

Annual Research Publications

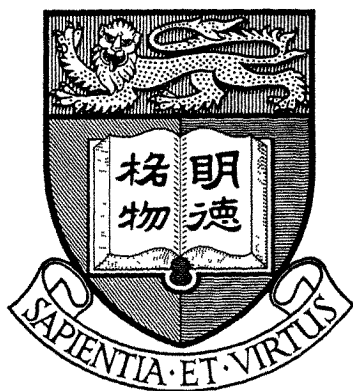
2003 - 2004



Faculty of Dentistry
The University of Hong Kong

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Dr. W. Keung Leung
Dept. of Periodontology
Faculty of Dentistry, HKU

Foreword

Living up to its vision to be Asia's leading faculty of dentistry, we have made significant contributions in conducting quality research in oral health sciences, in applying that research in providing total oral care at the Prince Philip Dental Hospital, and in advancing oral health for Hong Kong and the Region. Thus, for instance, over the past year, the Faculty of Dentistry has distinguished itself as the Faculty producing the highest number of research publications per staff in the University of Hong Kong (Data from the Management Information Unit, Vice-Chancellor's Office, February 2004).

Our Faculty is only 23 years old and its full strength, vigor and youth is yet to be realized. The research reform programme we are currently conducting should, and must, add greater impetus to our well-established research culture. The Faculty's varied research and taught postgraduate programmes, that are highly sought after, with a multicultural and multinational mix of students auger well for the ultimate fruition of research productivity and output.

Having completed yet another fertile year of research and discovery, it is harvest season for our hard-working colleagues to display their excellent products at our annual autumn fair. It gives me great pleasure indeed to recommend this collection of abstracts of research papers signifying the industry, the productivity and the quality of all research workers in the Faculty. I am most delighted and proud to write this Foreword in the hope that through this publication our efforts and achievements in dental research may reach the wider public and the academic community further afield. I also take this opportunity to congratulate all colleagues who have contributed to this volume, and therefore to the advancement of knowledge in dental science, and to offer them my heartfelt thanks for their synergistic efforts that combine to make the name of our Faculty excel.



Professor L.P. Samaranayake
Dean
Faculty of Dentistry

Preface

The year 2004 is a year marked by a number of changes in the Faculty of Dentistry. To begin, we have a new Dean, Professor Samaranayake, providing excellent leadership in implementing the recommendations of the Faculty review conducted in 2002-3. Change of research strategy is an onerous agenda that I have taken the responsibility to accomplish in response to the university's wish to further our research output.

I give below a glimpse of our activities in this context. In February 2004, we obtained grass roots information from our Faculty staff in a transparent and open process using a feedback questionnaire on faculty research and, at a subsequent Faculty retreat discussed the implementation of the research reforms. A document that emanated from these proceedings was then endorsed by the Faculty Board. This has empowered me and my assistant dean to realign the research groups based on research themes that are congruent with the priority research areas of the University. The three newly emergent research groups are: i) biomedical and tissue engineering, ii) infection and immunity, and iii) public health and healthy ageing. We trust these new groups based on novel, functional research themes will re-energize our staff to produce cutting-edge research in top bio-medical journals.

An equally important arm of the research reform is to provide a research conducive environment. To fulfill this aim we have now centralized the management of the four research laboratories under the leadership of the Associate Dean for Research and Discovery. In this regard we have held regular meetings with the research laboratory technicians to synergize internal communication systems and implement the various policy changes including provision of round the clock access to all laboratories.

This annual scientific research publication is a compendium of the dedicated work of our faculty colleagues and provides in a single tome the research outcomes published in numerous venues including those presented at conferences during 2003-2004. A novel addition this year is an account of major research equipment in our research laboratories. A more detailed version of this information will soon be available on the Faculty's webpage for ease of reference for staff / student members planning their research projects, and for the putative research postgraduates who may wish to enroll in our varied research programmes.

We wish that the full implementation of the research reforms will lead to further improvement of not only the quantity but also the quality of our publications so that we can maintain our leading edge as the finest, research-led faculty of dentistry in the Asian region.

Professor Lim K. Cheung
Associate Dean
(Research & Discovery)

Dr. W. Keung Leung
Assistant Dean
(Research & Discovery)

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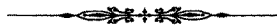
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Adair, P. M., Pine, C. M., Burnside, G., Nicoll, A. D., Gillett, A., Anwar, S., Broukal, Z., Chestnutt, I. G., Declerck, D., Ping, F. X., Ferro, R., Freeman, R., Grant-Mills, D., Gugushe, T., Hunsrisakhun, J., Irigoyen-Camacho, M., Lo, E. C. M., Moola, M. H., Naidoo, S., Nyandindi, U., Poulsen, V. J., Ramos-Gomez, F., Razanamihaja, N., Shahid, S., Skeie, M. S., Skur, O. P., Splieth, C., Soo, T. C., Whelton, H & Young, D. W. (2004) Familial and cultural perceptions and beliefs of oral hygiene and dietary practices among ethnically and socio-economically diverse groups. *Community Dental Health*, **21**, 102-111.

OBJECTIVE: The aim of this international study was to develop a valid and reliable psychometric measure to examine the extent to which parents' attitudes about engaging in twice-daily tooth brushing and controlling sugar snacking predict these respective behaviours in their children. A supplementary objective was to assess whether ethnic group, culture, level of deprivation or children's caries experience impact upon the relationships between oral health related behaviours, attitudes to these respective behaviours and to dental caries. **CLINICAL SETTING:** Nurseries, health centres and dental clinics in 17 countries. **PARTICIPANTS:** 2822 children aged 3 to 4 years and their parents. **MAIN OUTCOME MEASURES:** Dental examination of children and questionnaire to parents. **RESULTS:** Factor analysis identified 8 coherent attitudes towards toothbrushing, sugar snacking and childhood

caries. Attitudes were significantly different in families from deprived and non-deprived backgrounds and in families of children with and without caries. Parents perception of their ability to control their children's toothbrushing and sugar snacking habits were the most significant predictor of whether or not favourable habits were reported. Some differences were found by site and ethnic group. **CONCLUSIONS:** This study supports the hypothesis that parental attitudes significantly impact on the establishment of habits favourable to oral health. An appreciation of the impact of cultural and ethnic diversity is important in understanding how parental attitudes to oral health vary. Further research should examine in a prospective intervention whether enhancing parenting skills is an effective route to preventing childhood caries.



Airila-Mansson, S., Soder, B., Jin, L. J., Soder, P. O. & Klinge, B. (2004) Self-reporting of periodontal diseases and clinical assessment outcome in a Swedish urban population of smokers and non-smokers. *Acta Odontologica Scandinavica*, **62**, 111-115.

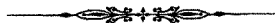
The aim of this study was to determine whether there is an association between self-reporting of periodontal diseases and outcome in a clinical examination, and whether any difference is present in awareness of periodontal status between smokers and non-smokers. Participants comprised 1676 adults (838 M and 838 F aged between 31 and 40 years), 564 of whom reported being smokers. Subjects were asked via questionnaire whether they thought they had periodontal disease and why. A total of 1655 subjects answered the questionnaire and were subsequently divided into those who suspected having periodontal disease (Yes-group) and those who did not (No-group). A full-mouth clinical examination was carried out in all subjects. Female smokers in the Yes-group had a significantly higher number of teeth with pockets ≥ 5 mm ($P < 0.001$) and a

higher calculus index (CI-S, $P < 0.01$) than female smokers in the No-group. Male smokers in the Yes-group had significantly less remaining teeth ($P < 0.01$), more teeth with pockets ≥ 5 mm ($P < 0.001$), and a higher CI-S ($P < 0.05$) than their counterparts in the No-group. For smokers, multivariate logistic regression analysis yielded an odds ratio (OR 3.21 [95% CI 1.73 5.74]) of self-reported periodontal disease to periodontitis outcome which was significant ($P < 0.001$). This association remained significant ($P < 0.01$) after adjustment for confounding factors. Subjects who reported having periodontal disease, especially those who also reported having movable teeth, were confirmed to have the disease. Smokers were more aware of their periodontal status than non-smokers.

Allen, P. F. & McMillan, A. S. (2003) A review of the functional and psychosocial outcomes of edentulousness treated with complete replacement dentures. *Journal of the Canadian Dental Association*, **69**, 662.

Loss of natural teeth has functional and psychosocial consequences that can, in many cases, be rectified with complete replacement dentures. However, the outcome of complete denture therapy is variable, and relies on patient factors, as well as the skill of

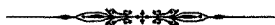
the clinician and laboratory technician making the dentures. This article reviews recent literature on the outcomes of edentulousness and complete denture therapy.



Anil, S. & Samaranyake, L. P. (2003) Brief exposure to antimycotics reduces the extracellular phospholipase activity of *Candida albicans* and *Candida tropicalis*. *Chemotherapy*, **49**, 243-247.

BACKGROUND: Although the phospholipase activity is considered a potential virulence determinant of the pathogenic *Candida* species, the effect of antimycotics on this attribute is not known. Hence we evaluated the phospholipase activity in 10 isolates each of *Candida albicans* and *Candida tropicalis*, after their exposure to antifungals. **METHODS:** The impact of antimycotics on phospholipase activity was also assessed after exposure of the isolates to sub-minimum inhibitory concentrations of nystatin, amphotericin B and fluconazole. **RESULTS:** All *Candida* isolates investigated exhibited phospholipase activity (Pz).

In general *C. Albicans* showed relatively higher P(z) activity than *C. tropicalis*, and exposure of the isolates to antimycotics led to a significant ($p < 0.05$) reduction in the phospholipase activity. Nystatin and amphotericin B, but not fluconazole, significantly reduced the phospholipase activity of both *Candida* species. **CONCLUSION:** These observations, while confirming the higher virulence of *C. albicans* relative to *C. tropicalis*, demonstrate for the first time the effect of antifungal agents on extracellular phospholipases of these common opportunistic pathogens.



Beighton, D., Brailsford, S., Samaranyake, L. P., Brown, J. P., Ping, F. X., Grant-Mills, D., Harris, R., Lo, E. C. M., Naidoo, S., Ramos-Gomez, F., Soo, T. C., Burnside, G. & Pine, C. M. (2004) A multi-country comparison of caries-associated microflora in demographically diverse children. *Community Dental Health*, **21**, 96-101.

OBJECTIVE: The aim of this formative international collaborative research on childhood dental caries was to undertake an initial investigation comparing the dental plaque of young children from diverse ethnic and socioeconomic backgrounds with and without dental caries. **BASIC RESEARCH DESIGN:** The following four null hypotheses were investigated. There were no differences in numbers of individual taxa when comparing plaque samples from: 1) caries-free children from deprived and non-deprived backgrounds; 2) children from deprived and non-deprived backgrounds with at least 3 decayed teeth; 3) children from non-deprived backgrounds who are

caries free with those from similar backgrounds with at least 3 decayed teeth; and, 4) children from deprived backgrounds who are caries free with those from similar backgrounds with at least 3 decayed teeth. **PARTICIPANTS:** 277 children aged 3-4 years from 5 countries. **MAIN OUTCOME MEASURES:** A sample of interproximal plaque from anterior teeth was collected using sterile dental floss, and cultured according to accepted international standards. **RESULTS:** Analysis of the data found that the first null hypothesis was accepted and that the fourth was rejected. Unexpectedly, the second null hypothesis was rejected as the children with caries

from deprived and non-deprived backgrounds had a different caries-associated flora. In particular, children living in deprivation harbored more caries-associated bacteria [mutans streptococci and lactobacilli]. This greater microbial challenge was associated with a higher level of cavitated carious

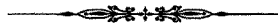
lesions and with more frequent consumption of confectionery. Conclusions Children from deprived backgrounds with caries may be further disadvantaged by having higher levels of caries-associated microflora.



Bian, J. Y., Wang, W. H., Wang, W. J., Rong, W. S. & Lo, E. C. M. (2003) Effect of fluoridated milk on caries in primary teeth: 21-month results. *Community Dentistry and Oral Epidemiology* **31**, 241-245.

OBJECTIVES: Use of fluoridated milk has been shown to be a safe and effective method to prevent caries in permanent teeth in children. However, studies on its effectiveness on caries prevention in the primary teeth are scarce. The purpose of the present study was to evaluate the effect of milk fluoridation on caries development in young Chinese children. **METHODS:** This was a community-based demonstration study carried out in Beijing, China. All children in three selected kindergartens were invited to participate. Each participant consumed 200 ml of fluoridated milk (concentration 2.5 mg F-per litre) per day from Monday to Friday in the kindergarten, and was given two packs of fluoridated milk (250 ml) for consumption at home on Saturday and Sunday every week. Children from a similar background, but without access to fluoridated milk,

attending two other kindergartens, were used as the control. **RESULTS:** There were 534 children (mean age 54 +/- 4 months) and 305 children (mean age 53 +/- 4 months) in the test and control groups, respectively, at baseline. After 21 months, 417 and 247 children in the test and control groups, respectively, remained in the study. There was no statistically significant difference in the baseline mean dmft scores between the two groups (3.2 vs. 3.5, $P = 0.312$). After 21 months, the mean net caries increment was 0.4 dmft for the test group and 1.3 dmft for the control group (t-test, $P < 0.001$). **CONCLUSION:** The consumption of fluoridated milk by the kindergarten children in Beijing was an effective measure in preventing caries in the primary teeth.



Botelho, M. G. (2004) Compressive strength of glass ionomer cements with dental antibacterial agents. *Journal of the South African Dental Association* **59**, 51-53.

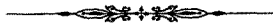
Glass ionomer cements have been suggested for obturating carious teeth that have been prepared with dental hand instruments. In such cases, carious dentine may be inadvertently or deliberately left in situ. The residual bacteria may, over time, lead to secondary caries and restoration failure. Benefit may be gained from combining antibacterial agents with the glass ionomer cement to control residual bacteria. The aim of this study was to investigate the effects on the compressive strength of glass ionomer cement combined with oral antibacterial agents. Cationic antibacterial agents; chlorhexidine hydrochloride, cetylpyridinium chloride and cetrimide were added to the powder and benzalkonium chloride, a liquid, to the liquid of Fuji IX glass ionomer cement. These

were prepared to concentrations of 1, 2 and 4 per cent by weight of the glass ionomer cement and compared to Fuji IX with no antibacterial agent. Test specimens were subjected to a compressive force to failure. Multiple analysis of variance showed highly significant reductions in compressive strength ($p < 0.01$) between the test materials and control group apart from one per cent benzalkonium chloride. Increasing concentration of the antibacterial agent had increasing adverse effects on the physical properties. The addition of the antibacterial agents tested to Fuji IX reduces the seven-day compressive strength which may affect the clinical performance of the material.

Bressmann, T., Sader, R., Whitehill, T. L. & Samman, N. (2004) Consonant intelligibility and tongue motility in patients with partial glossectomy. *Journal of Oral and Maxillofacial Surgery* **62**, 298-303.

PURPOSE: The primary determinants for good speech outcome after glossectomy are not well established. This study evaluated the effect of tongue motility, type of reconstruction, and affected muscles on speech intelligibility. **METHODS:** Fourteen German glossectomy patients participated in an intelligibility test, which targeted lingual consonants. Tongue motility was rated on nine 3-point scales. Surgical mapping documented type of reconstruction and affected muscles. **RESULTS:** Mean consonant intelligibility was 71.25% and mean tongue motility was 34%. There was a moderate correlation

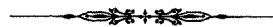
between tongue motility and consonant intelligibility ($r = 0.619$). Patients with platysma flap reconstructions ($n = 6$) had a tendency for more correctly identified consonants. Patients with an intact genioglossus ($n = 4$) had significantly better tongue motility scores. **CONCLUSIONS:** The findings support the hypothesis that good tongue motility is a precursor of good postglossectomy speech. Although flap reconstructions led to better consonant intelligibility in this study, this should be interpreted with caution due to the small sample size.



Ceballos-Salobrena, A., Gaitain-Cepeda, L., Ceballos-Garcia, L. & Samaranayake, L. P. (2004) The effect of antiretroviral therapy on the prevalence of HIV-associated oral candidiasis in a Spanish cohort. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics* **97**, 345-350.

OBJECTIVE: To investigate the temporal changes in the prevalence of oral candidiasis in a cohort of Spanish human immunodeficiency virus (HIV)-infected individuals, before and after the introduction of highly active antiretroviral therapy (HAART). **STUDYDESIGN:** Retrospective analysis of a clinical database from "Carlos Haya" Hospital, Malaga, Spain, from 1995 to 2000. The prevalence of oral candidiasis was assessed in 807 HIV/AIDS patients and the temporal progression of its major variants evaluated using a linear regression model. **RESULTS:** Overall oral candidiasis was prevalent in 30.0% to 48.3% of the cohort throughout and no significant

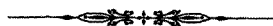
variation in its incidence was noted during the study period. Prevalence of erythematous candidiasis increased from 24.5% (1995) to 45.0% (2000) and pseudomembranous candidiasis decreased from 22.4% (1995) to 5.2% (2000) ($P < .05$). Hyperplastic candidiasis was not detected in the cohort after the introduction of HAART therapy. **CONCLUSIONS:** Although oral candidiasis in HIV-infected Spanish individuals has not decreased significantly after the introduction of HAART, there appears to be a significant reduction in hyperplastic and pseudomembranous variants of the disease with a compensatory increase in erythematous candidiasis.



Chan, K. M. & King, N. M. (2004) Treatment planning and behavioural management of a child with caries and hemifacial microsomia. *Dental Asia* 20-26.

Treatment planning for a paediatric dental patient in the dental setting remains a major challenge to the paediatric dentist. Many treatment alternatives need to be considered before deciding on the ones to utilize. It is important to address the specific dental, medical and psychological needs of each patient. This case

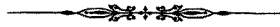
report presents the decisions made in the treatment planning for the management of dental caries in a young child with a congenital facial deformity and a compromised medical condition, with special emphasis on the behavioural management techniques.



Chau, A., Fung, K., Pak, K. & Yap, M. (2004) Is eye size related to orbit size in human subjects? *Ophthalmic and Physiological Optics* **24**, 35-40.

The purpose of this study is to determine if there is an association between eye size and the volume of the orbit in adult subjects. Thirty-three subjects with varying degrees of ametropia (+1.00 to -12.75 D)

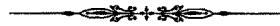
underwent magnetic resonance scan of the orbit. Results show that the larger myopic eye was not associated with a larger orbit.



Chau, A., Fung, K., Yip, L. & Yap, M. (2004) Orbital development in Hong Kong Chinese subjects. *Ophthalmic and Physiological Optics* **24**, 436-439.

The purpose of this study was to examine the development of the orbit in Hong Kong Chinese subjects. Orbit volume was determined from magnetic resonance images of 81 subjects aged from 1 to 42 years old. Results show that orbit volume ranged from 11.56 to 25.50 cm³. In the first year of life, the mean orbit volume was 12.36 cm³. The orbit showed

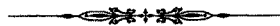
rapid growth in the first 3 years of life. From about 1-3 years old, the mean volume was 15.31 cm³. The orbit grew steadily to the age of 10 years. From age 11 to 15 years old, the mean volume was 20.24 cm³. Orbit growth levelled off at about 16 years of age with the mean volume at 21.00 cm³.



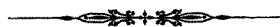
Chayanupatkul, A., Rabie, A. B. & Hagg, U. (2003) Temporomandibular response to early and late removal of bite-jumping devices. *European Journal of Orthodontics* **25**, 465-470.

This study was designed to monitor the amount of bone formed after 'early' and 'late' removal of bite-jumping devices and to compare it with that of normal growth. One hundred and thirty-five 35-day-old female Sprague-Dawley rats were randomly divided into seven control (n = 5) and 10 experimental (n = 10) groups. Appliances were fitted to position the mandible forward in the experimental groups. On day 30, the bite-jumping device was removed in two groups ('early' removal) and the rats were sacrificed on days 44 and 60. On day 44 the device was removed in one group ('late' removal) and the rats were sacrificed on day 60. The full-time wear and matched control animals were then sacrificed at different time points. Tissue sections (7 microm) were cut through the temporomandibular joint (TMJ) in the sagittal

plane and stained with periodic acid and Schiff's reagent for the evaluation of new bone formation. Newly formed bone was measured using a computer-assisted image analysing system. The results showed that, in the condyle, early removal of the appliance resulted in less bone formation when compared with that of natural growth. Late removal of the appliance resulted in bone formation similar to that of natural growth. In the glenoid fossa, the level of bone formation was similar to that of the control at early and late removal of the appliance. In conclusion, early appliance removal results in subnormal growth of the posterior condyle but not of the glenoid fossa. Increasing the length of mandibular advancement secures normal levels of mandibular growth in the post-treatment period.



Chen, Z. F. & Darvell, B. W. (2004) Calcium phosphate research - ripe for change. *Journal of Sun-Yat-Sen University (Medical Sciences)* **25**, 1-2. (Review Article)



Chen, Z. F., Darvell, B. W. & Leung, V. W. (2003) Determination of solubility isotherm of hydroxyapatite. *Chinese Journal of Oral Implantology* **8**, 160-163.

Objective: To determine solubility isotherm of hydroxyapatite (HA) at 37°C using small - increment solid titration and laser - scattering method. **Methods:** The solid used was HA. Diode laser was the light source and the laser scattering detector was used to monitor the precipitation occurring just after the equilibrium point. The tested solution was identified as supersaturated when a steady but increased laser scattering output was obtained. The end point of the amount of HA added was taken as representing a

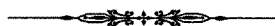
point on the solubility isotherm. **Results:** The solubility isotherm of HA at 37°C was constructed from six runs of the titration, including fifty end points. An apparent solubility of about one - hundredth of that normally obtained was determined. **Conclusion:** Small - increment solid titration and laser - scattering method is applicable for the study of equilibrium of HA and has been shown capable of determining the solubility isotherm more precisely.



Chen, Z. F., Darvell, B. W. & Leung, V. W. (2004) Hydroxyapatite solubility in simple inorganic solutions. *Archives of Oral Biology* **49**, 359-367.

OBJECTIVE: To use solid titration and laser-scattering end-point detection to determine the hydroxyapatite (HAP) solubility isotherm at 37 degrees C in a plain KCl solution, with CO(2) present, and with additional phosphate. **DESIGN:** Pulverised HAP solid was used to perform a titration to saturation. A very sensitive detector capable of detecting the light scattered at small forward angles from a laser beam was adopted to monitor the onset of precipitation (or failure to dissolve) near the equilibrium point. Each addition of HAP solid caused a step increase in scattered light and this signal decreased quasi-exponentially with time. When a steady but elevated scattering was obtained, small portions of 1M HCl were added to lower the pH by about 0.5-2 units, according to need, to dissolve excess solid and allow a further titration. The scatter signal and pH data, plotted against the amount of

HAP added, were used to estimate the actual end-point by interpolation and thus construct each point on the solubility isotherm. **RESULTS:** The solubility isotherm for HAP in plain KCl solution in the absence of CO(2) obtained now differs substantially from the results of previous solubility studies (i.e. much lower). The increase in solubility due to CO (2) reported earlier was confirmed, while the effect of excess phosphate was found to be to increase the apparent solubility of HAP, contrary to elementary mass-action expectations. **CONCLUSIONS:** The solid titration method is a more reliable approach than that of conventional excess solid method with respect to the determination of the HAP-carrying capacity. The solubility of HAP appears to be substantially lower than previously reported, and a reconsideration of all aspects of the system is warranted.



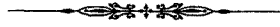
Cheong, C., King, N. M., Pashley, D. H., Ferrari, M., Toledano, M. & Tay, F. R. (2003) Incompatibility of self-etch adhesives with chemical/dual-cured composites: two-step vs one-step systems. *Operative Dentistry* **28**, 747-755.

This study tested the null hypothesis that there no difference between two-step and one-step self-etch adhesives in their compatibility with these composites. The microtensile bond strengths (microTBS) of two two-step systems (Clearfil SE Bond, Kuraray and Tyrian SPE/One-Step Plus, BISCO) were compared with two one-step systems

(Xeno III, Dentsply DeTrey and Brush&Bond, Parkell) for their coupling to a dual-cured composite. Silver tracer penetration of the four adhesives bonded to a light-cured or a chemical-cured composite was examined using TEM. Significant differences in microTBSs between composite curing modes were seen only in the one-step adhesives. For one-step

self-etch adhesives bonded to the chemical-cured composite, TEM revealed signs of frank composite uncoupling along the adhesive-composite interface, which may be attributed to the adverse chemical interaction between the acidic adhesive and the composite. In addition, "water trees" that represent

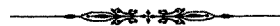
channels of increased permeability with the polymerized adhesive layer were also observed in the one-step adhesives. Both features were absent along the resin-dentin interfaces when chemical-cured composites were coupled to the two-step self-etch adhesives.d.



Cheung, L. K. & Leung, A. C. (2003) Dental implants in reconstructed jaws: implant longevity and peri-implant tissue outcomes. *Journal of Oral and Maxillofacial Surgery* **61**, 1263-1274.

PURPOSE: The study aimed to evaluate the clinical status and survival of dental implants inserted in reconstructed jaws, with particular reference to the peri-implant tissues. **MATERIALS AND METHODS:** We conducted a clinical follow-up study based on 29 rehabilitated patients after oral tumor surgery, who received autogenous bone grafts from the ilium and endosseous implants (14 maxillary and 15 mandibular cases; 140 implants) for functional jaw reconstruction between 1988 and 1999. Clinical records of the patients were reviewed retrospectively. Clinical parameters of plaque index, probing pocket depth, and bleeding on probing were assessed around the implants and control teeth at 4 locations (mesiobuccal, distobuccal, mesiolingual, and distolingual). Implant mobility was assessed clinically and objectively using a Periotest (Gulden; Siemens, Bensheim, Germany) equipment for those implants supporting removable prostheses. Radiographically, the proportion of implant length remained osseointegrated was measured. **RESULTS:** With a mean follow-up time of 50 months, 90.7% of the 140 implants placed were functional in supporting dental prostheses; 4.3% of implants failed in osseointegration and the remaining 5.0% implants were osseointegrated but nonfunctional. A total of 493 sites of 127 functional implants and 392 sites of

98 control teeth were assessed. No significant difference was found between the implants and control teeth parameters, except on the probing pocket depth. The mean peri-implant probing depth was 3.5 mm, and 52.7% of the measured sites were 3 mm or less. More than one third of the implants (35.9%) presented with increased probing depth ($>$ or $=$ 4 mm), and this was significantly higher than in the control teeth ($P < .001$, chi(2) test). Bleeding on probing was found in 19.3% of the measured peri-implant sites, corresponding to 42.2% of the dental implants. Of the implants, 28.9% were completely free from plaque and 9.4% show visible plaque accumulation. Mobility assessment was feasible on 32 implants and no mobility was detected. Radiographically, the mean implant length remained in bone was 81.1%, with 82.6% in the maxilla and 79.4% in the mandible. Implant survival rate calculated using the Kaplan-Meier method was 86.9% for 5 years. Based on the defined criteria, the success rate of implants placed in reconstructed jaws in this study was 90.7%. **CONCLUSION:** Endosseous implants can be successfully placed in reconstructed jaws for oral rehabilitation with maintenance of reasonable health status of the peri-implant tissues in the long-term.



