The British Society for Dental Research
(A Division of the IADR)
43rd Annual Meeting
April 10-13, 1995
University of Manchester
England

Participants and Sequence Numbers of Abstracts

Aaron, J.E., 360, 361
Abang, Z., 265
Abdeia, R., 239
Abdi, M., 508, 510, 525
Abdullah, M.S.B., 141
Abour Bashir, M., 201
Aboush, Y.E.Y., 245, 477, 478
Absi, E.G., 428, 437
Abu-Hammad, O.A., 124
Abu-Kasim, N.H., 160
Adam, S., 374
Adams, E.K., 378
Adams, M., 60
Adams, N., 515
Adamson, R., 300
Adonogianaki, E., 210
Aduse-Opoku, J., 214, 215, 506
Agalamanyi, E.A., 454
Agarwal, A., 624
Agarwal, N., 562
Agarwal, P., 396
Ahmad, S., 150
Ahmed, I., 419
Ahmed, N., 85
Akeel, R., 614
Alam, Y., 103, 460
Albiston, L., 241, 250
Al-Deghaishem, F., 607
Aldred, M.J., 392
Ali, S., 510
Al-Hokail, O.S., 484
Allaker, R.P., 500, 516
Allen, P.F., 26
Allison, C., 198, 250, 252
Allison, R.T., 540
Allsop, J.F., 36
Amess, T.R., 1
Anderson, L.C., 180, 181
Anderson, M., 511
Anderson, P., 62, 220, 221, 379, 390, 405, 425
Anderson, R.J., 41, 42
Anderson, Z., 317
Andrew, D., 2
Andrews, D.M.A., 305, 515
Annaz, B., 460
Ansari, G., 402
Anstice, H.M., 90, 243, 592
Appleton, J., 368
Archer, C.W.A., 492
Arici, S., 142
Armstrong, R.A., 268, 433
Arngrimsson, R., 6
Arora, M., 136
Asfour, M.A.M., 232
Ashley, F.P., 196, 316
Ashley, P., 404
Ashmore, J., 497
Ashton, M., 109
Assinder, S.J., 48
Atherton, M., 462
Attrill, D.C., 369
Awad, M., 131, 470
Babb, D.C., 277
Baird, J., 131
Baggatt, F.J., 230
Bahrami, M., 372
Baidya, P., 207
Bailey, G.C., 110
Bakri, M.M., 317
Baldwin, P., 84
Ballantyne, H.M., 324, 407
Bamber, M.A., 265
Barber, P.M., 83, 110, 120, 254, 290, 456
Barclay, C.W., 247
Barnard, K.M., 558
Barnfather, R., 396
Bartlett, D.W., 162
Barton, P., 520
Basker, R.M., 22
Beal, J.F., 283
Bedi, R., 371, 382, 383
Beeley, J.A., 176, 402, 563
Beighton, D., 47, 161, 325, 407, 488, 517, 524
Benington, I.C., 119, 619
Benington, P., 310
Bennett, E., 375
Bennett, K., 505
Bentley, E.M., 234, 235
Bertenshaw, B.W., 594
Best, T., 540
Beynon, A.D., 57
Bhatti, S.A., 334
Bhudia, N., 530
Biagioni, P.A., 119, 400, 537, 571, 572, 574
Billington, R.W., 245, 248
Binnie, A., 349, 350, 351
Binnie, L.I., 74, 190, 281
Bishop, D.T., 297
Bishop, P.A., 253, 439
Blain, K.M., 233
Blair, F.M., 291
Blau, W., 61
Lamey, P.-J., 101, 119, 400, 429, 537, 563, 564, 565, 566, 567, 568, 569, 572, 574
Lampert, F., 304
Landes, D.P., 105
Lane, D.P., 468
Langley, M.S., 362, 495
Langton, S.G., 435, 561
Last, K.S., 84
Lau, P., 439
Law, D., 509
Lawrence, G.M., 99
Laws, R., 290
Lawson, C., 11
Lazlo, J., 72
Leard, A., 346
Lee, A.R., 224, 367, 478
Lee, G.T.R., 184, 381
Lee, R.T., 236
Leek, J., 17
Leigh, I.M., 297, 555
Leighton, T.G., 501
Lehner, T., 95, 96
Lench, N.J., 18
Lennon, A., 208
Lennon, M.A., 106, 186
Leong, W., 618
Leung, T., 117, 604, 605
Lesot, H., 59
 Lesser, S., 341
Levinkind, M., 222, 236, 355, 356, 357, 358, 425, 593
Lewis, D.A., 524
Lewis, H.L., 559
Lewis, M.A.O., 253, 437, 439, 518, 559
Leyshon, R.J., 620
Li, J., 549, 550
Li, T.-J., 551
Likeman, P., 591
Lilico, J.T., 474
Lilley, J.D., 78, 209
Liloglou, T., 298
Lim, W.S., 456
Lim, S., 16
Linden, G.J., 242, 429, 482, 483, 490
Linden, R.W.A., 319
Lindsay, S.J.E., 185
Littlewood, J.M., 395
Liu, P., 626
Lloyd, W., 566
Locker, D., 167
Loke, S.T., 139
Long, A., 320
Long, B., 111
Long, M., 566
Longbottom, C., 271, 324, 326, 407
Longman, L.P., 454
Longmore, R.B., 27
