yoo, Y.A.<sup>2</sup><sup>1</sup>Dept. Oral Health, Dae-gu Nam-Ku Public Health Center, <sup>2</sup>Director of Public Health Center, Nam-Ku, Dae-gu City, Korea.

**Aim:** The objective of the study was to assess the problems associated with Ministry of Health and Welfare sponsored dentures delivered at Public Health Centers. **Methods:** The study population consisted of elderly patients who had free dentures provided at Dae-gu Nam-Ku Public Health Center. Patients were asked to complete a questionnaire regarding any complaints in relation to their dentures. Dryness of mouth was determined using paper strips as well as measuring for volatile sulphur compound gases using B&B unit before and after denture wearing. **Results:** 57 elderly patients participated in the study. The mouth was found to be significantly drier after denture wearing both on the dorsum (p<0.01) and ventral (p<0.05) of tongue. Furthermore, volatile sulphur compound gases were also found to be significant after denture wearing (p<0.05). **Conclusion:** It is recommended that oral health education for proper denture usage along with prevention of dryness of mouth and oral malodor be provided with denture delivery.

POSTER NO: 81

**The Effects of Mastic-Containing Dentifrice and Oral Rinse on Dental Plaque, Malodor**

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**Aim:** To determine the effect of mastic-containing dentifrice and oral rinse on dental plaque and oral malodor. **Method:** Oral examination was performed on subjects five to six times before the use of mastic-containing dentifrices. Other parameters measured during the examination were PMA index, phase-contrast microscopy, oral malodor and m-PHP indices. **Results:** 120 subjects were recruited in the study. M-PHP was significantly lowered in subjects using mastic-containing dentifrice or mastic-containing dentifrice and oral rinse ( $p < 0.05$ ). It was also found that the use of this dentifrice or simultaneous use of this dentifrice and oral rinse significantly reduced early gingivitis and oral malodor (both  $p < 0.05$ ). **Conclusions:** In conclusion, the use of mastic-containing dentifrice and oral rinse aids in dental plaque removal, reduction of malodor and relieves early gingivitis.

POSTER NO: 83

**Halitosis during Pregnancy**Otsuka W.<sup>1</sup>, Abe C.<sup>2</sup>, Honda S.<sup>3</sup>

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**Introduction:** In recent years the interest on "halitosis" is rising among general public. A pregnant woman undergoes considerable physiological changes over the gestation period when compared to non-pregnant women. In the present study, we assessed the halitosis of the pregnant women and compare it with the halitosis of non-pregnant women matched for age. **Methods:** The duration of study is for 2 years, from April, 2008 to April, 2010. One hundred pregnant women who visited to Momo Dental Clinic were age matched and compared with 100 women who aren't pregnant. All subjects were examined for caries of the permanent dentition, which was quantified using the DMF index, and whether they needed treatment for periodontal disease, which was quantified using the CPITN. To assess breath odor, mouth air was evaluated with an Oral Chroma portable gas chromatograph. **Result:** 1, there is no significant differences in DMF and CPITN scores between pregnant and non-pregnant women. 2, Oral Chroma results showed pregnant women have higher level of methyl sulfide when compared with non-pregnant women. 3, Non-pregnant women have slightly higher percentage of hydrogen sulfide ( $H_2S$ ) than pregnant women, however, this difference is none significant. **Discussion / Conclusion:** During pregnancy, the methyl sulfide level tends to increase irrespective of the age and the number of pregnancy weeks, that this may also be affected by metabolism of the whole body.

POSTER NO: 82

**A Study on Oral Malodor Changes in a Day**Lee M.O.<sup>1</sup>, Kim H.J.<sup>2</sup>, Cho J.W.<sup>1</sup>

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**Objectives:** The aim of this study was to assess the degree of malodor changes in a day. **Materials and methods:** The level of malodor in subjects was tested eight times from 7am to 9pm in the evening. The level of volatile sulfide and oral synthetic gases were measured using Oral-chroma and BB checker respectively. **Results:** 20 subjects were recruited in the study. It was found that there was no significant difference in the flow of malodor with respect to age and sex. The level of malodor was found to be the highest in the morning right after waking up from sleep ( $p < 0.05$ ). Malodor level decreased after meal compared to before meal and increased again as the day passed. **Conclusions:** The level of malodor fluctuates throughout the day. Therefore, it is recommended that a malodor test should be carried out at a fixed time in order to obtain reliable results.

POSTER NO: 84

**Clinical Significance of Halitosis Complaints from Patients**Furuta E.<sup>1</sup>, Furuta Y.<sup>1</sup>, Somemura K.<sup>1</sup>, Honda S.<sup>2</sup>

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**Introduction:** Many patients with halitosis and low QOL (Quality of Life) visit halitosis clinics. The goal of each treatment is not only to reduce or get rid of objective halitosis, but to fully understand the psychological aspects of the patient, and to raise each individual's QOL. This study reports on how much patients recognize their own halitosis. **Method:** A random sample of 50 individuals who visited Misumi Dental Clinic for halitosis treatment between September 2003 and December 2008 were selected and assessed through questionnaires and daily analysis on halitosis, and investigated how each individual determined they had halitosis. Oral gas and breath gas was measured by BB Checker (Taiyo Mfg) and MS Halimeter (Interscan). **Results:** The ratio of men to women was 38:12 aged distribution was under 20 1(2%), 20-30 11(22%). 4 patients had objective halitosis while the others did not. Patients reported to recognize or feel uneasy about their own breath through: (1) No self awareness or uneasy sense of halitosis: 1 patient (2) Felt their own bad breath 48 patients, with 47 patients (94%) sensing oral cavity bad breath such as morning breath, others factors contributing they had bad breath was 30 patients (60%). (3) Patients that did not smell their own bad breath but thought they had bad breath due to unpleasant sense in the oral cavity: 48 patients. (4) Felt they had bad breath due to other people's gestures or through conversation: 48 people. **Conclusion:** There were various ways that a patient's uneasiness about one's bad breath may be classified. So while it is important to treat objective halitosis it is also important to control or eliminate the unpleasant taste or feeling while giving psychological care. Development of devices to measure low level VSC, and oral care products to alleviate unpleasant oral senses are needed.

POSTER NO: 85

**Oral Breathing, Malocclusion and Malodor in Orthodontic Patients**Yamauchi E.<sup>1</sup>, Watanabe T.<sup>1</sup>, Watanabe E.<sup>1</sup>, Yoshii A.<sup>1</sup>, H. Kohinata H.<sup>1</sup>, Honda S.<sup>2</sup><sup>1</sup>Kosei Dental Clinic, Chiba, Japan, <sup>2</sup>Honda Dental Clinic Med. Co., Excellent Breath Alliance Clinics

**Aim:** Oral breathing (OB) has been reported to be one of the causes of malocclusion and has also an influence on oral condition to induce malodor. The aim of this study is to investigate oral breathing, malocclusion, malodor and general oral condition among orthodontic patients in our clinic. **Methods:** Thirty four (11 male, 23 female) orthodontic patients with an average age of 23.1 years-old were examined from 2006 to 2010 in Kosei dental clinic (Chiba, Japan). Eleven patients (male 7, female 4, average age 16.0) complained of OB, but not in 23 patients (male 4, female 19, average age 21.3). Nasal blockage, Open bite and double protrusion, DMF teeth, plaque score, saliva test, streptococcus mutans ratio (streptococcus mutans / the whole streptococci), lactobacilli level, exhalation, oral mal odor and anaerobic bacteria level were investigated. **Result:** Six OB patients were found to have open bite while double protrusion was observed in 2 OB patients. Those without OB had neither open bite nor double protrusion. Eight OB patients and one without OB had nasal blockage. The average measurement of malodor in OB patients was oral (40.8) and exhalation (36.4). On the other hand those without OB measurements were; oral (38.6), exhalation (41.8). The average Lactobacilli level of OB patients was 0.70, without was 0.05 ( $p=0.05$ ). The average anaerobic bacteria level and streptococcus mutans ratio in OB patients was a little higher. **Discussion and conclusion:** There was no difference between OB patients and no OB patients in terms of malodor in orthodontic patients. However OB patients had more open bite, double protrusion and nasal blockage. Increased Lactobacilli level, anaerobic bacteria level and streptococcus mutans ratio and poorer oral condition was found in orthodontic patients with OB relative to those without.

POSTER NO: 87

**Associated Problems of Oral Malodor-Uncomfortable Intraoral Sensations and Behaviors of Other People**Higuchi K.<sup>1</sup>, Honda S.<sup>2</sup><sup>1</sup>Higuchi Dental Clinic Co. Med., <sup>2</sup>Honda Dental Co. Med, Excellent Breath Alliance Clinics

**Introduction:** In a specialized halitosis clinic, most patients perceive their own smell as self-recognizing halitosis. Their recognition of oral malodor is not a smell only they detect. They complain of abnormal intraoral conditions too as their bad breath. Patients are further afraid of certain behaviors of others such as covering their mouths and bending backward when the patients speak to them. This means that there exist many implications of oral malodor to the patients. **Aim:** This study investigated the actual situation caused by bad breath and the associated implications. **Methods:** The sample comprised of 242 patients who had come to Higuchi Dental Clinic from October 2005 to Jun 2010 because of oral malodor. They were classified by sex, age, time of falling ill, and other relevant questions. **Results:** Findings showed that majority of halitosis patients affected middle-age patients. The duration of halitosis was more than 10 years for the majority of patients. Half of the patients recognized their own oral malodor every day. A quarter of them were aware of it occasionally. Although half of them smelled their malodor, it was the minority that began to worry about halitosis because of self-awareness. They complained of a variety of abnormal intraoral conditions such as stickiness of their mouth, xerostomia, unpleasantness, sour taste in their mouth and bitter taste. Most of patients had been notified of the problems of halitosis by other persons. Many patients were anxious about the suspicious behaviors of others. The greatest number of such behaviors was rubbing and covering of their noses. The second was alerting them and looking away. **Conclusions:** Patients with physiological oral malodor were dominant in our specialized halitosis clinic. They often detected their own bad breath, sensed some abnormal intraoral conditions and tended to recognize the suspicious behaviors of others as the evidence of their own bad smell.

POSTER NO: 86

**Subjective Strengths of Oral Malodor: Peculiar Circadian Variation and Reduction through Treatment**Higuchi K.<sup>1</sup>, Honda S.<sup>2</sup><sup>1</sup>Higuchi Dental Clinic Co. Med., <sup>2</sup>Honda Dental Co. Med, Excellent Breath Alliance Clinics

**Introduction:** Most patients with self-recognizing halitosis sense that they have certain oral malodor including abnormal intraoral conditions and behaviors of others. Their smell is usually physiological and relatively lighter than pathological halitosis. Many patients perceive that the malodor changes periodically and it is especially the worse just after rising. These changes are not well-known and there are a few reports about them. **Aim:** The aim of this study is to observe malodor changes measured with a visualized analogue scale (VAS) every treatment time and the effect of comprehensive malodor treatment on the patient's problems. **Methods:** 48 patients who came to Higuchi Dental Clinic from September 2007 to April 2010 because of oral malodor were included in the study. Patients were examined for objective findings including breath smell, saliva, tongue coated and anaerobes activities. At the same time a cross (X) was marked on a VAS denoting the strength of malodor. The VAS was recorded four times a day for successive seven days prior to every visit to the clinic. Comprehensive treatment was given for three times. The treatment procedures consisted of three components, namely; to control the anaerobe's activity, to recover the orophysiological functions and to get rid of the anxiety about oral malodor. **Results:** There were no significant differences between the VAS scores of the days. The score was highest at the time they got up and lowest at the time they went to bed. As a result of treatment the VAS score of each time zone reduced significantly. In addition, organoleptic scores were reduced by the treatment. **Conclusions:** We investigated the objective and subjective strengths of oral malodor. The VAS is a useful tool to reveal the temporal changes of subjective odor. In consequence, we found a peculiar circadian variation and advancement followed by the malodor treatment.

POSTER NO: 88

**The Effects of Tongue Cleaning on Patients with Oral Malodor**

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**Introduction:** Oral malodor is caused mainly by volatile sulfur compounds (VSCs) produced by specific oral microorganisms. The tongue surface is one of the major habitats for these VSC-producing pathogens. The aim of this study was to evaluate the effects of tongue cleaning on oral malodor in 2 patients groups: non-periodontitis and periodontitis. **Methods:** Subjects were 58 patients without periodontitis and 51 patients with periodontitis. Both groups of patients were diagnosed with oral malodor using the Organoleptic Test/OT and Oral Chroma™ at the National Dental Hospital in Ho Chi Minh City, Vietnam. At baseline, tooth, periodontal, tongue coating status and tongue coating sampled BANA test were examined. All subjects were instructed to clean their tongue using a small head tooth brush for 7days. Subjects in the periodontitis group were further provided with non-surgical periodontal treatment. **Results:** There were significant positive correlations of OT and VSCs with tongue coating and BANA test in both group and with all periodontal parameters in the periodontitis group at baseline. After tongue cleaning, reductions were observed in OT (2.33 to 1.12), H<sub>2</sub>S (5.62 to 1.10) and CH<sub>3</sub>SH (3.00 to 0.41) in the non-periodontitis group. The degree of reductions in OT (2.82 to 2.61), H<sub>2</sub>S (7.63 to 4.88) and CH<sub>3</sub>SH (8.92 to 5.99) was smaller in the periodontitis group. The periodontal treatment provided resulted in additional reduction in OT (2.61 to 0.94), H<sub>2</sub>S (4.88 to 1.13) and CH<sub>3</sub>SH (5.99 to 0.27) in the periodontitis group. **Conclusion:** Tongue cleaning was indicated as the more effective approach to oral malodor treatment in patients without periodontitis than those with periodontitis. It also effectively reduces oral malodor when combined with periodontal treatment in patients with periodontitis.