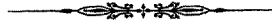
Cheung, L. K. & Zhang, Q. (2003) Radiologic characterization of new bone generated from distraction after maxillary bone transport. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics* **96**, 234-242.

OBJECTIVE: The purpose of this study was to characterize the radiologic features of the new bone generated from distraction following maxillary bone transport. **STUDY DESIGN:** Maxillary dentoalveolar

segments were transported by distraction to close posterior maxillectomy defects in 9 rhesus monkeys. The distracted dentoalveoli were harvested at 1, 2, 3, and 6 months after the completion of the

distraction. The specimens were evaluated by plain radiography and microcomputerized tomography scanning, which included 2- and 3-dimensional quantitative analyses of bone regeneration volume and microstructural indices. **RESULTS:** Plain radiographs showed that radiolucency in the distraction regenerate reduced with time. Microcomputerized scanning found that bone formation and trabecular thickness increased in the

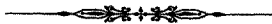
new bone with longer consolidation. The high orientation and connectivity of the trabeculae were reduced at longer consolidation intervals. Within the whole distraction gap, bone volume was found to be site-specific. **CONCLUSION:** Morphologic analysis in the high resolution offered by microcomputerized tomography shows that active bone mineralization and remodeling occur in the new bone within 3 months after distraction in maxillary dentoalveolus.



Cheung, L. K. & Zhang, Q. (2004) Healing of maxillary alveolus in transport distraction osteogenesis for partial maxillectomy. *Journal of Oral and Maxillofacial Surgery* **62**, 66-72.

PURPOSE: This study aims to evaluate histologic healing of the new bone and soft tissue in the distraction gap of maxillary alveolus after transport distraction at different consolidation intervals. **MATERIALS AND METHODS:** In a monkey model, dentoalveolar segment was distracted backward to a surgical defect in the posterior maxilla with an internal distractor at a rate of 1 mm/day for 2 weeks. The distracted dentoalveolar processes were harvested at 1, 2, and 3 months of consolidation after the completion of distraction. Histologic examination included the new bone, gingiva of the distraction gap, and teeth carrying the transport segments. Tartrate-resistant acid phosphatase was used to assess the presence of osteoclasts in the new bone. The collagen type and expression of bone morphogenetic proteins (BMPs) in the new bone were assessed by immunohistochemistry. **RESULTS:** The histology confirmed new bone bridging the distraction gap at 1 month of consolidation. Woven

bone was progressively replaced by mature lamellar bone at the second and third months. The gingiva covering the distraction gap was of normal appearance. There were no pathologic pulpal changes noted in the transport segment. Tartrate-resistant acid phosphatase-positive osteoclasts were minimal in the new bone. The mode of ossification was confirmed as intramembranous, and the fibrous stroma consisted mainly of collagen type I. At 1 month of consolidation, the BMPs were expressed profusely in the fibrous matrix and also inside the fibroblasts and osteoblasts. At 2 and 3 months of consolidation, the BMP expression intensity was reduced significantly in the fibrous stroma. **CONCLUSIONS:** The study confirmed that the bone regenerate in maxillary transport distraction was formed by intramembranous ossification and teeth in the transport segment remain viable after maxillary transport distraction osteogenesis.



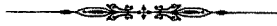
Cheung, L. K., Zhang, Q., Zhang, Z. G. & Wong, M. C. (2003) Reconstruction of maxillectomy defect by transport distraction osteogenesis. *The International Journal of Oral and Maxillofacial Surgery* **32**, 515-522.

The study aimed to explore the feasibility of posterior maxillectomy reconstruction by transport distraction in a primate model. In each of 14 adult rhesus monkeys, posterior partial maxillectomy was performed on one side of maxilla to create a posterior maxillary defect. Immediately after the maxillectomy, a dentoalveolar segment anterior to the defect was osteotomized as transport segment

and a custom-made transport distractor was fixed on the residual maxilla. After a latency period of 5 days, the distractor was activated 1 mm daily to move the transport segment backward to the defect. This process lasted about 2 weeks. The transport segment was allowed to consolidate and the animals were sacrificed at different defined intervals. Transport distraction was successful in six animals. Three other

cases were completed with minor wound dehiscence and one had a small oro-antral fistula with subsequent maxillary sinusitis. New bone bridging the distraction gap was confirmed by radiography and histology in

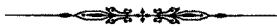
the animals completing distraction. Reconstruction of posterior maxillectomy defect is proven feasible by transport distraction osteogenesis.



Chu, F. C., Andersson, B., Deng, F. L. & Chow, T. W. (2003) Making porcelain veneers with the Procera AllCeram system: case studies. *Dental Update* **30**, 454-8, 460.

Different laboratory techniques are available for making porcelain veneers, and each has its own advantages and limitations. This article describes how high-density alumina core constructed with Computer Assisted Design/Computer Assisted

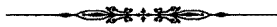
Manufacture (CAD/CAM) technology can be successfully used for making porcelain veneers. Different clinical conditions are also presented to illustrate the use of these bi-layer veneers.



Chu, F. C., Deng, F. L., Siu, A. S. & Chow, T. W. (2004) Implant-tissue supported, magnet-retained mandibular overdenture for an edentulous patient with Parkinson's disease: a clinical report. *The Journal of Prosthetic Dentistry* **91**, 219-222.

Degenerative neurologic disorders such as Parkinson's disease are becoming more prevalent as life expectancy is improved. Although the use of an implant-supported overdenture is an acceptable treatment modality, the clinician should recognize the indications and maintenance requirements of

different attachment systems for individual patients. The use of a magnetic attachment system in an implant-supported mandibular overdenture for an edentulous patient with Parkinson's disease is presented.



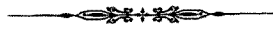
Chu, F. C., Sham, A. S., Luk, H. W., Andersson, B., Chai, J. & Chow, T. W. (2004) Threshold contrast ratio and masking ability of porcelain veneers with high-density alumina cores. *The International Journal of Prosthodontics* **17**, 24-28.

PURPOSE: The purposes of this study were to: (1) investigate the correlation between the color difference of bilayer porcelain veneers over white and black backgrounds (ΔE_1) and their opacity (contrast ratios); (2) determine whether there is a recommendable threshold contrast ratio above which the color difference is clinically acceptable (when $\Delta E < \text{or} = 5$); and (3) compare the ability of porcelain veneers to mask a color change from white to black backgrounds (ΔE_1) and their ability to mask a color change from white to clinically discolored teeth (ΔE_2). **MATERIALS AND METHODS:** Forty-four maxillary anterior teeth of eight patients with severe tetracycline discoloration were prepared for bilayer porcelain veneers in shade A2 porcelain.

The cores were 0.25 mm thick. The color (CIE $L^*a^*b^*$) and reflectance (Y) of the midbuccal region of each veneer were measured over white and black backgrounds using a colorimeter under artificial daylight. The veneers were bonded to discolored teeth, and their color was measured after 1 week. **RESULTS:** The mean color difference ΔE_1 was 10.6 (SD 2.6). The mean contrast ratio was 0.75 (SD 0.1). There was a close and statistically significant correlation between ΔE_1 and contrast ratio. The determined threshold contrast ratio was 0.91. The mean color difference ΔE_2 was 11.6 (SD 5.5). A paired t test showed no difference between ΔE_1 and ΔE_2 . **CONCLUSION:** There was a significant correlation between the masking ability of veneers

(deltaE1) and their opacity (contrast ratio). There was no significant difference in the ability of the porcelain veneers in masking a color change from

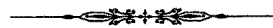
white to black backgrounds compared to their ability to mask the color change from white to the discolored teeth.



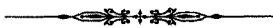
Chu, F. C., Wong, W. K., Wong, Y. K., Chow, B. K. & Cheng, J. C. (2003) Implant treatment of macroglossia and edentulous mandible following radiotherapy for nasopharyngeal cancer: a case report. *Quintessence International* **34**, 670-673.

Radiotherapy for the nasopharyngeal cancer patient with poor oral care may lead to severe deterioration of the dentition and may require multiple extractions. Although the use of an implant-retained overdenture can successfully restore the function and esthetics of edentulous patients, its use can be complicated by

the tissue changes subsequent to head and neck irradiation. The difficulties in implant treatment planning for an edentulous patient with macroglossia and soft tissue changes following radiotherapy are discussed.



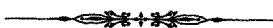
Corbet, E. F. (2004) Diagnosis of acute periodontal lesions. *Periodontology 2000* **34**, 204-216. (Review Article)



Dini, E. L., McGrath, C. P. J. & Bedi, R. (2003) An evaluation of the oral health quality of life (OHQoL) instrument in a Brazilian population. *Community Dental Health* **20**, 40-44.

OBJECTIVES: To translate and evaluate the performance of a Brazilian Portuguese version of the United Kingdom Oral Health related Quality of Life instrument, OHQoLUK, in assessing the impact of oral health on quality of life among a Brazilian adult population. **DESIGN:** Following forward-backwards translation the 16-item OHQoLUK measure was administered to adults utilising municipal dental health services in Araraquara, Sao Paulo, Brazil. The instrument's psychometric properties, validity and reliability, were assessed. **RESULTS:** The response rate was 72% (323/450). OHQoLUK scores were associated with self-reported oral health status including number of teeth present ($p < 0.001$), denture status ($p < 0.01$) and self-reported dental attendance pattern; time ($p < 0.05$) and reason for

last dental visit ($p < 0.001$), supporting the construct validity of the measure. In addition, OHQoLUK scores were associated with self-ratings of oral health ($p < 0.0001$) and perceived need for dental treatment ($p < 0.001$), supporting its criterion validity. Internal reliability was high: Cronbach's alpha = 0.96, while the agreement for each of the 16 OHQoLUK items (Kappa values) ranged from 0.57 to 0.87. **CONCLUSION:** The Brazilian Portuguese version of OHQoLUK measure of oral health related quality of life performed well, exhibiting good validity (face, construct and criterion) and reliability (internal and external). This confirms the sound psychometric properties of the OHQoLUK measure and the applicability of the Portuguese version among a Brazilian population.



Du, X. & Hagg, U. (2003) Muscular adaptation to gradual advancement of the mandible. *The Angle Orthodontist* **73**, 525-531.

Muscular activity of the superficial masseter muscle and anterior portion of the temporal muscle before,

during, and after treatment, with gradual advancement of the mandible, was evaluated by assessing the

average integrated electromyogram (EMG) with the mandible in retruded position (RP) and incisal edge-to-edge (EE) position on 23 consecutive subjects with skeletal Class II malocclusion. Toward the end of active treatment and follow-up, the RP position and EE position coincided. At any given registration, the EMG activity of the masseter muscle was at least twice ($P < 0.001$) that of the anterior portion of the temporal muscle. The EMG activity in RP for the anterior portion of the temporal muscle was not affected significantly, whereas the EMG activity at EE position decreased significantly ($P < 0.05$) during the initial treatment, but thereafter, it increased

continuously. The difference in EMG activity between six months of follow-up and pretreatment level reached statistical significance ($P < 0.05$). For the masseter muscle, the EMG activity at both RP and EE position was reduced about 20% during the initial treatment but returned to the pretreatment level during active treatment and exceeded pretreatment level by approximately 30% to 50% at two and six months of follow-up, respectively. In conclusion, it seemed that gradual advancement affected the anterior portion of the temporal muscle to a minor extent, whereas the effect on the masseter muscle was significant.



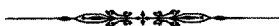
Hagg, U., Du, X., Rabie, A. B. & Bendeus, M. (2003) What does headgear add to herbst treatment and to retention? *Seminars in Orthodontics* **9**, 57-66. (Review Article)



Hagg, U., Rabie, A. B. & Bendeus, M. (2003) Treatment response to alternative functional appliance therapy. *European Journal of Orthodontics* **25**, 521-522.

AIM: to compare the mechanism change of jaw base relationship with various modes of functional appliances. SUBJECTS AND METHOD: Four groups of consecutive skeletal Class II patients were studied; two groups were treated with the headgear-activator ($n = 30$) and conventional Herbst appliance ($n = 24$) both with maximal jumping of the mandible, and two groups with step-by-step advancement of the mandible using the Herbst appliance with ($n = 22$) and without ($n = 14$) headgear. Lateral cephalograms obtained before and after 12-15 months of treatment were analyzed using Pancherz's method. RESULTS: The improvement of jaw base

relationship was significantly larger in the two groups treated with step-by-step advancement of the mandible compared with the two groups treated with maximal jumping of the mandible. The use of headgear in combination with the Herbst appliance was the superior method. The headgear-activator and Herbst appliance with maximal conventional jumping of the mandible showed no difference in improvement of the jaw base relationship, which was less than half that achieved with the headgear Herbst with step-by-step advancement. CONCLUSION: The choice of functional appliance is critical to the orthopaedic effect on the jaw base relationship.



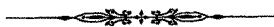
Hagg, U., Tse, A., Bendeus, M. & Rabie, A. B. (2004) A follow-up study of early treatment of pseudo Class III malocclusion. *The Angle Orthodontist* **74**, 465-472.

This study investigated the long-term outcome of 27 consecutive young patients diagnosed with pseudo Class III malocclusion treated with simple fixed appliance (2 x 4 appliance), which resulted in a positive overjet in all cases. Of the original sample of 27 patients, 25 patients (93%) were examined at the five-year follow-up. Two patients dropped out

soon after the active treatment was completed. Of the remaining 25 patients, 20 patients had had no other treatment other than treatment with 2 x 4 appliance, and the other five patients had undergone additional comprehensive fixed appliance therapy because of crowding. Lateral cephalograms were obtained before and after active treatment with the 2

x 4 appliance and at five-year follow-up. The long-term results showed that at the five-year follow-up all 25 patients still maintained a positive overjet. The immediate treatment outcome in the sagittal plane was the same for those who had had 2 x 4 appliance treatment only and those who had had additional treatment with comprehensive fixed appliance treatment, but lower face height increased ($P < .01$) and the mandibular plane angle opened

($P < .05$) more in those who had had additional treatment, comprehensive fixed appliance treatment. During the five-year follow-up period, the dental compensation and the growth of the jaw were similar in both groups. In conclusion, in young patients diagnosed with pseudo Class III malocclusion and treated early with a 2 x 4 appliance, the overjet was corrected, and the treatment result was maintained in the long term.



Jin, L. J., Ren, L., Leung, W. K. & Darveau, R. P. (2004) The in vivo expression of membrane-bound CD14 in periodontal health and disease. *Journal of Periodontology* 75, 578-585.

BACKGROUND: Membrane-bound CD14 (mCD14) is a myeloid differentiation antigen expressed on monocytes/macrophages and neutrophils. It is a key molecule responsible for the innate recognition of bacteria by host cells and functions as an important receptor for bacterial lipopolysaccharide. This study investigated the in vivo expression profile and levels of mCD14 in healthy and diseased gingival tissues. **METHODS:** Gingival biopsies were obtained from 24 patients with chronic periodontitis, including 22 periodontal pocket tissues, 13 clinically healthy tissues, and 18 inflamed connective tissues (i.e., granulation tissues). Gingival biopsies from seven periodontally healthy subjects were used as controls. mCD14 was detected by immunohistochemistry. **RESULTS:** mCD14 was detected in 21 of 22 periodontal pocket tissues and

all other categories of tissues. The mCD14-positive cells were mainly confined to the gingival epithelium-connective tissue interface. The expression levels in periodontally healthy subjects were significantly higher than in the patients. Within the patients, clinically healthy tissues showed greater levels of mCD14 than periodontal pocket tissues and granulation tissues. **CONCLUSIONS:** mCD14 was commonly expressed in both healthy and diseased gingival tissues and was predominantly confined to the epithelium-connective tissue interface. The positive relationship observed between mCD14 expression levels and periodontal health may imply that mCD14 is associated with favorable host responses to bacterial challenge and contributes to maintaining periodontal homeostasis.



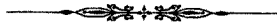
Jin, L. J., Yu, C. & Corbet, E. F. (2003) Granulocyte elastase activity in static and flow gingival crevicular fluid. *Journal of Periodontal Research* 38, 303-310.

OBJECTIVES: This study aimed to evaluate the volume of gingival crevicular fluid (GCF) and granulocyte elastase activity in static GCF (sGCF) and flow GCF (fGCF) from subjects with various periodontal conditions. **METHODS:** Eleven periodontally healthy, 10 gingivitis and 12 periodontitis subjects were recruited and the sites investigated consisted of healthy sites from healthy subjects (HH); healthy (HG) and gingivitis sites (GG) from gingivitis subjects; and healthy (HP), gingivitis (GP) and periodontitis sites (PP) from periodontitis subjects. fGCF samples were collected either 1 min

or 5 min following sGCF collection by paper strip technique. GCF volume was determined by Periotron 6000 and granulocyte elastase activity was assayed with a specific substrate [l-pyroglutamyl-l-prolyl-l-valine-p-nitroanilide (pGluProVal-pNA)]. **RESULTS:** At baseline, no significant differences existed in clinical and GCF parameters between the two matched sites for subsequent collection of fGCF samples either 1 min or 5 min after sGCF sampling in all subjects. The flow exudate in HG and HP sites quickly replenished to sGCF levels, while a delayed replenishment was found in HH sites, despite the

similar sGCF volumes of these sites. The GCF volume and elastase levels in the fGCF at 1 min were higher in GP sites than in GG sites ($P < 0.05$). Overall, depletion of elastase levels in the fGCF at 1 min was observed in all subjects, whereas elastase levels in the fGCF at 5 min had replenished to sGCF levels in HP, GP, PP sites and GG sites, but had remained at a lower level in HH and HG sites. An overall positive correlation was found between sGCF and fGCF for

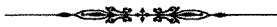
GCF volume and elastase activity ($P < 0.001$); however, this correlation varied with GCF parameters and with site conditions of the subjects concerned. CONCLUSIONS: This study shows that patterns of dynamic changes in GCF flow and elastase activity varied under different periodontal conditions. Assessment of both sGCF and fGCF may allow better insight into the dynamic change of the target components in GCF.



Jin, Y., Samaranayake, L. P., Samaranayake, Y. H. & Yip, H. K. (2004) Biofilm formation of *Candida albicans* is variably affected by saliva and dietary sugars. *Archives of Oral Biology* **49**, 789-798.

The pathogenesis of both superficial and systemic candidiasis is closely dictated by properties of the yeast biofilms. Despite extensive investigations on bacterial biofilms, the characteristics of candidal biofilms, and various factors affecting this process remain to be determined. Therefore we examined the effect of human whole saliva and dietary sugars, glucose and galactose on the adhesion and biofilm formation of *Candida albicans*. Biofilms of *C. albicans* isolate 192 887 g were developed on polystyrene, flat-bottomed 96-well microtiter plates and monitored using ATP bioluminescence and tetrazolium (XTT) reduction assays as well as the conventional colony forming unit (CFU) evaluation. Our data showed that both the ATP and the XTT assays strongly correlated with the CFU assay (ATP versus CFU: $r = 0.994$, $P = 0.006$; XTT versus CFU:

$r = 0.985$, $P = 0.015$). Compared with a glucose-supplemented (100 mM) medium, galactose containing (500 mM) medium generated consistently lower levels of both candidal adhesion and biofilm formation (all $P < 0.05$), but a higher pace of biofilm development over time (96 h). Whilst the presence of an immobilised saliva coating had little effect on either the candidal adhesion or biofilm formation, the addition of saliva to the incubation medium quantitatively affected biofilm formation especially on day 3 and 4, without any significant effect on yeast adhesion. To conclude, biofilm formation of *C. albicans* within the oral milieu appears to be modulated to varying extents by dietary and salivary factors and, further investigations are required to elucidate these complex interactions.



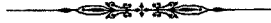
Jose, B. & King, N. M. (2003) Early childhood caries lesions in preschool children in Kerala, India. *Pediatric Dentistry* **25**, 594-600.

PURPOSE: No data are available on possible risk indicators or the prevalence of caries lesions for preschool children under 4 years of age in Kerala, southern India. Therefore, the aims of this study were: (1) to gather data on caries lesion frequency and distribution; (2) to determine any possible associations with feeding habits and oral health care practices. METHODS: A sample of 530 children, aged from 8 to 48 months (mean=2.5+/-0.96 years), who attended 13 day care centers were clinically examined for caries lesions using a disposable mouth mirror, tongue spatula, and a torch light. There were

513 dentate children. The caregiver of each child then completed, by interview, a structured questionnaire. RESULTS: Among the group of 252 girls and 278 boys, the dmft was 1.84+/-2.87 with 56% of the children being caries-lesion free. Fifty-nine (12%) were considered to have early childhood caries (ECC), based on the criteria that smooth surface caries lesions on all 4 maxillary incisor teeth indicated severe ECC. Breast-feeding was practiced by 99% of the mothers, and 5% did so exclusively. Generally, breast-feeding was on demand. Statistically significant correlations were found between caries

lesions and the child's dental condition, as perceived by the mother or caregiver ($P<.0001$), the dental status of the caregiver ($P=.0417$), consumption of snacks ($P=.0177$), giving of sweets as a reward ($P<.0001$), cleaning of the child's mouth ($P<.0001$), oral hygiene status of the child ($P<.0001$) and low socioeconomic status, as measured by income ($P<$

$.0001$). CONCLUSION: From the results of this study of preschool children in Kerala, the groups at high risk from dental caries lesions are: (1) those with poor oral hygiene status; (2) those who consume snacks and are given sweets as rewards; (3) those belonging to a lower socioeconomic class.



King, N. M., Cheong, C. H & Sanares, A. M. (2004) Van der Woude syndrome: a report of two cases. *The Journal of Clinical Pediatric Dentistry* **28**, 267-271.

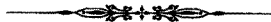
Van der Woude syndrome is a rare autosomal dominant condition with high penetrance and variable expression. It consists of a cleft lip and/or palate pits on the vermilion of the lower lip, and hypodontia. Two cases of congenital lip pits with cleft lip and

alveolus and an isolated cleft palate are described to illustrate the variable presentation of the clinical features and the importance of early recognition of Van der Woude syndrome because of the genetic implications.

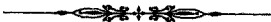
King, N. M., Wu, I. I. & Tsai, J. S. (2003) Caries prevalence and distribution, and oral health habits of zero- to four-year-old children in Macau, China. *Journal of Dentistry for Children (Chicago, Ill.)* **70**, 243-249.

This study sought to determine the prevalence of early childhood caries and the oral health habits of children ages 0 to 4 years in Macau, China vs. children in Hong Kong. Caregivers of 353 children from 7 nursery centers completed a questionnaire, and dental personnel examined their children with a light and disposable mouth mirror. The children's mean age was 2.8 +/- 0.6 years. Using the diagnostic criterion that cavitation was evidence of dental caries, the caries prevalence was 18%. When the age range

was narrowed to 1.8 to 3.5 years, the caries prevalence was 19% in Macau children compared to 17% in Hong Kong children. No statistically significant relationship existed among caries prevalence, feeding habits, or oral hygiene habits, supporting the notion that the etiology of ECC is multifactorial. The similarity of caries prevalence in these 2 populations may result from the effects of cultural norms on the dental habits of the children.



Koshy, G., Corbet, E. F. & Ishikawa, I. (2004) A full-mouth disinfection approach to nonsurgical periodontal therapy - prevention of reinfection from bacterial reservoirs. *Periodontology 2000* **36**, 166-178. (Review Article)



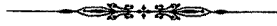
Lee, C. K. & King, N. M. (2003) A treatment strategy of the management of early childhood caries with enamel hypoplasia. *Dental Asia* 10-16. (Review Article)



Lee, C. K., King, N. M. & Law, K. T. (2004) Diagnosis and surgical removal of a rare type of permanent maxillary canine impaction: a case report. *Quintessence International* **35**, 89-96.

The maxillary canine has a long path of eruption, and the frequency of its impaction is second only to that of third molars. It usually impacts palatally or buccally, and the etiologies of these two types of impaction are quite different. This article highlights

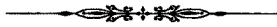
the importance of a meticulous radiographic examination and describes the surgical procedure used to treat a permanent maxillary canine impacted buccally to the lateral incisor but palatally to the central incisor.



Lee, P. K., Samman, N. & Ng, I. O. (2004) Unicystic ameloblastoma—use of Carnoy's solution after enucleation. *The International Journal of Oral and Maxillofacial Surgery* **33**, 263-267.

A retrospective analysis of 29 patients with a histologically confirmed diagnosis of unicystic ameloblastoma is reported with special emphasis on a treatment regime employing enucleation and application of Carnoy's solution. Despite the finding

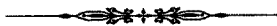
that 93% of lesions exhibited mural invasion, a recurrence rate of 10% after treatment is reported, suggesting a possible benefit of Carnoy's solution against recurrence.



Leung, F. Y., Rabie, A. B. & Hagg, U. (2004) Neovascularization and bone formation in the condyle during stepwise mandibular advancement. *European Journal of Orthodontics* **26**, 137-141.

The aims of this investigation were to identify the temporal expression of vascular endothelial growth factor (VEGF) in the mandibular condyle and to correlate it with the pattern of new bone formation during stepwise mandibular advancement. Two hundred and fifty female, 35-day-old Sprague-Dawley rats were randomly divided into 10 groups, with 10 rats allocated to the single-step bite-jumping subgroup, 10 rats to the stepwise advancement subgroup and five rats to the control subgroup. In the experimental groups, the mandibles were kept in a continuous forward position. The initial stepwise advancement commenced on day 35, whereas the second advancement started on day 65. The rats were sacrificed on experimental days 3, 7, 14, 21, 30, 33, 37, 44, 51 and 60. Sections (7 microm) were cut through the condyle in the parasagittal plane and

stained with anti-VEGF antibody. Each section was counter-stained with haematoxylin for observation of the cellular response. The sections were digitized and quantitatively analysed with a computer-assisted image analysing system. The results showed that the initial advancement in the stepwise group led to significantly less expression of VEGF when compared with single advancement. However, the second advancement on day 30 resulted in a significant increase in VEGF expression when compared with the one-step group and the natural growth control group. Thus, it was concluded that changes in the amplitude of mechanical loading, produced by stepwise advancement, have a significant effect on the production of VEGF by the chondrocytes. During the later stages of advancement, more VEGF and more condylar bone was produced.



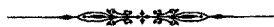
Leung, G. & Jin, L. J. (2003) A combined approach of enamel matrix derivative gel and autogenous bone grafts in treatment of intrabony periodontal defects. A case report. *Primary Dental Care* **10**, 41-43.