Longhurst, P.B., 49
Louca, C., 319
Lovius, B.B.J., 538
Loyn, T., 342, 493, 502
Lucas, V.S., 517
Lumley, P.J., 112, 113, 114
Lundy, F.T., 569
Lynch, E., 80, 226, 354, 403, 414, 462, 488, 587, 588, 589
MacAndrew, R., 344, 502
MacDonald, A., 287
MacDonald, D.G., 100, 101, 171, 570
MacFarlane, T.W., 208, 241
MacGregor, I.D.M., 191
MacKenzie, D., 208
MacMillan, S., 13
MacPherson, L.M.D., 281, 385
McAndrew, M., 374
McAndrew, R., 341, 342, 374, 493
McCartan, B.E., 101
McCombes, W., 188
McCormick, R.J., 37
McCullagh, J.J.P., 572, 574
McCann, J.P., 387
McCabe, J.F., 22, 24, 88, 93, 157, 159, 160, 202, 207, 244, 291, 474, 476, 603
McCord, J.F., 147
McDonald, A., 63, 285
McDonald, F., 389, 447, 459, 577, 578
McEwan, T., 560
McGeady, J., 401
McGill, J.T., 24
McGoldrick, P.M., 76
McGimpsey, J.G., 27, 537
McGreevy, C., 491
McGurk, M., 68, 269, 445
McKenna, W., 122
McKenzie, D., 241
McKenzie, S., 199
McKeown, S., 349
McKie, R.M., 101
McKinley, R., 73
McLaughlin, J.O., 521
McLaughlin, W.S., 93
McLean, W., 12, 441
McLeod, M.H., 197
McMichael, A., 39
McQuaid, C.A., 334, 335, 336
McQueen, A., 380
McWilliam, J., 14
Ma, K.-C.J., 96
Mackie, I.C., 230, 231, 234
Maher, R., 541
Main, J.R., 79, 581
Mair, L.H., 155, 489, 562
Mak, M., 586
Mannion, H., 371
Marcenes, W., 237, 238
Marchant, S., 325
Marley, J.J., 429
Markham, A., 17
Marsh, P.D., 252
Marshall, C.E., 414
Marshall, K.J., 415
Martin, M.V., 519, 520
Martin, N., 600, 601, 602
Marquis, P.M., 36, 112, 583
Maryan, C., 471
Mason, C., 560
Mason, G.M., 487
Mather, E., 476
Matoorian, N., 590
Matthews, J.B., 36, 133, 170, 487, 542, 551
Mee, A., 560
Meechan, J.G., 93, 207
Meikle, M.C., 323
Meghji, S., 135, 136, 137, 211, 530, 554
Mellor, A.C., 278, 279, 376
Mercer, C.E., 221
Meredith, N., 89
Middlehurst, R.J., 66
Mighell, A.J., 464
Miles, A., 430, 431
Millar, B.J., 232, 416, 472, 579, 580, 597, 617, 621, 622
Millard, L., 28
Millins, B., 519
Milsom, S., 106, 344, 345, 345a, 463
Minirons, M.J., 582
Mirandani, R.M., 50
Mistry, M., 408
Mitchell, C.A., 598
Mitchell, S.A., 184
The present experiments investigate the diffusion of lignocaine into cat dentin. They were carried out in the lower canines of 2 cats, anaesthetised with sodium pentobarbital (42 mg/kg I.P. followed by 4 mg/kg I.V. as required). Dentine was exposed by removing the labial cusp tip with a diamond disc under Ringer's solution and the cut surface etched with acid. A Pampers cap was sealed over the tip of the tooth to provide a reservoir for the solutions to be tested. The effects of lignocaine (10% w/v in Ringer's) applied at acute angles to the tooth surface, from the tip of a cap with a pair of Ag/AgCl electrodes, during electrical stimulation of fibres in the adjacent periodontal ligament (PDL) were investigated by the application of brief stimuli. The size of the antidromic single unit and compound action potentials began to decrease 3 mins after the onset of activity and were completely abolished 10 mins after the application of lignocaine for 3 mins. When the lignocaine solution was replaced with Ringer's solution recovery began after 15 mins of total blockade. Total recovery of the dentine was complete within 45 mins after discontinuation of the applied pressure stimulus. It can be concluded that 10% lignocaine applied to dentine for 3 mins will block the response of the intradental nerves to 0.02% w/v lignocaine pressure stimulus.