POSTER NO: 89

**Social Anxiety Disorder in Halitosis Patients**

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**Introduction:** Many halitosis patients feel anxiety about their malodor and suffer from social interaction in daily lives. There is a possibility that the anxieties of these patients may occur due to social anxiety disorder. The objective of this research was to investigate the social anxiety disorder of halitosis patients. **Methods:** The subjects were 266 genuine halitosis patients who were diagnosed by Organoleptic Test in Fresh Breath Clinic. Based on a self-administered questionnaire of the Liebowitz social anxiety scale (LSAS), patients were divided into the low LSAS group (N=168) and the high LSAS group (N=98). The Visual Analog Scale of Anxiety (VAAS) assessed anxiety, and face scale assessed quality of life of the subjects. VAAS and face scale were conducted in pre and post oral malodor treatment to compare the improvement. The Volatile Sulphur Compounds (VSCs) level determined by gas chromatography was used to confirm oral malodor in pre and post-treatment. **Results:** There was no significant difference of mean age between the high and the low LSAS groups. However, the ratio of female was significantly higher in the high LSAS group. The ANCOVA adjusting for age and gender showed that the high LSAS group had significantly higher VAAS and face scale scores before the treatment compared with low LSAS group. After the treatment, VSCs levels of both groups were decreased. However, the high LSAS group had still significantly higher VAAS and face scale scores after the treatment. **Conclusion:** It was revealed that the high level social anxiety disorder patients had higher anxiety and lower quality of life, even though oral malodor was improved. It was suggested that not only an ordinary clinical treatment, but also an approach targeting on social anxiety disorder is necessary for halitosis patients

POSTER NO: 91

**Assessment of Current Situation and Supply of Dentists in Mongolia.**

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**Introduction:** Proper distribution of medical human resource work, evaluation of labor and growth of professional and development have a pivotal role to implement the medical trend to protect and support health which is the modern main idea of WHO. **Aim:** The purpose of this study was analyze the supply and sufficiency of dental human resources in Mongolia. **Methods:** Specially elaborated questionnaires were distributed to all level hospitals and private dental clinics to be completed. In addition, archives of Health Sciences university of Mongolian and Ministry of Health National Medical Registry were also used for this study. **Results:** First five Mongolian dentists graduated from Medical Institute of USSR in Leningrad in 1956 was the start of the development of dentistry in Mongolia. Since then until 2009, 1400 dentists have graduated School of Dentistry, HSUM and abroad. As a result of this study, we can conclude that Mongolian dentists rate is in the midpoint and sufficient enough. There are over 850 dentists actively working in 21 provinces and Ulaanbaatar city in 2009. National average rate shows that one dentist is per 4004 people (24.97 dentists per 100'000 populations). **Conclusion:** There was one dentist per 2114 people (47.31 dentists per 100'000 populations) in Ulaanbaatar, compared to dentist per 13322 people (7.51 dentists per 100'000 populations) in provinces. Also, it shows that 74.6% of total dentists are working in Ulaanbaatar, and rural compared 25.4% working actively with than 22.2% in center of provinces and 3.2% in sum, intervillage's hospital.

POSTER NO: 90

**Do Indonesians Receive The Dental Care Treatment They Need?**

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**Introduction:** Increasing access for citizens to health services, including dental care, is one of the primary targets of the Indonesian Ministry of Health. **Aim:** This study aims to assess progress toward this goal, to describe the magnitude of unmet needs for dental care among Indonesians. **Method:** Cross-sectional secondary data of a nationally representative survey, the Indonesian National Socio Economic Survey, conducted from 2003 to 2007 was used. Analysis was done to describe the proportion of perceived unmet need for dental care. Descriptive, bivariate and multivariate logistic regression analyses were used to describe the association between unmet need for dental care in different demographic groups (based on age, gender, residence, macro regions, and health insurance entitlement) in Indonesia. **Results:** On the average, 2.28% of the Indonesian population reported perceiving need for dental care and 0.74% reported utilizing dental care. Additionally, the average of unmet need was 67.94%. Logistic regression analysis indicated that respondents who lived in rural areas, who were uninsured, had higher odds ratios in reporting unmet dental care needs. **Conclusion:** Perceived need for and utilization of dental care among Indonesians was found to be low. Moreover, the unmet need for dental care is relatively high.

POSTER NO: 92

**Burden of Care in Mobile Dental Teams (MDT), MOH Malaysia**Tan B.S.<sup>1</sup>, Zamzuri A.T.<sup>2</sup>, Othman N.<sup>2</sup>, Baharom M.R.<sup>2</sup>, Othman A.B.<sup>2</sup>, Kassim R.A.<sup>2</sup>, Badariah T.C.<sup>2</sup>, Bakar A.A.<sup>3</sup>, Sararaks S.<sup>3</sup>.<sup>1</sup>International Medical University, <sup>2</sup>Oral Health Division, Ministry of Health, and <sup>3</sup>Institut for Health Systems Research, Ministry of Health Malaysia

**Introduction:** This was part of a larger study conducted to furnish estimates of costs to provide all MDT in the country with optimal numbers and types of instruments. This paper aims to determine the workload in MDT, MOH Malaysia. **Method:** The study was conducted throughout the nation in April 2008. Information was solicited on work burden retrospectively for the period of 1 April 2007 to 30 June 2007. **Result:** A total of 836 MDT participated in this study. The MDT were in operation for a total of 26,355 days. The mean number of workdays was 25.66. There were 2094 operators with a total of 53,723 man-days. A total of 1,561,974 patients were seen comprising 956,863 primary and 605,111 secondary schoolchildren. An estimated 7189.55 days were related to "Examination and Diagnosis" (E&D) (charting the oral health status) and the remaining 19165.45 days were associated with non-E&D (other specific procedure) tasks. There was a total of 1,014,683 E&D patients seen. The mean number of E&D was 157.70 per MDT and 89.91 per operator per day. The mean daily work burden per MDT were 8.40 amalgam restorations (range 1.25-137.5), 3.32 scaling (range 0.06-97.0), 4.55 anterior tooth coloured restorations (range 0.79-87.5), 11.99 posterior tooth coloured restorations (range 2.32-153.60), 6.24 deciduous extractions (range 1.00-84.77) and 0.50 permanent extractions (range 0.02-21.85). The corresponding means per day per operator were amalgam 4.29, scaling 1.87, anterior tooth coloured restorations 2.43, posterior tooth coloured restorations 5.72, deciduous extractions 3.01 and permanent extractions 0.32. **Conclusion:** This modality of care (MDT) provides benefit to a substantial proportion of the target group in the country. It indicates the importance of MTD in the provision of oral health care for school children.

POSTER NO: 93

**Caries Experience in Three Ethnic Groups of Schoolchildren in Malaysia**Yusof N.<sup>1</sup>, Masood M.<sup>1</sup>, Hassan M.I.<sup>1</sup>, Jaafar N.<sup>2</sup><sup>1</sup>Department of Community Dentistry, Faculty of Dentistry, University Teknologi MARA, <sup>2</sup>Department of Community Dentistry, Faculty of Dentistry, University Malaya

**Introduction:** The school incremental dental care programme in Malaysia has benefitted thousands of schoolchildren. The programme ensures that all children from 6 to 12 years old received a comprehensive dental health care every year which include screening, treatment and dental health education. **Aim:** The aim of this study is to describe the dental caries experience and increment among a cohort of primary schoolchildren covered by this programme. **Methods:** This 6 years longitudinal cohort study comprised of primary school children initially aged 6 years old attending government aided schools. Data collected were from 2004 to 2009. A multi-stage cluster random sampling was used in the study. At first stage, schools were randomly selected from two districts as clusters. During the second stage children's records were selected from each selected school by using simple random sampling. A total of 1830 records of children attending 26 government schools were included in this study. **Results:** This study showed overall increment of mean DMFT (CI) from 0.06(0.04-0.07) in 2004 to 0.14(0.11-0.17) in 2009. Mean DMFT showed no significant difference among the three ethnic groups although Indians maintained the lowest mean DMFT throughout study period. Caries increment (mean DMFT) in each ethnic group from 2004 to 2009 was 0.07 to 0.55 in Malays, 0.06 to 0.61 in Chinese and 0.04 to 0.54 in Indians. **Conclusion:** Overall caries experience remained low throughout the study period which corresponds well with the National Oral Health goal of DMFT < 1.5 for 12 years old. There was no significant difference in caries experience and increment among the three ethnic groups.

POSTER NO: 95

**School Dental Service in Malaysia – A 5 Year Retrospective Review**

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Incremental Dental Care (IDC) was introduced in the 1980's where school children were given a systematic and comprehensive oral healthcare. The IDC involves oral health promotion and curative care mainly by the mobile dental team and mobile clinics consisting of dental officers, dental nurses, dental surgery assistants, medical assistant and driver. The 5 year retrospective review is important in providing evidence for practice and basis for future planning. This review aimed to describe the Caries Free (CF) status of 2 sets of cohort over 5 years in Malaysia. The 12 year old schoolchildren in 1997 and 2001 were selected as the cohort group. The CF status by state was obtained from the Health Information Centre (HIC) at the beginning of review and subsequently after 5 years. A total of 462,514 schoolchildren aged 12 years old in 1997 and 461,688 in 2001 were involved in the review. Result shows that the overall percentage of CF status of 12 years old was 44.9 % in 1997 and 49.9 % in 2001. At 16 years old the CF status was recorded as 26.3 % (2001) and 30.2 % (2005) respectively. There was an increase in the overall CF status of both 12 years old and 16 years old schoolchildren over the years. However it was noted that caries free status decline as the cohort reaches 16 years old. However, some states in Malaysia such as Terengganu, Kelantan, Sabah, and Sarawak are still experiencing high caries prevalence in both primary and secondary schoolchildren. It is suggested that a regular recall system would identify the problem of caries risk and formulate a programme to sustain the CF status amongst secondary schoolchildren.

POSTER NO: 94

**Fifteen-Years-Trends of Dental Specialists Proportion in Thailand**Korwanich N.<sup>1</sup>, Srisilapanan P.<sup>1</sup>, Tuangratanapan S.<sup>1</sup>, Sheiham A.<sup>2</sup><sup>1</sup>Faculty of Dentistry, Chiang Mai University, Chiang Mai, Thailand, <sup>2</sup>Department of Epidemiology, UCL, London, UK.

**Introduction:** Dental specialist system in Thailand has been established for 15 years. Ten fields of dental specialty include oral and maxillofacial surgery, periodontics, pedodontics, orthodontics, prosthodontics, dental public health, endodontics, operative dentistry, general dentistry, and diagnostic science. To be qualified as dental specialists, general dental practitioners are required to pass both written and oral examination from The Royal College of Dental Surgeons of Thailand. This study aims to explore trend of proportion of dental specialists to general dental practitioners of Thailand during the past 15 years. **Methods:** Data from Thailand Dental Council Secretariat office data base were retrieved. Number of general practitioners and those of dental specialists in each field were evaluated. Descriptive statistics were used in analyzing processes. **Results:** At present, only 717 dentists are recognised as dental specialists in Thailand. It is equivalent to 6.38 percent compared to the whole amount of 11,233 dentists registered to Thailand Dental Council. From the 717 specialists, there are 199 specialists (27.8%) who are in the field of oral and maxillofacial surgery. There are only 11 specialists (1.53%) working in operative dentistry. Proportion of specialists to general dental practitioner rose from 2.05% in 1997 to 6.38% in 2010. However, the percentage is increasing each year tend to be narrower over time. **Conclusion:** The number of dental specialists in Thailand is small compare to those who are general dental practitioners. Trend of general practitioners who pass the specialty examination is also lower. If this trend continues the dental health system in Thailand may be affected in the future.

POSTER NO: 96

**Factors Affecting Dental Visits in Kuala Terengganu**Yunus N., Harun M.H.<sup>1</sup>, Abdul Aziz H.<sup>2</sup>, Zakaria S.<sup>3</sup>

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**Introduction:** Regular dental visits are important to maintain good oral health. Unfavorable patient's perception towards oral health may have an effect on the importance and urgency in attending preventive dental check-ups. The aim of this study was to determine factors affecting visits to the dentist among patients in Kuala Terengganu. **Method:** This was a descriptive, cross sectional study conducted on newly registered patients. Anonymous, self administered questionnaires were distributed to 381 respondents between March and September 2007. **Results:** Completed questionnaires were obtained from 290 respondents, giving a response rate of 76.1%. Data were analysed using SPSS 12.0. A majority of respondents reported their visit to the dentist was only in cases of dental pain (80.3%). There was no significant difference in proportion of dental visits frequencies between males and females (p=0.512). The proportion of dental visits between education levels was not significantly different (p=0.212). There was also no statistically significant difference between age and frequency of dental visits (p=0.058). **Conclusion:** Most of the patients seek dental treatment only when they are in pain. There is no difference between gender, level of education and age with frequency of dental visits.