Enamel matrix derivative (EMD) has recently been introduced as a new modality in regenerative periodontal therapy. This case report demonstrates a combined approach in topical application of EMD gel (Emdogain) and autogenous bone grafts for treatment of intrabony defects and furcation involvement defects in a patient with chronic periodontitis. The seven-month post-surgery clinical and radiographic results were presented. The

combined application of EMD gel with autogenous bone grafts in intrabony osseous defects resulted in clinically significant gain of attachment on diseased root surfaces and bone fill on radiographs. Further controlled clinical studies are required to confirm the long-term effectiveness of the combination of EMD gel and autogenous bone grafts in treatment of various osseous defects in subjects with chronic periodontitis.



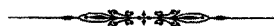
Leung, K. C. M. & Leung, T. K. (2003) Chair-side addition of cast clasp to removable partial denture after abutment extraction. *The Journal of Prosthetic Dentistry* **90**, 413-414. (Short Communication)



Leung, K. C. M., McMillan, A. S., Leung, W. K., Wong, M. C. M., Lau, C. S. & Mok, T. M. Y. (2004) Oral health condition and saliva flow in southern Chinese with Sjogren's syndrome. *International Dental Journal* **54**, 159-165.

OBJECTIVE: To investigate the oral health condition and saliva flow of southern Chinese patients with Sjogren's syndrome (SS). **METHOD:** 51 SS patients (26 primary and 25 secondary cases) and 29 controls took part in this cross-sectional study. Stimulated whole and parotid saliva flow rates, pH, and buffer capacity, and xerostomia, oral mucosal lesions, oral hygiene status, dental and periodontal conditions, prosthetic status were assessed and compared between groups. **RESULTS:** Stimulated whole saliva (SWS) flow was reduced in primary and secondary SS cases ($p < 0.001$), pH and buffer capacity were also reduced in the primary SS group ($p < 0.05$). SS patients had a greater prevalence of xerostomia than

controls ($p < 0.001$). Primary SS patients had a higher mean DMFT, more missing teeth, and more prostheses than secondary SS cases and controls ($p < 0.05$). SWS flow correlated negatively with the number of filled teeth in both SS groups ($p < 0.05$) and the number of decayed teeth in the primary SS group ($p < 0.05$). **CONCLUSION:** Despite good oral hygiene and regular dental check-ups, the oral health of southern Chinese with primary SS was significantly compromised compared with secondary SS cases and controls, most probably due to the combined effect of impaired salivary gland function and poorer saliva buffer capacity.



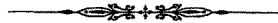
Leung, W. K. & Chu, C. H. (2003) Dental caries and periodontal status of 12-year-old school children in rural Qinghai, China. *International Dental Journal* **53**, 73-78.

OBJECTIVES: To describe the dental caries and periodontal status of 12-year-old children in rural Qinghai and to compare the oral health status between the Han and ethnic minority children. **METHOD:** Children aged 12-years in three primary schools in

Hexi Townships, Guide County, Hainan Tibetan Autonomous State, Qinghai Province, China, were invited to participate in the survey conducted during July 2001. Each child was interviewed and clinically examined in the schools, using portable equipment.

World Health Organization (WHO) examination procedures and diagnostic criteria were used. SPSS 11.0 was used for data compilation and statistical analysis. RESULTS: All 196 12-year-olds (118 Han and 78 from ethnic minorities, i.e. Muslims and Tibetans) were surveyed. 48% of the children reported never brushing their teeth, while 12% brushed only every 2-3 days. Over ninety per cent (n=182) of the children had never visited a dentist. The DMFT scores in Han and in minority groups were found to be 0.12 and 0.23 respectively. A larger proportion of children in Han group (94%) had no

caries experience (DMFT = 0) than that of Muslim and Tibetan (82%) groups ($p < 0.01$). None of the children had healthy gingiva (i.e. highest CPI score=0) and 85% had calculus. CONCLUSION: The prevalence of caries experience in Han children is significantly lower than that in Muslim and Tibetan children in rural Qinghai. Dental caries and caries treatment needs of Han and minority rural schoolchildren in Qinghai are low but their periodontal health status is unsatisfactory. Basic dental health care and preventive education for the children in this part of China is needed.



Li, C. Z., Cao, Z. G., Yang, R., Shang, Z. H., Jin, L. J. & Corbet, E. F. (2004) Effects of baicalin on the expression of pro-MMP-1 and MMP-3 in human gingival fibroblasts and periodontal ligament cells. *Zhonghua Kou Qiang Yi Xue Za Zhi* **39**, 197-200.

OBJECTIVE: To investigate the influence of baicalin on the IL-1beta induced pro-MMP-1 in HGF and the effects of baicalin on MMP-3 expression in periodontal ligament cells (PDLs). METHODS: The amount of secreted pro-MMP-1 and MMP-3 expression was detected by ELISA and cell immunochemistry. RESULTS: (1) The amount of secreted pro-MMP-1 (3.333 ± 0.123) microg/L increased significantly following 1 microg/L of IL-1beta, compared with control group (1.960 ± 0.180) microg/L. Addition of baicalin to cell culture medium for 1 hour following IL-1beta decreased pro-

MMP-1 secretion in a dose-dependent manner in the range of 10 approximately 1,000 microg/L. (2) 1 microg/L IL-1beta could significantly stimulate the synthesis and secretion of MMP-3 in PDLs. (3) The baicalin could not interfere the synthesis of MMP-3, but could inhibit the release of MMP-3 from PDLs. CONCLUSIONS: Baicalin could inhibit the secretion of pro-MMP-1 and MMP-3 expression in IL-1beta induced HGF and PDLs, which suggests that baicalin may play an important role in preventing and treating periodontal disease.



Li, R. W. & Chow, T. W. (2004) The specialty of family dentistry: a future for general dental practitioners? *Dental Update* **31**, 6-7.

A new Specialty in dentistry, Family Dentistry, has been established to provide a structured, co-ordinated training for general dental practitioners who are the major oral health service providers. The training emphasizes the importance of continuing and

comprehensive care, the interface between primary and secondary care, the relationship between the patient and his/her family and the community, and a holistic approach in treatment planning and delivery.



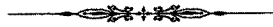
Li, R. W., Leung, K. W., Sun, F. C. & Samaranayake, L. P. (2004) Severe Acute Respiratory Syndrome (SARS) and the GDP. Part I : Epidemiology, virology, pathology and general health issues. *British Dental Journal* **197**, 77-80.

The health profession faces a new challenge with the emergence of a novel viral disease Severe Acute

Respiratory Syndrome (SARS), a form of atypical pneumonia caused by a coronavirus termed SARS-

CoV. This highly infectious disease has spread through 32 countries, infecting more than 8,400 patients with over 790 deaths in just over 6 months. Over one quarter of those infected were unsuspecting healthcare workers. The major transmission mode of SARS-coronavirus appears to be through droplet spread with other minor subsidiary modes of transmission such as close contact and fomites although air borne transmission has not been ruled out. There is as yet no definitive treatment protocol. Although the peak period of the outbreak is likely to

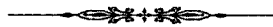
have passed and the risk of SARS in the UK is therefore assessed to be low, the World Health Organisation has asked all countries to remain vigilant lest SARS re-emerges. Recent laboratory acquired cases of SARS reported from Taiwan and Beijing, China are a testimony to this risk. Until reliable diagnostic tests, vaccine and medications are available, control of SARS outbreaks depends on close surveillance, early identification of index cases, quick isolation of carriers and effective infection control and public health measures.



Li, R. W., Leung, K. W., Sun, F. C. & Samaranayake, L. P. (2004) Severe acute respiratory syndrome (SARS) and the GDP. Part II: implications for GDPs. *British Dental Journal* **197**, 130-134.

The transmission modes of SARS-coronavirus appear to be through droplet spread, close contact and fomites although air borne transmission has not been ruled out. This clearly places dental personnel at risks as they work in close proximity to their patients employing droplet and aerosol generating procedures. Although the principle of universal precautions is widely advocated and followed throughout the dental community, additional precautionary measures - termed standard precaution may be necessary to help control the spread of this highly contagious disease. Patient assessment should include questions on recent travel to SARS infected

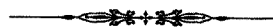
areas and, contacts of patients, fever and symptoms of respiratory infections. Special management protocols and modified measures that regulate droplet and aerosol contamination in a dental setting have to be introduced and may include the reduction or avoidance of droplet/aerosol generation, the disinfection of the treatment field, application of rubber dam, pre-procedural antiseptic mouthrinse and the dilution and efficient removal of contaminated ambient air. The gag, cough or vomiting reflexes that lead to the generation of aerosols should also be prevented.



Lo, E. C. M., Luo, Y. & Dyson, J. E. (2004) Oral health status of institutionalized elderly in Hong Kong. *Community Dental Health* **21**, 224-226.

Objectives: To describe the oral health status of institutionalized elderly in Hong Kong. Methods: Older adults in 56 elderly homes were clinically examined in the institution by one of two calibrated dentists using standard methods recommended by the World Health Organization. Information on their perceived oral health status and behaviour was obtained from an interview. Results: A total of 3, 153 elderly aged 65 years or above (mean 79.8) were examined. Around 20% of them were edentulous.

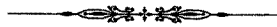
The mean DMFT score was 23.0 (DT = 2.6; MT = 20.1; FT = 0.3). The percentage of dentate subjects with healthy gingivae, bleeding on probing, calculus, shallow pockets, and deep pockets (according to the highest CPI score) were 1, 2, 41, 37 and 20 respectively. Two-thirds of the elderly reported having difficulties chewing, and over half had not visited a dentist for over 5 years. Conclusion: The oral health status of institutionalized elderly in Hong Kong is poor and needs to be improved.



Lo, E. C. M., Luo, Y. & Dyson, J. E. (2004) Outreach dental service for persons with special needs in Hong Kong. *Special Care in Dentistry* 24, 80-85.

The authors describe the acceptance and efficiency of an outreach dental service, which provided oral health care to persons with special needs in Hong Kong. Portable dental equipment was transported to various institutions. Basic dental care including prevention, scaling, restoration, extraction, and denture repair was provided free of charge. Elderly adults living in institutions were the main service recipients, but other people with special needs, including physically disabled and persons with mental retardation were also reached. One-third of

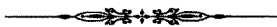
the patients had dental pain or sensitivity, and 70% had not visited a dentist for more than three years. Dental care was provided to 6,867 patients over four years. Feedback from the patients showed that more than 90% of them were satisfied with the service. These findings indicate that patients with special needs in Hong Kong are in great need of dental care. An outreach dental service appears to be both appropriate and efficient in providing care to these persons.



Lo, E. C. M., Zheng, C. G. & King, N. M. (2003) Relationship between the presence of demarcated opacities and hypoplasia in permanent teeth and caries in their primary predecessors. *Caries Research* 37, 456-461.

OBJECTIVE: To investigate the relationship between the presence of demarcated opacities and hypoplasia on permanent teeth and the caries status of the primary predecessor teeth in a cohort of Chinese children. **METHODS:** The study sample consisted of 250 children living in a non-fluoridated area in Southern China whose caries status of primary teeth at the age of 3-6 years had been recorded annually in a previous study. A follow-up examination of their permanent teeth was conducted when they were about 12 years old. The presence of enamel defects was determined by consensus of 2 dentists according to the modified DDE index. **RESULTS:** 56.8% of the 250 children examined had

demarcated opacities, while 10.8% of them had hypoplasia. Demarcated opacities and hypoplasia were found in 5.8 and 1.3% of the teeth examined, respectively. A higher prevalence of demarcated opacities was found in those permanent teeth of which their primary predecessor teeth had caries than in those without (7.5 vs. 3.8%, $p < 0.001$). A similar finding was obtained for the prevalence of hypoplasia (1.9 vs. 0.4%, $p < 0.001$). **CONCLUSION:** There was an association between caries in primary teeth and the presence of demarcated opacities and hypoplasia in their permanent successors.



Lo, J., Luk, H & Cheung, L. K. (2004) Simulation model for endoscopically assisted fixation of the intraoral vertical subsigmoid ramus osteotomy. *Asian Journal of Oral and Maxillofacial Surgery* 16, 103-108.

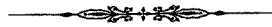
Objective: to create a simulation model for endoscopically assisted fixation of the intraoral vertical subsigmoid ramus osteotomy for training purposes. **Materials and Methods:** A polyurethane model of the upper and lower jaws in prognathism with or without mandibular asymmetry was created and covered by stretchable rubber material to simulate the cheeks. Vertical subsigmoid ramus osteotomy was performed intraorally in the usual manner. A straight endoscope was used intraorally to monitor

and assist in fixation of the segments through the transbuccal approach. **Results:** Both monocortical miniplate fixation and bicortical screw fixation of the vertical subsigmoid ramus osteotomy were feasible using the above model, and enabled satisfactory stability and control of the segments while achieving the planned movements. **Conclusion:** The simulation model is a useful tool for learning the procedure of endoscopically assisted rigid fixation of the vertical subsigmoid ramus osteotomy.

Low, D. & Chan, A. W. (2004) Unusual maxillary lateral incisors: case reports. *Australian Endodontic Journal* **30**, 15-19.

Root canal morphology is often complex and the number of root canals may vary for any type of tooth. Abnormalities in the root canal morphology of maxillary lateral incisors are rare. Maxillary lateral incisors can have two root canals, even though the dental literature supports their 100% single-canal

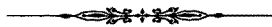
anatomy. It is vital to consider the possibility of extra root canal(s), even in teeth with a low frequency of abnormal root canal anatomy. This report presents two cases of maxillary lateral incisors with two root canals.



Lu, M. & Rabie, A. B. (2003) Microarchitecture of rabbit mandibular defects grafted with intramembranous or endochondral bone shown by micro-computed tomography. *The British Journal of Oral & Maxillofacial Surgery* **41**, 385-391.

The aim of this study was to assess the integration of intramembranous and endochondral autogenous bone grafts into membranous bony defects, by analysing the microarchitectural changes of the grafted bone 3 months after grafting. Twelve critical size defects (15 x 10mm) were created in rabbit mandibles bilaterally. Six defects on the right side of the mandible were grafted with autogenous endochondral bone, and six on the left were grafted with intramembranous bone. Three months later, the defects were retrieved for imaging with micro-

computed tomography (Micro-CT) and for radiographic and histological evaluation. Micro-CT showed that intramembranous bone gave more bone volume a larger, trabecular number and trabecular thickness ($P < 0.001$), and that endochondral bone had more trabecular separation ($P < 0.001$). These findings indicate that intramembranous bone grafts integrate better than endochondral bone grafts in three-dimensions when they are grafted into membranous bony defects.



Lu, Q., Jin, L. J., Darveau, R. P. & Samaranayake, L. P. (2004) Expression of human beta-defensins-1 and -2 peptides in unresolved chronic periodontitis. *Journal of Periodontal Research* **39**, 221-227.

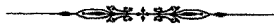
BACKGROUND: Human beta-defensins (hBDs) are antimicrobial peptides which contribute to host innate immunity by disrupting the membrane integrity of a broad spectrum of microorganisms. **OBJECTIVES:** This study aimed to determine the expression profiles of hBD-1 and -2 peptides in gingiva and to assess the possible relations of these antimicrobial peptides with periodontal health and disease. **METHODS:** Seven periodontally healthy subjects and 22 patients with unresolved chronic periodontitis were recruited and the gingival biopsies collected consisted of healthy tissues from the healthy subjects (HT-C); periodontal pocket tissues (PoT) and inflamed connective tissues (ICT) from the base of pocket, i.e. granulation tissues, as well as clinically healthy tissues (HT-P) from the adjacent clinically healthy sites from the patients. The expression of hBD-1 and -2 peptides was detected by immunohistochemistry and quantitatively

analyzed with a computerized image processing system. **RESULTS:** Both hBD-1 and -2 peptides were detected in all periodontally healthy subjects, while hBD-1 was detected in all patients and hBD-2 was found in most of the patients. Their expression was mainly confined to the granular and spinous layers of gingival epithelium, in which hBD-1 was detected in both intercellular spaces and cytoplasm, whereas hBD-2 was mainly observed in the cytoplasm. HT-C expressed significantly higher levels of hBD-2 than HT-P ($p < 0.05$). Within the patients, both defensins were up-regulated significantly in PoT as compared with the adjacent HT-P ($p < 0.05$). **CONCLUSIONS:** The present study showed that hBD-1 and -2 were frequently expressed in the granular and spinous layers of gingival epithelia and their expression may be associated with periodontal health and disease.

Lucas, P. W., Dominy, N. J., Riba-Hernandez, P., Stoner, K. E., Yamashita, N., Loria-Calderon, E., Petersen-Pereira, W., Rojas-Duran, Y., Salas-Pena, R., Solis-Madrigal, S., Osorio, D. & Darvell, B. W. (2003) Evolution and function of routine trichromatic vision in primates. *Evolution; International Journal of Organic Evolution* **57**, 2636-2643.

Evolution of the red-green visual subsystem in trichromatic primates has been linked to foraging advantages, namely the detection of either ripe fruits or young leaves amid mature foliage. We tested competing hypotheses globally for eight primate taxa: five with routine trichromatic vision, three without. Routinely trichromatic species ingested leaves that were "red shifted" compared to

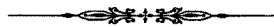
background foliage more frequently than species lacking this trait. Observed choices were not the reddest possible, suggesting a preference for optimal nutritive gain. There were no similar differences for fruits although red-greenness may sometimes be important in close-range fruit selection. These results suggest that routine trichromacy evolved in a context in which leaf consumption was critical.



Luk, H. W., Pow, E. H., McMillan, A. S. & Hui, C. F. (2004) A double casting technique to minimize distortion when constructing fixed partial dentures on implants. *The Journal of Prosthetic Dentistry* **91**, 93-96.

The casting of extensive implant superstructures that have a good passive fit may be technically demanding. A simple, 2-stage casting technique is presented that avoids common problems associated with the casting

of large superstructures. The fabrication of a 7-unit metal-ceramic screw-retained fixed partial denture supported by 5 implants is used to illustrate this technique.



Luo, G., Samaranayake, L. P., Cheung, B. P. & Tang, G. (2004) Reverse transcriptase polymerase chain reaction (RT-PCR) detection of HLP gene expression in *Candida glabrata* and its possible role in *in vitro* haemolysin production. *Acta Pathologica, Microbiologica, et Immunologica Scandinavica* **112**, 283-290.

Although haemolysins are known to be putative virulence factors contributing to pathogenicity in *Candida* species, the haemolytic activity of *Candida glabrata* and its genetic expression is ill understood at present. Thus, we studied a total of 34 *Candida glabrata* isolates for their *in vitro* haemolytic activity using a previously described plate assay system. The mRNA expression of HLP, a putative haemolysin gene, of these isolates was also evaluated using a semi-quantitative, non-competitive RT-PCR assay. All 34 *C. glabrata* isolates exhibited both partial (alpha) and complete (beta) haemolytic activity to varying degrees. In parallel with the haemolytic

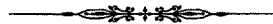
activity, all isolates were also positive for HLP mRNA expression. The expression levels of HLP mRNA (as relative units) ranged from 1.01 to 1.82, with a mean value of 1.32. On regression analysis of latter values and the haemolytic activity (in terms of the dimension of the haemolytic zone in the plate assay) of the *C. glabrata* isolates a highly significant positive correlation was noted ($r=0.759$, $p<0.0001$). Taken together, our data illustrate not only the phenotypic characteristics of haemolysin(s) and HLP expression of a battery of *C. glabrata* clinical isolates, but also, for the first time, evidence for a role of HLP in haemolysis.



MacDonald-Jankowski, D. S., Yeung, R., Lee, K. M. & Li, T. K. (2004) Ameloblastoma in the Hong Kong Chinese. Part 1: systematic review and clinical presentation. *Dentomaxillofacial Radiology* **33**, 71-82.

OBJECTIVES: The aim of Part 1 of this study was to determine the clinical presentation of central ameloblastomas in the Hong Kong Chinese and to compare them with other reported series by a systematic review (SR). **METHODS:** The study had two elements, that of a complete series of all ameloblastomas presenting at a major Chinese maxillofacial surgical unit as well as a SR. The files of the Department of Oral and Maxillofacial Surgery of the University of Hong Kong between 1989 and 2000 were reviewed for ameloblastoma cases. The relevant literature was identified by electronic databases, review of citation lists and hand searching of key journals. The principal selection criterion was that the study should represent a complete collection of cases. **RESULTS:** Fifty-three published series of cases were included in the SR. They generally reported little more than sex, mean age and range, and affected jaw. Only 16 studies considered recurrence. Sixty-one cases of ameloblastoma were identified in the present study. There were 30 males and 31 females, contrary to the predilection for males in

other reports. Eighty-four percent of cases were found in the mandible, agreeing with the SR. The mean age at first presentation was 30.5 years, lower than that of the SR; only a Korean report and a small Bangladeshi report showed younger presentation. The present report had the shortest period between first becoming aware of the lesion and seeking treatment; this period was significantly shorter for younger patients. Although the present study was in agreement with the SR with regard to swelling, this study reported a significantly higher proportion of patients presenting with pain. **CONCLUSION:** Although the presentation of ameloblastoma within this Chinese community was broadly similar to that observed in other populations, it differed in a number of important respects. It had a younger age at first presentation than many other communities, including other Orientals; it was associated with a shorter period between first becoming aware of the lesion and seeking treatment, particularly in the young; and it was more frequently associated with pain than in the SR.



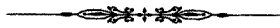
MacDonald-Jankowski, D. S., Yeung, R., Lee, K. M. & Li, T. K. (2004) Ameloblastoma in the Hong Kong Chinese. Part 2: systematic review and clinical presentation. *Dentomaxillofacial Radiology* **33**, 141-151.

OBJECTIVES: The aim of this part of the study was to determine the radiological presentation on conventional radiographs of central ameloblastomas in the Hong Kong Chinese and compare them with other reported series by a systematic review (SR). **METHODS:** The study had two elements, that of a complete series of all ameloblastomas presenting at a major Chinese maxillofacial surgical unit and a SR. The files of the Department of Oral and Maxillofacial Surgery of the University of Hong Kong between 1989 and 2000 were reviewed for ameloblastoma cases. The relevant literature was identified by electronic databases, review of citation lists and handsearching of key journals. The principal selection criterion was that the study should represent a complete collection of cases. **RESULTS:** Only 13 reports gave any radiological details. The present study of the Hong Kong Chinese contained 61 cases. With the exception of radiodensity and shape of

radiolucency, the majority of the 13 other reports did not record the other radiological features that could be important in the diagnosis. The present study agreed with the synthesis of the 13 reports with regards to complete radiolucency and cortication of ameloblastomas, but disagreed with regards to other important features. The present study had a significantly higher proportion of unilocular lesions, better marginal definition, and more frequent perforation of the cortex and buccolingual expansion. Nine of the ten maxillary lesions straddled both anterior and posterior sextants with four crossing the midline, whereas only 13 of the 51 mandibular cases affected both sextants, of which eight crossed the midline. The unicystic form, which was most prevalent, appeared significantly more frequently as unilocular radiolucencies in comparison with the non-unicystic forms. The frequencies of unicystic forms and unilocular presentations were significantly greater

in the young. The lesions in the young were significantly sited solely in the posterior sextant. The lower border of the mandible was reached and affected by ameloblastoma in 36 cases in the present report. It was displaced and thinned in 15 cases whereas in just five it was at least partially undisplaced with the lesion expanding down past it either buccally or

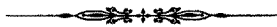
lingually to it. The unicystic form was significantly more associated with root resorption, tooth displacement and crowns of unerupted teeth. **CONCLUSION:** Radiologically, ameloblastomas in the Hong Kong Chinese differ significantly with regards to many features. This can be in part explained by the higher proportion of the unicystic form.



MacDonald-Jankowski, D. S., Yeung, R. W., Li, T. K. & Lee, K. M. (2004) Computed tomography of odontogenic myxoma. *Clinical Radiology* **59**, 281-287.

AIM: The aim of this study was to determine the computed tomography (CT) presentation of odontogenic myxoma (OM) in a Chinese population and to compare them with those observed on the accompanying conventional radiographs (CR). **MATERIALS AND METHODS:** The files of the Department of Oral and Maxillofacial Surgery of the University of Hong Kong between 1989 and 2000 were reviewed for myxoma cases. **RESULTS:** Ten cases of OM were found of which eight had been investigated by CT. The formatted hard copy was found in seven cases, four in the maxilla and three in the mandible. Most of the OMs had a round shape but one was fusiform. CT was more likely to display a cortex and its perforation. All OMs had perforated

cortices on CT with soft tissue appearing outside the bony contour in two cases. Contrast enhancement was apparent in six cases. Both CR and CT displayed septae, but the latter method revealed that most septae were situated at the periphery, presenting as "sunray" type spicules in one case. Tooth displacement and root resorption were more reliably observed on CR. **CONCLUSION:** The likelihood of perforation and pattern of septa of OM is better displayed by CT. CR should also allow a better assessment of the degree of definition of the lesion's margins with adjacent normal bone. Therefore, both CT and CR should be used in an investigation of an OM.



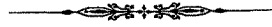
MacDonald-Jankowski, D. S., Yeung, R., Li, T. K. & Lee, K. M. (2004) Computed tomography of fibrous dysplasia. *Dentomaxillofacial Radiology* **33**, 114-118.

OBJECTIVE: Fibrous dysplasia (FD) is an uncommon, but important lesion affecting the jaws. The aim of this study was to reveal its presentation on computed tomography (CT) in a consecutive series of cases. **METHODS:** The files of the Department of Oral and Maxillofacial Surgery of Hong Kong University between 1989 and 2000 were reviewed for cases of FD. **RESULTS:** Of the ten cases investigated by CT, two were rejected because of extensive biopsy or surgery before the CT investigation. Seven of the remaining eight cases were Chinese and one was Indian. The mandible and maxilla were equally affected. The cortex was generally intact, except when adjacent to the teeth in the maxilla. The margins were generally poorly-defined, but well-

defined on at least some sections of each maxillary case. Five cases were extensive, affecting or nearly affecting the whole hemi-mandible or hemi-maxilla to the midline. All cases displayed expansion, which was fusiform in the mandible and an enlargement of the normal contour in the maxilla. The maxillary antrum was completely obturated in three maxillary cases; one displayed a rounded dome-shaped lesion more suggestive of a benign neoplasm. The orbital floor was displaced in three cases; one of those cases presented with proptosis. All maxillary cases extended back to the pterygoid process, but did not displace it. The "bone windows" of eight cases generally displayed a "ground-glass" pattern; one also displayed cyst-like radiolucencies. The soft

tissue window, which depicts mineralized tissue as "white", showed that five cases were completely mineralized. CONCLUSION: CT can be used to

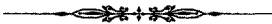
determine the extent, specific dimensions and radiodensity of FD.



McGrath, C. P. J. & Bedi, R. (2003) Dental services and perceived oral health: are patients better off going private? *Journal of Dentistry* **31**, 217-221.