The aim of the current study was to characterise the MAB 61B.G (Görl et al. 1986; Oral Microbiol. Immunol. 1, 189-195) as an effective and selective indicator for the detection of Porphyromonas gingivalis and its use in passive immunisation. The 3 major bands recognised by MAB 61B.G in Western blots had M, consistent with those reported for P. gingivalis haemagglutinins. Binding of MAB 61B.G in a rabbit haemagglutination assay by a P. gingivalis preparation and the antisera inhibited haemagglutination of erythrocytes by that preparation. 14 patients with adult periodontal disease were each split into 2 subgroups of 7 patients from whom the number of pockets was 7 at the 2nd and 5 at the 6th month. Patients were randomly assigned, in a double blind study to either group. Just prior to the start of their participation in the study. The major aim of this investigation was to ascertain whether an effective change in the microbiological status of oral mucosa can be achieved using a therapeutic agent with proven value in the fight against periodontal disease. The results of this investigation indicate that the mucosal Microorganism, the second to the genus Prevotella and the third to Porphyromonas gingivalis.

The purpose of this prospective study was to quantitatively assess, epideiologically and by the use of a 3-D facial surface scanning technique, the treatment changes on the facial soft tissue profile and form produced by three different surgical appliances. Five patients were randomly allocated to the treatment groups (Twist Block, Bioclear or Intraocclusal) with a further treatment to the control group. The main aim of this 1 year treatment to the control group was to determine the changes in soft tissue profile and form produced by three different functional appliances. Eight patients were randomly allocated to the treatment groups (Twist Block, Bioclear or Intraocclusal) with a further treatment to the control group.

An extract of the tissue was prepared using similar procedures in parallel with the sample used for the experiment. The results of this investigation indicate that the mucosal surface area can be achieved using a therapeutic agent with proven value in the fight against periodontal disease. The results of this investigation indicate that the mucosal Microorganism, the second to the genus Prevotella and the third to Porphyromonas gingivalis. In conclusion, molecular analysis of the flora associated with denoto-alveolar abscesses has been successfully performed and these non-susceptible oral bacteria have been identified. The results obtained using this technique have profound implications for all areas of microbial ecology.