POSTER NO: 97

**Work-Related Musculoskeletal Pain among Indian Dental Students.**

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**Introduction:** Dentists experience more neck, shoulder, and lower back pain than practitioners in other occupational groups. While the occasional backache or neck ache is not a cause for alarm, if regularly occurring pain is ignored, the cumulative physiological damage can lead to an injury or career ending disability. Dental students usually perform similar clinical tasks as dentists and therefore face similar risks. **Aim:** To assess the prevalence of musculoskeletal pain in Indian dental students. **Materials and methods:** Investigation was done regarding body distribution and severity of reported musculoskeletal pain in a population of dental students studying under Barkatullah University, Bhopal, India, of academic year 2009-2010. Dental students in all four years of college and interns completed a questionnaire focusing on pain reported in five general regions of body. Increasing exposure to clinical experience with years in dental college was considered. Data was collected and analyzed using SPSS v. 17 package. **Results:** 70 to 90 percent of students reported body pain, with the percentage generally increasing with years in dental college. Intensity of pain was higher in females. Frequency of pain was higher in the third year students. **Conclusion:** Chronic pain appears early in dental careers. The high percentage of pain among dental students obligates dentistry to further examine the mental, physical and ergonomic factor that may be contributory.

POSTER NO: 99

**Occupational Hazards in Dental Practice. Do We Know Enough? A Pilot Study**

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**Introduction:** Recent technological advancement has made dentistry user friendly. Yet occupational health problems such as percutaneous exposure incidents, radiation, musculoskeletal disorders; dermatitis, respiratory disorders; eye injuries; and psychological problems still persist in modern dentistry. **Aim:** 1) To survey Dentists in Bangalore city concerning common occupation-related health problems, 2) To assess their knowledge and experience with these problems, and 3) The precautions taken to avoid such problems. **Method:** The data was obtained from 200 dentists working in Bangalore city using a self-administrated structured questionnaire that included questions on personal data, awareness of occupational hazards, safety measures practiced and experience of occupational hazard while in practice. **Results:** The response rate was 95%. SPSS version 16 was used for statistical analysis. All the respondents were aware of the occupational hazards, the majority had attended workshops on the subject and were vaccinated against Hepatitis B. Nearly all of the respondent dentists wore gloves (99%) and face masks (97%) during work, however wearing protective eye goggles was the least employed cross infection control measure. 82% had regular exposure to dental amalgam and majority neglected their amalgam blood levels. Backache was the commonest hazard in members of the study. **Conclusion:** Despite high levels of awareness towards occupational hazards among the dentists of Bangalore, the practical steps to prevent them need to be reinforced. Increased awareness must be created about the dangers of chronic mercury poisoning. The physical activities and body positions that predispose dentists to backaches needs to be identified and simple in-office exercises be reinforced. There is a substantial need and demand for further training in occupational health and safety.

POSTER NO: 98

**Barriers In Using Material Safety Data Sheet Among Dental Dent Personnel**

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**Introduction:** Development of Material Safety Data Sheet (MSDS) was mandated by the Occupational safety and Health Administration (ASHA) in their Hazard Communication Standard 29CFR 1910.1200. It is an important source of information on the materials and their potential hazards. This study aims to identify the barriers in using the MSDS among the Dental Personnel. **Method:** This was a cross-sectional study which involved Dental Officers (DO), Dental Nurses (DN), Dental Technologists (DT) and Dental Surgery Assistants (DSA) working in Oral Health Division, Perak. They were selected by simple random sampling to get the calculated sample size of 250. A structured questionnaire with the selection of the variables was determined by reference to the content of MSDS available. This questionnaire was pretested among the related categories of dental personnel not included in the final sample to determine the content validity and reliability. SPSS version 15.0 was used for data analysis. **Results:** More than 85% of all the participants reported that it was important to read the MSDS. Majority of the participants (>60%) revealed that they had no problem using the MSDS. Highest proportion of DT (56.5%) reported that understanding of language was a barrier, followed by DN (50.7%), DSA (44.4%) and DO (15.2%). About 14% of the participants claimed that there were no MSDS kept in their clinics and 16.4% of them did not know where to get MSDS as a reference. **Conclusion:** Around one third of all the categories of dental personnel encountered problem in using the MSDS and approximately half of all the categories of dental personnel experienced language barrier except DO. The translation of the important information on the proper handling, storage and disposal of the potentially hazardous materials into simple national language is helpful for the dental personnel to understand and implement the important messages in the MSDS.

POSTER NO: 100

**Study of Ergonomic Aspect in Daily Practice Dentistry of Some Private Dental Clinics in Makassar**

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**Introduction:** Most practicing dentists experienced pain or discomfort in the neck and spine region. General dentist that treat patients usually work in a rigid posture for a long period of time, and this can lead to musculoskeletal syndrome. Ergonomics systems in the field of dentistry is not just the operator's position and design tools, but also the integration of equipments used in dental practices. The purpose of this study is to assess the application of ergonomics system by dentists in daily practice in order to prevent the musculoskeletal disorders. **Methods:** This is a descriptive study and questionnaires were used to gather information needed. Data were processed using SPSS version 16.0. **Results:** All respondents (100%) have used standard equipment that support the ergonomic design. Half of the respondents (50%) worked in environment that was comfortable and efficient for treatment of patients. For sitting position as an aspect of ergonomics, 51.9% was applied by the male respondents, 75% dental specialists, and 51% of respondents have adequate knowledge to it. For standing ergonomics aspect, it was adopted by all respondents from all groups with a total of 75%. For ergonomics aspects of work processes (teamwork), 68.2% was applied by the male respondents, 100% dental specialists and 57.1% of respondents have adequate knowledge to it. About 56.8% respondents admitted experiencing occasional pain, with 25% were back pain. **Conclusion:** In general, the implementation of ergonomics components in everyday dental practice is important, and we still need to pay attention to aspects of ergonomics in sitting position, considering that most dentists often sit while treating patients.

POSTER NO: 101

**Effect of Using Mouthwashing Solutions Containing IPMP and GK2 on Oral Environment**Kang J.O.<sup>1</sup>, Seo W.S.<sup>2</sup>, Sano H.<sup>3</sup>, Kambara M.<sup>4</sup>, Park Y.D.<sup>1</sup><sup>1</sup>Dept. of Preventive and Social Dentistry, & Institute of Oral Biology, School of Dentistry, Kyung Hee University, Seoul, Republic of Korea, <sup>2</sup>Best Living Institute, CJ LION Corp. Seoul, Korea, <sup>3</sup>Product Development Dept. International Division, LION Corp. Sumida-ku, Tokyo, Japan, <sup>4</sup>Dept. of Preventive and Community Dentistry, Osaka Dental University, Hirakata, Osaka, Japan.

**Aim:** The objective of this study is to determine the oral environment improvement effects and safety of IPMP/GK2 mouthwash. **Methods:** This double-blind study was carried out in 30 healthy Korean adults to evaluate the oral environment improvement effects and safety after application of the mouthwash containing IPMP and/or GK2 in given amounts over 4 cycles ( 2 weeks of carry-out effect period, and 2 weeks of IPMP/GK2 mouthwash use, total 4 weeks/cycle, group X 4 groups ), compared with the placebo group. **Results:** After 4 cycles, IPMP/GK2 groups showed statistically significant reductions in oral environmental indexes, such as halitosis, GCF, periodontal pocket depth and plaque index, when compared to the placebo group. In particular, there were statistically significant reductions in the total counts of *S. mutans*, *S. sobrinus*, *P. gingivalis* before and after application of the mouthwash containing 0.02% IPMP and 0.02% GK2, using RT-PCR method. **Conclusions:** The safety and clinical effectiveness of IPMP/GK2 mouthwash in this study were identified in terms of its indirect bactericidal activity in the control of the deep-inside of plaque, as shown in the reduction of periodontal pocket depth and GCF as well as effective inhibition of oral microorganisms.

POSTER NO: 103

**Clinical Efficacy of a Mouthwash Containing Extract of Flower Star Fruit (Averrhoa Bilimbil) against Healing of Aphthous Stomatitis**

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**Introduction:** Indonesia is a tropical country, enabling the growth of some species of which there are efficacious as a medicine. One of the plants used as medicine is a starfruit (*Averrhoa bilimbil*), which can be used as a drug using its leaf, fruit and flowers. **Aim:** The purpose of this study was to investigate the effectiveness of a mouthwash containing extracts of flowers of star fruit on the healing rate of aphthous stomatitis. **Method:** This study used a clinical experimental design of clinical research involving 24 patients with aphthous stomatitis who attended the Oral Medicine Clinic, Faculty of Dentistry, University of Makassar. Measurements were carried out on days 2 through 6. Analysis of data to know the difference of decrease in the number of bacterial colonies before and after the rinse used Wilcoxon Signed Rank test and to determine the difference between the average difference before and after the rinse between the two groups, Mann-Whitney test with used program SPSS version 16. **Result:** There are differences in the average decline in the number of colonies of bacteria and germs streptococcus mutans before and after the rinse and no difference in the average rate of decline of bacterial colonies (  $p = 0.575$ ) and *Streptococcus mutans* ( $p = 0.705$ ) between treatment and control groups. Treatment groups showed a significant decrease in ulcer diameter before and after the second day compared with the control group, for the third day until the sixth day showed the effects of a significant decrease in ulcer diameter of the two groups. The percentage recovery for treatment groups for days 3, 4, 5 and 6 were 33.3, 58.3, 7 and 0%, for the control group was 0, 33.4, 50 and 16.7%. **Conclusion:** Effects of a mouthwash containing extracts of star fruit flowers showed a similar effect compared with the control mouthwash containing herbal ingredients. Based on these results, the star fruit can be used as active ingredients of mouthwash.

POSTER NO: 102

**Effect of Dentifrice Combined by Extracts Of DPG, BA and CA on Oral Conditions**Ahn J.H.<sup>1</sup>, Ahn K.S.<sup>2</sup>, Kwon H.J.<sup>2</sup>, Park Y.D.<sup>2</sup><sup>1</sup> LG Household & Health Care Research Park, Korea, <sup>2</sup>Dept. of Preventive and Social Dentistry, & Institute of Oral Biology, School of Dentistry, Kyung Hee University, Seoul, Republic of Korea.

**Introduction:** This experiment was contrived to find out the changed in Oral Condition Indices when the standardized and regular use of the dentifrice is administered according to its recommended dosage. **Methods:** After inspecting the result of acceleration of collagen forming and suppressing effect of inflammatory reaction by using the extracts of CA (*Centella asiatica*) and DPG (Dipotassium glycyrrhizinate) with In-vitro experiment (done inside the lab), the remedying effect on oral cavity condition was to be obtained with dentifrice made with combined BA(bamboo salt) and those above through In-vitro experiment (clinical) worked with 90 healthy bodied examinees for over 6 months. **Results:** With the result of the experiment done at the lab, when the changes of improved index of oral cavity condition, MMP-1 formative inhibition analysis, and collagen analysis were obtained during the experiment periods, the quantitative extract of CA suppresses the damage of the tissue due to inflammatory response at the gingival cell and after the inflammatory response, accelerated regeneration of the gingiva were clearly shown. Also, as with the result in clinical experiment, the effect was acceptable in decreased dental plaque index and gingivitis index with only dentifrice that contains the quantitative extract of CA and also showed outstanding result in antibacterial activity. **Conclusions:** The most effective improvement especially shown on the oral conditions were dentifrice that contains DPG, BA and quantitative extracts of CA.

POSTER NO: 104

**An Appraisal of an Oral Health Education Program through Use of Tooth-Brushing Facilities**

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**Objectives:** To establish a dental health education system in Korean elementary students through various groups for tooth-brushing facilities. **Method:** This experiment is conducted from May through December in the year 2009 and the dental health education and group tooth-brushing facilities were established and operated in three elementary schools at Jung-gu, Seoul city. The schools are classified into continuing-project group and new-project group. From this dental education and operation of facilities, the effect of dental health education according to tooth-brushing facilities is measured, compared and analyzed. **Results:** For first grade students, the continuing-project group (31.78%) and the new-project group for schools that established tooth-brushing facilities(29.35%) show the highest increasing rate in the score when compared the scores before and after the dental education ( $P < 0.01$ ). Also, the experiment shows that there is no significant difference between the scores of schools before and after the education ( $P > 0.05$ ). For sixth grade students, the continuing-project group shows an increasing rate in the score of 21.5% when the scores were compared for before and after the education ( $P < 0.01$ ). However, the schools that established class-type tooth-brushing facilities and schools that established corridor-type tooth-brushing facilities amongst new-project group showed a small increasing rate in the scores with 8.78% and 7.54% respectively, and they showed no statistically significant differences ( $P > 0.05$ ). Moreover, the experiment shows that there is no significant difference between the scores of schools before and after the education ( $P > 0.05$ ). **Conclusion:** For the establishment and operation of group tooth-brushing facilities in schools, it is recommended that dental health education must be conducted together. Also, it is reviewed that class-type tooth-brushing facilities establishment and operation are more effective and that they should be conducted under continuous interests and instruction of teachers.