OBJECTIVE: The aim of this study is to determine associations between method of payment for dental services and perceived oral health in the UK. METHOD: A national UK study involving a random probability sample of 2718 adults. Respondents were interviewed in their homes about their method of payment for dental services (private or NHS), service use (time and reason for last dental visit), self-reported oral health status (number of teeth possessed and denture status) and the impact of their oral health on their quality of life (employing the 16-item OHQoL-UK(Copyright) measure). RESULTS: The response rate was 68% (1838/2718). Thirty one percent (575/1838) claimed they paid privately for dental services the last occasion they visited their

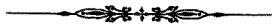
dentist. This was associated with self-reported number of teeth possessed ($P<0.01$), denture status ($P<0.01$), WHO goal of retaining 20 teeth with and without a prosthesis ($P<0.05$), impact of oral health on life quality ($P<0.01$), and number of positive oral health influences experienced ($P<0.01$). However, these associations did not remain apparent having accounted for socio-demographic factors (age, gender, and social class background) and reported dental attendance pattern. CONCLUSION: Difference in perceived oral health exists between private and NHS dental service users. However, this is more likely to be attributed to socio-demographic factors and regular use of services rather than method of payment.



McGrath, C. P. J. & Bedi, R. (2003) Measuring the impact of oral health on quality of life in Britain using OHQoL-UK(W). *Journal of Public Health Dentistry* **63**, 73-77.

OBJECTIVES: This study assessed the impact of oral health on quality of life (OHQoL) in Britain and identified disparities in OHQoL among subgroups of the population. METHODS: A national survey involved a random probability sample of 2,667 households. Participants were interviewed about their oral health status and sociodemographic information was collected. The impact of oral health on life quality was measured utilizing the OHQoL-UK(W). RESULTS: The response rate was 68 percent. Most people in Britain (73%) claimed their oral health did

affect their life quality, most frequently through physical influences rather than social or psychological. Disparities in perceived influences of oral health on life quality among subgroups of the population were apparent by age, sex, and social class; OHQoL also was influenced by oral health status (self-reported). CONCLUSION: Most Britons claim their oral health affects their life quality and OHQoL was associated with sociodemographic and oral health factors.



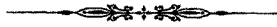
McGrath, C. P. J. & Bedi, R. (2004) A national study of the importance of oral health to life quality to inform scales of oral health related quality of life. *Quality of Life Research* **13**, 813-818.

OBJECTIVES: To assess the content validity of traditional oral health status scales as measures of

oral health related quality of life (OHQOL), based on a general public's perception of the most important

ways in which oral health affects quality of life (QoL). **METHODS:** A nationwide United Kingdom study involving a random probability sample of 1778 adults. Data were collected by face-to-face interviews in participants homes. **RESULTS:** Most 75% (1332) perceived oral health as being important to QoL. Among them, 53% (699/1332) identified oral health's importance to QoL as being in a positive manner. Existing scales predominantly fail to include this dimension. The general public ranked oral health's importance to QoL through a range of physical, social

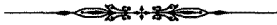
and psychological domains. Most frequently though affecting eating or comfort; domains considered by all instruments. Other domains/ways are presented. It is apparent that even when some of the multidomain scales are employed, they frequently omit items that the public perceives as being most important to QoL. **CONCLUSION:** The study raises concerns about the appropriateness of utilising many of the existing oral health status scales as measures of OHQOL because the concepts do not appear to be interchangeable.



McGrath, C. P. J. & Bedi, R. (2004) Why are we "weighting"? An assessment of a self-weighting approach to measuring oral health-related quality of life. *Community Dentistry and Oral Epidemiology* **32**, 19-24.

OBJECTIVE: To determine whether or not self-weighting at an item level contributes to the performance of an oral health-related quality-of-life measure. **DESIGN:** Data were collected in two national surveys conducted a month apart, one using the "weighted" measure and the other an "unweighted" version of the UK oral health-related quality-of-life measure. In addition, sociodemographic and self-reported oral health status were recorded. **RESULTS:** The UK oral health-related quality-of-life measure discriminated between groups based on age group (<65, 65 and older) and social class (higher

and lower) irrespective of the version of the questionnaire used. Both versions also showed significant associations with self-reported oral health: denture status ($P < 0.01$) and number of teeth possessed ($P < 0.01$). In addition, both versions demonstrated predictive ability in identifying those in prosthetic need (<20 teeth and without recourse to a denture, $P < 0.01$). **CONCLUSION:** Weighting the UK oral health-related quality-of-life instrument does not improve the psychometric properties of the instrument and thus raises questions about the value of self-weighting at an item level.



McGrath, C. P. J. & Bedi, R. (2004) The association between dental anxiety and oral health-related quality of life in Britain. *Community Dentistry and Oral Epidemiology* **32**, 67-72.

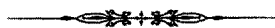
OBJECTIVE: The aim of this study was to identify associations between level of dental anxiety and the impact of oral health on quality of life (OHQOL) in Britain, controlling for sociodemographic and oral health status (self-reported) factors. **METHODS:** The basic research design included a cross-sectional study involving a random probability sample of 3000 UK residents. The outcome measures were: levels of dental anxiety, which were measured on the Corah Dental Anxiety Scale (DAS), and the impact of OHQOL, which was assessed using UK oral health-related quality of life instrument (OHQoL-UK (W)). **Results:** DAS was correlated with OHQoL-UK (W) scores ($P < 0.01$). Having controlled for

sociodemographic factors (age, gender and social class) and oral health status factors (self-reported number of teeth possessed and denture status), known confounding factors associated with OHQOL, those with high levels of dental anxiety (DAS \geq or = 15) were approximately two times as likely to be among those experiencing the poorest OHQOL (below the population median OHQoL-UK (W) score) in Britain ($P < 0.001$; OR = 1.93; 95% CI 1.41, 2.65). **CONCLUSION:** Dental anxiety is associated with the impact oral health has on life quality. Those experiencing high levels of dental anxiety are among those with the poorest oral health-related quality of life in Britain.

McGrath, C. P. J., Alkhatib, M. N., Al Munif, M., Bedi, R. & Zaki, A. S. (2003) Translation and validation of an Arabic version of the UK oral health related quality of life measure (OHQoL-UK) in Syria, Egypt and Saudi Arabia. *Community Dental Health* **20**, 241-245.

OBJECTIVE: The aim of this study was to translate and evaluate the performance of an oral health related quality of life measure--an Arabic version of OHQoL-UK in three middle eastern countries: Syria, Egypt and Saudi Arabia. **BASIC RESEARCH DESIGN:** Following forward and backwards translation of OHQoL-UK into Arabic and pilot testing the Arabic version among focus groups, a questionnaire containing the instrument was administered to 1,000 adults from the three Arab countries. In addition, the study participants were interviewed about their oral health status, experience of oral health problems in the past year, self-rating of oral health and also some socio-demographic information was collected. **RESULTS:** Among the three study populations, variations in OHQoL-UK scores were apparent in relation to socio-demographic factors ($p < 0.01$), self-

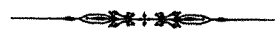
reported number of teeth possessed ($p < 0.001$) and experience of oral health problems in the past year ($p < 0.01$) which supports the construct validity of the instrument. Furthermore, variations in OHQoL-UK scores were apparent in relation to self-rating of oral health status ($p < 0.01$) which supports the criterion validity of the measure. The internal reliability of the instrument was high in the three groups with Cronbach alpha values of above 0.90, indicating good internal consistency. **CONCLUSION:** The Arabic version of OHQoL-UK, an index of oral health related quality of life demonstrated satisfactory construct validity, criterion validity and internal reliability in Syria, Egypt and Saudi Arabia. This provides further evidence of the instrument's psychometric properties and its cross cultural use.



McGrath, C. P. J., Broder, H. & Wilson-Genderson, M. (2004) Assessing the impact of oral health on the life quality of children: implications for research and practice. *Community Dentistry and Oral Epidemiology* **32**, 81-85.

Traditionally, child oral health has been assessed using clinical parameters of disease and deformity. However, there is a growing interest in the psychosocial impact of oral health among children. This commentary outlines the value and need for assessing child oral health-related quality of life (COHQoL). COHQoL has implications for oral health needs assessment (at an individual and population level) and for evaluating outcomes from specific treatments, initiatives and dental services overall. In addition, it could prove to be a useful

adjunct tool for evidence-based dentistry research and practice. Theoretical and practical considerations in assessing the complex psychosocial construct of oral health among children are discussed: the use of general versus oral health-specific measures, the development of tools for children, the use of generic versus condition-specific measures, and the measurement of 'positive' oral health. Recommendations for research and practice are presented.



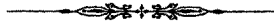
McGrath, C. P. J., Comfort, M. B., Lo, E. C. M. & Luo, Y. (2003) Can third molar surgery improve quality of life? A 6-month cohort study. *Journal of Oral and Maxillofacial Surgery* **61**, 759-763.

PURPOSE: In this study, we evaluated patients' perceptions of changes in oral health-related quality of life (OHQOL) over a 6-month period after third molar surgery. **Patients and Methods:** One hundred patients participated in this prospective study. Two

specific OHQOL measures, the 14-item Oral Health Impact Profile (OHIP-14) and the 16-item UK Oral Health-Related Quality of Life measure (QHqoL-UK), were administered to the study group before surgery. Standardized surgical and analgesic protocols

were used. Patients kept a diary of changes in life quality each postoperative day (POD) for 7 days and were contacted at 1, 3, and 6 months after surgery. RESULTS: Both measures identified a significant deterioration in quality of life in the immediate postoperative period ($P < .01$). However, there was an improvement in OHQOL compared with preoperative status at 1 ($P < .05$), 3 ($P < .05$), and 6 ($P < .01$) months after surgery. Patients perceived

physical, social, and psychologic changes in life quality after surgery. Previous pericoronitis was associated with changes in quality of life ($P < .05$). CONCLUSION: The study concludes that third molar surgery is associated with changes in OHQOL. This has implications for understanding the value of third molar surgery from patients' perspectives and in assessing health gain.



McGrath, C. P. J., Hegarty, A. M., Hodgson, T. A. & Porter, S. R. (2003) Patient-centred outcome measures for oral mucosal disease are sensitive to treatment. *The International Journal of Oral and Maxillofacial Surgery* **32**, 334-336.

The aim of this study was to evaluate the sensitivity of two patient-centred outcome measures to the topical application of a corticosteroid (betamethasone) in the treatment of oral lichen planus (OLP). Forty-eight patients with clinical and histological features of OLP were recruited to take part in a 6-week study of the effectiveness of topical betamethasone for the treatment of symptomatic OLP. Participants completed a questionnaire incorporating the 16-item UK Oral Health Related Quality Of Life measure (OHQOL) and the 14-item Oral Health Impact Profile (OHIP-14), rated their pain on 'global' and visual analogue scales (VAS) and

underwent an oral examination, at the start and end of the trial. Four (8%) patients failed to complete the study. The clinical signs of OLP had improved for half (22) of the patients following treatment. Twenty-nine (66%) reported that their oral pain had reduced ('global' scale). More objectively, there were significant differences in VAS ratings of pain ($P = 0.005$), OHIP-14 scores ($P = 0.036$) and OHQOL scores ($P = 0.003$) between the start and end of the trial. In conclusion, both OHQOL and OHIP-14, patient-centred outcome measures are sensitive to the clinical effects of topical betamethasone in the treatment of oral lichen planus.



McMillan, A. S. & Wong, M. C. M. (2004) Emotional effects of tooth loss in community-dwelling elderly people in Hong Kong. *The International Journal of Prosthodontics* **17**, 172-176.

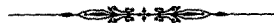
PURPOSE: This study investigated the emotional effects of tooth loss among community-dwelling elderly people in Hong Kong and compared the effects among edentulous and partially dentate elderly. MATERIALS AND METHODS: A questionnaire study involved 233 southern Chinese elderly who were recruited and interviewed at social centers for elderly people throughout Hong Kong. Data were analyzed using chi-square or chi-square exact tests. RESULTS: Twenty-two percent of the participants reported difficulty accepting tooth loss, with no difference between the edentulous and partially dentate. However, 95% stated that their confidence was unaffected. For more than half of elderly people, tooth loss had a negative effect on food choice and

enjoyment of food, with removable denture wearers having greater restrictions. Avoiding going out, eating in public, and forming close relationships were less-common problems. Twenty-two percent felt unprepared for the effects of tooth loss, and more than half said that better communication with the dentist would have helped. CONCLUSION: The emotional effects of tooth loss were not marked among elderly people, and there were no differences between edentulous and partially dentate individuals. However, significant disability was experienced because of restrictions in daily living activities. Restrictions were more severe in people who had lost enough teeth to necessitate denture wearing.

McMillan, A. S., Leung, K. C. M., Leung, W. K., Wong, M. C. M., Lau, C. S. & Mok, T. M. Y. (2004) Impact of Sjogren's syndrome on oral health-related quality of life in southern Chinese. *Journal of Oral Rehabilitation* **31**, 653-659.

The effect of oral symptoms of Sjogren's syndrome (SS) on health-related quality of life is presently uncertain. This study aimed to investigate oral health-related quality of life (OHRQOL) among southern Chinese people with SS. Twenty-six primary SS cases, 25 secondary cases and 29 matched controls took part in this cross-sectional study. Each participant completed a SF-36 questionnaire, the Oral Health Impact Profile and a dry mouth measure, assisted by a trained interviewer. Data on socio-demographic variables were also collected. The dry mouth measure revealed that people with primary and secondary SS had significant problems associated with subjective symptoms of dry mouth generally,

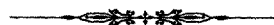
and dry mouth when eating and speaking ($P < 0.01$). Sticky saliva and coughing were also problems in some primary SS cases. OHIP summary and sub-scale scores did not reveal differences in negative impacts between groups. Mean SF-36 sub-scale scores were significantly different between groups ($P < 0.05$). In physical function, role-physical and general health domains, primary and secondary SS sufferers had lower scores indicating poorer health. Oral symptoms of SS, notably xerostomia, had a negative effect on OHRQOL. Health-related quality of life in general was also impaired in SS sufferers. The OHIP did not appear to discriminate oral problems of concern to SS sufferers.



McMillan, A. S., Pow, E. H., Leung, W. K., Wong, M. C. M. & Kwong, D. L. (2004) Oral health-related quality of life in southern Chinese following radiotherapy for nasopharyngeal carcinoma. *Journal of Oral Rehabilitation* **31**, 600-608.

Although the complications of head and neck radiotherapy in the treatment of nasopharyngeal carcinoma (NPC) have been described, there is limited information on the effect of oral complications on oral health related quality of life. The aim of this study was to describe the psychosocial and functional impact of oral conditions in southern Chinese following radiotherapy for NPC. A cross-sectional study design was used with a sample of 109 subjects including NPC survivors, newly diagnosed NPC cases and a control group. Oral health related quality of life was assessed through the SF-36 and the Oral Health Impact Profile measures and a dry mouth measure. Data on socio-

demographic variables and treatment seeking were also collected. The psychosocial and functional impact of oral conditions as revealed by the health status measures was significantly greater in NPC survivors than newly diagnosed NPC cases and controls. The oral specific and condition specific measures appeared to discriminate more effectively between groups than the generic measure. NPC survivors sought significantly more dental treatment than the other groups. The oral complications of radiotherapy for NPC, notably sequelae of salivary gland damage, have a significant negative effect on oral health related quality of life and result in an increased burden of dental care in the long-term.



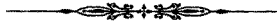
Mombelli, A. & Samaranayake, L. P. (2004) Topical and systemic antibiotics in the management of periodontal diseases. *International Dental Journal* **54**, 3-14.

Both systemic and topical antibiotics are increasingly used in the management of periodontal infections. Whilst these drugs are used mostly on an empirical basis, some contend that rational use of antibiotics should be the norm due to their wide abuse and consequential global emergence of antibiotic resistance

organisms. Here we review the rationale and principles of antimicrobial therapy, treatment goals, drug delivery routes and various antibiotics that are used in the management of periodontal diseases. The pros and cons of systemic and local antibiotic therapy are described together with practical guidelines for

their delivery. The available data indicate, in general, that mechanical periodontal treatment alone is adequate to ameliorate or resolve the clinical condition in most cases, but adjunctive antimicrobial agents, delivered either locally or systemically, can enhance the effect of therapy in specific situations. This is particularly true for aggressive (early onset) periodontitis, in patients with generalised systemic disease that may affect host resistance and in case of poor response to conventional mechanical therapy.

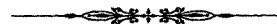
Locally delivered antibiotics together with mechanical debridement are indicated for non-responding sites of focal infection or in localised recurrent disease. After resolution of the periodontal infection, the patient should be placed on an individually tailored maintenance care programme. Optimal plaque control by the patient is of paramount importance for a favourable clinical and microbiological response to any form of periodontal therapy.



Mortada, A. & King, N. M. (2004) A simplified technique for the restoration of severely mutilated primary anterior teeth. *The Journal of Clinical Pediatric Dentistry* **28**, 187-192.

The restoration of severely carious primary anterior teeth is a challenge to the pediatric dentist. The introduction of new materials and technologies makes re-evaluation of existing treatment philosophies necessary. A technique involving the placement of an omega shaped stainless steel wire extension into the entrance of the root canal prior to restoring the

crown with a compomer material is described. 96 restorations were placed in 25 children. After 18 months 81.2% of the 96 restorations, which were available for evaluation, 60 (79.9%) were intact. The technique for restoring primary anterior teeth was simple, quick and effective.



Needleman, I., McGrath, C. P. J., Floyd, P. & Biddle, A. (2004) Impact of oral health on the life quality of periodontal patients. *Journal of Clinical Periodontology* **31**, 454-457.

OBJECTIVES: To assess the impact of oral health on the life quality of a periodontal patient group. **MATERIALS AND METHODS:** Two hundred and five patients attending a private periodontal clinic completed a questionnaire incorporating the 16-item UK oral health-related quality-of-life measure (OHQoL-UK), a check list of questions about their periodontal health over the past year and a comprehensive periodontal examination. **RESULTS:** The effect of oral health on quality of life was considerable, with many individuals experiencing negative impacts across a broad range of physical, social and psychological aspects of life quality. OHQoL-UK(Copyright) scores was associated with

patient's self-reported periodontal health in the past year: experiences of "swollen gums" ($p < 0.01$), "sore gums" ($p < 0.01$), "receding gums" ($p < 0.01$), "loose teeth" ($p < 0.01$), "drifting teeth" ($p < 0.01$), "bad breath" ($p < 0.01$) and "toothache" ($p < 0.01$). In addition, OHQoL-UK scores were correlated with the number of teeth with pocket depths of 5 mm or more ($r(s) = 0.42$, $p < 0.01$). New patients had poorer oral health-related quality of life compared with the treated maintenance group ($p < 0.01$). **CONCLUSIONS:** Periodontal status impacts on life quality. This has implications in understanding the consequences of periodontal health and in the use of patient-centred outcomes in periodontal research.



Newsome, P. R. H (2003) Current issues in dental practice management. Part 1. The importance of shared values. *Primary Dental Care* **10**, 37-39.

There can be few who would argue with the notion that the nature of dental practice in the United Kingdom has changed dramatically over the last

couple of decades. A variety of factors, including new clinical techniques, growing consumerism, a much greater awareness of health-related and well-

being issues in the public at large, as well as a marked deregulation within the dental profession, the development of vocational training and recently mandatory lifelong learning, the growing number of females working in the profession, and an increasing reluctance of young dentists to finance dental practices have all combined to create an environment which has enabled and encouraged a move away from traditional forms of dental care delivery. Instead, there has been considerable growth in independently-funded practice and a commensurate growth in the number of practices operating under a corporate body umbrella of one form or another. Currently there are 27 corporate bodies registered with the General Dental Council (GDC) with the likelihood of more in the future given the proposed GDC review. This will no doubt take into consideration European law, under which the restriction within the Dentist's Act on the number of corporate bodies is likely to be untenable. Although they still have only a small share of the dental market--with 4% of all dentists in the UK in 1999--they have expanded rapidly from a small base. The data available at the time the paper was written indicate that the global total of fees earned from dentistry in the UK in the financial year 2001/2002 was almost 3 billion Pounds, of which 1.9 billion Pounds (64%) came from NHS fees and 1.1 billion Pounds (36%) from private fees. Of this 1.9 billion Pounds received in NHS fees in 2001/2002, 0.55 billion Pounds were paid by patients who were not exempt from charges, bringing the total amount actually paid out of patients' pockets for dental treatment to 1.65 billion Pounds. Compare these

figures with 1996/1997 when NHS fees stood at 1.6 billion Pounds (71%) and private fees at 0.6 billion Pounds (29%) and it can be seen that while the size of the whole market has grown NHS fees have risen by around 18% while private sector fees have gone up by 64% during the same period. It cannot be said therefore that NHS dentistry has disappeared although it is clear that access to NHS dentistry has been and may still be difficult in some parts of the country. The Department of Health in England has responded by developing 'access centres' and in the recently published Options for Change sets out sweeping proposals to revitalise NHS dentistry and delegate decisions over funding to a local level. It is far from clear what the consequences of these changes will be. However, one possible scenario is that in many parts of the UK, although relief of pain, prevention and restoration of function will be funded by the NHS, other than in 'special circumstances' such as after trauma and inherited conditions 'cosmetic embellishment' will not be funded. In which case, ever increasing public interest in personal appearance may well lead to further growth in private dentistry. Against a background of change and uncertainty, this series of articles explores some of the issues facing dentists coming to terms with working in this brave new world. This first part examines an aspect of dental practice that is seldom discussed openly and yet is of such fundamental importance that it is the cornerstone of all successful practices and the main fault line in unsuccessful ones, namely the nature and strength of practice values.



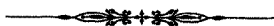
Newsome, P. R. H (2003) Current issues in dental practice management. Part 2. Pricing policy in dental practice. *Primary Dental Care* 10, 69-72.

This is the second in a series of articles exploring some of the issues facing dentists coming to terms with working in the 'brave new world'. It examines the complex issues of understanding how pricing

works, determining the price of a product or service, communicating this to customers, and understanding how people perceive prices and price changes.



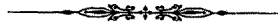
Newsome, P. R. H (2003) Current issues in dental practice management. Part 3. Attracting and keeping patients. *Primary Dental Care* 10, 109-112. (Review Article)



Newsome, P. R. H. (2003) From I don't care to customer care. An evolution in patient expectation. *Dental Update* **30**, 488-490.

This paper explores the way that the delivery of dental care has changed over the past three decades. Comparisons are made between dentistry and other

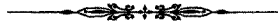
business fields to show how the profession has moved in line with shifts in societal attitudes.



Newsome, P. R. H. & Wolfe, I. S. (2003) Value gaps in dental practice: understanding how differences in core values can adversely affect the practice. *The Journal of the American Dental Association* **134**, 1500-1504.

BACKGROUND: The authors explore the importance of human values in dental practice, an area often overlooked as we struggle to deal with the everyday demands of treating patients and managing staff members. Such values are, however, fundamental to the success of any practice; therefore, it is important to understand their significance. **CONCLUSIONS:** Problems arise in dental practices when gaps develop between the values held by the various players involved (that is, between the entire

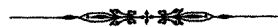
dental team and patients, the dentist/owner's personal values and business goals, the dentist/owner and staff members, and the dental practice and any third-party funding organizations). **PRACTICE IMPLICATIONS:** By understanding the potentially damaging consequences of value gaps for practice viability, dental practice owners and managers can take steps to create a more harmonious workplace in which all parties strive to reach common goals.



Ng, S. K., Chau, A. W. & Leung, W. K. (2004) The effect of pre-operative information in relieving anxiety in oral surgery patients. *Community Dentistry and Oral Epidemiology* **32**, 227-235.

Appropriate stress management of patients is essential for smooth running of invasive or surgical dental procedures conducted under local anaesthesia. **OBJECTIVE:** The current study analysed the effectiveness of pre-operative information provision for anxiety reduction during dentoalveolar surgery in patients with high- or low-trait anxiety. **METHODS:** Patients scheduled for oral surgical procedures performed by six private dental practitioners were invited to participate in the study. They were randomly assigned to four groups and received the following pre-operative information: (i) basic information only, (ii) basic information with details of the operative procedures, (iii) basic information with details of the expected recovery, and (iv) basic information with details of both the operative procedures and recovery. The participants' trait anxiety level was measured with the Depression Anxiety Stress Scales (DASS), then they were

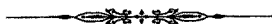
divided into high- or low-trait anxiety groups with the method of median-split on the basis of the DASS score. Self-rated anxiety was recorded immediately before, during and 10 min after the surgical procedures. **RESULTS:** High-trait anxiety subjects gave higher self-reported anxiety levels (repeated-measures ANOVA, $P < 0.05$). Pre-operative provision of details about the expected recovery only or details concerning both the operative procedures and recovery led to significant reduction in self-reported anxiety among the participants throughout the procedure ($P < 0.01$). However, information on operative procedures led to anxiety reduction in low ($P < 0.05$) but not high-trait anxiety participants. **CONCLUSION:** Provision of pre-operative information of the recovery process leads to significant anxiety reduction in all patients who undergo surgical/invasive procedures with local anaesthesia.



Ng, Y. W. & King, N. M. (2004) Is there scientific evidence to support the various steps in the technique for acid etching of enamel? *Dental Asia* 46-52.

The acid etching technique has been responsible for dramatic changes in the practice of restorative, paediatric and preventive dentistry. However, the optimum enamel etching times appear to vary from author to author and the relationship between the

etching patterns and the adhesion of resins seems to be unclear. This paper questions whether all the steps in the technique are necessary by reviewing the evidence for the various steps in the acid etching technique for the bonding of resins to enamel.



Nikawa, H, Fukushima, H, Makihira, S., Hamada, T. & Samaranayake, L. P. (2004) Fungicidal effect of three new synthetic cationic peptides against *Candida albicans*. *Oral Diseases* 10, 221-228.