An intact maxillary central incisor (3 subjects) and an intact mandibular first molar (1 subject) were chosen as test teeth. A roentgen surface gauge was attached to the buccal surface of each test tooth. While occluding the central incisor tooth a load cell, subjects attempted to attain steady load levels of 0.5 N on the composite, and then a control was noted with the results of a previous benchtop study (Meredith N., PhD Thesis, University of London 1992). Repeat recordings with the separate gauges were consistent. There was a linear relationship between applied load and the surface strain. Results showed a significant correlation with the results of a previous benchtop study (Meredith N., PhD Thesis, University of London 1992).

It was concluded that it was possible to measure surface strains in teeth in vivo. It was also concluded that there was a linear relationship between load and strain, and that strain orientations were not readily predictable from observation of tooth shape and loading site.
I ware period. The effect of most hybrids. Polymerasede.

C. LAWSON (School of Biological Sciences, University of Manchester, UK): Molecular genetic studies of bisphosphonate sequences.

The aim of the investigation was to delineate the critical region encompassing the bisphosphonate sequence (BPES) on human chromosome 3. BPES is an autosomal dominant disorder that is characterized by diffuse bone pain, erosions, and fractures. Bisphosphonates are typically used in the treatment of patients with osteoporosis. To identify the critical region, the authors used microsatellite markers in a family with known osteoporosis. The results showed that the critical region is located on chromosome 3, which is consistent with previous studies. The authors concluded that the BPES region is crucial for the development of osteoporosis.

S. MacMillan (Department of Adult Dental Care, University of Glasgow, UK): Factors associated with shear bond strength of composite resin to human enamel.

The effect of enamel surface preparation before etching has been studied in this investigation. The relationship of etchant pH and surface topography as related to shear bond strength of composite resin to enamel. The shear bond strength of composite resin to enamel is affected by the surface topography. The surface topography of etched enamel occurs under enamel and the topography correlated with the shear bond strength. The results showed that etching the enamel surface improved bond strength. The shear bond strength was significantly reduced compared to the control group, which was not etched. It is suggested that enamel preparation and etchant pH have no effect on the shear bond strength but that the surface topography of the etched enamel correlates moderately well.


The tumour suppressor gene p53 is frequently over-expressed in neoplasms, such over-expression is often associated with gene mutation, p53 over-expression is partially detected in paraffin sections of tumours using immunohistochemistry. Microwave antigens retrieval of sections prior to immunohistochemistry can increase antigenicity and therefore the detection of desired antigens. The authors performed a study to investigate the effects of microwave antigens retrieval on the detection of p53 protein in the oral cavity and larynx. They observed that using Microwave antigens retrieval, the level of p53 protein was increased in the oral cavity and larynx tissues compared to non-retrieved tissues. The results suggest that Microwave antigens retrieval can be used to increase the detection of p53 protein in oral cavity and larynx tissues.
17

Divisional Abstracts: The British Society for Dental Research

18

P. ROBINSON, I. KAZEMI, J. LEE, W. HUME & P. MARKHAM (Leeds Dental Institute, Leeds, UK): Clonal haemopoiesis of tumour necrosis factor 9q DNA marker in oesophageal carcinoma.

The oesophageal basal cell carcinoma syndrome (NBCCS) or Gorlin syndrome is a complex pleiotropic autosomal dominant disorder, associated with a broad spectrum of developmental abnormalities, and a predisposition to several malignant neoplasms, in particular basal cell carcinoma (BCC).

The NBCCS locus has been mapped to chromosome 9q22-23-x31 using genetic linkage studies. The consensus DNA marker order in the region is: cen-D9S196-D9S217-D9S180-D9S109-D9S127 (Sheth et al., 1993). Loss of heterozygosity studies in NBCCS patients and sporadic BCCs have demonstrated deletion of large regions of 9q22-23 although data on deletions and points in 9q22-23 have not been observed. In order to define the critical region containing the NBCCS locus, we have chosen to examine DNA from oesophageal tumours to see for loss of heterozygosity. Oesophageal tumours occur at a very early age and may be one of the first clinical manifestations of homozygous inactivation of the NBCCS gene. We have analysed DNA, microdissected from tumour and normal paraffin-embedded tissue sections, for loss of heterozygosity by PCR of the microsatellite markers D9S196, D9S217, D9S180, D9S173, D9S176 and D9S127. Preliminary results indicate that there is loss of heterozygosity for some or all of these markers in oesophageal tumor tissue from various patients.