POSTER NO: 105

**Management of Talon Cusp using Mineral Trioxide Aggregate**  
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Talon cusp is an uncommon dental anomaly that manifests as an accessory cusp-like structure, projecting from the lingual or facial surface of anterior teeth. A talon cusp is composed of normal enamel and dentin and may involve a pulpal extension. Various treatment regimens have been followed for the management of talons cusp depending on the absence/ presence of pulpal extension. In case of premature contact and occlusal interference, the talon cusp should be reduced gradually on consecutive visits over 6 to 8-week intervals in order to allow time for deposition of reparative dentin for pulpal protection. In some cases pulp therapy becomes mandatory due to pulpal extension. Hence we present a novel approach in management of talon cusp in three cases using the properties of MTA – angelus.

POSTER NO: 107

**Solving Problems Before They Arise-Preventive Orthodontics**  
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**Introduction:** Orthodontics is devoted to building beautiful smiles by bringing teeth, lips, and jaws into proper alignment. Teeth in proper alignment function better, are easier to clean, and are more likely to last your lifetime. One of the dilemmas facing the orthodontic clinician is whether or not to intervene before the eruption of the permanent dentition. **Methods:** Five cases with mixed dentition were treated at the Department of Orthodontics, Manipal College of Dental Sciences over a period of one and half year. These cases were treated with habit breaking appliance, myofunctional appliance, and space maintainers, to improve the esthetics, function and smile of the patients. **Result:** Usages of these appliances help to improve or correct orthodontic problems that would result in an irreversible damage to supporting structures which would progress into a more severe orthodontic problem. **Conclusion:** Early Orthodontic treatment guides the jaw growth in a favorable direction thus reducing the chance of extraction or surgery.

POSTER NO: 109

**Erosive Effect of Hangover Beverages on Sound Enamel**Lee H.J.<sup>1</sup>, Hong S.J.<sup>1,3</sup>, Jung E.J.<sup>1,2</sup>, Oh H.N.<sup>1,2</sup>, Jeong S.S.<sup>1,2,3</sup>, Chung K.Y.<sup>1</sup>, Choi C.H.<sup>1,2,3,4</sup><sup>1</sup>Department of Preventive Dentistry and Public Health Dentistry, <sup>2</sup>2nd stage of Brain Korea 21 Project, <sup>3</sup>Dental Science Research Institute, <sup>4</sup>Department of Dental Education, Chonnam National University, Korea.

**Introduction:** There are several hangover beverages for hard drinkers in Korea. The aim of this study was to evaluate the erosive effect of hangover beverages on sound enamel. **Method:** Three popular hangover beverages currently used in Korea were selected (Dawn808, Condition Power, Morning Care). The pH and the concentrations of calcium, phosphate and fluoride of hangover beverages were measured. Specimens of bovine tooth enamel were embedded in resin, and polished with grinding papers(#60, 240, 600, 4000 grit). The Specimens were immersed for 10 minutes in hangover beverages and in deionized water as a control. The surface hardness was measured by VHN (Vickers hardness number : VHN) and analysed by one-way ANOVA among groups. **Results:** The pH of the tested beverages was 3.86 (range, 3.4 to 4.5), which caused the tooth erosion. The concentration of Dawn808 with calcium and fluoride (178.9±0.006ppm, 5.2±0.5ppm) were higher than all other beverages. After 10 minutes treatment, the surface microhardness (ΔVHN) was decreased by 63.5±8.3(Morning Care), 37.6±10.1(Condition Power), 4.4±12.7(Dawn808) and 0.3±9.3(deionized water). There is statistically significant difference among four groups (p<0.05). It was found that the erosive effect of Dawn808 was similar to that of deionized water. **Conclusion:** The hangover beverages, Condition Power and Morning Care induced erosion in sound enamel, while Dawn808 did not.

POSTER NO: 106

**Latest Trends in Cancer Chemoprevention**  
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Cancer chemoprevention is the use of natural, synthetic or biologic chemical agents to reverse, suppress, or prevent carcinogenic progression. Oral cancer is an ideal model to investigate chemopreventive strategies. Because of the ease of tissue sampling, the patients could be followed closely so that any lesion that progressed could be immediately removed surgically. Many agents have been evaluated as possible chemopreventive therapies. One such agent is curcumin, a polyphenol, an active principle of perennial herb curcuma longa (commonly known as turmeric). Tetrahydrocurcuminoids is one of the major metabolites of curcumin. Curcumin has shown to exert chemopreventive effects on premalignant lesions. This paper encompasses various chemopreventive agents and their possible role in chemoprevention. Also describes the findings of an interventional pilot study conducted at our centre to assess the efficacy and safety of Tetrahydrocurcuminoids in treating Oral Leukoplakia. To the best of our knowledge, this is the first in - vivo study undertaken to investigate Tetrahydrocurcuminoids in the treatment of Oral Leukoplakia.

POSTER NO: 108

**Prevention of Oral Health Problems with Help of Multidisciplinary Therapy**Sachin, Valiathan A.

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Mutilated dentition in an adult can affect diet of the individual and can manifest as nutritional deficiencies and can even have great adverse impact on the psychology of the patient. One common example is osteoporosis seen among the old postmenopausal females. If dental treatment of suboptimal quality is performed in such kind of patients, it will neither restore the lost hard and soft tissue properly nor will ameliorate future dental related problems. This case report showed how inappropriate crown and bridge work can lead to severe periodontal deterioration and destruction of dentition in a 52 year old female. With the help of combined orthodontic, periodontics and restorative care we could restore the dentition functionally, esthetically and prevent future oral and systemic health problems in this post menopausal patient.

POSTER NO: 110

**Tooth Discoloration among Patients seen at a University Teaching Hospital**Bunyarit S.S., Mohammad H.A.J, Sayed H.S.M. and Nurul A.M.

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**Introduction:** Discolorations of teeth are common occurrence found on anterior teeth. This can affect the aesthetic of patients. Tooth discoloration can be extrinsic or intrinsic in nature. **Aim:** To assess distribution and causes of tooth discoloration among dental patients in relation to age, gender and race. **Method:** Data were collected from patients with tooth discoloration attending for treatment at the Primary Care Unit (KRU), Universiti Kebangsaan Malaysia. The data were collected by means of questionnaires and clinical examinations to determine the cause and type of tooth discoloration. Standardised clinical pictures of tooth discoloration were used as a guide in the selection and classification. The independent sample T-test was used for numeric variables. **Results:** A total of 102 patients were examined for tooth discoloration. Slightly more than half of the patients (53.9%) were males. The Malay patients (66.7%) were highest group, prone to tooth discoloration. Mean age for male was 27.1±8.6 and for female was 30.8±8.6 years old. There was no significant difference in age between males and females (p>0.05). The prevalence of extrinsic tooth discoloration (52.9%) was higher than intrinsic. In extrinsic tooth discoloration, most of patients had staining caused by tobacco, coffee and tea (49.1%). Fluorosis was the commonest type of intrinsic tooth discoloration seen. There was no significant difference in types of tooth discoloration between males and females (p>0.05). **Conclusion:** Tooth discolorations happen in any age, gender and race. Awareness of the causes of tooth discoloration will help to minimised its occurrence.

POSTER NO: 111

**Erosion of Tooth Enamel and Cementum by Carbonated Beverages**

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**Aims:** The objectives of the study were to observe tooth erosion by carbonate beverages and to determine the correct time to brush teeth after consuming these beverages. **Method:** Four extracted teeth were prepared, divided into eight pieces and mounted on resin models. Each model was 0.5mm in size. Four types of carbonated beverages i.e. cola, orange juice, 13% sugar solution and alkaline were prepared and inserted into the specimens. The control group was labeled as Group A. Group B consisted of specimens inserted with the beverages. In Group C, tooth-brushing was simulated after one hour of insertion. In Group D, simulation was carried out after one hour of insertion and another hour in saliva. All samples were examined with SEM using magnification x1000 and x3000. **Result:** More rough surfaces were seen in Group C than Group B or Group A. **Conclusion:** Tooth-brushing immediately after taking carbonated beverages causes the most erosion in enamel and cementum.

POSTER NO: 113

**Okc: Cyst Or Benign Neoplasm? A Study Using AgNors with Image Analysis Tools**

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**Introduction:** In view of the current designation of OKC as benign cystic neoplasm, the aim of this study was to assess the proliferative activity of odontogenic keratocyst and compare it with that of an acknowledged indolent odontogenic cyst (e.g. dentigerous cyst) and an aggressive tumour (e.g. ameloblastoma). **Methods:** Histological sections were prepared from formalin-fixed, paraffin-embedded tissue blocks of 15 sets of odontogenic keratocyst, dentigerous cyst and conventional ameloblastoma cases and 10 cases of unicystic ameloblastoma with silver stain for visualization of AgNORs. The number of AgNORs per nucleus was counted manually whereas AgNOR area and perimeter were determined using computerized image analysis. The results obtained were statistically analyzed. **Results:** Results suggested that the mean AgNOR number was the reliable marker of the proliferative activity of a cell but mean AgNOR area and perimeter were unreliable parameters to assess the proliferative potential of the odontogenic lesions studied. **Conclusion:** We conclude that based on the AgNOR count, the keratocystic odontogenic tumour is comparable to conventional ameloblastoma in its biological behaviour i.e., it behaves as an odontogenic tumour and hence should be treated as a tumor and not as a cyst, thereby preventing its recurrence to a certain extent.

POSTER NO: 112

**Estimation of Candidal Secreted Aspartyl Proteinase Activity (Sap) in the Saliva of Premalignant Lesion and Oral Squamous Cell Carcinoma by Absorbent Spectrophotometry**

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**Introduction:** Several virulence attributes have been considered for candidal infection and among the most widely studied are the secreted aspartyl proteinase (Sap), a hydrolytic enzyme. Sap proteins have versatile functions including digesting nutrient molecules or host membranes, facilitating adhesion and tissue invasion. We determined the in-vitro salivary Sap level in healthy individuals, smokers, patients with pre-malignant lesions and oral squamous cell carcinoma and to observe its co-relation with the Candida cell count. **Method:** The Sap activity was measured by spectrophotometry at 24- and 48- hour's interval in sixty *Candida* isolates which were cultured in proteinase inducing media, YCB-BSA at pH-5.6. The speciation of *Candida* by Candida Identification Kit and *Candida* cell count was measured using haemocytometer. **Results:** Sap levels and *Candida* cell count were found to be higher in diseased individual than that of normal individuals ( $p$  value < 0.001) and the level was almost doubled at 48-hours as compared to be found at 24-hours in diseased ones ( $p$  value < 0.002). **Conclusion:** This study indicated that *Candida* species secrete increased Sap levels in pre-malignant lesion and oral squamous cell carcinoma individuals and yeast growth was also found to be higher in accordance with Sap activity. The present study in conjunction with recent studies suggested that an increased Sap facilitates *Candida* colonization. However, the precise regulatory factors that control or influence Sap in-vivo remains to be elucidated. Ultimately, this could be helpful for understanding the interaction of *Candida albicans* with the human host and consequently in the progression to neoplasia. Thus, diagnosis and elimination of Candida infection in suspected lesion will help in regression of premalignant lesion.

POSTER NO: 114

**Description of Clinical Features of Premolars Among Young Malaysian Adults**

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**Introduction:** Premolar teeth are transitional teeth located between the canine and molar teeth. Premolars may fail to erupt, partially impacted or erupt in ectopic position either as a result of mechanical obstruction, idiopathic or pathological in origin, or disruption to the eruption mechanism itself. Premolars play a role in the development of malocclusion and subsequently affect treatment decisions in orthodontics. This study aims to determine the clinical features of premolar among 15-35 year old young Malaysian adult and to assess the occlusal features associated with this pattern of malocclusion of premolars. **Methods:** This is a cross-sectional epidemiological study. Subjects from randomly selected secondary school in Klang Valley and polyclinic UKM were screened. Impression of 509 subjects who fulfilled the inclusion criteria were taken using alginate and poured into dental casts. Data were analysed with SPSS software. **Results:** The most common clinical features of premolar are normal position (60.6%). Followed by rotated (29.8%), impacted (1.1%) and missing (0.6%). The majority of the occlusal features associated with normal position of premolars are class I incisor relationship (44.4%), class I molar relationship (62.4%), class II canine relationship (48.6%), overjet 0-3mm (49.5%) and overbite between 10-30% (40.2%). **Conclusion:** Premolars in this study are commonly found to be in the normal position. In spite of this, clinicians may still decide to extract them as part of orthodontic treatment; depending on related factors such as incisor, canine and molar relationship, and extent of overjet and overbite.

POSTER NO: 115

**Erosive Effect of Some Beverages on Sound Enamel**Song A.H.<sup>1</sup>, Youn H. J.<sup>5</sup>, Hong S.J.<sup>1,2,4</sup>, Jeong S.S.<sup>2,3</sup>, Kim S.H.<sup>2</sup>, Jeon J.N.<sup>2,3</sup>, Choi C.H.<sup>1,2,3,4</sup><sup>1</sup>Department of Dental Education, <sup>2</sup>Department of Preventive and Public Health Dentistry, <sup>3</sup>Brain Korea 21 Project, <sup>4</sup>Dental Science Research Institute, Chonnam National University, <sup>5</sup>Department of Dental Hygiene, Shin Heung college, South Korea.