OBJECTIVE: Peptide antibiotics are considered a new class of antifungal agents. Of these, an alpha-helical, cationic peptide termed Dhvar 4, a relative of salivary histatin has been shown to be an antifungal of relatively high potency. Similarly, lactoferricin B (LFB) and a derivative thereof, LFB(17-30), disrupts the fungal cell membrane and acts against *Candida albicans*. As Dhvar 4 and LFB(17-30), exhibit almost identical amino acid sequences at their C-terminal, we hypothesized that laboratory synthesis of peptides with an alpha-helical structure and having similar amphipathic properties could lead to products with candidacidal activity. Hence, three such peptides - JH8194, JH8195 and JH 8944, were synthesized and their antifungal properties compared with recognized antifungals LFB, LFB(17-30), human lactoferricin (LFH), Histatin-5 and Dhvar 4, against two isolates of *C. albicans*. **MATERIALS AND METHODS:** The antifungal agents were synthesized and their secondary structures evaluated according to a previously described protocol of Situ and Bobek (2000) *Antimicrob Agents Chemother* 44: 1485-1493. The *C. albicans* strains were oral isolates from a human immunodeficiency virus-infected (isolate A2) and a healthy (A6) individual. A standard concentration of yeasts was exposed to a range of dilutions of the agents for a specific duration and the cell death (viability) in terms of the resultant colony forming units ml⁻¹ was quantified. **RESULTS:**

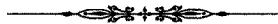
Dhvar 4, showed the most alpha-helical propensity, and was the least fungicidal while LFB and LFB(17-30) showed the highest antifungal potential, and demonstrated total kill of A6, and A2 at 5 and 10 microM concentrations, respectively whilst LFH killed both isolates at a 10 microM concentration. Of the three new synthetic peptides, JH 8194 was the most potent (total kill of A6/A2 strains at 1.25/2.5 microM), followed by JH 8195 (total kill of A6/A2 strains at 5/10 microM while JH 8944 was the least potent as a 25 microM concentration was required to kill either strain of *Candida*. On further analyses of the relationship between pI value of the peptides and their anticandidal activity, a significant positive correlation was noted. In order to rule out a cytotoxic effect of the new synthetic peptides we compared the fungicidal and hemolytic activities under similar incubation conditions using freshly isolated erythrocytes and all three peptides exhibited no detectable hemolysis upto a concentration of 100 microM in contrast to the polyene antifungal amphotericin B that elicited significant initiation of hemolysis at a concentration of 5.0 microM. **CONCLUSION:** Our data suggest that laboratory synthesis of agents with an alpha-helical structure and having amphipathic properties similar to known, natural antifungal agents may be a promising avenue to generate products with improved antifungal activity.



Pine, C. M., Adair, P. M., Burnside, G., Nicoll, A. D., Gillett, A., Borges-Yanez, S. A., Broukal, Z., Brown, J., Declerck, D., Ping, F. X., Gugushe, T., Hunsrisakhun, J., Lo, E. C. M., Naidoo, S., Nyandindi, U., Poulsen, V. J., Razanamihaja, N., Splieth, C., Sutton, B. K., Soo, T. C. & Whelton, H. (2004) Barriers to the treatment of childhood caries perceived by dentists working in different countries. *Community Dental Health* **21**, 112-120.

OBJECTIVE: To explore whether dentists' beliefs and attitudes to providing preventive and restorative dental care for young children can form a barrier to the provision of care. **BASIC RESEARCH DESIGN:** The Barriers to Childhood Caries Treatment (BaCCT) Questionnaire, a standardised international measure was developed and applied. **PARTICIPANTS:** Through a research consortium, each site was asked to recruit 100 dentists. The sample participating was not intended to be nationally representative. Dentists were mainly randomly selected and contacted by mail with one or more mailings depending on site. **RESULTS:** 2,333 dentists in 14 countries and 17 sites participated. Factor analysis identified four factors as potential barriers. Two factors were found to be barriers in many sites. First, in most countries, dentists agreed

that young children's coping skills limit their ability to accept dental care. Secondly, dentists with negative personal feelings, for example, that providing care can be stressful and troublesome and that they feel time constrained. Differences in dentists' beliefs can be partly explained by their work profile, with those treating children often, and those working under systems where they feel they can provide quality care being least likely to identify barriers to providing care for children. **CONCLUSIONS:** The BaCCT Questionnaire was determined to be a valid psychometric measure. Separately, it was found that health systems do impact on dentists' ability to deliver preventive and restorative care for children but that these effects vary across countries and further work is needed to determine how best these should be examined.



Pine, C. M., Adair, P. M., Nicoll, A. D., Burnside, G., Petersen, P. E., Beighton, D., Gillett, A., Anderson, R., Anwar, S., Brailsford, S., Broukal, Z., Chestnutt, I. G., Declerck, D., Ping, F. X., Ferro, R., Freeman, R., Gugushe, T., Harris, R., Lin, B., Lo, E. C. M., Maupome, G., Moola, M. H., Naidoo, S., Ramos-Gomez, F., Samaranayake, L. P., Shahid, S., Skeie, M. S., Splieth, C., Sutton, B. K., Soo, T. C. & Whelton, H. (2004) International comparisons of health inequalities in childhood dental caries. *Community Dental Health* **21**, 121-130.

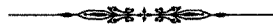
OBJECTIVE: To undertake formative studies investigating how the experience of dental caries in young children living in diverse settings relates to familial and cultural perceptions and beliefs, oral health-related behaviour and oral microflora. **PARTICIPANTS:** The scientific consortium came from 27 sites in 17 countries, each site followed a common protocol. Each aimed to recruit 100 families with children aged 3 or 4 years, half from deprived backgrounds, and within deprived and non-deprived groups, half to be "caries-free" and half to have at least 3 decayed teeth. **OUTCOME MEASURES:** Parents completed a questionnaire, developed using psychological models, on their beliefs, attitudes and behaviours related to their child's oral health. 10% of children had plaque sampled. **RESULTS:** 2,822 children and families were recruited. In multivariate analyses, reported toothbrushing behaviours that

doubled the odds of being caries-free were a combination of brushing before age 1, brushing twice a day and adult involvement in brushing. Analyses combining beliefs, attitudes and behaviours found that parents' perceived ability to implement regular toothbrushing into their child's daily routine was the most important predictor of whether children had caries and this factor persisted in children from disadvantaged communities. 90% of children with lactobacillus had caries. **CONCLUSIONS:** Parental beliefs and attitudes play a key role in moderating oral health related behaviour in young children and in determining whether they develop caries. Further research is indicated to determine whether supporting the development of parenting skills would reduce dental caries in children from disadvantaged communities independent of ethnic origin.

Pine, C. M., Adair, P. M., Petersen, P. E., Douglass, C., Burnside, G., Nicoll, A. D., Gillett, A., Anderson, R., Beighton, D., Jin-You, B., Broukal, Z., Brown, J. P., Chestnutt, I. G., Declerck, D., Devine, D., Espelid, I., Falcolini, G., Ping, F. X., Freeman, R., Gibbons, D., Gugushe, T., Harris, R., Kirkham, J., Lo, E. C. M., Marsh, P., Maupome, G., Naidoo, S., Ramos-Gomez, F., Sutton, B. K. & Williams, S. (2004) Developing explanatory models of health inequalities in childhood dental caries. *Community Dental Health* **21**, 86-95.

OBJECTIVE: Long-term aim is to determine optimum interventions to reduce dental caries in children in disadvantaged communities and minimise the effects of exclusion from health care systems, of ethnic diversity, and health inequalities. **DESIGN:** Generation of initial explanatory models, study protocol and development of two standardised measures. First, to investigate how parental attitudes may impact on their children's oral health-related behaviours and second, to assess how dentists' attitudes may impact on the provision of dental care. **SUBJECTS:** Core research team, lead methodologists, 44 consortium members from 18 countries. To complete the development of the questionnaire, the initial set of items was administered to parents ($n = 23$) with children in nursery schools in Dundee, Scotland and sent to the same parents one week later. A standardised measure examining barriers

to providing dental care for children aged 3 to 6 years was developed. 20 dentists working in primary dental care in Scotland completed the measure on two different occasions separated by one week. **RESULTS:** Explanatory models were developed. Family questionnaire: test-retest reliability excellent ($r = 0.93$ $p < 0.001$) with very good internal reliability ($\alpha = 0.89$). Dentists questionnaire: excellent test-re-test reliability $r = 0.88$, ($\alpha = 0.90$). **CONCLUSIONS:** Interaction between consortium members enhanced the validity of the questionnaires and protocols for different cultural locations. There were challenges in developing and delivering this multi-centre study. Experience gained will support the development of substantive trials and longitudinal studies to address the considerable international health disparity of childhood dental caries.



Pow, E. H. & McMillan, A. S. (2004) A locating splint for placing implant abutments. *The Journal of Prosthetic Dentistry* **91**, 97-98. (Short Communication)



Pow, E. H., McMillan, A. S., Leung, W. K., Kwong, D. L. & Wong, M. C. M. (2003) Oral health condition in southern Chinese after radiotherapy for nasopharyngeal carcinoma: extent and nature of the problem. *Oral Diseases* **9**, 196-202.

OBJECTIVE: To measure the oral health status of southern Chinese nasopharyngeal carcinoma (NPC) survivors 1-4 years after radiotherapy. **SUBJECTS AND METHODS:** A total of 109 subjects participated in this cross-sectional study. Thirty-eight subjects were NPC survivors, 40 subjects were patients newly diagnosed with NPC and 31 were healthy subjects. Verified clinical examination techniques were used to assess limitation of jaw opening, the presence of mucositis, candidiasis, dental caries, periodontal disease [community periodontal index (CPI)] including attachment loss (ALoss) and prosthetic status/need. Differences among three

groups were tested by chi-squared and Kruskal-Wallis tests. Relationships between selected clinical variables and radiation parameters were analysed using Spearman's rank correlation coefficients. **RESULTS:** The NPC survivors attended for dental treatment more frequently than the other groups ($P < 0.01$). NPC survivors had significant xerostomia (92%, $P < 0.01$), trismus (29%, $P < 0.01$), a higher prevalence of clinical candidiasis (24%, $P < 0.01$), a greater DMFT (16.4 \pm 7.0, $P < 0.01$), more decay/filled roots (2.1 \pm 2.9, $P = 0.01$) compared with new NPC patients and controls. No difference was found in CPI, ALoss, prosthetic status and need

between groups. Dry mouth and tooth hypersensitivity were the most common oral problems perceived by the NPC survivors.

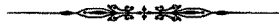
CONCLUSION: Despite having regular dental follow-ups, oral health was compromised in NPC survivors 1-4 years postradiotherapy.



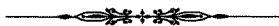
Pow, E. H., McMillan, A. S., Leung, W. K., Wong, M. C. M. & Kwong, D. L. (2003) Salivary gland function and xerostomia in southern Chinese following radiotherapy for nasopharyngeal carcinoma. *Clinical Oral Investigations* 7, 230-234.

Nasopharyngeal carcinoma (NPC) is rare among Caucasians but very common among southern Chinese. No information is presently available on the relationship between salivary gland function and xerostomia in irradiated southern Chinese. Salivary gland function and xerostomia were measured in irradiated NPC patients, recently diagnosed NPC patients, and a matched control group. Stimulated whole saliva was collected from each participant and flow rate, pH and buffer capacity measured. All participants completed a multi-item dry mouth questionnaire. Comparisons were made using Chi-square and Mann-Whitney tests and correlations assessed using Spearman's rank correlation

coefficients. The mean saliva flow rate and pH were significantly lower and the buffer capacity impaired in irradiated NPC patients compared with the other groups ($P < 0.01$). Significantly more irradiated NPC patients had negative impacts associated with dry mouth generally, sticky saliva, and hoarse voice ($P < 0.01$). Subjective dry mouth symptoms and associated reduced saliva flow were also relatively common in non-irradiated participants. Salivary gland hypofunction and xerostomia were major complications in irradiated NPC patients. In irradiated and non-irradiated southern Chinese, subjective dry mouth symptoms appeared to be correlated with actual salivary gland function.



Rabie, A. B., Chayanupatkul, A. & Hagg, U. (2003) Stepwise advancement using fixed functional appliances. Experimental perspective. *Seminars in Orthodontics* 9, 41-46. (Review Article)



Rabie, A. B., Tang, G. H., Xiong, H. & Hagg, U. (2003) PTHrP regulates chondrocyte maturation in condylar cartilage. *Journal of Dental Research* 82, 627-631.

PTHrP is a key factor regulating the pace of endochondral ossification during skeletal development. Mandibular advancement solicits a cascade of molecular responses in condylar cartilage. However, the pace of cellular maturation and its effects on condylar growth are still unknown. The purpose of this study was to evaluate the pattern of expression of PTHrP and correlate it to cellular dynamics of chondrocytes in condylar cartilage during natural growth and mandibular advancement. We fitted 35-day-old Sprague-Dawley rats with functional appliances. Experimental animals with

matched controls were labeled with bromodeoxyuridine 3 days before their death, so that mesenchymal cell differentiation could be traced. Mandibular advancement increased the number of differentiated chondroblasts and subsequently increased the cartilage volume. Higher levels of PTHrP expression in experimental animals coincided with the slowing of chondrocyte hypertrophy. Thus, mandibular advancement promoted mesenchymal cell differentiation and triggered PTHrP expression, which retarded their further maturation to allow for more growth.



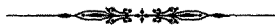
Rabie, A. B., Wong, L. & Hagg, U. (2003) Correlation of replicating cells and osteogenesis in the glenoid fossa during stepwise advancement. *Acta Chirurgiae Orthopaedicae et Traumatologiae Cechoslovaca* **123**, 521-526.

The purposes of this study were to quantify the number of replicating mesenchymal cells and to correlate it with the amount of new bone formed in the glenoid fossa during stepwise advancement. We randomly divided 250 female Sprague-Dawley rats, 35 days old, into 10 control groups (n = 5) and 20 experimental groups (n = 10). Fifty rats from the stepwise experimental group received initial advancement of 2 mm and another 1.5 mm of advancement on day 30 by the addition of veneers. On days 3, 7, 14, 21, 30, 33, 37, 44, 51, and 60, the rats were killed. One hour before that, the rats were injected with bromodeoxyuridine (BrdU) intravenously. We cut 7-microm tissue sections through the glenoid fossa sagittally and stained them with anti-BrdU antibody to evaluate the number of

replicating mesenchymal cells. During the first advancement, the number of replicating cells in the posterior region of the glenoid fossa showed a significant increase compared with natural growth, but a significant decrease compared with 1-step advancement. On the second advancement, however, an increase in the number of replicating cells was observed on day 37 with a subsequent and significant increase in bone formation on day 44. Mandibular advancement conducted in a stepwise fashion increases the number of replicating mesenchymal cells in the glenoid fossa. However, a minimum threshold of strain must first be exceeded before these mesenchymal cells can differentiate to ultimately form new bone.



Rabie, A. B., Wong, R. W. & King, N. M. (2003) The effect of differential torque control on gingival margins: A case report. *Journal of the Thai Association of Orthodontists* **2**, 30-34. (Case Report)



Rabie, A. B., Xiong, H & Hagg, U. (2004) Forward mandibular positioning enhances condylar adaptation in adult rats. *European Journal of Orthodontics* **26**, 353-358.

The aim of this investigation was to assess quantitatively the adaptive changes in the condyles of adult rats to forward mandibular positioning. The level of types II and X collagen expressed in the condyles of adult rats was compared with that formed in response to forward mandibular positioning and the levels of expression were correlated to the amount of bone formed in response to mandibular advancement. Seventy-eight 120-day-old female Sprague-Dawley rats were included in this study. The rats were randomly allocated to six groups. Each group consisted of nine rats with bite-jumping devices and four untreated controls. The animals in each group were sacrificed on days 3, 7, 14, 21, 30, and 60. Immunostaining was used for the detection

of types II and X collagen, while Alcian blue-PAS was used to observe the extracellular matrix and new bone formation. The results showed that new cartilage was formed in the posterior condyle. The highest level of expression of types II and X collagen were present on day 21, the amount of increase was 247.99 and 540.08 per cent, respectively. The highest level of new bone formation was measured at day 30 of advancement when the amount of increase in new bone formation was 318.91 per cent. These findings indicate that forward mandibular positioning causes changes in the biophysical environment of the temporomandibular joint (TMJ) of adult rats that leads to condylar adaptation.



Rees, J. S., Jin, L. J., Lam, S., Kudanowska, I. & Vowles, R. (2003) The prevalence of dentine hypersensitivity in a hospital clinic population in Hong Kong. *Journal of Dentistry* **31**, 453-461.

OBJECTIVES: Dentine hypersensitivity is a common clinical finding with a wide variation in prevalence values. The aim of this study was to establish the prevalence of dentine hypersensitivity and to examine some associated aetiological factors in a cross-sectional study of patients visiting the Periodontology and Oral Hygiene Clinic at Prince Phillip Dental Hospital, Hong Kong over a three-week period. **METHODS:** 226 patients were examined over a three-week period using a triple syringe to administer a blast of cold air to confirm

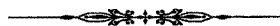
the diagnosis of dentine hypersensitivity. Additional factors such as smoking habits, initiating stimuli, gingival recession and cervical tooth surface loss were noted. **RESULTS:** 153 patients were diagnosed as having dentine hypersensitivity, giving a prevalence figure of 67.7%. The commonest teeth affected were the lower incisors and the commonest initiating factor was cold drinks. **CONCLUSIONS:** The prevalence of dentine hypersensitivity in a hospital periodontology clinic population in Hong Kong was 67.7%.



Ren, L., Jin, L. J. & Leung, W. K. (2004) Local expression of lipopolysaccharide-binding protein in human gingival tissues. *Journal of Periodontal Research* **39**, 242-248.

BACKGROUND: Lipopolysaccharide-binding protein (LBP) functions as a crucial molecule in innate host defense responses to bacterial challenge through neutralization of bacterial lipopolysaccharide (LPS) and activation of cellular responses. **OBJECTIVES:** This study was to investigate the expression profile and levels of LBP in gingival tissues and their associations with periodontal health and disease. **METHODS:** Gingival biopsies were collected from 44 chronic periodontitis patients, including periodontal pocket tissues (PoTs) and the adjacent healthy gingival tissues (HT-Ps), as well as from 15 periodontally healthy subjects as controls (HT-Cs). The peptide and mRNA of LBP were detected by semi-quantitative immunohistochemistry and reverse transcription-polymerase chain reaction (RT-PCR), respectively. **RESULTS:** LBP peptide was detected in 90.9% of

PoTs (20/22), 84.6% of HT-Ps (11/13) and all HT-Cs (7/7). The expression of LBP was mainly confined to the cytoplasm of granular and keratinized layers of gingival epithelium, spreading from the oral sulcular epithelium to oral epithelium with the expression density decreasing gradually from coronal to apical portion. LBP peptide was also found on endothelial surfaces and/or inside the lumens of blood vessels in connective tissues. The mean LBP expression levels in HT-Cs were significantly higher than those in HT-Ps and PoTs. LBP mRNA was detected in 55% of PoTs (11/20), 55% of HT-Ps (11/20) and 75% of HT-Cs (6/8). **Conclusions:** We for the first time found the expression of LBP peptide and mRNA in human gingival tissues. Local expression of LBP in gingival tissues might contribute to periodontal homeostasis.



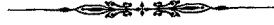
Rodrigo, M. R., Irwin, M. G., Tong, C. K. & Yan, S. Y. (2003) A randomised crossover comparison of patient-controlled sedation and patient-maintained sedation using propofol. *Anaesthesia* **58**, 333-338.

This randomised, crossover study compared patient-controlled sedation using boluses of propofol and patient-maintained sedation using a target-controlled infusion of propofol. Twenty-three patients aged 18-35 years having surgical removal of bilateral third molar teeth under local anaesthesia during two

separate visits were studied. In the majority of patients, both techniques provided moderate sedation, good operating conditions, stable physiological parameters and a high degree of patient satisfaction. Two patients became over-sedated during patient-controlled sedation. The time taken

for titration to adequate sedation was longer with patient-maintained sedation than with patient-controlled sedation [mean (SD) = 8.6 (3.7) min vs. 5.7 (3.1) min, $p < 0.005$]. The mean overall propofol

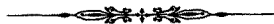
consumption was similar with both techniques. The majority of patients preferred patient-maintained sedation to patient-controlled sedation, $p < 0.05$.



Samaranayake, L. P. (2004) Severe Acute Respiratory Syndrome (SARS) and dentistry: Lessons for the future. *Dental Asia* 10-18.

Severe Acute Respiratory Syndrome (SARS) could be considered the first severe, infectious disease with devastating consequences that emerged in the 21st Century. The World Health Organization has estimated the economic cost of the disease in the region of US\$30 billion in the Far-East alone. Fortunately however, up until now, not a single dental care worker has been instrumental in

transmitting SARS nor has any SARS patient been documented to have contracted the disease through a dental clinic/office setting. This is thought to be due to the rigorous universal infection control measures the dental community is currently practicing as well as the acute febrile nature of the initial phase of the disease which obviates SARS patients visiting the dentist, for routine dentistry.



Samaranayake, L. P. & Peiris, J. S. M. (2004) Severe Acute Respiratory Syndrome (SARS) and dentistry: a retrospective view. *Journal of the American Dental Association* **165**, 1292-1302.

BACKGROUND: Severe acute respiratory syndrome, or SARS, which has created panic in Asia and in some parts of North America, is the first epidemic of the new century. Although it has been well-contained, sporadic cases continue to emerge. **OBJECTIVES:** The authors trace the emergence of the SARS outbreak from southern China and its spread worldwide, discuss the viral etiology of the infection and its clinical features, and review the infection control guidelines issued during the outbreak by the health authorities in Hong Kong, the Centers for Disease Control and Prevention, the World Health Organization and the American Dental Association. They also review the prospects for a new outbreak and preventive measures. **OVERVIEW:** The disease, which is caused by a novel coronavirus termed the "SARS coronavirus," or SARS-CoV, essentially spreads through droplet infection and affects people

of any age. It has a mortality rate ranging from 10 to 15 percent. A major hallmark of this disease has been the rate at which it has affected health care workers through nosocomial transmission; in some countries, up to one-fourth to one-third of those infected were in this category. However, no dental health care worker has been affected by SARS in a nosocomial or dental setting. **CONCLUSIONS AND CLINICAL IMPLICATIONS:** Researchers believe that a combination of factors, including the universal infection control measures that the dental community has implemented and/or the low degree of viral shedding in the prodromal phase of SARS, may have obviated the spread of the disease in dental settings. The dental community should reflect on this outbreak to reinforce the currently applied infection control measures.



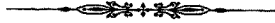
Samman, N. (2004) Secondary cleft lip nose correction. *Indonesian Journal of Oral and Maxillofacial Suppl.* **7**, 36-37.

Secondary (or residual) deformity of the lip and nose after surgical repair of a cleft is a common finding. Although the degree of severity varies, surgical

correction almost always leads to less than perfect results but with significantly improved outcome for the patient. Unilateral and bilateral lip and nose

deformities will be described, and the variety of surgical options demonstrated. Emphasis will be placed on the role of septoplasty in improving the results of rhinoplasty, the sequencing of treatment

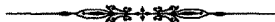
when a combined deformity of the lip and the nose exist, and the relationship of soft tissue deformity to the underlying skeletal elements.



Sham, A. S., Cheung, L. K., Jin, L. J. & Corbet, E. F. (2003) The effects of tobacco use on oral health. *Hong Kong Medical Journal* 9, 271-277.

OBJECTIVE: To review the effects of tobacco use on oral health, with particular emphasis on the effects of periodontal diseases, dental implant failures, and risk of development of oral cancers and precancers. **DATA SOURCES:** Medline literature search (1977-2002). **STUDY SELECTION:** Key words for the literature search were 'tobacco smoking', 'periodontal disease', 'dental implant', and 'oral cancers and precancers'. **DATA EXTRACTION:** Evidence-based literature review. **DATA SYNTHESIS:** The prevalence and severity of periodontal diseases in their various forms are higher among smokers than among non-smokers. The success of dental implant treatments is significantly influenced by addiction to tobacco smoking. The failure rate of implant

osseointegration is considerably higher among smokers, and maintenance of oral hygiene around the implants and risk of peri-implantitis are adversely affected by smoking. The risks of developing oral cancers and precancers are greater in smokers. Betel nut chewing and smokeless tobacco produce similar risk to cancer incidence as tobacco smoking. Cessation of tobacco use has a beneficial effect on halting the progression of periodontal diseases and on the outcome of periodontal therapy. **CONCLUSIONS:** Medical and dental teams should be aware of oral problems associated with tobacco use. Counselling on smoking cessation and smoking prevention programmes should be an integral component of medical and dental teaching and practice.



Sham, A. S., Chu, F. C., Chai, J. & Chow, T. W. (2004) Color stability of provisional prosthodontic materials. *The Journal of Prosthetic Dentistry* 91, 447-452.

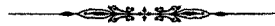
STATEMENT OF PROBLEM: Discoloration of provisional prosthodontic materials may result in patient dissatisfaction and additional expense for replacement. **PURPOSE:** The purpose of this study was to determine the color stability of 5 provisional prosthodontic materials before and after immersion in distilled water or coffee for 20 days or exposure to ultraviolet (UV) light for 24 hours. **MATERIAL AND METHODS:** A total of 105 disc-shaped specimens (20±0.1 mm by 1±0.05 mm) were fabricated with 5 provisional prosthodontic materials: polyethyl methacrylate resins (Trim II), polymethyl methacrylate resins (Duralay; Alike), and bis-acryl methacrylate resin (Luxatemp; Integrity), according to manufacturers' instructions (n=21). Seven specimens of each material were randomly selected and immersed individually in distilled water (60 degrees C) or coffee (37 degrees C) for 20 days or exposed to UV irradiation for 24 hours, respectively. Color was measured as CIE L*a*b* with a colorimeter before and after the immersion or UV exposure. Color change (Delta E)

was calculated and data were analyzed with 1-way ANOVA and the Tukey multiple comparisons test (alpha=.05). **RESULTS:** For specimens immersed in water, the color change of bis-acryl-methacrylate-based provisional materials (Integrity and Luxatemp) was significantly less than that of 3 methyl/ethyl methacrylate-based provisional materials (Trim II, Alike, and Duralay) (P<.002). After immersion in coffee, the 3 methyl/ethyl methacrylate-based provisional materials exhibited significantly less color change compared to the 2 bis-acryl methacrylate-based provisional materials (P<.0001). After ultraviolet irradiation, 2 bis-acryl methacrylate-based provisional materials showed significantly less color change than any of the 3 methyl/ethyl methacrylate-based provisional materials (P<.0001). **CONCLUSION:** Luxatemp and Integrity (bis-acryl-methacrylate-based resins) demonstrated acceptable color stability and were the most color-stable provisional prosthodontic materials tested compared to the methyl/ethyl methacrylate-based resins.

Shum, L., Rabie, A. B. & Hagg, U. (2004) Vascular endothelial growth factor expression and bone formation in posterior glenoid fossa during stepwise mandibular advancement. *Acta chirurgiae orthopaedicae et traumatologiae Cechoslovaca* **125**, 185-190.

This study assessed the amount of vascular endothelial growth factor (VEGF) expression and related the findings to new bone formation in the posterior glenoid fossa during stepwise mandibular advancement. A total of 250 female Sprague-Dawley rats, 35 days old, were randomly divided into 10 groups, each including 5 control and 20 experimental rats. Within each group, 10 experimental rats were fitted with functional appliances with a 1-step advancement of 3.5 mm. Another 10 were fitted with stepwise appliances with an initial advancement of 2 mm and a subsequent increase to 3.5 mm on day 30. The rats in the experimental groups were killed on days 3, 7, 14, 21, 30, 33, 37, 44, 51, and 60, respectively. The matched controls were killed on the same time points. Sections (7 microm) were cut through the glenoid fossa sagittally and stained with

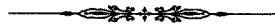
anti-VEGF antibody. VEGF expression in the posterior glenoid fossa was evaluated with a computer-assisted image-analyzing system. Both VEGF expression and new bone formation were greater in the experimental rats than in the controls. During stepwise advancement, initial VEGF expression was less than that of 1-step advancement, but the second advancement elicited another peak on day 44. New bone formation was also less than that of 1-step advancement during early stages of stepwise advancement but then began to increase from day 37 onward. The maximum increase was observed on day 60. Stepwise advancement of the mandible delivers mechanical stimuli that produce a series of tissue responses that lead to increased vascularization and bone formation.