Combination of data from all patients tested defines a minimum region of deletion defined by the markers D9S217 centromeric and D9S176 telomeric, a distance of approximately 350kb.

19

C. WU, L. ROZ, S. HOLLAND, P. SLOAN, A. P. READ, N. S. THAKKER. (University of Manchester, Eastman Dental Institute, London): Two discrete areas of loss of heterozygosity on chromosome 9q in oral squamous cell carcinomas.

The genes for the basal cell nevus syndrome (BCNS), multiple self healing epithelial nevi (MSEN) and Fas-related apoptosis susceptibility (FAS) and some of its homologues map to chromosomes 9q. Furthermore, loss of heterozygosity (LOH) studies indicate presence of a tumour suppressor gene involved in bladder carcinomas in this region. We have performed LOH analysis of oral squamous cell carcinomas (SCCs) using 13 highly informative microsatellite markers along the 9q22-23 region and at least two non-contiguous regions were identified. The most proximal of these regions maps to 9q22.3-3.1 and is centred around D9S180. -90% of informative samples show LOH at this locus. The distal microsatellites D9S231, D9S121 and D9S164 show -35% of informative samples show LOH at this region of 9q22.3-3.1.

We selected the two tumour suppressor areas on chromosomes 9q in oral carcinomas.
The two regions of deletion identified closely overlap the BCNS/SS11 locus (9q22.31) and the area of deletion in bladder carcinomas (9q22.11-12).

20


The purpose of this 3-centre trial was to evaluate methods which could be used for standard specification testing of long-term soft tissue linings. Four materials were chosen as subjects for investigation (A and B at 30a and 30b) and elastic recovery at both room temperature and 37°C. The softness of materials was determined by penetration at 5s 0.64mm, S 0.455mm, C 0.97mm and D 0.56mm. Material C was significantly softer than the other materials (p<0.05 ANOVA). There was good agreement between test centres. The penetration test was shown to be an effective test which was quick and easy to use and showed highly significant differences (p<0.05) in the 3 centres.

21


9q33 is a putative metastasis suppressor gene whose expression has been inversely associated with metastatic potential in experimental systems and human breast carcinomas (Royda JA, et al., J. Pathol 175: 211-212.1994). The aim of this study was to determine whether 9q33 expression was affected in squamous cell carcinomas of the oral cavity. Sixty patients were studied. 24 patients had a primary oral cancer (19 were SCCs) and 24 patients were controls. 12 cases were in the buccal mucosa and 12 cases were in the tongue. There was evidence of both nuclear and cytoplasmic positivity. Further studies of the lymph node metastases are in progress.

9q33 is expressed in oral SCCs. However this study has not demonstrated any correlation between expression in the primary tumour and its metastatic potential.

Novocast Design Ltd.

22

M. J. WATERS* & R. G. JAGGER (Cardiff Dental School, UK): Properties of a new experimental silicone soft tissue lining material.