**Introduction:** Dental erosion caused by beverages can induce esthetic and hypersensitivity problem on human. The purpose of this investigation was to evaluate the dental erosive effect of some beverages which are popular in Korea. **Method:** Four kinds of beverages were selected in this study. Mixed beverage, carbonated flavored, fruit juice were experimental groups, and natural mineral water was control group. The 44 slabs for specimens were obtained from bovine teeth. The concentration of fluoride, Ca and P, and level of pH in four beverages were measured. Specimens were treated by beverages during 10minutes, 4 times per day for 8 days. Surface hardness and lesion depth of enamel were measured and analyzed. **Results:** The pH level of the four beverages was in the range of 2.39~7.60, and the concentration levels of fluoride, Ca and P were in the range of 0.03~0.16 ppm, 1.67~9.07 mg per 100 gm, 0~3.73 mg per 100 gm, respectively. The differences of surface microhardness (Vickers Hardness Number: VHN) before and after 8-day treatment were significantly different among four groups on sound enamel ( $p < 0.05$ ). Lesion depths measured by confocal laser scanning microscopy after 8-day treatments on sound enamel decreased significantly in order of mixed beverage, carbonated flavored, fruit juice and natural mineral water ( $p < 0.01$ ). Lesion depths were correlated with surface microhardness numbers of specimens ( $r = -0.891$ ). **Conclusion:** In this study, beverages with rich Ca in low pH showed less dental erosive effect on sound enamel. Thus, it is suggested that the low pH beverages with rich Ca could reduce the possibility of dental erosion.

POSTER NO: 117

**Prevalence of Developmental Dental Anomalies - A Clinical Study**

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**Introduction:** Developmental dental anomalies are considered as a trivial matter in the population and can often go unchecked. They however can have clinical implications when it comes to any treatment involving the tooth. **Aim:** The aim of this study was to determine the prevalence of dental anomalies in a south Indian population. Objectives were to find out the prevalence of each anomaly and to observe the gender expression. **Methods:** All patients visiting our hospital in a period of 6 months were examined. All the developmental anomalies seen clinically were recorded and details of those patients (namely age, sex) were noted. **Results:** Out of 2248 patients who visited the hospital 72 patients had one or more dental anomalies (4.04%). The most frequently seen anomalies were supernumerary teeth (1.60%) and enamel hypoplasia (1.02%). Frequencies of right and left occurrence were equal. Each sex was affected similarly. **Conclusion:** The prevalence of dental anomalies was 4.04% in a south Indian population. Most of the anomalies were seen in maxillary area. Supernumerary teeth and enamel hypoplasia were the most common anomalies seen. Developmental anomalies are unavoidable in all populations. Its presence can however alter the course of treatment.

POSTER NO: 116

**Aesthetic Component of IOTN Malocclusion Index and Quality Of Life in Secondary Schoolchildren**Nantichai M.<sup>1</sup>, Srisilapanan P. P.<sup>2</sup><sup>1</sup>Mae Tha Hospital, Lampang, Thailand, <sup>2</sup> Dept of Family and Community Dentistry, Chiang Mai University Thailand

**Introduction:** Needs for orthodontic treatment has increased dramatically among young adolescents in Thailand. The real needs for orthodontic treatment as well as the effect of malocclusion on the quality of life of these children need to be assessed. This study aims to assess the impact of aesthetic component in the orthodontic treatment need on the quality of life among secondary schoolchildren. **Methods:** This was a cross-sectional study, conducted on 257 subjects aged 13 years old. Subjects were examined clinically to assess their orthodontic treatment need using Aesthetic component (AC) of the Index of Orthodontic Treatment Need (IOTN). Face-to-face interview was performed using a Child Oral Impacts on Daily Performances (Child-OIDP) to assess the prevalence, intensity and extent of oral impacts. A Chi-square test, a Mann-Whitney test and Kruskal – Wallis test were used in the analysis. **Results:** Among 257 schoolchildren, 44.7% were boys and 55.3% were girls. The mean age was 13.06 ( $\pm 0.24$ ). 58.7% had very little need/no need for orthodontic treatment and 16.0% had a very great need for orthodontic treatment. 73.1% of schoolchildren reported having any oral impacts during the last 3 months. 61.5% reported having impacts of a very little intensity. 32.7 reported having impacts only during daily performance activity. 23.7% reported having impact on the ability to smile without embarrassing component. Seventy-one (27.6%) schoolchildren perceived they had malocclusion. When assessing the oral impacts among these children, 46.5% reported that smiling was the most common performance affected. Comparison on the effect of malocclusion on daily performances between the groups using AC of the IOTN showed that there were not significant differences on the mean overall score of the total Child-OIDP. **Conclusion:** With reduced number of orthodontists, the assessment of orthodontic treatment should incorporate the assessment of the impact of malocclusion on the quality of life and both DHC and AC of the IOTN.

POSTER NO: 118

**Bolton Tooth Size Discrepancies among Orthodontic Patients**

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**Aims:** To determine the prevalence of tooth size discrepancy (TSD) greater than 2 standard deviation (SD) from Bolton's mean among orthodontic patients and to evaluate the post-treatment results of these cases. **Methods:** 226 fixed appliance cases with pre and post-treatment study models which met the inclusion and exclusion criteria were selected from all available completed cases from the orthodontic clinic. Each tooth from first molar to first molar was measured at its greatest mesiodistal diameter using a digital caliper. Bolton's analysis of overall ratio and anterior ratio were performed on each set of the pre-treatment models. Post-treatment occlusions were noted. **Results:** 26.54% of orthodontic patients have TSD greater than 2 SD of Bolton's mean for anterior ratio ( $77.2 \pm 3.30$ ). For the overall ratio, 7.08% of cases have TSD greater than 2 SD of Bolton's mean ( $91.3 \pm 3.82$ ). It was found that those cases that have greater than 2 SD of Bolton's mean, 18.46% were able to achieve good interdigitation with or without any addition or removal of tooth structure. 81.54% of cases that fall outside of 2 SD of Bolton's mean have compromised treatment results. **Conclusion:** There is a low prevalence of TSD greater than 2 SD of Bolton's mean present among orthodontic patients. However it shows that majority of cases with TSD greater than 2 SD of Bolton's mean, do resulted in compromised post-treatment result.

POSTER NO: 119

**Salivary Bisphenol –A Level According to Resin Filled Tooth Surfaces: A Case-Control Study**

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**Introduction:** Bisphenol-A diglycidylether methacrylate (Bis-GMA), which is synthesized from bisphenol-A (BPA), a compound with exogenous endocrine disrupter action, is widely used as a dental material. BPA is believed to mimic the hormone estrogen and disrupt endocrine function. **Aim:** The purpose of this study was to evaluate the salivary BPA between those who have resin/sealant filled tooth surfaces and those who do not have. **Method:** The subjects of this study were 96 underprivileged children in Busan, Korea. They were surveyed from April 2009 to August 2009. This study was approved by the Institutional Review Board for Human Subjects at the Pusan National University Hospital at Yangsan Campus (approval number: 2009016). Oral health status was examined by a trained dentist. The number of surfaces with resin/sealant was counted. BPA was measured using the EcologenaR supersensitive BPA ELISA KIT. We used the independent t-test to determine the differences according to the existence of resin/sealant. **Results:** 48 were children with resin/sealant and 48 were not. There was a significant differences of BPA concentration according to resin/sealant (0.35 vs. 1.10,  $p=0.014$ ). **Conclusion:** Resin might be a substantial source of salivary BPA. Further study will be needed to find more evidence about the association between resin and BPA.

POSTER NO: 121

**Evaluation of Methods to Measure Salivary Flow Rate in Clinical Practice**

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**Objectives:** The objective of the study was to determine the most effective method of measuring salivary flow rate for clinical use by comparing the method of the traditional salivary flow measure method and the brief method by use of the moisture paper and Periotron as one of the check unit for the amounts of the Gingival Crevicular Fluid. **Methods:** Oral examination recruited 90 subjects which consisted of 30 teens, 30 in their 20'S and 30 in their 50'S were carried out. Salivary testing by both the flow rate measurement by collecting the saliva with test tube for 5 minutes and the other simple method such as setting of the moisture paper under or dorsum of the tongue for 10 seconds was carried out on the subjects. Periotron was used for application of the moisture paper in order to measure the moisture state of the individuals. The co-relation co-efficient was estimated between the results for each methods. **Results:** Measurement of stimulated and unstimulated salivary flow rate and salivary viscosity by Periotron and moisture paper strip was significantly influenced by age ( $p<0.05$ ). A positive correlation was found between stimulated salivary flow rate and Periotron measurement values ( $r=0.395$ ) and was statistically significant ( $p<0.01$ ). A positive correlation ( $r=0.395$ ) was also found between measurements of stimulated salivary flow rate and mouth dryness with moisture paper strip. This was also found to be statistically significant ( $p<0.01$ ). **Conclusion:** In conclusion, stimulated salivary flow rate and mouth dryness can be measured with moisture paper strips simply in clinical setting.

POSTER NO: 120

**Artificial Plaque Removal Effect at the Proximal Area by Use of the Dentifrice and Proximal Gel with Interdental Brush**

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**Aim:** In order to compact the removal effect of artificial plaque at the proximal area according to use of the artificial saliva, dentifrice and the proximal Gel with the use of interdental brush, on experiment with the dental model was performed. **Method:** 6 Anterior teeth & 6 posterior teeth extracted were selected and produced the 3 model for 2 types. Artificial plaque was removed with discolored agent at proximal surface by use of automatic tooth -brushing machine which was made for a back and forth movement per second with 1cm distance. Proximal Gel,(Exp, Gr.2) dentifrice (Exp, Gr.1) and artificial saliva (Control Gr) were used as intermediate materials. The remnant plaque amounts were measured with the use of the translucent plotting paper, by counting the numbers of the cells included. **Result:** The removal effect of the artificial plaque was the most in experimental 2 group as use of the Gel form type of dentifrice, the next in experimental 1 group as use of the normal dentifrice, and the least in control group as use of the artificial saliva. **Conclusion:** The use of the proximal Gel was recommended in order to achieve the effective elimination of the proximal dental plaque, with the use of interdental brush

POSTER NO: 122

**The Evaluation of Level and Motility of Salivary Micro-organisms Using Phase-Contrast Microscopy**

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**Objectives:** To determine the level and motility of oral micro-organisms in saliva for different age groups using phase-contrast microscopy. **Method:** Saliva samples were collected from lingual of lower anterior teeth of subjects. The level and motility of each oral micro-organism species were determined in each subject. **Results:** A total of 177 subjects were recruited in the study. In general, the level of micro-organisms in saliva was found to be less than in dental plaque inter proximally. The cocci and bacilli species were found to be decreasing in level from infancy to childhood, increasing rapidly at adolescence and later decreasing gradually in adulthood and geriatric. However, the finding was not statically significant. The level and motility of the filamentous or spiral types of oral micro-organism were found to be very little in all ages. **Conclusions:** Using the oral micro-organisms in saliva as a mean to estimate an individual's oral health status is deemed difficult because there are no distinct differences on the level and motility of these micro-organisms between different age groups.

POSTER NO: 123

**Investigation of Co-Relations between Factors in Saliva**

Shin W.Y., Chang Y.S

**Objectives:** To investigate and analyses the relationship between various factors related to saliva such as salivary flow, viscosity, pH, concentration of glucose, dryness of mouth and oral micro-organisms. **Methods:** Subjects were divided into six groups of twenty according to their age. The groups were preschool, primary school, adolescent, young adult, adult and geriatric. Oral examination was carried out to measure for these parameters: DMFT and CPITN. Stimulated salivary flow was measured for five minutes. The pH of the saliva was tested using Ostwald pipette. Concentration of glucose and dryness of the mouth were measured using glucose tester and moisturized paper strips respectively. Phase-contrast microscopy was used for oral micro-organism examination. Co-efficient -correlation was calculated between each factor. **Results:** 120 subjects were recruited in the study. Some factors have much related with others and the significant factors were shown. **Conclusion:** The results for the relationships between each factors with the different weight, would be utilized as a basic data to estimate the caries prediction, at each group.

POSTER NO: 125

**Orthodontic Considerations in the Pediatric Cancer Patients**

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Approximately one third of all the malignancies that affect children are leukemias. Leukemia is a malignant disease of bone marrow and the blood characterized by uncontrolled growth of blood cells. Acute lymphoblastic leukemia (ALL) is the most common form of leukemia affecting young children. Advances in treatment regimens including multi agent chemotherapy and radiation therapy have greatly increased the chances for survival. The sequelae of treatment may be immediate or may occur several months after treatment. These effects can be caused by the malignancy itself or, by the treatment including chemotherapy, radiotherapy and supportive care such as transfusions, antibiotics and immunosuppressive treatment. The degree to which an individual is affected is related to the age at which the disease is diagnosed and treated and the type and intensity of the treatment. Some of the craniofacial features seen in these individuals are reduced vertical dimensions of the face, alveolar processes and mandibular retrognathism. The most common dental disturbances are arrested root development with V shaped roots, premature apical closure, microdontia, enamel disturbances and increase caries risk. Due to increase in survival times of children diagnosed with ALL it is likely that a percentage of these long term survivors may develop a dento -skeletal problem for which orthodontic treatment may be required. Enamel disturbances, increase in caries risk and abnormal root morphology may compromise the orthodontic treatment results. The treatment should be modified to reflect the patient's medical condition and planned with the patient's best interests in mind. This case report describes successful treatment of skeletal class II malocclusion in a preadolescent patient with a medical history of ALL. The risk of external root resorption on teeth with abnormal root morphology as a result of fixed appliance therapy should be weighed against the relative benefits that are expected from treatment.