Shum, M. Y. & Wong, R. W. (2004) Lingual orthodontics - a review. *Hong Kong Dental Journal* **1**, 13-20.

The addition of lingual appliances to the world of aesthetic orthodontic appliances has provided the ultimate in aesthetics because they are not visible. Patients with high aesthetic demands seem more interested in this approach and enjoy having

confidence in their smile *before* their braces are removed. This article attempts to review the development and current principles and techniques of lingual orthodontics



Smales, F. C. & Samaranayake, L. P. (2003) Maintaining dental education and specialist dental care during an outbreak of a new coronavirus infection. Part 1: a deadly viral epidemic begins. *British Dental Journal* **195**, 557-561.

During the three months from March 2003 the economically vibrant city of Hong Kong was seriously dislocated after becoming 'second port of call' of the new and potentially fatal disease, Severe Acute Respiratory Syndrome (SARS). The uncertainties during that period had a significant impact on the provision of dental care. However the city's only dental hospital continued to function and to support the Faculty of Dentistry of the University of Hong Kong in educating dental students and other

members of the dental team. At the time of writing no transmissions of the disease have been attributed to procedures associated with dental healthcare. This article chronicles the sequence of events during the outbreak from a dental perspective. It highlights information that may be useful to dental colleagues who might someday be confronted with similar outbreaks of newly emerged potentially lethal infections.



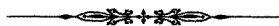
Smales, F. C. & Samaranyake, L. P. (2003) Maintaining dental education and specialist dental care during an outbreak of a new coronavirus infection. Part 2: Control of the disease, then elimination. *British Dental Journal* **195**, 679-681.



Tang, G. H., Rabie, A. B. & Hagg, U. (2004) Indian hedgehog: a mechanotransduction mediator in condylar cartilage. *Journal of Dental Research* **83**, 434-438.

Indian hedgehog (Ihh) is a critical mediator transducing mechanical signals to stimulate chondrocyte proliferation. To clarify the cellular signal transduction pathway that senses and converts mechanical signals into tissue growth in mandibular condyle, we evaluated Ihh expression and its relation to the kinetics of replicating mesenchymal cells in condylar cartilage during natural growth and mandibular advancement. Thirty-five-day-old Sprague-Dawley rats were fitted with functional appliances. Experimental animals with matched controls were doubly labeled with iododeoxyuridine

and bromodeoxyuridine so that we could evaluate the cycles of the proliferative mesenchymal cells. Mandibular advancement triggered Ihh expression in condylar cartilage. A higher level of Ihh expression coincided with the increase of the replicating mesenchymal cells' population and the shortening of the turnover time. These findings suggested that Ihh acts as a mediator of mechanotransduction that converts mechanical signals resulting from anterior mandibular displacement to stimulate cellular proliferation in condylar cartilage.



Tang, G., Samaranyake, L. P., Yip, H K., Chu, F. C., Tsang, P. C. & Cheung, B. P. (2003) Direct detection of *Actinomyces* spp. from infected root canals in a Chinese population: a study using PCR-based, oligonucleotide-DNA hybridization technique. *Journal of Dentistry* **31**, 559-568.

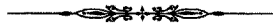
OBJECTIVES: The poor sensitivity of phenotypic identification techniques has hampered the taxonomic differentiation of *Actinomyces*. Hence we developed a sensitive and specific, PCR-based oligonucleotide-DNA hybridization technique to detect *Actinomyces* spp. and, used this method to detect these organisms in samples directly obtained from infected root canals. **METHODS:** A total of 32 samples from 28 Chinese patients, with primary root canal infections, aseptically exposed at the first patient visit, were studied. Whole bacterial genomic DNA was isolated directly from paper point samples. The variable regions of 16S ribosomal DNA of bacteria were amplified and labeled with digoxigenin for further hybridization and detection. A total of seven oligonucleotide probes specific for *A. bovis*, *A. gerencseriae*, *A. israelii*, *A. meyeri*, catalase-negative *A. naeslundii* (genospecies 1 and 2), catalase-positive *A. naeslundii* genospecies 2 and *A. odontolyticus* were used. **RESULTS:** 16 of the 32 teeth were infected with one or more *Actinomyces* species. The prevalence rates of the examined species were: *A. odontolyticus*

31.3%, *A. meyeri* 9.4%, *A. naeslundii* 9.4%, *A. israelii* 6.3% and *A. gerencseriae* 3.1%; no *A. bovis* was detected in any of the canals. Furthermore, *A. odontolyticus* was isolated more frequently from root canals with caries or a history of caries (Fisher's exact test: $P=0.0496$; Odds ratio=9.00, 95% confidence interval: 0.97-83.63), and *A. naeslundii* was significantly associated with traumatized teeth (Fisher's exact test: $P=0.0121$; Odds ratio=57.00, 95% confidence interval: 2.10-1546.90). However, no significant correlation was found between *Actinomyces* spp. and clinical symptoms and signs, such as pain, swelling, percussion to tenderness, sinus and periapical radiolucency. **CONCLUSION:** *Actinomyces* spp. may be important pathogens of root canal infections. *A. naeslundii* in particular may be related with traumatized teeth. *A. odontolyticus* appears to be involved in infections related to caries, exposure of dentinal tubules during cavity preparation and/or leaking restoration, but further clarification with large samples is necessary.

Tang, G., Yip, H. K., Samaranayake, L. P., Chan, K. Y., Luo, G. & Fang, H. H. (2004) Direct detection of cell surface interactive forces of sessile, fimbriated and non-fimbriated *Actinomyces* spp. using atomic force microscopy. *Archives of Oral Biology* **49**, 727-738.

Actinomyces species are predominant early colonizers of the oral cavity and prime mediators of inter-bacterial adhesion and coaggregation. Previous workers have evaluated the adhesion of *Actinomyces* spp. by quantitative assessment of sessile, as opposed to planktonic cells attached to substrates, but did not quantify the cell surface interactive forces. Therefore we used atomic force microscopy to directly detect the interactive force between an approaching silicon tip and sessile *Actinomyces* spp. adhering to a substrate, at nanonewton (nN) range force levels. A total of eight strains each belonging to fimbriated and non-fimbriated *Actinomyces* species were employed, namely *A. bovis*, *A. gerencseriae*, *A. israelii*, *A. meyeri*, *A. naeslundii* genospecies 1 and 2, *A. odontolyticus* and *A. viscosus*. The sterile mica discs, used as the adhesion substrate, were immersed in mono-species bacterial suspensions for five days to obtain a thin bacterial biofilm. Interactive forces were measured using a silicon nitride cantilever attached to a Nanoscope IIIA atomic force microscope. The interactive forces between the approaching silicon nitride tip and bacterial biofilm surfaces were randomly quantified at three different locations on each cell;

namely, the cell surface proper, the periphery of the cell and the substrate and, the interface between two cells. When the interactive forces at these locations of the same species were compared, significantly higher force levels at the cell-cell interface than the other two locations were noted with *A. gerencseriae* ($P < 0.001$), *A. viscosus* ($P < 0.01$) and *A. israelii* ($P < 0.05$). When the interactive forces of different *Actinomyces* spp. at an identical location were compared, fimbriated *A. naeslundii* genospecies 2 showed the greatest interactive force at the cell surface proper (-32.6 ± 8.7 nN, $P < 0.01$). *A. naeslundii* genospecies 1, 2 and *A. viscosus* demonstrated greater interactive force at the cell-mica periphery than the other five species ($P < 0.05$); *A. viscosus* (-34.6 ± 10.5 nN) displayed greater interactive force at the cell-cell interface than the others ($P < 0.01$), except for *A. gerencseriae* ($P > 0.05$). These data indicate that fimbriated *Actinomyces* spp., including *A. naeslundii* genospecies 1, 2 and *A. viscosus* exert higher cell surface interactive forces than those devoid of fimbriae and, such variable force levels may modulate their adhesion and coaggregation during biofilm formation.



Tang, G., Yip, H. K., Samaranayake, L. P., Luo, G., Lo, E. C. M. & Teo, C. S. (2003) *Actinomyces* spp. in supragingival plaque of ethnic Chinese preschool children with and without active dental caries. *Caries Research* **37**, 381-390.

Very limited molecular epidemiological data are available on the role of *Actinomyces* spp. in the pathogenesis of caries in the primary dentition. Therefore, we investigated their distribution in supragingival plaque of ethnic Chinese preschool children from Singapore and Hong Kong, either with or without active caries. Plaque samples were taken from intact interproximal enamel areas using dental floss. Bacterial genomic DNA of each sample was extracted and variable regions of 16S ribosomal DNA amplified and labelled with digoxigenin. Oligonucleotide probes specific for *Actinomyces bovis*, *Actinomyces gerencseriae*, *Actinomyces israelii*, *Actinomyces meyeri*, *Actinomyces odontolyticus*, catalase-negative *Actinomyces naeslundii* (genospecies 1 and 2) and catalase-positive *Actinomyces naeslundii* genospecies 2 (previously *Actinomyces viscosus* serotype II) were used to detect these species using

Southern hybridization with a Minislot and Miniblotter system. *A. odontolyticus*, *A. gerencseriae* and *A. meyeri* were detected with similar frequency in both Singapore and Hong Kong samples or in those with and without active caries. However, the prevalence of *A. naeslundii* was significantly different in the two locales ($p < 0.05$). *A. odontolyticus* (88.7%), *A. gerencseriae* (56.6%) and *A. naeslundii* (50.9%) were detected in a majority of the samples and the positive hybridization signals of *A. gerencseriae* in the caries-active group were stronger than from the caries-free group. *A. bovis* and *A. israelii* were undetectable in any of the samples. These data imply that *A. odontolyticus*, *A. naeslundii* and *A. gerencseriae* may play an important role in supragingival plaque formation on primary teeth in ethnic Chinese, with others such as *A. meyeri* contributing.

Tay, F. R., Lai, C. N., Chersoni, S., Pashley, D. H., Mak, Y. F., Suppa, P., Prati, C. & King, N. M. (2004) Osmotic blistering in enamel bonded with one-step self-etch adhesives. *Journal of Dental Research* **83**, 290-295.

One-step self-etch adhesives behave as permeable membranes after polymerization, permitting water to move through the cured adhesives. We hypothesize that osmotic blistering occurs in bonded enamel when these adhesives are used without composite coupling. Tooth surfaces from extracted human premolars were bonded with 5 one-step self-etch adhesives. They were immersed in distilled water or 4.8 M CaCl₂, and examined by stereomicroscopy, field-emission/environmental SEM, and TEM. Water blisters were observed in bonded enamel but not in bonded dentin

when specimens were immersed in water. They collapsed when water was subsequently replaced with CaCl₂. Blisters were absent from enamel in specimens that were immersed in CaCl₂ only. Water trees were identified from adhesive-enamel interfaces. Osmotic blistering in enamel is probably caused by the low water permeability of enamel. This creates an osmotic gradient between the bonded enamel and the external environment, causing water sorption into the interface.



Tay, F. R., Pashley, D. H., King, N. M., Carvalho, R. M., Tsai, J., Lai, S. C. & Marquezini, L., Jr. (2004) Aggressiveness of self-etch adhesives on unground enamel. *Operative Dentistry* **29**, 309-316.

Manufacturers of mild self-etch adhesives advocate the adjunctive use of phosphoric acid etching when bonding to unground enamel. This study tested the null hypothesis that there is no difference between the recently introduced, more aggressive self-etch adhesives and a total-etch adhesive in bonding to unground enamel. The ultrastructure and microtensile bond strengths (microTBS) of Xeno III (Dentsply) and Simplicity (Apex Dental Materials), bonded to

unground enamel, were examined after thermocycling. Clearfil SE Bond (Kuraray), a mild self-etch adhesive, was used as the negative control, and One-Step (BISCO), a total-etch adhesive bonded to phosphoric acid-etched unground enamel, was used as the positive control. Differences in the thickness of enamel hybrid layers were observed and the aggressiveness of apatite dissolution in the four adhesives.



Tong, A. C., Ng, I. O. & Yan, B. S. (2003) Variations in clinical presentations of the simple bone cyst: report of cases. *Journal of Oral and Maxillofacial Surgery* **61**, 1487-1491. (Case Report)



Tong, A. C., Yan, B. S. & Chan, T. C. (2003) Use of interdental distraction osteogenesis for orthodontic tooth alignment and correction of maxillary hypoplasia: a case report. *The British Journal of Oral & Maxillofacial Surgery* **41**, 185-187. (Case Report)



Tong, K. S., Zee, K. Y., Lee, D. H. & Corbet, E. F. (2003) Clinical responses to mechanical periodontal treatment in Chinese chronic periodontitis patients with and without *Actinobacillus actinomycetemcomitans*. *Journal of Periodontology* **74**, 1582-1588.

BACKGROUND: The purpose of this study was to compare 12-month clinical responses to mechanical

periodontal treatment in Chinese chronic periodontitis patients at sites with and without *Actinobacillus*

actinomycetemcomitans at baseline, and to investigate the ability of mechanical periodontal treatment to eliminate *A. actinomycetemcomitans*. METHODS: Nineteen patients and a total of 76 selected sites with a mean probing depth (PD) of $> \text{ or } = 7$ mm were studied. Whole mouth presence or absence of supragingival plaque (PI%), bleeding on probing (BOP%), probing depth (PD), and probing attachment level (PAL) were recorded at six sites per tooth at baseline and after 3, 9, and 12 months. Baseline subgingival plaque samples were taken from the deepest PD site in each quadrant using sterile paper points and were cultured on TSBV plates for 5 days in a 5% CO₂-air incubator. All sites received mechanical periodontal treatment, which included oral hygiene instructions and supragingival and subgingival instrumentation with or without surgical access, with maintenance care being provided once every 3 months thereafter. RESULTS: At baseline, *A. actinomycetemcomitans* was isolated in 13 of the 19 subjects (68%) and in 29 out of the 76 sampled sites (38%). At the end of 12 months, in three of the initially *A. actinomycetemcomitans*-positive subjects, *A. actinomycetemcomitans* was not detected in the

sampled sites, while one subject, in whom *A. actinomycetemcomitans* was not initially found at the sampled sites was *A. actinomycetemcomitans*-positive at 12 months. Multi-level variance component models showed there was no statistically significant difference in all clinical parameters between *A. actinomycetemcomitans*-positive and -negative subjects ($P > 0.05$). In the sampled sites of the initially *A. actinomycetemcomitans*-positive subjects, the mean PD was reduced from 7.6 ± 1.6 mm to 3.2 ± 1.8 mm, the mean PAL gain was 1.4 ± 2.0 mm, and the mean recession was 3.0 ± 2.3 mm. The corresponding figures in the sampled sites of the initially *A. actinomycetemcomitans*-negative subjects were 7.5 ± 1.6 mm to 2.7 ± 1.0 mm, 2.3 ± 2.6 mm and 2.4 ± 2.2 mm for mean PD changes, PAL gain, and mean recession, respectively. CONCLUSIONS: Favorable clinical responses to mechanical periodontal therapy may occur in Chinese chronic periodontitis patients at sites infected with *A. actinomycetemcomitans*. The mere detection of subgingival *A. actinomycetemcomitans* does not necessarily imply poorer treatment outcomes in the control of chronic periodontitis.



Tsang, W. M., Tong, A. C., Chow, L. T. & Ng, I. O. (2004) Massive osteolysis (Gorham disease) of the maxillofacial skeleton: report of 2 cases. *Journal of Oral and Maxillofacial Surgery* **62**, 225-230. (Case Report)



van Palenstein Helderma, W., Lo, E. C. M. & Holmgren, C. (2003) Guidance for the planning, implementation and evaluation of oral health care demonstration projects for under-served populations. *International Dental Journal* **53**, 19-25

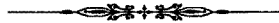
Recently, it has been proposed that in planning oral health care services in non-established market economy (non-EME) countries, and for under-served communities throughout the world, high priority be given to a basic package of oral care (BPOC). This package contains three key components: emergency care (oral urgent treatment--OUT), exposure to appropriate fluoride (affordable fluoride toothpaste--AFT) and appropriate treatment technology (atraumatic restorative treatment--ART). These three components are embedded in the supporting context of oral health promotion (OHP). There is a lack of experience in implementing BPOC and besides, there is not much known about the effectiveness, efficiency and sustainability of the proposed components of

BPOC, either individually or as a package, under local conditions. An effective approach in one setting may not be successful in another setting due to many factors such as a lack of acceptability by the community or local government or because of insufficient financial and human resources. It is therefore recommended to consider small scale demonstration projects for effectiveness, efficiency and sustainability assessments of the various components of BPOC before embarking on large scale programmes. The purpose of this paper is to highlight the different aspects related to the planning, implementation and evaluation of oral health demonstration projects for under-served communities.

Waltimo, T., Luo, G., Samaranayake, L. P. & Vallittu, P. K. (2004) Glass fibre-reinforced composite laced with chlorhexidine digluconate and yeast adhesion. *Journal of Materials Science Materials in Medicine* **15**, 117-121.

The aim of this study was to lace dental glass fibre reinforced composite (FRC) prepreg with chlorhexidine digluconate and to examine the adherence of common oral fungal pathogen *Candida albicans* to FRC made of the prepreg. Four different test and control material groups each comprising 16 test specimens ((5.0 x 5.0 x 0.8) mm³) each were used as substrates for *C. albicans* adherence. A porous polymer pre-impregnated woven glass fibre prepreg was laced with solution of chlorhexidine gluconate and it was used with autopolymerized denture base polymer to fabricate FRC test specimens. Control group (Group 1) consisted of FRC test specimens stored in water. In Group 2, the test specimens were stored in 10% chlorhexidine digluconate solution for 24 h. Group 3 consisted of specimens fabricated using such fibre reinforcements which were pre-soaked in 20% chlorhexidine digluconate and dried before preparation with denture base resin, and followed by

storage of the specimens in water. Group 4 was similar to Group 3 but instead of water storage the specimens were immersed in 10% chlorhexidine digluconate for 24 h. For the candidal adhesion assay the test and control specimens were incubated in standardized suspensions of four different strains of *C. albicans*, rinsed and prepared for light-microscopy. The mean number of adherent cells in each group was counted microscopically and analysed statistically. There were significantly ($P < 0.05$) more adherent *C. albicans* cells found in Group 1 than in the other three groups which did not differ significantly from each other. The lowest numbers of adherent cells were found in Group 3. Pretreating the porous polymer pre-impregnated glass fibre reinforcement with chlorhexidine digluconate result in reduction in the number of adherent yeast cells on the surface FRC material.



Xiong, H., Hagg, U., Tang, G. H., Rabie, A. B. & Robinson, W. (2004) The effect of continuous bite-jumping in adult rats: a morphological study. *The Angle Orthodontist* **74**, 86-92.

The aim of this study was to determine the mandibular morphology before, during, and after bite-jumping in nongrowing species. Fifty-two adult female Sprague-Dawley rats were divided into four experimental groups and four control groups. The experimental groups were fitted with fixed bite-jumping devices that protruded the mandible. The animals were sacrificed on days 3, 14, 30, and 60. Right halves of the mandible were harvested and freed of soft tissue. Digital pictures were obtained in a standardized manner. Selected linear and angular measurements were made. There were no morphological differences

between the controls and experimental group on days 3 and 14. The length of condylar process increased significantly on day 30 and remained so on day 60 in the experimental group. The angulation of the condylar process was significantly affected because of increased apposition of bone in the middle and especially the posterior parts of the condyle. Thus, bite-jumping of the mandible in adult rats affects the size and angulation of the condylar process because of differential apposition of bone on the condylar head.



Yang, Y. Z., Sun, Z., Jin, L. J., Liang, H. Q., Hu, C. Z., Yang, Y. G. & Corbet, E. F. (2004) Observations of the non-surgical treatment response on diabetic patients with chronic periodontitis. *Shanghai Kou Qiang Yi Xue* **13**, 6-9.

PURPOSE: To observe the non-surgical treatment response on diabetic patients with chronic

periodontitis. METHODS: Moderate to advanced chronic periodontitis was studied in 36 Diabetes

Mellitus (DM) patients classified as 20 cases with high and fluctuating blood glucose level (DM-H) and 16 cases with relatively low and stable blood glucose level (DM-L). 28 non-DM patients with chronic periodontitis served as control (Non-DM). Plaque Index (PII), Gingival Index (GI), Bleeding on Probing (BOP), Probing Depth (PD) and Clinical Attachment Loss (AL) of all patients were recorded at 6 sites on each tooth at the baseline and in the first, the third, the sixth month after oral hygiene instrument (OHI), scaling and root planing. **RESULTS:** It was found that the short-term effect of non-surgical periodontal

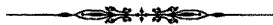
procedure had resulted in significant resolution of gingival inflammation and pronounced reduction in pocket depth and gain of attachment loss in all patients. The treatment response was similar in both DM and Non-DM patients with chronic periodontitis. **CONCLUSIONS:** Non-surgical periodontal treatment allowed for favorable treatment responses in a group of diabetic patients with chronic periodontitis and that their various profiles of blood glucose did not influence the short-term healing response to the treatment.



Yip, H. K. (2004) Angina bullosa haemorrhagica: a case report and a concise review. *General Dentistry* **52**, 162-164.

Various differential diagnoses pertaining to angina bullosa haemorrhagica (ABH) have been reported in the dental literature; these differential diagnoses include mucous membrane pemphigoid, bullous pemphigoid, bullous lichen planus, epidermolysis bullosa, dermatitis herpetiformis, linear IgA disease, and oral amyloidosis. ABH is characterized by a solitary blood blister in the palate and may worsen progressively, leading to multiple lesions in other areas. The bullae usually rupture spontaneously and the sites

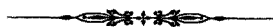
heal uneventfully. Possible etiological factors include trauma, long-term use of steroids, diabetes, and hereditary predilection. Pathological studies have yielded nonspecific findings and the underlying etiopathology remains ill-defined. This article describes a case of ABH following the use of a 0.12% chlorhexidine gluconate mouthrinse and presents a concise review of the literature pertaining to ABH and differential diagnoses.



Yip, H. K. & Smales, R. J. (2003) Oral rehabilitation of young adults with amelogenesis imperfecta. *The International Journal of Prosthodontics* **16**, 345-349.

PURPOSE: This article describes the restorative management of two patients in whom the diagnosis of amelogenesis imperfecta was not made until young adulthood. **MATERIALS AND METHODS:** Amelogenesis imperfecta is a variable developmental abnormality of the tooth enamel that affects relatively few persons. Previous case reports have focused largely on the early management of children and young adolescents. However, some patients may not be diagnosed correctly or may not request dental treatment until they are older, as with the two cases

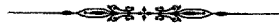
presented. In some instances, parents fail to appreciate the importance of early intervention. **RESULTS:** Both patients required intensive preventive therapy and extensive restorative treatment over several years. The correct sequencing of treatment phases was required to achieve relief of pain and provide satisfactory function and esthetics. **CONCLUSION:** The two cases presented illustrate the degree of complexity that extended restorative treatments can involve, especially following severe tooth wear and poor bonding of restorations to the affected enamel.



Yip, H K. & Smales, R. J. (2004) Clinical and technical aspects of occlusal reconstruction in oral rehabilitation. *Journal of the Pakistan Medical Association* **13**, 25-31.

Two basic occlusion schemes that can be used for the oral rehabilitation of patients following extensive tooth tissue loss are discussed. Irrespective of using a conformational or a reorganized occlusion approach, accurate and reproducible jaw registrations and the correct transfer of the occlusal records to the working casts for mounting on a semi-adjustable articulator are essential. In patients who require oral rehabilitation at a re-established occlusal vertical dimension, a multidisciplinary approach is often advisable.

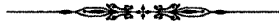
Adjunctive orthodontic treatment can facilitate the subsequent prosthodontic treatments and also allow a more minimally invasive approach to be considered, such as the use of adhesive retainers for fixed partial dentures. Conservation of sound tooth tissue by using dental implants can also optimise the functional and aesthetic results. Careful sequential occlusal reconstruction procedures are required for successful oral rehabilitation.



Yip, H K. & Smales, R. J. (2004) Prosthodontic management of older severe hypodontia patients in general dental practice: a case series. *Special Care in Dentistry* **24**, 260-263.

Although a detailed understanding of the etiology of hypodontia is lacking, there is a need for awareness among dental professionals of the social and psychological consequences of severe hypodontia, as well as knowledge of those affected by hypodontia have ongoing dental treatment needs. Although, there may be a need for immediate referral of children to different specialists for optimal multidisciplinary treatment planning, most older patients with severe

hypodontia can be treated by general practitioners. Practitioners therefore need to be aware of the ramifications of the condition and be capable of providing adequate oral health care for these patients and referring them for additional services when necessary. A case-report series is used to illustrate routine prosthodontic treatments that can be offered to older patients in general dental practice.



Yip, H K., Li, D. K. & Yau, D. C. (2003) Dental amalgam and human health. *International Dental Journal* **53**, 464-468.

The use of dental amalgam as a restorative material has long been a contentious issue because of its elemental mercury component. While microleakage of mercury from amalgam has been conclusively confirmed over the past 30 years intensive research has failed to identify deleterious health outcomes. Mercury, as with other metals entering the body tissues, appears to be tolerated at low levels. Nevertheless, a contrary opinion is held by some professional and lay groups who advocate a zero tolerance for inhaled or ingested elemental mercury. They identify dental amalgam as an aetiological factor for neurological conditions such as chronic fatigue syndrome, multiple sclerosis and Alzheimer's disease resulting from chronic mercury poisoning.

Epidemiological and clinical evidence of widespread chronic mercury toxicity associated with a body burden of amalgam has consistently failed to be established even in populations with a high prevalence of dental amalgam restorations. On current evidence, international consensus heavily supports the statement that amalgam does not constitute a health risk to patients. However, exposure to volatile free mercury in dental clinics should be controlled to eliminate occupational risk. This paper provides a general review of the current situation and issues. It offers a consensus viewpoint for practitioners and lay people in reaching an informed decision on dental amalgam restorations.



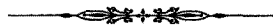
Yip, H K., Poon, B. K., Chu, F. C., Poon, E. C., Kong, F. Y. & Smales, R. J. (2003) Clinical evaluation of packable and conventional hybrid resin-based composites for posterior restorations in permanent teeth: results at 12 months. *The Journal of the American Dental Association* **134**, 1581-1589.

BACKGROUND: Packable resin-based composites and simplified resin bonding systems are marketed to offer many advantages over conventional posterior hybrid composites and total-etch bonding systems. The authors conducted a study to evaluate the initial clinical performances of a packable and a conventional hybrid resin-based composite used with a simplified bonding system. **METHODS:** A total of 57 Class I and 45 Class II restorations were placed in the permanent teeth of 65 adult patients. The carious lesions were restored with either packable resin-based composite (SureFil, Dentsply DeTrey GmbH, Konstanz, Germany) or conventional hybrid resin-based composite (SpectrumTPH, Dentsply DeTrey GmbH), using a resin adhesive (Non-Rinse Conditioner and Prime & Bond NT, both manufactured by Dentsply DeTrey GmbH). The authors evaluated the restorations using U.S. Public Health Service-Ryge modified criteria (in which Alfa is the highest rating) and by using color transparencies and die stone replicas. **RESULTS:** Three SureFil restorations failed before

their baseline evaluation. There were no failures among the 78 SpectrumTPH restorations evaluated at 12 months. For both resin-based composites, Alfa ratings were 90 percent or higher for marginal discoloration, anatomical form, surface texture and surface staining. Lower percentages of restorations were rated Alfa for color match, marginal integrity and gingival health. Occasional mild postoperative sensitivity was reported for four SureFil restorations and one SpectrumTPH restoration. The mean occlusal wear rate was 38 micrometers for the larger SureFil restorations and 25 microm for the smaller SpectrumTPH restorations. **CONCLUSIONS:** The 12-month clinical performances of the two restorative materials were satisfactory and not significantly different for each of the parameters evaluated. **CLINICAL IMPLICATIONS:** A packable and a conventional hybrid resin-based composite placed with a simplified bonding system in posterior permanent teeth showed satisfactory and similar results after 12 months.



Yip, H K., Samaranayake, L. P., Tsang, P. C., Leung, M. K. H., Cheng, K. P. & Fung, K. (2004) Research combating SARS. *Hong Kong Dental Journal* **1**, 45-46. (Letter to the Editor)



Yip, H K., Smales, R. J. & Kaidonis, J. A. (2003) Case report: management of tooth tissue loss from intrinsic acid erosion. *The European Journal of Prosthodontics and Restorative Dentistry* **11**, 101-106.

Acid erosive tooth wear is increasingly being reported in many western countries, and is also being recognised as a significant cause of tooth destruction in persons with xerostomia. The primary aetiology is related to a high consumption of dietary sources of acids and also to an increasing awareness of gastric acid as a significant factor in both children and adults. Recommended preventive dental treatments aim to

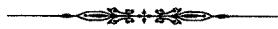
neutralise the effects of acids, reduce the severity of xerostomia, stimulate salivary flow and buffering capacity, and increase the acid resistance of tooth substance. Initial restorative treatments should be conservative, using adhesive dentistry techniques. This treatment approach is illustrated by the oral rehabilitation of a severe erosion case using adhesive onlays, veneers and all ceramic crowns.



Yip, H. K., Smales, R. J. & Kaidonis, J. A. (2004) Differential wear of teeth and restorative materials: clinical implications. *The International Journal of Prosthodontics* **17**, 350-356.

PURPOSE: This study reviewed the wear of commonly used dental restorative materials and their effects on the opposing dentition. **MATERIALS AND METHODS:** Key words were used with PubMed to retrieve pertinent references to publications on tooth and restoration wear. **RESULTS:** The wear resistance of newer esthetic restorative materials has generally improved, and the damage caused by several materials to the opposing dentition has been reduced. However, the different structures and physical properties of

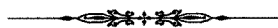
tooth substance and restorative materials will eventually lead to varying degrees of differential wear. The extent and rate of wear are influenced by many intraoral factors. **CONCLUSION:** Selection of restorative materials must be based on knowledge of their wear behavior and the individual needs of each patient. The lowest wear rates for restorations and the opposing dentition occur with metal alloys, machined ceramics, and microfilled and microfine hybrid resin composites.



Yiu, C. K., Tay, F. R., King, N. M., Pashley, D. H., Sidhu, S. K., Neo, J. C., Toledano, M. & Wong, S. L. (2004) Interaction of glass-ionomer cements with moist dentin. *Journal of Dental Research* **83**, 283-289.

Glass-ionomer cements (GICs) are regarded as aqueous gels made up of polyalkenoic acid salts containing ion-leachable glass fillers. The consequence of water permeation across the GIC-dentin interface is unknown. This study used SEM, field-emission/environmental SEM (FE-ESEM), and TEM to examine the ultrastructure of GIC-bonded moist dentin. Dentin surfaces bonded with 6 auto-cured GICs were examined along the fractured GIC-dentin interfaces. Additional specimens fractured 3 mm away from the interfaces were used as controls. SEM

revealed spherical bodies along GIC-dentin interfaces that resembled hollow eggshells. FE-SEM depicted similar bodies with additional solid cores. Energy-dispersive x-ray analysis and TEM showed that the spherical bodies consisted of a silicon-rich GIC phase that was absent from the air-voids in the controls. The GIC inclusions near dentin surfaces result from a continuation of the GI reaction, within air-voids of the original polyalkenoate matrix, that occurred upon water diffusion from moist dentin.



Yiu, E. Y., Fang, D. T., Chu, F. C. & Chow, T. W. (2004) Corrosion resistance of iron-platinum magnets. *Journal of Dentistry* **32**, 423-429.

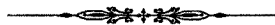
OBJECTIVES: The objective of this study was to investigate the corrosion resistance of the prototype iron-platinum (FePt) magnets and non-encapsulated neodymium-iron-boron (NdFeB) magnets in three different pH environments. **METHODS:** The corrosion resistance of the magnets was studied using a corrosion indicator, the breakaway force. The breakaway forces of the magnets after immersion in three media, namely 1% lactic acid solution (pH=2.7), 0.1% sodium sulphide solution (pH=12) and adjusted artificial saliva (pH=6.8) were compared after 28 and 60-day periods. **RESULTS:** By day 7, all NdFeB magnets dissolved completely in the acid medium, and they showed significantly lower

breakaway forces at day 28 and day 60 in artificial saliva (90%, 69%) and in alkaline medium (67%, 42%). In contrast, the FePt magnets did not show a drop in the breakaway forces after immersion in acid or artificial saliva, although approximately half of the original breakaway forces were recorded at day 28 and day 60 after immersion in strong alkali. **CONCLUSIONS:** The new iron-platinum magnets, which require no yoke assembly or protective casing, has good corrosion resistance for the oral environment. If its retentive force can be improved without increasing its thickness (0.3 mm), then it will have distinct advantages for clinical use.

Yu, C., Gao, X. J., Deng, D. M., Yip, H. K. & Smales, R. J. (2004) Survival of glass ionomer restorations placed in primary molars using atraumatic restorative treatment (ART) and conventional cavity preparations: 2-year results. *International Dental Journal* **54**, 42-46.

OBJECTIVE: To compare the survival of glass ionomer cement (GIC) restorations placed in a dental clinic setting using both the atraumatic restorative treatment (ART) approach with hand instruments, and conventional cavity preparation with rotary instruments. **METHOD AND MATERIALS:** Two encapsulated high-strength conventional GICs (Fuji IX GP, Ketac-Molar Aplicap) were placed in 82 Class I and 53 Class II preparations and one encapsulated non-gamma 2 amalgam alloy (GK-amalgam) was placed in 32 Class I preparations, in the primary molars of 60 Chinese children with a mean age of 7.40 +/- 1.24 (SD) years. Thus, 9 treatment groups were formed. **RESULTS:** After two years, there were no

significant survival differences found among 7 of the 9 treatment groups ($p = 0.99$). However, two groups comprising Fuji IX GP and Ketac-Molar Aplicap placed in Class II cavities prepared using the ART approach showed significantly lower restoration survivals ($p < 0.001$). Only 3 of the 72 initially sealed fissures adjacent to the restorations appeared to retain any GIC material. **CONCLUSIONS:** In a clinic setting, both the ART hand instrument and conventional rotary instrument methods were equally suitable for high Class I restoration survival, but not for Class II restoration survival where the conventional cavity preparation method was preferable.



Zee, K. Y. (2003) Recent development of intraoral radiography. *Singapore Dental Journal* **25**, 82-85. (Review Article)



Zhang, Z. K. & Jin, L. J. (2004) A brief introduction on the national licensing examination and dentist registration ordinance in China. *Hong Kong Dental Journal* **1**, 40. (Review Article)



Scientific Abstracts in Journals

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Abstracts of Theses from Research Postgraduates

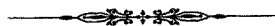
Chu CH (2003) Effectiveness of silver diamine fluoride and sodium fluoride varnish in arresting dentine caries.

Introduction: Caries prevalence in young children in China is very high and most decayed teeth are left untreated. In many rural areas of China, the conventional methods for treating dental caries are either not readily available or are unaffordable. Innovative approaches are needed to improve this situation. **Aim:** This prospective controlled clinical trial investigated the effectiveness of topical fluoride applications in arresting dentine caries. The first null hypothesis to be tested was that there were no differences in the effectiveness of applying a 38% silver diamine fluoride (SDF) solution (44,800 ppm F), a 5% sodium fluoride (NaF) varnish (22,600 ppm F) and water in arresting dentine caries. The second null hypothesis was that caries removal prior to fluoride application had no impact on its effectiveness in arresting dentine caries. **Materials and Methods:** A total of 375 Chinese preschool children, aged 3-5 years living in Guangzhou in southern China, with carious upper anterior teeth were divided into five groups. Children in the first and second groups received annual applications of SDF. NaF was applied every three months onto the lesions of children in the third and fourth groups. For children in the first and third groups, soft carious tissues were removed with hand instruments without local anesthetics prior to fluoride application at baseline examination. The fifth group of children was

the control and they received applications of water only. Regular examination was carried out every six months. The children's parents completed a short questionnaire to assess parental satisfaction with the appearance of the upper anterior teeth of their child before treatment and again at 24 months after treatment. **Results:** A total of 308 children were followed for 30 months. The respective mean numbers of arrested caries tooth surfaces in the five groups of children were 2.5, 2.8, 1.5, 1.5 and 1.3 (ANOVA, $p < 0.001$). Results of the post-hoc multiple comparisons showed that children receiving SDF had more caries arrested than other children after 30 months. There was no significant difference in caries arrest between children with caries removal before fluoride treatment and those who had not received this treatment. These results supported the second but not the first null hypothesis. Children in the control group developed more new caries lesions than children receiving SDF and NaF varnish after 30 months (ANOVA, $p < 0.001$). There were no statistically significant differences in the increment of non-vital teeth among the five groups of children. No adverse side-effects such as discoloration or damage to the gingival tissues were observed. **Conclusion:** Silver diamine fluoride was found to be effective in arresting dentine caries in primary anterior teeth in preschool children. Topical application of 5% sodium

fluoride varnish every 3 months provided no evidence in support of an effect in arresting dental caries in primary anterior teeth in preschool children. There was no evidence

to show that removal of carious tissues prior to application of fluoride agents has an effect on the ability to arrest dentine caries.



Lee DH (2003) Predominant cultivable putative pathogens in Chinese adults with and without periodontal diseases.

The aims of this study were to elicit data on the clinical and microbiological profiles in Hong Kong Chinese, both in health and disease through a cross-sectional and a longitudinal approach, in order to determine the predominant cultivable periodontal pathogens for this population and to evaluate the clinical and microbiological responses of nonsurgical mechanical periodontal treatment. The investigation comprised three parts. In the first cross-sectional clinical and microbiological study, a total of 19 subjects with severe chronic periodontitis participated. Plaque percentage (P1%), bleeding on probing (BOP), probing pocket depth (PPD), recession (RES) and mobility (MOB) were measured. Subgingival plaque samples were collected using sterile paper points before extraction and curettes in 3 different sites along the root surfaces of the extracted teeth. The results indicated that the common species at the coronal, middle and apical pocket depth levels were *Fusobacterium* species, *Wolinella* species, *Porphyromonas melaninogenica*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Actinomyces viscosus* and *Actinomyces naeslundii*. The species exclusive to each level were *A. actinomycetemcomitans* and *Prevotella loescheii* at the coronal level; *Bacteroides forsythus* and *Prevotella denticola* at the middle level; and *Selenomonas* species at the apical level. Gram-negative anaerobic

rods and cocci were the most frequently found bacterial group with progressively increasing mean percentage and frequency of detection from the coronal to the apical level. Bacteria species found in paper point samples were more similar to that of apical and middle samples. In the second study, a total of 19 subjects with generalised severe chronic periodontitis were selected. P1%, BOP, PPD and probing attachment level (PAL) were measured and subgingival plaque samples using sterile paper points were taken from one selected site in each quadrant at baseline, 3, 9 and 12 months after conventional periodontal treatment. Bacterial samples were cultured using conventional media and identified using standard techniques. The results at the end of 12 months showed that nonsurgical mechanical periodontal treatment was clinically effective in improving all clinical parameters and could reduce putative pathogens. These patients demonstrated consistently higher magnitude of gain in PAL, greater reduction in PPD and greater REC compared with published data from Caucasians undergoing similar therapeutic interventions. However, the nonsurgical mechanical periodontal treatment alone could not eliminate. *A. actinomycetemcomitans*, *Fusobacterium* species and *Veillonella* species during the study period. In the third study, a total of 15 subjects with free of chronic periodontitis

were selected. A pooled subgingival plaque sample was taken from the mesiobuccal sties of all teeth, excluding third molars, in each quadrant, using a single sterile paper point per tooth at each site. The results showed that gram-positive facultative cocci, gram-positive facultative rods and gram-positive anaerobic rods were the predominant groups of cultivable microflora of the healthy subjects. These subjects also harboured

some aforementioned putative pathogens such as *Fusobacterium* species, *P. melanionogenica* and *A. actinomycetemcomitans*. In conclusion, clinical and microbiological results of the present studies demonstrate that in Chinese patients with chronic periodontitis, a marked improvement of gingival health can be obtained through nonsurgical mechanical periodontal treatment.



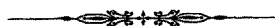
Lung CYK. (2003) Residual monomer in denture base acrylic.

Acrylic resins have been used as denture base materials for more than 60 years. Although possessing many good properties, it has been known that denture bases contain residual monomer, that is after processing some remains unreacted. Methyl methacrylate (MMA) is an irritant and sensitizer to oral tissues and also affects the mechanical properties of polymer. It is desirable to reduce the amount of residual monomer to minimize its biological and mechanical effects. However, it has not been realized that some MMA is thermodynamically inevitable. Two methods of analysis were tested for the determination of MMA in poly (methyl methacrylate) (PMMA). The first was to recover methyl methacrylate from a solution of polymer by distillation in a stream of air at room temperature, the distillate being condensed in a liquid nitrogen cold trap and analysed using gas chromatography (GC). Calibration data indicated that the method was sufficiently accurate and reliable. It was then demonstrated that direct injection of polymer solution gave valid results with minimum preparation effort, the polymer not interfering as it decomposed only slowly.

The second approach was to determine the concentration of MMA ([MMA]) using nuclear magnetic resonance spectroscopy. The vinyl proton peaks were integrated and compared with the proton peak from an internal standard (dimethyl sulphoxide) to determine [MMA]. This method was also shown to be viable. On the basis of the cost of reagents, time taken, detection limit and availability of the instrument, GC with direct injection was chosen. Two types of trial were conducted to investigate residual monomer, using small samples (~100 mg) in sealed, low-volume glass tubes. Firstly, 6 mg of MMA was added to pure PMMA powder, and incubated at 23 to 170°C for between 1 and 384 h. Secondly, the PMMA powder was similarly incubated on its own. Similar trials were done with a range of seven commercial dental PMMA powders. Broadly, [MMA] decreased with time at a temperature-dependent rate, finally approaching an equilibrium value. However, there was a tendency to 'overshoot' and approach equilibrium from below this value above about 100°C. The equilibrium value itself was temperature-dependent, being roughly linear over the range studied. The

commercial products showed very similar behaviour. A function was constructed to fit to the MMA - PMMA equilibrium data. From this, it appeared that a good approach to a minimum value of [MMA] would be obtained at 100°C in approximately 24 h. Accordingly, denture bases were fabricated and processed in the usual dental manner to test this prediction. However, lower than expected [MMA] was obtained. This was

attributed to loss by diffusion of monomer through the porous dental mould at a rate faster than it was generated by depolymerization. It has now been demonstrated that residual monomer is inevitable, although the amount varies with the processing conditions. A rational approach to denture base processing conditions is now possible.



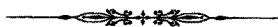
Rong WS. (2004) Oral health care for Chinese adults with special needs.

This thesis reports the results of a 3-year cohort study on the effect of providing oral health care to institutionalized elders in Hong Kong and a one-year clinical trial on the effect of providing oral health care to older adults with type 2 diabetes mellitus. The cohort study assessed the changes in oral health status and oral health-related quality of life in a group of institutionalized Chinese elders receiving oral health care during a three-year study period. At baseline, 353 institutionalized elders aged between 65 and 80 years attended on oral examination and completed a face-to-face questionnaire. Basic dental treatment was provided by an outreach dental unit (ODU) of HKU, appropriate to each individual's oral health condition. Annual clinical examinations were given and dental treatment was provided as necessary. After 3 years, 199 of the original cohort elders were evaluated. The oral health of those who had received dental treatment had significantly improved. They had fewer decayed teeth ($p < 0.005$) and more filled teeth ($p < 0.001$) than the untreated elders. Little change in the scores of two oral health-related quality of life measures over the study period was found among the two groups. However, a greater percentage

of elders who had received dental treatment during the study period were satisfied with their own oral health at evaluation than those who had not. The clinical trial was a matched case-control study to compare the changes in the level of glycated hemoglobin (HbA1c) over a one-year period in Chinese patients with type 2 diabetes mellitus in the presence or absence of regular oral health care. One hundred and five poorly-controlled type 2 diabetic patients aged between 41 and 70 years, with active oral diseases, received comprehensive dental treatment in the Prince Philip Dental Hospital. The subjects were reviewed every 3 months during the following 12 months, and further maintenance treatment was provided as necessary. A final examination was carried out 12 months after the active treatment phase and 83 of the original patients were evaluated. A questionnaire was completed by each patient before receiving treatment and at evaluation. At evaluation, 60 matched type 2 diabetic patients were recruited as a comparison group and completed an oral examination and a face-to-face questionnaire. Significant improvements in oral health status were found in the test group subjects. They had

fewer decayed teeth ($p < 0.001$) and more healthy periodontal sextants ($p < 0.001$) than at baseline and compared with the comparison group subjects. The level of HbA1c in the test group subjects fell by 0.9% during the 12-month study period, compared with only 0.3% in the comparison group. The area under curve (AUC) of

HbA1c in the test group subjects was also significantly lower than in the comparison group ($p < 0.01$). Baseline HbA1c level, baseline diabetes control with insulin, and receipt of oral health care services during the study period were significantly related to the change in HbA1c and the AUC of HbA1c.



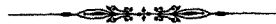
Shen S. (2004) The bacterial and yeast flora of root surface caries in elderly Chinese: clinical and in vitro studies".

Root caries is emerging as a significant problem in the middle aged and elderly. However there is sparse data on i) the microbiology of root caries in ethnic Chinese; ii) the coaggregation reactions amongst root caries bacteria, and iii) the cariogenic potential of the predominant root caries bacteria. Hence the objectives of the present study were first, to investigate both qualitatively and quantitatively the microflora of root caries in elderly, ethnic Chinese, and then to evaluate the coaggregation profiles of the major wild-type bacteria isolated. Finally, the *in vitro* growth, acidogenicity and cariogenicity of the predominant root caries isolates from the study cohort were evaluated using an *in vitro* model system. A total of 30 samples of carious dentine were aseptically taken from root caries lesions of institutionalized elderly Chinese. The cultivable microorganisms were isolated and identified using standard methodology. The coaggregation reactions of 22 wild-type microbial species comprising ten bacterial genera and a single *Candida* spp. were evaluated by a visual, semi-quantitative scoring system and, a spectrophotometric, quantitative assay. Three predominant wild-type root caries bacteria, *Streptococcus mutans*, *Lactobacillus acidophilus* and

Actinomyces israelii, were assembled into either mono- or cocultural groups and incubated with the root specimens derived from intact extracted human molars. Growth curves of each "culture group" and the pH values of the media were monitored for 24 hrs and mean depths of artificial root lesions produced measured using polarized light microscopy. The main findings were i) *Streptococcus* spp., *Actinomyces* spp. and *Staphylococcus* spp. were the predominant isolates. The isolation frequency of *Candida* spp. was notably high although the proportion of yeasts within each sample was low. *C. dubliniensis*, a newly described species was isolated from three patients; ii) Significant levels of inter-species coaggregation were seen between *Actinomyces* spp. and *Veillonella* spp., *Actinomyces israelii* and *Peptostreptococcus prevotii*, *Bacteroides gracilis* and *Actinomyces* spp., *Prevotella intermedium* and nine different species, and *Fusobacterium nucleatum* and six other species. The single *Candida* isolate did not coaggregate to a significant extent with any of the bacteria studied; iii) Synergistic growth was observed in co-cultures of *L. acidophilus* / *S. mutans*, *A. israelii* / *L. acidophilus* and *A. israelii* / *L. acidophilus*

S. mutans pairs compared with the mono-cultures. The pH of all culture media were similar after 24-hr incubation. Mean lesion depths produced in *L. acidophilus* group was significantly shallower than other mono- or co-culture groups. The present studies provide baseline information on the microbiologic features of root caries in the elderly, ethnic Chinese. Whilst the data on the most predominant bacteria isolated concur with those from other regions of the world the isolation of *C. dubliniensis* from these

lesions has not been documented hithertofore. The findings on coaggregation amongst the studied isolates confirm the existence of multiple and complex interactions between various bacteria in root lesions. Finally the data on growth, acidogenicity and cariogenicity of these predominant root caries bacteria further elucidate the complex host-parasite interactions leading to the initiation of root caries in humans.



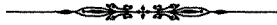
Tang G. (2003) Growth modification of the mandibular condyle by functional appliances: a cellular and molecular study.

The aim of this study was to evaluate the cellular and molecular changes in the mandibular condyle in response to functional appliance treatment, especially the temporal pattern of the expression of *Ihh*, *PTHrP* and *Cbfa1*. One hundred female Sprague-Dawley rats at 35 days of age were randomly divided into five control and five experimental groups. The experimental animals were fitted with functional appliances that positioned the mandible forward. Rats were sacrificed on day 3, 7, 14, 21 and 30. To study the cell kinetics of the proliferating mesenchymal cells, animals were labeled with iododeoxyuridine (IdU) and/or bromodeoxyuridine (BrdU) before sacrifice. Sections were cut mid-sagittally through the condyles for in situ hybridization, immunohistochemical and histological evaluations. Indian hedgehog (*Ihh*) is a dynamic mediator transducing mechanical signals to stimulate chondrocyte proliferation. In condylar cartilage, *Ihh* immunostaining was observed in mesenchymal cells and chondroblasts.

Mandibular advancement triggered 63% and 76% increase of *Ihh* expression in the proliferative layer on day 3 and day 7 respectively. The overexpression of *Ihh* coincided with the increase of the number of the replicating mesenchymal cells and the shortening of the turnover time. Parathyroid hormone related protein (*PTHrP*) is a key factor regulating chondrocyte differentiation and the pace of endochondral ossification. *PTHrP* expression was detected in the proliferative layer and chondroblast layer of condylar cartilage. A fivefold increase of *PTHrP* expression was identified in experimental animals on day 7. The higher level of *PTHrP* expression corresponded with the increase of mesenchymal cells differentiation and the slowing down of chondrocyte hypertrophy. Core binding factor 1 (*Cbfa1*) is a transcription factor required for osteoblast differentiation and chondrocyte maturation. *Cbfa1* mRNAs and proteins were detected in the pre-hypertrophic and hypertrophic chondrocytes of condylar cartilage and in the osteoblasts

lining the subchondral bone. The domain of Cbfa1 immunostaining overlapped with that of VEGF (vascular endothelial growth factor) in the chondrocytes. Mandibular advancement elicited Cbfa1 expression in condylar cartilage. The increase was 152% and 58% on day 14 and day 21 respectively. The expression of type X collagen, the hallmark of the hypertrophic chondrocytes, followed that of Cbfa1. A higher level of Cbfa1 expression was also observed in the osteoclasts breaking down the cartilage. Concomitantly, an increase of the deposition of the calcified extracellular matrix and the recruitment of osteoblasts was observed. In conclusion, mandibular advancement triggered a cascade of cellular and molecular events that induced the chondrogenesis and subsequently enhanced the endochondral

ossification in the condyle. Ihh acted as a mechanotransduction mediator that sensed and converted the mechanical forces resulting from anterior mandibular displacement to stimulate mesenchymal cells proliferation. Ihh up-regulated PTHrP expression, which promoted mesenchymal cells differentiation and increased the recruitment of the chondroblasts. PTHrP further retarded chondrocyte hypertrophy to allow for more growth. The increase of Cbfa1 transcripts up-regulated the expression of VEGF and elevated type X collagen expression. The cooperation of these factors promoted chondrocyte terminal maturation and also induced osteoclast invasion and osteoblast formation, resulting in more new bone formation in the condyle.



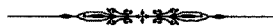
Tang G. (2004) Molecular and phenotypic characteristics of the genus *Actinomyces* with particular reference to the human oral cavity.

Bacteria belonging to the genus *Actinomyces* comprise a group of either facultative or obligate anaerobic, non-spore-forming, non-motile, and Gram-positive pleomorphic rods. They are an important category of autochthonous, oro-intestinal bacteria both in human and animals. In order to accurately differentiate *Actinomyces* spp., oligonucleotide probes were developed for *A. bovis*, *A. gerencseriae*, *A. israelii*, *A. meyeri*, *A. odontolyticus*, *A. naeslundii* genospecies 1 (cross-reacting with catalase-negative genospecies 2) and *A. viscosus* (cross-reacting with catalase-positive *A. naeslundii* genospecies 2, previously *A. viscosus* serotype II). After verifying the specificity and sensitivity, these probes were used for evaluating associations between

Actinomyces spp. and caries and, endodontic infections. The investigation of *Actinomyces* spp. in supragingival plaque from 17 caries-free and 36 caries-active children using the developed probes indicated that *A. odontolyticus*, *A. naeslundii* and *A. gerencseriae* contributed to supragingival plaque development, and might contribute, directly or indirectly to childhood caries initiation. Further, a higher prevalence and proportions of *A. naeslundii* genospecies 2, compared with genospecies 1 were noted in these plaque samples. The predominance and highly genetic diversity of genospecies 2 tend to suggest that it may contribute to the initiation of childhood caries. Endodontic infection is a sequel of the carious process and, *Actinomyces* spp. are considered prime

mediators of this common disease. Southern hybridization data from 32 endodontic infections, using the probes developed, indicated that *A. odontolyticus* was particularly common in diseased pulp chambers associated with caries, whilst catalase-negative *A. naeslundii* was more common in pulp infections with a history of trauma. One advantage of molecular detection techniques over the traditional culture techniques is their superior ability to detect dormant bacteria. The susceptibility of endodontic organisms to routine, one-week, root canal medication with either calcium hydroxide or Septemoxine, was directly evaluated using polymerase chain reaction and Southern hybridization with the probes described above. No significant difference in antimicrobial efficacy between calcium hydroxide and Septomixine was found either with regard to the total bacterial load or the quality of the *Actinomyces* spp. detected. Thus, in clinical terms this study tends to imply that the routine one-week, endodontic medication with either of these drugs may not totally eliminate residual

intra-canal bacteria. *Actinomyces* colonization, either within or outside root canals is considered to be facilitated by fimbriae on their cell surfaces. When examined using atomic force microscopy, the fimbriated *A. naeslundii* and *A. viscosus* possessed higher cell-surface interactive forces than those non-fimbriated, such as *A. bovis*, *A. gerencseriae*, *A. israelii*, *A. meyeri* and *A. odontolyticus*. When this novel technique was used to quantify cell-surface interactive forces of sessile *Actinomyces* spp. attached on inert mica substrates, varying force levels were found at different locations of the organism implying complexities associated with bacterial adhesion and coadhesion. Taken together, the work described indicated that commensal oral *Actinomyces* spp. play a critical and complex role both in health and disease, together with other putative pathogens sharing the same ecological niche. How this genus initially colonizes in the oral cavity, communicate and co-adhere with other organisms awaits clarification in the further study.