POSTER NO: 124

**Cytokine Profile in Human Saliva and Its Relationship with That in Blood.**Fukui M.<sup>1</sup>, Mani M.<sup>2</sup>, Uno K.<sup>3</sup>, Kataoka K.<sup>1</sup>, Ito H-O.<sup>1</sup>

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**Introduction:** Recently, it has been reported that various bioactive substances such as cytokines are present in saliva, as well as digestive enzymes or secretory IgA. The use of saliva as an examination sample is expected because its collection is noninvasive and easier compared with blood. **Aim:** The aim of this study was to clarify the relationship between cytokines in saliva and in blood for the application of saliva sample use in health examinations. **Materials & Methods:** Saliva and blood samples were obtained from 17 Japanese adults without diagnosed diseases. Concentrations of 14 cytokines (IL-1-beta, IL-8, IL-10, IL-12(p70), IFN-gamma, IP-10, TNF-alpha, VEGF, IL-1-alpha, IL-18, HGF, MIF, M-CSF, and VCAM-1) in saliva and blood were measured using the Bio-Plex suspension array system (Bio-Rad, Hercules, CA, USA). The relationships between levels of cytokines in saliva and blood were analyzed employing Spearman's rank correlation test using SPSS 15.0J. **Results:** Among the 14 cytokines measured, all cytokines in saliva and 13 in blood, except VCAM-1, beyond the upper limit of the measurement range were measured. Although a significant ( $p < 0.05$ ) positive correlation between the levels in saliva and blood for IP-10 and a negative correlation for VEGF were indicated, there were no significant relationships regarding other cytokines. **Conclusion:** It was shown that many cytokines were present in saliva, and the levels of many cytokines in saliva were higher than in blood. In addition, 11 of the 13 quantifiable cytokines in this study showed no correlation between the levels in saliva and blood. The results suggest that cytokines in saliva may be controlled by a mechanism differing from that in blood

POSTER NO: 126

**A Case of Xerostomia with Dental Implant Treatment**Yoshii A.<sup>1</sup>, Watanabe E.<sup>1</sup>, Watanabe T.<sup>1</sup>, Yamauchi E.<sup>1</sup>, Honda S.<sup>2</sup>

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**Aim:** The aim is to discuss the influence of xerostomia caused by Sjogren's syndrome (SS) on implant treatment and oral hygiene maintenance. **Method:** This is a case report of a 45-years-old female, (156cm tall, 57kg) and a nonsmoker who visited the clinic for the first time on 1st August 1983. Oral examination showed an edentulous maxilla, 8 remaining teeth in the mandible. Main complaint was dissatisfaction with wearing upper jaw dentures. Implant surgeries were performed seven times between 19 February 1984 to 19 April 2009. As of 2010, 20 implants had been placed. During the implant treatment, all of the remaining teeth had to be extracted because of cavities. In 2009, SS was diagnosed. The patient had been receiving a regular maintenance care program and oral wetting care program. The wetting care program consisted of salivary glands massage, health education on rehydration, eating habits, and how to use the wetting gel oral spray. From May 2010, pilocarpine tablets have been administered to improve oral dryness. Progress is being observed, and follow-up is continuing. **Results:** The survival rate of the loaded 20 implants was 100%. Finally, the patient became completely edentulous. The oral hygiene of the patient has remained in good condition. **Discussion and Conclusion:** For this case, xerostomia caused by SS did not appear to influence the retention of implants. Oral dryness is a problem in the prevention of caries. It was therefore necessary to make sure that dental hygienist perform the maintenance associated with oral dryness and SS. Scheduled follow-up were recommended.

POSTER NO: 127

**Oral Status of Patients with Dementia in a Memory Clinic, Chiang Mai Neurological Hospital**Chonwarin J.U.<sup>1</sup>, Patcharawan S.<sup>2</sup><sup>1</sup>Dental department of Chiang Mai Neurological Hospital <sup>2</sup> Faculty of Dentistry, Chiang Mai University, Thailand

**Introduction:** Dementia is an important health problem among the elderly. Dementia might affect the daily health activities including oral health care. **Aim:** This descriptive study aimed to investigate the oral health status of patients with Dementia in a Memory Clinic, Chiang Mai Neurological Hospital. **Method:** The study involved all patients aged 60 or over with dementia who attended a Memory Clinic from February 2009 to July 2009. Mini Mental State Examination was used to classify dementia level. Clinical examination was conducted by one trained dentist. The clinical assessment included DMFT scoring, CPI scoring, assessment of dentures and oral lesion. Data were analyzed using descriptive statistics. **Results:** 40 patients were participated in this study. 57.5% of dementia patients were female, 42.5% male, aged range was 61-88 years, mean age of 75.1±7.1 years. Most of them were classified having Alzheimer (45%), had 1-2 years experience of dementia (47.5%), were medically compromised (75%), had moderate dementia (75.5%), were living independently with some assistant for daily living activities (72.5%), had an ability to perform oral self-care (50%). The clinical findings showed 35% had tooth decay, 82.5% had some natural teeth and 27.5% had retained root. The mean remaining teeth was 16.6±10.3, a mean DMFT was 17.4±10.0. 93.3% had periodontal problems. One-thirds (36.7%) had calculus, 30.0% had 4-5 mm pocket depth. Calculus level was most common in a group with mild to moderate dementia. Most patients (over 90%) experienced tooth loss. 42.1% wore dentures. 68.7% of denture wearers were removable type. The majority (87.5%) could clean their own dentures. **Conclusion:** The results from this study led to the need to promote oral health care programme to the dental and nursing staffs in the hospital. This oral health care programme will enable these elderly patients with dementia to maintain the good oral health.

POSTER NO: 129

**Management of Infection and Hygiene Control in Dental Care in Some Dental Clinics**

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**Aim:** This study aimed to assess problems and formulate future improvement plans of infection prevention in Korea's dental clinics and to provide the conclusion as a basic data for a more focused management. **Method:** 50 dental clinics were randomly selected from Seoul, Gyeonggi-do, Chungcheongnam-do, Chungcheongbuk-do, Gyeongsangnam-do, Gyeongsangbuk-do, Jeollanam-do, Jeollabuk-do, and Gangwon-do regions. These clinics were visited and examined, and then the frequency and percentage on bacteria measurements and general characteristics of the examinees were calculated with the collected data. Significance tests and correlation analysis were done on the difference in clinic environment hygiene effort degree and the infection prevention action effort degree according to the clinic characteristics. **Results:** Both of the hygiene effort degree on the hands of dentists and assistant's was found to be degree 2, and the practice effort degree was found to be degree 2. The hygiene effort degree on dentists' gloves was found to be degree 1 and the practice effort degree was found to be degree 2, showing proper change of gloves between each patient, otherwise in assistant's glove was found to be degree 3, and it was shown that the assistants wore gloves generally only in important surgeries. A high level of negative correlation was shown between the washing and exchange of dentists' gloves and gowns, and the hand washing of assistants. **Conclusion:** It is necessary to provide guidance on education and training courses, such as the development of more active infection control programs and the introduction of systems that mandates such programs.

POSTER NO: 128

**Apple Polyphenol Prevent Development of *Porphyromonas Gingivalis*-Associated Arteriosclerosis.**

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**Introduction:** Vascular smooth muscle cell proliferation is thought to be involved in the development of arteriosclerosis. We previously showed that cultured supernatant of plasma incubated with *P. gingivalis* induced a marked proliferation of human aortic smooth muscle cells (AOSMCs), resulting in enhancement of cell growth. **Aim:** In this study, we examined whether apple polyphenol inhibits the proliferation of AOSMCs by *P. gingivalis*. **Methods:** *P. gingivalis* ATCC33277 and its gingipain deficient mutants were used. Plasma was mixed with bacterial suspensions ( $1 \times 10^7$  cells), and incubated at 37°C for 24 hours. Cell proliferation was analyzed with a MTT assay in the presence or absence of apple polyphenol or EGCg (20-0.0016  $\mu$ g/ml). **Results:** Addition of the supernatant of plasma incubated with *P. gingivalis* wild type induced the growth of AOSMCs for 72 hours. While, the gingipain mutants did not. KYT1 and KYT36, gingipain inhibitors, prevented the proliferation of AOSMCs in a dose dependent manner. Apple polyphenol also revealed the dose-dependent growth-prevention, whereas, EGCg was not significantly effective. **Conclusion:** These results suggest that apple polyphenol may be useful to prevent atherosclerosis associated with *P.ginigvalis*.

POSTER NO: 130

**Various Factors Influencing the Individual Oral Health Index**

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**Introduction:** In order to develop a model for a preventive-oriented dental care system, caries prediction through an individual oral health index should be developed. **Methods:** Some important factors influencing caries causes were selected from among many factors with different influences, by calculating the statistical analysis in stepwise technique, in each age group. **Results:** Equations to estimate the oral health index in caries state were introduced at each individual age group as follows: 4 factors in preschoolers, 4 factors in children. in children, 3 factors in adolescents in adolescents, 3 factors (salivary flow, Bacilli motile, frequency of sweetener) in young adults, 4 factors in male adults and 4 factors in the elderly were introduced as important influencing factors in each age group. The relative factors of caries prediction model were derived as: Preschoolers = Number of teeth with deep pits + Bacilli amount + S-PHP + Number of teeth with deep pits S-PHP. Children = Number of teeth with deep pits - pH + Snyder test + pH Snyder test. Adolescents = Number of teeth with deep pits + Number of brush-Tooth brushing time. Young adults = Salivary flow + Bacilli motile + Frequency of sweetener. Male adults = PD + cocci motile + Snyder test -S-PHP. Elderly = RPD + Salivary viscosity-cocci amount + Salivary viscosity cocci amount. **Conclusions:** From the results of the equations and the influencing factors, it is possible to estimate the oral health state and caries prediction for individual dental patients.

POSTER NO: 131

**Evaluation of Cross Infection Control Program Using Adenosine Tri Phosphate (ATP) Test in Dental Environment**

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**Aim:** The study was to determine the cross infection control in dental environment using the ATP test. **Method:** ATP test was used to measure level of cross infection control on stationary items in the dental environment. The unit of measurement for the ATP test is relative light unit (RLU). The items tested were pencil or pen, telephone; cash card reader, computer key board, desk and dental hygienists clinical gown. Dental hygienists awareness of cross infection control measures was investigated using a questionnaire. The correlation between the RLU level and dental hygienists level cross infection control awareness was determined. **Results:** 20 dental clinics participated in the study. High degree of RLU was found on clinical gown of dental hygienists. The level was statistically significant ( $p < 0.05$ ) compared to other stationary instruments. **Conclusion:** It is recommended that all stationary instruments and dental hygienists clinical gown should be cleaned more often, in order to achieve good cross infection control at dental clinics.

POSTER NO: 133

**Shock-Proof Study on Anterior Tooth Arrangement and the Use of Mouth-Guard**Woo S.H.<sup>1</sup>, Shin S.C.<sup>2</sup><sup>1</sup>Dept of Oral Health, Graduate School, <sup>2</sup>Dept of Preventive Dentistry, College of Dentistry, Dankook University, Korea

**Objectives:** The objectives of the study were to evaluate the compressive strength of the upper anterior teeth model of various tooth arrangement or malocclusion, with or without wearing a mouth-guard. **Methods:** 120 dental models from plaster were produced and divided into several groups according to tooth arrangement. The groups were normal occlusion, anterior spacing, anterior crowding, class II division 1 and class II division 2 of malocclusion. Multi-test 1-i was used to measure the compressive strength and data was analyses and comparisons made between the groups. **Results:** The compressive strength of dental models of anterior spacing, anterior crowding and class II division 1 was lower compared to the normal tooth arrangement group. The class II division 2 dental models were found to have a higher compressive strength than the normal tooth arrangement group. The compressive strength in the groups with mouth-guard was also found to be higher than those without, for all types of malocclusion. For the models with mouth-guard, the teeth in normal arrangement and those with anterior spacing had the highest and lowest compressive strength, respectively ( $p < 0.05$ ). **Conclusion:** It is recommended to wear mouth-guard during vigorous exercise and sports in order to prevent injuries to the teeth

POSTER NO: 132

**A Survey on Oro-facial Trauma Involvement in Motorcycling Accidents**

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**Objectives:** To determine the parameters involved in oral-facial injuries in motorcycle accidents. **Methods:** Motorcyclists aged 20 to 50 who were involved in accidents were invited to participate in the study. They were required to answer a questionnaire survey on various factors concerning their injuries. These were history of previous motorcycling accident, degree of present injury, site of injury, wearing of protective gear and mouth-guard or mouth-piece. **Results:** The highest injury site was found to be the leg (25%) followed by the arm (25.6%). The facial region and teeth were affected 7.4% and 5.4% of the times, respectively. 51.1% of the subjects reported of post-trauma symptoms to the oral regions after treatment. **Conclusions:** It is recommended that motorcyclists wear helmet and other protective gear including mouth-guard. The wearing of mouth-guard is more effective than mouth-piece in preventing injuries to the teeth as well as other oral and facial tissues.