Wong RWK. (2004) Bone induction using Simvastatin and Gusuibu.

Objectives: (i) To quantitatively assess the amount of new bone produced by Statin and Gusuibu. (ii) To study the early healing pattern of Statin-induced osteogenesis. (iii) To assess effect of Gusuibu consumption on bone density and bone trabecular number. **Material and Methods:** (i) Twenty four bone defects were created in the parietal bone of twelve New Zealand White rabbits. In the experimental groups, six defects were grafted with Simvastatin solution mixed with collagen matrix carrier and six defects were

grafted with Gusuibu extract mixed with collagen matrix carrier. In the control groups, six defects were grafted with water for injection mixed with collagen matrix carrier (positive control) and six were left empty (negative control). The animals were killed on day 14 and the grafted sites were dissected and prepared for histological assessment. Serial sections were cut across each defect. Quantitative analysis of new bone formation was made on 150 sections using image analysis. Three specimens from

experimental and active control groups were prepared for ultrastructural study. (ii) Thirty bone defects were created in the parietal bone of fifteen New Zealand White rabbits. In the Statin Group of nine rabbits, the defects were grafted with Simvastatin solution mixed with collagen matrix carrier, killed from one to six days after surgery. In the Control Group of six rabbits, the defects were grafted with water for injection mixed with collagen matrix carrier, killed similarly. The grafted sites were dissected and prepared for histological and immunolocalisation studies. (iii) Twenty eight-week-old male BALB/c mice were divided into two groups. In the Control Group, ten mice were daily fed with distilled water. In the Gusuibu Group, ten mice were daily fed with distilled water mixed with Gusuibu extract. The mice were kept for five weeks and were then killed. Using micro-computed tomography, twenty micro-tomographic slices with an increment of 0.25mm were acquired to cover the proximal end of the left tibia of each mouse. Quantitative morphometry of the bone structure was performed. **Results:** (i) a

total of 308% and 90% more new bone was present in defects grafted with Simvastatin and Gusuibu than those grafted with the collagen carrier alone (positive control) respectively ($P < 0.0001$). No bone was formed in the negative control group. (ii) Immunolocalisation studies on the defects grafted with Simvastatin showed VEGF was expressed on day 3 after surgery, BMP-2 was expressed on day 4, Cbfa1 was expressed on day 5 and new bone was formed on day 5. These events occurred one day earlier than those of control. No cartilage intermediate stage was detected. (iii) Consumption of Gusuibu increased 6.45% in bone density with bone trabeculae increased 10.00% in number. **Conclusions:** (i) Simvastatin and Gusuibu are osteoinductive and can be used as materials for bone graft. (ii) Simvastatin accelerated bone formation locally by triggering the early expression of growth factors that regulate angiogenesis and osteogenesis. (iii) Gusuibu taken orally increased bone density and triggered bone remodeling to occur.



Zheng LW. (2004) Biochemical modulation of mandibular distraction osteogenesis.

Distraction osteogenesis is a method of producing new bone directly from the osteotomy site by gradual distraction of the divided bone fragments. It has become a widely accepted approach in the treatment of severe craniofacial deformities. However, one of the major disadvantages of this technique is the lengthy treatment course required for distraction and ossification, which may result in complications. The present study aims to (1) clarify the time and dosage dependent

response of recombinant human bone morphogenetic protein-2 (rhBMP-2) in osteogenesis on rabbit mandibular lengthening model; (2) compare the effect of rhBMP-2 in mandibular ossification under normal and rapid rates of distraction; (3) study the influence of distraction rates on the expression of BMPs during distraction osteogenesis; (4) evaluate the long term stability of bone regenerate formed by distraction osteogenesis; (5) study the role of endogenous matrix metalloproteinases

(MMPs) and tissue inhibitor of metalloproteinases (TIMPs) and the influence of recombinant human TIMP-1 (rhTIMP-1) on the bone remodeling and resorption in mandibular distraction osteogenesis. In the baseline study, 21 adult New Zealand white rabbits were used to establish a mandibular distraction model activated at a rate of 0.9mm/day. Different dosages of rhBMP-2 were injected into the distraction regenerate by three different time sequences. Plain radiography, micro-CT and histological examination demonstrated that rhBMP-2 could enhance bone formation and remodeling in mandibular distraction osteogenesis. The osteogenic activity of rhBMP-2 was found to be dosage dependent. A single injection of rhBMP-2 at a sufficient dosage was just as effective as multiple injections. Based on the result of the baseline study, two distraction rates were tested in 30 rabbits' mandible. rhBMP-2 was injected into one side of the distraction regenerate and the contralateral side was used as control. Plain radiography, micro-CT, histological examination and mechanical testing showed that rhBMP-2 was able to promote bone formation in both distraction rates producing bone regenerate of good

quality. Therefore, speeding up the distraction rate by the addition of rhBMP-2 was confirmed to be feasible. The contralateral sides of the above mandibular specimens were subjected to immunostaining and in situ hybridization. A gradual decrease expression of BMP-2 through -8, with the exception of BMP-7, was observed during the consolidation period. The biological microenvironment created by normal rate distraction seems to be superior to the rapid distraction at the early stage of consolidation. 15 rabbits were used to establish a unilateral mandibular distraction model. rhTIMP-1 impregnated in absorbable collagen sheet was implanted subperiostally onto the distraction regenerate. CT, micro-CT, histological and immunostaining examinations showed that the bony regenerate formed by distraction osteogenesis was stable without surgical relapse and excessive resorption. MMPs and TIMPs might reflect the metabolic activity involved in bone remodeling during distraction osteogenesis. No obvious influence of rhTIMP-1 on the bone remodeling or resorption was noted in this mandibular distraction model.

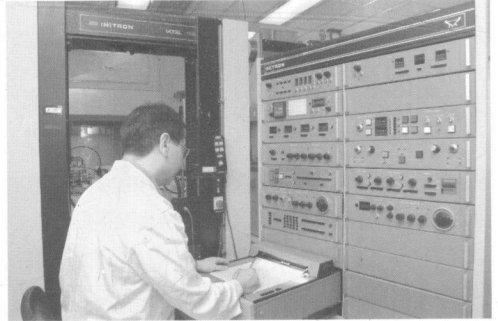
Dissertations of Taught Postgraduates

1. Chanchareonsook N. (2004) Speech outcome and velopharyngeal function in Cantonese cleft patients: comparison of Le Fort I maxillary osteotomy and distraction osteogenesis; a pilot study.
 2. Chien A.Y.J. (2004) Adjunctive orthodontic treatment of pathologically migrated incisors in adults with periodontitis.
 3. Chow R.L.K. (2003) Clinical morbidity of resorbable plates and screws for internal fixation in orthognathic surgery.
 4. Chua H.D.P. (2004) Cleft maxillary distraction versus orthognathic surgery: clinical morbidities and surgical replase.
 5. Ho K.Y. (2004) Healing responses following surgical/non-surgical treatment in residual peridontally-involved sites.
 6. Kam Y.L. (2004) The efficacy of a novel lubricating system in the management of radio-therapy related xerostomia.
 7. Loh J.S.P. (2004) The psychological profile of cleft and non-cleft patients presenting with dento-facial deformities and its changes following surgery.
 8. Movva L.R. (2004) The associations between health behaviours, metabolic control and periodontal status in Type 2 Diabetics.
 9. Ng C.H.C. (2004) A longitudinal study of conventional periodontal therapy and one-stage debridement in periodontitis patients with Type 2 Diabetes Mellitus.
 10. Ng Y.W. (2004) Effects of calcium phosphate lozenges on enamel lesions: an in vitro study
 11. Omer R.S.M. (2004) Determination of the optimum time for surgical removal of supernumerary teeth.
 12. Seto A.W.C. (2004) Design factor affecting air turbine handpiece performance.
 13. Sununliganon L. (2003) Facial profile and craniofacial architecture in cleft lip and palate.
 14. Wan P. (2004) A clinical trial of local delivery of hyaluronic acid gel as an adjunct to non-surgical periodontal treatment.
 15. Wong A.HH (2004) A randomized controlled trial of home tooth-whitening products.
 16. Yeung R.W.K. (2004) Adjunctive effect of hormone replacement therapy on periodontal treatment responses in postmenopausal women.
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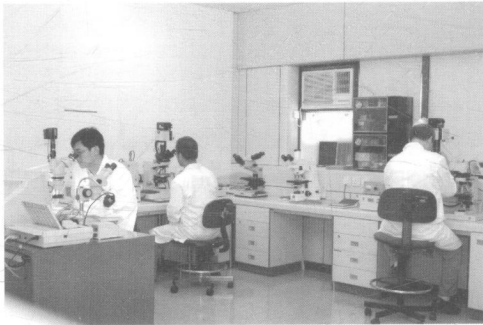
Centralized Research Laboratory Equipment of Faculty of Dentistry



BioStatistics Laboratory



Dental Material Science Laboratory

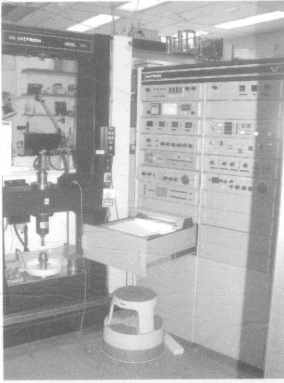


Oral BioSciences Laboratory



Hard Tissue Laboratory

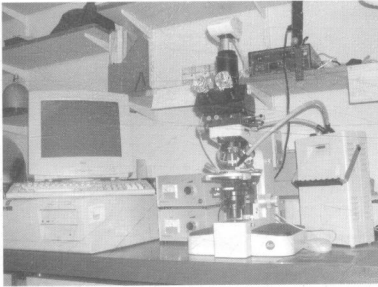
Dental Material Science Laboratory



INSTRON

Function/capability:

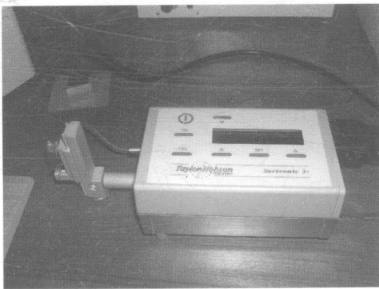
- The machine is a highly accurate and versatile materials testing instrument, designed for the precise measurement of the properties and behaviour of materials in tension, compression and flexure.
- It has a 100kN (10,000kg) max. load capacity



LEITZ-Micro Hardness Tester with Leica DC Camera

Function/capability:

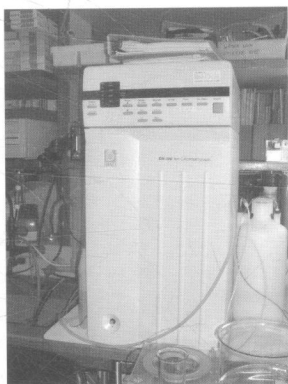
- The automatic micro-hardness tester serves for nondestructive hardness testing (Vickers and Knoop hardness) with small test loads from 19.62×10^{-3} N to 3924. 0×10^{-3} N (2 to 400p). It is used for the determination of the hardness of metals, ores, glass and ceramic parts, electroplating and industrial products.



Surtronic 3+

Function/capability:

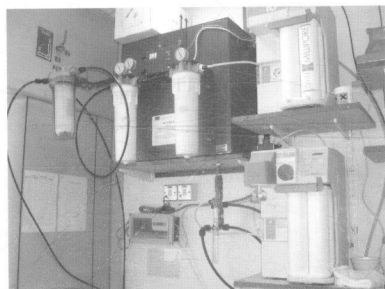
- The Surtronic 3+ is a portable, self contained instrument for the measurement of surface texture.
 - Parameters available for surface texture evaluation are: Ra, Rq, Rz(DIN), Ry and Sm.
 - Cut-off values : 0.25mm, 0.80mm, 2.50mm
 - Traverse lengths : $1/4 \text{ Lambda} + n \text{ Lambda}$;
(n = 1, 3, 5, 10, 25.4)
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DX-100 Ion Chromatograph

Function/capability:

- Ionchromatography is the method of choice for determining a multitude of water soluble compounds in complex matrices. It combines efficient chromatographic separations with conductivity detection for highly selective and sensitive analyses.
- It provides the controls necessary to operate the Self-Regenerating Suppressor (SRS) for AutoSuppression.

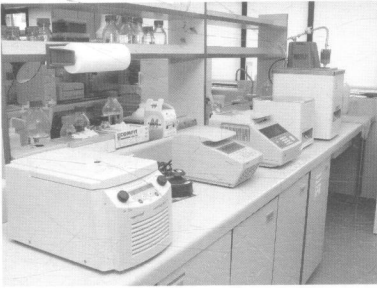


Water purification system

Function/capability:

- The system provides ultra pure water on demand, for use in analytical applications requiring the absence of interfering inorganic, organic, particulate, or microbiological material.
 - It removes a high percentage of each of the four main types of contaminants: Monovalent ions, Polyvalent ions, Dissolved organics, Microorganisms.
-

Oral Sciences Laboratory



GeneAmp® PCR System 9700

Function/capability:

- is an ideal instrument for both basic PCR and cycle sequencing applications
- 5°C/sec average sample block heating/cooling rate
- sample volume range: 5 to 100 µl
- 96-well reaction plates

GeneAmp® PCR System 2700

Function/capability:

- is an ideal instrument for both basic PCR and cycle sequencing applications
- sample volume range: 5 to 100 µl
- 96-well reaction plates

RoboCycler 40 Temperature Cycler

Function/capability:

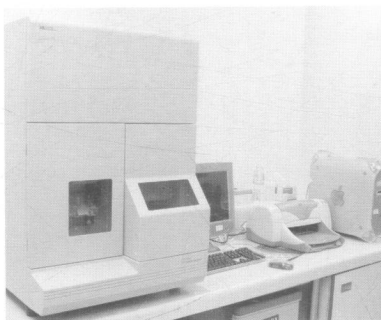
- is an instrument for basic PCR
- 40-wells reaction plate



CHEF Mapper XA System

Function/capability:

- The ultimate tool of pulsed field gel electrophoresis
- High resolution in the range of 100bp to 200kb
- For strain typing-molecular epidemiology
- RFLP & DNA fingerprinting



ABI PRISM® 310 Genetic Analyzer

Function/capability:

- automates all aspects of multi-color DNA sizing and sequencing in a single capillary
 - 1 base detection for fragments up to 250nt within 30 minutes
 - Over 600 bases can be electrophoresed with a standard 2 hours 45 minutes cycle time, while 400 bases can be electrophoresed with only a 1 hours cycle time.
-



Spiral Plater, Autoplate 4000

Function/capability:

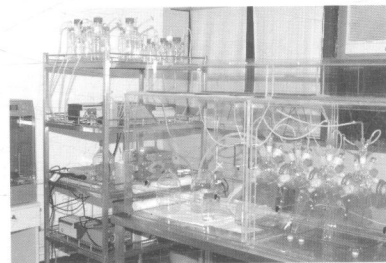
- A microprocessor-controlled spiral plater for bacterial and yeast enumeration, antimicrobial susceptibility testing and mutagenicity assays
- Eight deposition modes are available for 100 and 150mm petri dishes
- Up to five replicate plates can be prepared without aspirating additions sample
- Fully automated cleaning and sampling cycles



Anaerobic chamber

Function/capability:

- A complete anaerobic system providing all the components needed to safely inoculate, incubate, examine and subculture most fastidious organisms
- Strict anaerobiosis is maintained with anaerobic grade gas and nitrogen, acting together with a catalyst/desiccant system that bonds and removes trace oxygen



Multi-station 'Artificial Mouth' Culture System

Function/capability:

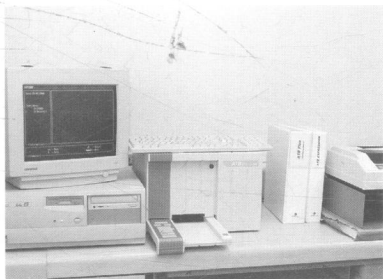
- Computerized controlled flow of nutrient/artificial saliva, maximum up to 8 channels in 37°C incubator.
- pH of each channel will be continuously monitored, stored in computer for the whole experimental procedures.
- *In vitro* studies on microbiological biofilm.



SpectraMax 340 Microplate Spectrophotometer

Function/capability:

- Measure fluid volumes of "endpoint" and "kinetic" optical density from a 96-multiwell plate
- Wavelength from 340-850nm, temperature regulation can range from ambient + 4°C to 45°C
- Applications for ELISA, Enzyme assays, colorimetric protein, growth curve of organisms



ATB Expression

Function/capability:

- Automated reading and interpretation of identification strips (ID 32 strips) and susceptibility test strips (ATBR strips) with an integrated printer
 - Standardized methodologies and fully objective interpretation, independent of user
- 1) Identification
 - ID 32 strips
An international reference for the identification of most microorganisms, including fastidious bacteria of over 550 different taxa.
 - It provides a complete range of automated identification test strips allow identification tests to be performed in 24 - 48. These test strips comprise 32 optimized biochemical tests and are associated with extensive databases, which are stored in the device's software and regularly updated
 - 2) Susceptibility testing
 - ATB® strips
For the determination of S/I/R of a wide range of antibiotics (resistance markers and therapeutic molecules)



TOA-DKKAF-100 ATP Analyzer

Function/capability:

- determine the values of Luminometric ATP (Adenosine Triphosphate), which are used in a wide variety of research activities where measuring microbial presence and growth is required.
- Measurement from 500 pieces/ml or 0.2 fmol (0.1pg) in ATP intensity is possible.

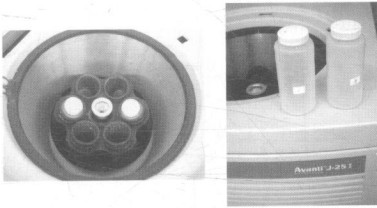


PHILIPS XL30 CP Scanning Electron Microscope (SEM)

Function/capability:

- XL30 CP is a low vacuum scanning electron microscope with a tungsten electron source, and the Oxford Instruments cryo-chamber attachment.
- Resolution: The resolution of the microscope is 3.5nm at 30kV using the secondary electron (SE) detector.
- All images may be stored using a standard resolution digital frame store (702*484) and digital (.tif) files could stored using CD, Zip or 3.5" floppy.
- Easy to use Windows NT Operation System. After training, users will be expected to operate the instrument themselves.

Hard Tissue Laboratory



Centrifuge, BECKMAN Avanti J-25I

Function/capability:

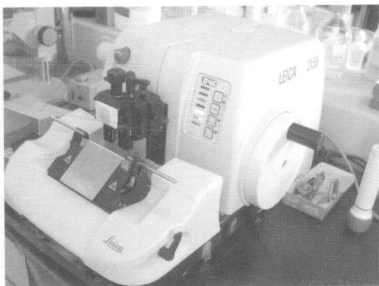
- For centrifugation when dealing with high speed and large quantity of specimen.
- Rotors are identified automatically.
- Easy chamber access by a convenient foot pedal.
- Maximum capacity volume 3000ml with the using of the Rotor JLA-10.500 which can accommodate 6 centrifuge bottles (500 ml).
- The value of g force is provided beside the speed (r.p.m.) on the screen.
- Air-cooled drive with CFC-free centrifugation reduces environmental effects.
- Runs 50% more quietly than conventional systems.



Ultracentrifuge, BECKMAN Optima XL-100K

Function/capability:

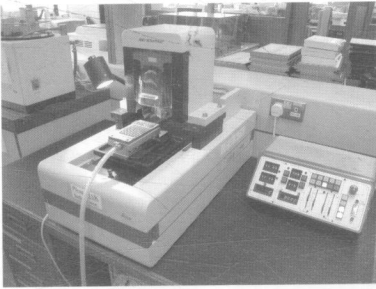
- Up to 100000 rpm(RCF 802400 g) is possible for 100Ti rotor.
- Imbalance-tolerant drive protects against small operator errors.
- Intuitive push-button operation.
- Air-cooled drive eliminates chlorofluorocarbons and other liquid coolants.
- Low power consumption and heat output.



Microtome, LEICA RM2155

Function/capability:

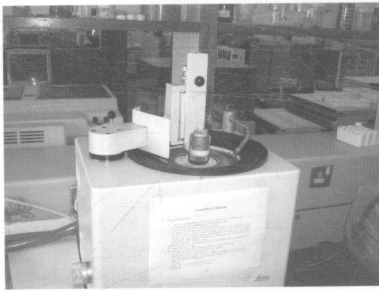
- For sectioning of paraffin or histoiresin embedded specimens.
- Motorized precision feed
- Clearly readable control panel
- Service-friendly design
- Quick release specimen clamping system
- Fast and safe specimen orientation
- Section counter



Polycut E/ Ultramiller, Leica SM2500 E

Function/capability:

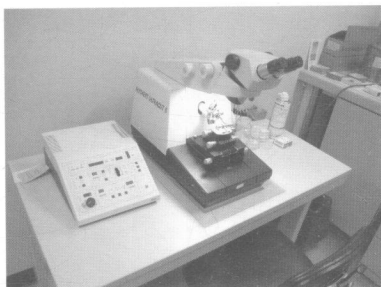
- With the ultramiller installed, it can produce highly smooth surface or section up to 30 μm thin, for extremely hard specimens such as tooth and bone etc.
- With the ultramiller head uninstalled, different type of knife holders and knife can be installed instead to become a microtome for sectioning large and hard specimens.
- Centralized control panel for both ultramilling and Polycut sectioning .
- The speed of miller rotation can be varied for different type of specimens.
- A built-in fitting connected to a vacuum cleaner removes the dust coming out from the ultramiller.



Saw Microtome, Leica 1600

Function/capability:

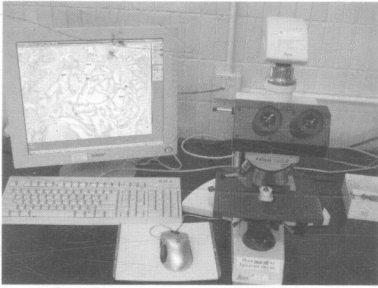
- For sectioning hard samples, e.g.
 - Decalcified or undecalcified, embedded or unembedded bone, with or without implants
 - Teeth with or without implants
 - Mineralogical samples, ceramics and porcelain
 - Glass-fibre reinforced plastics
- Internal-hole saw (280 μm thin) is diamond coated and rotates horizontally at a speed of approximately 600 r.p.m.. An annular triple frame ensures outstanding stability.
- The saw's small thickness of 280 μm ensures a relatively little material loss.
- The specimen is drawn towards the saw by a spring which can be adjusted according to the different degree of specimen hardness.
- A built-in water cooling prevents overheating of the sample and carries the saw dust away.



Ultramicrotome, Ultracut S, Leica

Function/capability:

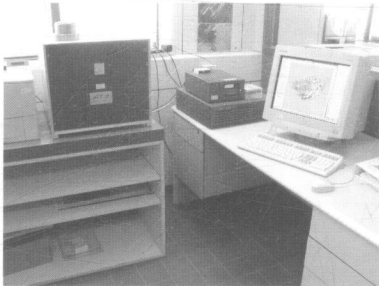
- For preparation of semithin and ultrathin sections prior to transmission electron microscopy investigation.
- Centralized control panel.
- Three transillumination pathways (top, under and behind-specimen) facilitate viewing of specimen.
- Stereo zoom microscope, magnification 10x to 60x
- Reflexomat II with fine control that permits the pumping of water in and out of the water truf.
- Ant vibration base plate.



Leica Qwin Image Processing & Analysis Software, Version V2.6

Function/capability:

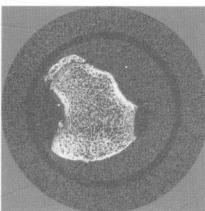
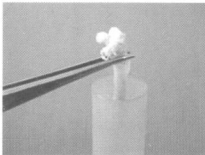
- Provides versatile analysis to images
- Window base
- Data can be transferred to Excel spreadsheet directly
- User friendly
- Microscope, Leica DMLB with objectives : x1.6, x2.5, x5, x10, x20, x40, x100
- Digital camera, Leica DC 300 which provides 3 million pixels picture



Laboratory Based Computer Tomography Machine, uCT-20

Function/capability:

- No specimen preparation required
- Nondestructive
- XRay Microfocus XRaysource
 7 μm Spot Size
 50 kVp, 8 W (160 μA)
 No shielding required
- Min. Scan time: 15 s/section
- Resolution: Slice thickness- 25 to 35 um
 Image Matrix 512x512 or 1024x1024
- Specimen Size: 9 to 17 mm
 max. Scan Length 50 mm
- Software Applications: Complete imaging solution
 Data acquisition
 Online/Offline Reconstruction
 Sophisticated 2D/3D evaluation
 3Dvisualization
 Animation
 Archiving
 Database
 Browser access (web based access)





High Performance Liquid Chromatography Systems, WATERS

Function/capability:

- For separation, identification, purification, and quantification of various compounds.
 - Waters Millennium 32 software:
It allows complete data acquisition and system control up to 4 chromatographic systems. It also provides integrated analysis, system control, information and results management etc.
 - Waters 600S controller and Waters 626 pump:
The pump has a built-in, non-metallic, variable injector which minimizes sample loss and dilution.
 - Waters 486 Tunable Absorbance Detector.
The detector incorporates a unique Taper-cell flow cell which eliminates refractive index effects. The dual beam system decreases effects of light source variation and give high sensitivity.
 - Waters Fraction collector.
The fraction collector is capable of collecting up to 120 fractions at a time in a variety of containers from microliter to-liter volumes. Collection can be done by time, number of drops, volume or external signal.
-

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