POSTER NO: 134

**Taste Hyposensitivity in Japanese Schoolchildren**

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**Introduction:** Most studies about taste disorder/hyposensitivity target old generations or patients. There were few studies conducted among the younger generation. This study aims to investigate the prevalence of taste hyposensitivity and the relationships of oral health status with taste hyposensitivity in Japanese schoolchildren. **Methods:** Taste tests and oral examinations were conducted on 241 primary schoolchildren (1-6 grade) and 111 junior high school students (7-9 grade). Four kinds of taste tests (sweet, salt, sour and bitter) were performed using a whole mouth method. A subject who could not recognize a certain concentration of taste solution was defined as having hyposensitivity. **Results:** The prevalences of sweet taste hyposensitivity were 13.2% (1-2 grade), 6.1% (3-4 grade), 3.7% (5-6 grade) and 3.6% (7-9 grade). The prevalences of sour taste hyposensitivity were 36.5%, 24.4%, 13.4% and 13.4%, and bitter taste hyposensitivity were 21.1%, 3.7%, 2.4%, and 0%, respectively. The prevalences of sweet, sour and bitter tastes hyposensitivity decreased as the schoolchildren's grade advanced. On the other hand, the prevalences of salt taste hyposensitivity were 21.6%, 7.3%, 6.5% and 18.8%, respectively. The prevalences of salt taste hyposensitivity increased in 7-9 graders. There were significant differences in the prevalences of salt, sour and bitter tastes hyposensitivity by gender in the 1-2 graders ( $p < 0.05$ ). Tongue coating was significantly related with low concentration of sour taste at 7-9 grade ( $p < 0.05$ ). **Conclusion:** This study investigated the prevalence of taste hyposensitivity in Japanese schoolchildren. There was a significant relationship of tongue coating with taste sensation in 7-9 graders. Whole mouth taste test can be carried out simply, do not need special equipment and it takes a short time. It was suggested that health education programs which included taste testing could be an effective motivation tool for schoolchildren.

POSTER NO: 135

**Factors Affecting Subjective Sense of Well-Being of Student Dental Hygienists.**

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**Aim:** The objective of this study was to identify and analyze factors affecting the subjective sense of well-being of student dental hygienists. **Methods:** A questionnaire survey was conducted involving 145 students in Iwate Medical University Dental Hygienist School, Morioka, Iwate, Japan between 2004 and 2006. It consisted of information regarding student's social background (whether they live with their parents, receive student loan, have any part-time jobs etc.) and those regarding exercise, lifestyle behaviors (e.g., tooth brushing) and satisfaction with school life. Subjective sense of well-being was assessed using the General Well-Being Schedule. **Results:** The results of the present survey suggest that dental hygiene students have a lower subjective sense of well-being in the second year of the dental professional education program than in the first and third years. High subjective sense of well-being was reported by first-year students who were brushing their teeth 3 times a day or more, second-year students who were participating in club activities and third-year students who were living alone, non-smokers and were receiving student loan. **Conclusion:** Satisfaction with school life was positively correlated with students' subjective sense of well-being. It is suggested that identification of factors affecting students' satisfaction with school life especially in relation to curriculum, is necessary to improve student's subjective sense of well-being.

POSTER NO: 137

**Risk Factors of Traumatized Anterior Teeth among 12 Year-Old Schoolchildren**

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**Introduction:** Oral facial trauma is among the prominent oral health problems among children in developing country. Trauma to anterior teeth with the underlying esthetics, psychosocial, functional and therapeutic problems adversely affect an individual's quality of life. This study aims to identify the risk factors for traumatized anterior teeth among 12 year-old schoolchildren in Marang, Terengganu. **Method:** A number of 15 subjects with traumatized anterior teeth were identified during screening sessions to all 12 year-old schoolchildren in Marang. Screening was conducted by Marang District Mobile Dental Team from January to December 2008. Further investigations on the selected subjects were carried out through clinical examination and questionnaire interview by trained dental officers. Trauma was scored according to the Ellie's Trauma Classification modified by Holland (1998). **Results:** The results revealed that majority of the subjects (66.7%) had class II division I incisal relationship. The low socioeconomic status group contributed 60% from all subjects with trauma anterior teeth. 80% of the parents of the subjects' educational level were in level II (secondary school). Traumatized anterior teeth were more common in boys (53.3%) as compared to girls (46.7%). **Conclusion:** There is a need to enhance the oral health education on the factors contributing to traumatized anterior teeth as well as the importance of trauma prevention to schoolchildren.

POSTER NO: 136

**Oral Health Related Behaviours of Laos's Children**Jin B.H.<sup>1</sup>, Khounsiri V.<sup>2</sup>, Sensombath S.<sup>3</sup>, Songpaisan Y.<sup>4</sup>, Phommavongsa K.<sup>3</sup>, Phantumvanit P.<sup>4</sup>, Petersen P.E.<sup>5</sup>, Paik D.I.<sup>1</sup><sup>1</sup>Dept. of Preventive & Social Dentistry, Seoul National University, Seoul, Korea, <sup>2</sup>Dept. of Dentistry, University of Health Sciences, Vientiane Capital City, Lao P.D.R., <sup>3</sup>Mahosoth Hospital, Dental Clinic, Vientiane Capital City, Lao P.D.R., <sup>4</sup>Thammasat University, Bangkok, Thailand, <sup>5</sup>Dept. for community Dentistry, Univ. of Copenhagen, Denmark and World Health organization, Geneva Switzerland

**Introduction:** Oral health related behaviors are important to maintain oral health of children. Lack of systematic health education may lead to much suffering and pain from dental disease. In order to achieve the goal of oral health for all, we have to plan a suitable program based on the current behavioural status. The aim of this study was to access the level of health behaviour status among 12-year school children in Laos. **Method:** A cross sectional study was conducted in 5 provinces in Lao P.D.R. The final study population was 481 children of age 12 selected by cluster sampling. Trained local dentists collected the data by personal interviews which focused on dental knowledge and oral health behavior. **Results:** About half of children thought that their teeth were healthy. However, 41% of the children experienced toothache or felt discomfort by teeth during the past 12 months. Almost 40% of the children never received dental care. Over two thirds of the children brushed their teeth once a day. Of all children 92% reported the use of fluoridated toothpaste. Meanwhile, half of the children did not recognize the toothpaste containing fluoride. The children reported that they were satisfied by the condition of their teeth, and their quality of life seems to be good. **Conclusion:** The Lao children seem to be satisfied by their oral health conditions, but their oral health related behavior should be improved. To further improve oral health knowledge and behavior of children, proper oral health educational programs should be implemented targeted at children.

POSTER NO: 138

**A Review on Facial Soft Tissue Injury in Kuala Terengganu Ahmad Y.**

Paediatric Dental Clinic, Hospital Sultanah Nur Zahirah, Kuala Terengganu, Malaysia

**Introduction:** Most studies in the literature noted that soft tissue injuries (STI) are the most common from all maxillofacial injuries seen by the primary care and emergency department. This shows that STI is an important issue in the trauma management in any healthcare setting. **Aim:** The objectives of this study were to (1) determine the age of patient frequently involved, (2) investigate the location, (3) assess the time and type of management and (4) evaluate the outcome of treatment of facial STI. **Method:** Data was collected from patient folders in the Paediatric Dental Clinic, Hospital Sultanah Nur Zahirah, Kuala Terengganu. The samples were 267 patients who sustained facial STI from the period of January 2006 until June 2008. These data were processed using SPSS 13.0. **Results:** Children from the age of 3 to 16 were frequently involved with facial STI (30% in age 7-12 group, 29% in age 13-16 group and 25% in age 3-6 group). The most common facial STI location was at the lower third of the face (59%) followed by multiple locations (29%). 92% of the patients had immediate treatment while others were more than 1 day. Most of the management carried out was toileting and suturing under local anesthesia (70%) followed by observation only (30%). 76% of the patients were given both analgesic and antibiotic for medication. On review, more than 90% patients had no pain, no infection and normal mouth opening. **Conclusion:** Children aged between 7-12 years were more prone to facial STI. Most injuries occurred in the lower third of the face. Immediate toileting and suturing, analgesics and antibiotic were given as the management. The overall outcome of facial STI management was good.

POSTER NO: 139

**Study of Patient Satisfaction on Issued Complete Denture in Government Dental Clinic**

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**Introduction:** Increasing demand of full denture is proportionate to the consistent increase of elderly population in Malaysia. Dissatisfaction causes disappointment in patients and dental practitioner. **Aim:** The purpose of this study is to measure patient satisfaction towards denture issued in Temerloh and Bera Government Dental Clinic by describing the sociodemographic factors and factors of denture quality influencing it. **Methods:** A cross-sectional study involving 100 patients who completed treatment of full denture. Questionnaire on sociodemographic factors and factors influencing patients toward their full denture were distributed during the survey. SPSS version 17 was used to analyze the data. **Results:** 85% respondents were satisfied with their full dentures. Factors affecting patient's satisfaction were gender, comfort, pain, esthetics, retention, mastication and speech ( $P < 0.001$ ). Post operative instruction also relates to patients' satisfaction ( $p < 0.034$ ). Factors that do not influence patients' satisfaction were age, level of education, monthly income, pre-operative instructions and dietary advice after issuing the complete denture. **Conclusion:** Good quality of complete denture, gender and post-operative instructions affects the level of patient satisfaction.

POSTER NO: 141

**Prevention of Dental Caries in Children in Ho Chi Minh City, Vietnam: A New Challenge.**

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Until 1990, both the prevalence and severity of dental caries in children in HoChiMinh city were the highest in Vietnam (Prevalence:  $> 80\%$ ; dmft =  $5 \pm 1.97$  in 3 years old children). At that time two oral public health programs were implemented in the city: the water fluoridation program and the school based oral health care program. The city drinking water was fluoridated in January 1990 at  $0.7 \pm 0.1$  ppm fluoride then adjusted to  $0.5 \pm 0.1$  ppm in June, 2000. However, only areas served by the HoChiMinh city water plant at Thu Duc benefitted from fluoridated water. In the mean time, the school based oral health care program covered all kindergartens and primary schools in the city. Oral health surveys were conducted in 1993 and 1995 (3 & 5 years after water fluoridation at 0.7 ppm F); and 2004 and 2006 (3 & 5 years after adjusting to 0.5 ppm F) according to WHO guidelines, in fluoridated and non-fluoridated areas of HoChiMinh city. The difference in caries experience between non-fluoridated and fluoridated areas was the indicator to assess the effectiveness of water fluoridation at different periods of time. The results of surveys over the years showed a significant increase in difference in dental caries experience between fluoridated and non-fluoridated areas among children (in 3 year-old children: dmft = 1,60,15 and  $3,4 \pm 0,25$ ; in 5 year-old children: dmft =  $3,42 \pm 4,25$  and  $6,52 \pm 5,20$ , respectively). However, along with the overall decrease in dental caries, its skewed distribution became more and more prominent. In both fluoridated and non-fluoridated areas, the mean SiC was high, respectively  $4,62 \pm 0,28$  and  $8,16 \pm 0,39$  among 3 year-old children (survey in 2004);  $8,39 \pm 3,72$  and  $12,70 \pm 2,91$  among 5 year-old children (survey in 2006). This review recognized that the public oral health programs in HoChiMinh city have significantly reduced dental caries experience in young children, water fluoridation being the major factor contributing to decrease caries in fluoridated areas of the city.

POSTER NO: 140

**Self-Inflicted Lip Biting: Preventive Management Options.**

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**Introduction:** Patients who have uncontrolled muscular activity may develop neuropathological chewing or clenching reflex that results in self-inflicted injury to the soft tissues of the oral cavity. An early and quick response to these problems may minimize the extent of the soft tissue trauma. There are varieties of management that can prevent these patients from biting their oral soft tissues. **Method:** In this presentation, 3 clinical cases and the different management will be discussed. The first case is about 2 year old boy presented with recurrent brief muscle spasm that resulted in recurrent laceration on lower lip. An upper soft polycarbonate cap splint was constructed for her to wear day and night for 1 month followed by usage as needed. The second case is regarding 2 year old girl presented with chronic tissue loss on the lower lip due to lip biting during frequent epilepsy attack. The case was discussed with the paediatrician, and the patient's medication was modified to reduce epilepsy attack. The third case is a 12 year old boy with Chronic Rheumatic Heart Disease and Bronchopneumonia. He had severe habits of tongue and lip biting. An upper and lower soft polycarbonate cap splints were constructed and patient wore them for 24 hours. **Results:** Review of these cases revealed satisfactory healing of the traumatized lips. **Conclusion:** The techniques used in these cases provide an effective alternative in managing self-inflicted lip and other oral soft tissues injuries.

POSTER NO: 142

**Oral Health Status and Habits of Orang Asli in Pahang and Johor, Malaysia**

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**Aim:** To investigate and evaluate the oral health status, habits and practices among Orang Asli in several parts of Pahang and Johor. **Methods:** This is a descriptive cross-sectional study involving adults aged 15 and over. Data was collected using questionnaire and clinical examination. Oral hygiene habits, knowledge and attitude towards dental care service utilization were assessed using the questionnaire. Three trained examiners were involved in the study. All examinations were carried out based on WHO guidelines using standard instruments and procedures. Periodontal condition and caries experience were assessed in the clinical examination. **Results:** Two hundred and ninety two Orang Asli participated in this study. The samples comprise of Kuala Tribe (17.1%), Semai Tribe (19.2%), Bateq Tribe (21.9%), Jakun Tribe (16.8%) and Semelai Tribe (23.6%). The health-promoting knowledge background among them is very poor since only 18.8% completed secondary education, 40.8% had primary education and 39.9% did not had formal education, however 79.8% claimed to practice tooth brushing with brush and tooth paste. A number of them didn't seek any dental treatment due to no experiencing of dental pain (37.2%), 15.2% due to transportation problem and 9.9% due to anxiety. Smoking and betel nut chewing are the common habits practiced by them. The mean DMFT for Kuala Tribe is 18.8 (SD=9.7), Semai Tribe is 6.2 (SD=6.6), Bateq Tribe is 9.2 (SD=7.8), Jakun Tribe is 6.7 (SD=6.9) and Semelai Tribe is 4.5 (SD=5.2). Among them only 33.6% had no caries experience. Almost all had periodontal problem with 31.2% had gingivitis and 68.5% had periodontitis. **Conclusions:** Prevalence of caries and periodontal diseases among the studied population of the Orang Asli were high. The contributing factors such as inaccessibility, inadequate health promotion knowledge, poor social backgrounds and some risk habits need to be addressed for improving the Orang Asli oral health status.

POSTER NO: 143

**Training of Trainers among Orang Asli Community: A Preliminary Report**Mahrusah J.<sup>1</sup>, Muz<sup>2</sup>ini M.<sup>1</sup>, Faridah A.<sup>1</sup>, Rahimah A.K.<sup>2</sup>  
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**Introduction:** The *Orang Asli*, the indigenous population of West Malaysia today still lived in their traditional and cultural ways including in health beliefs. Johore state has 63 *Orang Asli* (aboriginal people) villages with 11,701 residents as reported in 2008. Available studies had shown that despite many efforts, the health and oral health services made available by the Johor State Health Department and Department of *Orang Asli* Affairs remained to be under-utilised by them. This study reports on a first attempt to develop health advocates (*Halaq Kesihatan*) among *Orang Asli* youths as frontline health promoters to their people. **Method:** Johor Health Department in collaboration with Faculty of Dentistry, Universiti Kebangsaan Malaysia embarked on an action oriented project to empower volunteers from the *Orang Asli* community in health promotion and basic healthcare to people in their respective community. A special combined team of health and oral health professionals developed a teaching module. Two separate training sessions were held, first to the selected trainers and the latter then trained the *Orang Asli* youths for 5 days. The volunteers selected were those who have at least completed secondary school education. The methods involved in this project consisted of short talks, hands-on sessions, site visits, role play and discussions with facilitators from the health department. The volunteers were then sent to the villages to conduct health talks, carry out basic screening and record their findings. They were equipped with basic practical instruments for basic screening, log book and guide book. **Results:** A total of 54 volunteers were selected and trained on various modules of health care including oral health. Twenty villages were selected for the volunteers to practice what they had learnt. Early assessment showed that the success of the programme required the need for continual training and assessment of the volunteers at periodic intervals to improve on their screening and health talk skills. **Conclusion:** This project highlights the potential of increasing awareness on the importance of health and oral health to the *Orang Asli* through volunteers of the same ethnic group. This reduces communication barrier and will lead to better knowledge reception.

POSTER NO: 145

**Beat the Heat**Manuel S. Thomas  
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Dental pulp is a highly vascularized tissue whose vitality may be impaired during tooth preparation and clinical restorative procedures. The most common cause for iatrogenic pulp damage is the rise in pulp temperature during restorative therapy. Pulp hyperthermia during restorative therapy may be caused by rotating instrument tooth preparation, laser treatment, light curing of dental composites, polishing of restorative materials, light-enhanced bleaching, and direct fabrication of provisional restorations or ultrasonic instrumentation. This poster describes the various reasons for rise in pulp temperature during restorative procedures and the precautions that need to be taken to avoid the risk of pulp hyperthermia.

POSTER NO: 144

**Normative and Self-Perceived Orthodontic Treatment Need of 14 Year-Old Yemeni Adolescents**Rasheed A.<sup>1</sup>, Abdul-Kadir R.<sup>2</sup>, Awang H.<sup>1</sup>, Zam Zam N.M.<sup>1</sup>  
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**Introduction:** This study aimed at assessing the normative and subjects' self-perceived orthodontic treatment need using the Index of Orthodontic Treatment Need (IOTN) among Yemeni adolescents. **Methods:** The study sample consisted of 2400, 14-year-old, equally distributed by gender, and selected by multi-stage stratified random sampling technique stretching over nine governorates (urban and rural) and covering five zones of Yemen. Normative assessment was by clinical examination carried out under natural lighting, using disposable mouth mirrors and IOTN rulers. Aesthetic assessment was evaluated by subjects. **Results:** Normative orthodontic treatment need assessment showed 26.8% of the population indicated needing 'definite need' for treatment, 17.5% were in the borderline category and 55.7% had no treatment need. Self-perceived need for treatment however showed only 4.7% was in 'definite need', 8.6% in 'borderline need' and 86.6% in no need for treatment. The difference between the orthodontist and subject need assessment of treatment was found to be statistically significant at  $p < 0.05$ . **Conclusion:** This study found that clinically assessed normative 'definite' or 'borderline' need for orthodontic treatment was found to be 3.5 times more than that perceived by the subjects.

POSTER NO: 146

**Prevention of Pulpal Disease**Muharriri A.F.<sup>1</sup>, Ershad M.<sup>2</sup>, Sockalingam S.N.M.P.<sup>2</sup>  
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Aetiologies of pulp injury comprise caries, trauma, and iatrogenic dental procedures. Management of these three factors leads to primary aim of preservation of pulp vitality. Firstly, for pulp injury due to caries, the clinical approach emphasizes complete excision of carious dentin to eliminate the source of infection, and to prevent further disease progression. These are achieved by treatment of indirect pulp capping for cases without pulp exposure, and pulp amputation for cases with pulp exposure on immature teeth where root formation is not yet completed. Secondly, pulp injury due to trauma. Protection is gained by applying atraumatic direct restoration if the fracture does not involve the pulp, performing direct pulp capping if the fracture involves the pulp for less than 24 hours, and pulpotomy for complicated fracture within 72 hours for immature teeth. Thirdly, pulp injury due to iatrogenic procedures, can ideally be prevented by incorporating biological principles into routine restorative techniques. These include maintaining standard cutting procedures, avoiding desiccation of the dentin, selecting the restorative materials to be used by considering both their physical and biological properties, using liner or base to prevent marginal leakage, and lastly, inserting the restoration without giving excessive force. Furthermore, establishing a patient recall system that ensures periodical evaluation of the status of pulp is of critical importance. In conclusion, preservation of pulp vitality means to maintain an ideal internal environment within the pulp's cage which is not to be affected by any kinds of external stimuli. But once the pulp is communicated with oral cavity, then inflammatory process starts, and the treatment is to remove the infected tissues and leave the remaining healthy ones for recovery.

POSTER NO: 147

**Government Dentists' Experience and Barriers in Providing Domiciliary Oral Health Care (DOHC) for Elderly People**

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**Introduction:** The number of elderly people requiring domiciliary dental care is increasing as a result of a growing population of elderly who are functionally dependent and who retain an increasing number of natural dentition. At the same time little attention has been given to the way in which dentists think about elderly patients or to the difficulties associated with the provision of treatment outside the normal environment of a dental practice. **Aim:** To assess government dentists' experience and their perceived barriers in providing DOHC service for elderly patients. **Method:** A descriptive cross-sectional study was conducted using self-administered questionnaire targeting government dentists working in Peninsular Malaysia. **Results:** In total, 711 out of 962 government dentists responded with response rate 74.0%. Only 257 out of the 711 respondents (36.1%) reported having experience in providing domiciliary oral health care for the elderly in the past 2 years with a majority (75.9%) had mean total number of visit per year of 1. The types of care mostly performed were check-ups (96.9%), followed by oral health education (87.2%), simple extractions (73.9%) and new dentures (60.3%). Main perceived barriers to effective service were patients' complex medical history (74.1%) and poor attitude towards oral health services (67.5%), dentists' unfavorable working conditions (64.4%), high workload at work (54.3%) and lack of commitment and cooperation from care givers (51.8%). **Conclusion:** The majority of Malaysian government dentists had not been involved in such care which suggests that the barriers of doing so are substantial in Malaysia and there are also many competing issues that appear to deserve more attention. Overcoming significant barriers that impact on the provision of DOHC for elderly patients are required to improve the service.

POSTER NO: 148

**Assessment Oral H<sub>2</sub>S, CH<sub>3</sub>SH and (CH<sub>3</sub>)<sub>2</sub>S in a General Population**

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**Introduction:** It has been confirmed that volatile sulfide compounds (VSCs), in particular hydrogen sulfide (H<sub>2</sub>S), methyl mercaptan (CH<sub>3</sub>SH) and dimethyl sulfide [(CH<sub>3</sub>)<sub>2</sub>S] contribute to malodour prominently. However how each of the VSCs components relate with oral health is still not well understood. This study aims to identify the relationship between the three VSCs components and oral health condition. **Method:** 306 volunteers aged 18-40 participated in this study. Caries, Plaque index, calculus index, bleeding index, pocket depth, attachment loss, tongue coating were evaluated by three dentists who have been calibrated prior to the study properly. Oral malodour was measured with Oral Chroma™, (Ablit Co. Japan) and organoleptic score. Two-sample t-test and Bonferroni multiple comparisons were done to analyze the data. **Results:** The prevalence of halitosis is 48.9% in this population. The results revealed that female has higher (CH<sub>3</sub>)<sub>2</sub>S concentration than male, but no significant difference on H<sub>2</sub>S and CH<sub>3</sub>SH between them. Value of H<sub>2</sub>S, CH<sub>3</sub>SH, (CH<sub>3</sub>)<sub>2</sub>S increased in older and periodontitis subjects, but no statistical significance was found. Subjects whose tongue coating is thicker or covers more surfaces had higher H<sub>2</sub>S concentration. CH<sub>3</sub>SH and (CH<sub>3</sub>)<sub>2</sub>S concentration are not significant in subjects with different tongue coating conditions. **Conclusion:** Findings from this study find that the prevalence of halitosis was higher in these subjects. Education and treatment should be conducted in the population. Tongue coating maybe the main cause of halitosis in the subjects with higher H<sub>2</sub>S value only. Subjects with periodontal problems have more chance to arrive higher H<sub>2</sub>S, CH<sub>3</sub>SH and (CH<sub>3</sub>)<sub>2</sub>S value. Higher (CH<sub>3</sub>)<sub>2</sub>S values suggest that systemic condition sources should be considered first.

POSTER NO: 149

**pH OF DENTAL PLAQUE IN RELATION TO CARIES STATUS AND SUGAR EXPOSURE FREQUENCY.**

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**Objective:** To analyze the relationship between pH of dental plaque fluid in the primary teeth with caries status and sugar exposure frequency. **Methods:** Subjects were 93 of 3-5 years old children lived in Beijing area. According to their caries status, they were classified into two groups: severe early childhood caries group, dt<sub>≥</sub>5, n=47; caries free group, dmft=0, n=46. Plaque samples were collected from subjects respectively. Micro-electrode technique was used to test pH of dental plaque fluid. The information of daily sugar exposure frequency of children was obtained from a standardized questionnaire filled by their parents. The relationship between pH of dental plaque fluid and daily sugar exposure frequency was analyzed, the relationship between pH of dental plaque fluid and dt in the S-ECC group was also analyzed. **Results:** The mean value for pH was lower in the S-ECC group, the difference between mean values was found to be statistically significant (p<0.05). There was an inverse relationship between pH of dental plaque fluid and sugar exposure frequency in primary dentition. In the S-ECC group, there was an inverse relationship between pH of dental plaque fluid in the primary teeth and dt value. **Conclusion:** There was an inverse relationship between the pH of dental plaque fluid and sugar exposure frequency in primary dentition. Dental plaque fluid from the S-ECC group shows a stronger cariogenic potential than that from the CF group

POSTER NO:150

**Primary Study of the Relationship between Periodontitis and COPD**

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**Objective:** To primary explore the relationship between Chronic Obstructive Pulmonary Disease (COPD) and periodontitis. **Methods:** Totally 498 subjects were recruited in this study and were divided into three groups, which were mild periodontitis group (77, 15.5%), moderate periodontitis group (143, 28.7%), and severe periodontitis group (278, 55.8%). Clinical examination index included probing depth (PD), attachment loss (AL), sulcus bleeding index (SBI) plaque index (PLI) and the level of the alveolar resorption. Lung function of each subject was also examined. **Result:** The levels of AL, PLI and alveolar resorption in COPD group were higher than non-COPD group. Significant differences of "FEV1% pre"(F=3.59, P=0.028) and "FEV1/FVC"(F=4.84, P=0.008) were found among different degrees of periodontitis. Negative relationship was found between the level of "FEV1% pre" and the periodontal index (AL, PLI, alveolar resorption), and the same relationship was found for "FEV1/FVC". **Conclusion:** There is a relationship found between COPD and the periodontitis index (AL, PLI, alveolar resorption).