Previous work has shown that an experimental room-temperature vulcanizing silicone soft tissue lining material had favourable properties (Waters MG J, and Jagger R G, J Dent Res 72: 807). However, the material was deemed unacceptable because of its high water absorption. A modification of this material has since been developed incorporating a new surface treated silica filler. In this study the new modified material was compared with Mollioblast® and the original material. The hardness, water, oxygen, bond to denture base, resistance to tear, viscoelastic properties and water sorption properties of the materials were investigated. A new material was developed using a conventional dough moulding technique. The experimental material was cured for 2 hours at room temperature and Mollioblast® was cured according to manufacturers instructions. The new formulation had low water absorption and solubility. It was slightly harder than the new modified material and slightly more elastic than Mollioblast®, B, and its weatability characteristics were similar to both. The tear resistance and bond to the denture base of the new material were greatly superior to both the original formulation and Mollioblast® and its weatability characteristics were similar to both. Clinical trials in the viscoelasticity of temporary soft tissue lining materials are characterized by a more rapid and increased reduction than observed in vitro. Water stress acting clinically is a potential variation. In this investigation four temporary soft tissue materials (Core Soft, Core Comfort, GC Soft Liner and Vicagel®) were immersed at 37°C ± 1°C in 8% alcohol, 50% alcohol, Hesper® and Core oil, solutions chosen to simulate dietary solvents. Core Soft showed a significant reduction in mechanical properties of both materials was A 1.68, B 0.56, C 0.72, D 1.33, E 1.08. There was significant inverse correlation between this ratio and elastic recovery (p<0.05) indicating that the viscoelastic properties of the materials could be characterised by a single penetration test. For some materials (negative) some properties may be dependent on both temperature, whilst for others (p<0.05) penetration was independent of temperature. This indicates the importance of standardizing temperature in these tests.

23


Clinical changes in the viscoelasticity of temporary soft tissue materials are characterized by a more rapid and increased reduction than observed in vitro. A solvent effect acting clinically is a potential variation. In the present investigation four temporary soft tissue materials (Core Soft, Core Comfort, GC Soft Liner and Vicagel®) were immersed at 37°C ± 1°C in 8% alcohol, 50% alcohol, Hesper® and Core oil, solutions chosen to simulate dietary solvents. As expected the materials showed significant reductions in mechanical properties of both materials was A 1.68, B 0.96, C 0.72, D 1.33, E 1.08. There was significant inverse correlation between this ratio and elastic recovery (p<0.05) indicating that the viscoelastic properties of the materials could be characterised by a single penetration test. For some materials (negative) some properties may be dependent on both temperature, whilst for others (p<0.05) penetration was independent of temperature. This indicates the importance of standardizing temperature in these tests. A similar penetration test maximised at 37°C can be used for the assessment characterization of long-term soft tissue lining materials.

*Regener GmbH and Co., Germany.
25

Light activated composites rely on adequate intensity of the light source to cause polymerisation through the bulk of material. Material factors such as filler size and loading, resin composition and the method of mixing affect the efficiency of the light curing process. This study measured the curing depths of light-cured and lower surface microhardnesses of 2mm thick and 4mm diameter samples of three light cured composites 1-3 cured with twelve light curing units. Composites samples was irradiated for 40s at zero degree from the resin side. Light curing was measured with a commercially available dental radiometer. Mean light intensity for the light curing units varied ranged from 101 to 725 (mW/mm2) at full optic distance. Upper surface microhardness was little affected by changes in light intensity. Lower surface microhardness was related to light intensity and the correlation between lower surface microhardness and light intensity was most pronounced with the microfilled composite 3.

Material composition is a very important variable at low light intensity to determine adequate polymerisation in bulk.

1. Hernlisa, X.R., Kerr
2. Z100, 3M Dental
3. Silux Plus, 3M Dental
4. Core-Ride, Efo Inc.

26

This study investigates the attitudes of dentists to cross-infection and compared them with those of dental students. Patient awareness and reactions to these measures were also sought. Questionnaires were distributed containing 15 items assessing hygienic procedures and attitudes. The patients were asked to answer these questions about hygienic procedures and attitudes. The study was a cross-sectional survey of patients and dental students in all years of the School.

This result indicates that the basic education of dental students is inadequate regarding cross-infection control. The patients are aware of the hygienic procedures and attitudes. The study shows that patients are more aware of the hygienic procedures and attitudes. The study also shows that patients are more aware of the hygienic procedures and attitudes.
Acrylic bone cements containing antimicrobial agents have been successfully used in joint replacement surgery. Novel injectable cements have several potential advantages over acrylics. The aim of this study was to compare the release of two antibiotics from injectable and acrylic cements. Dogs (n = 5) were divided into two groups; one group was prepared for both cements. The discs were placed into phosphate buffered saline (PBS) at 37°C and sampled between 1 hour and 9 months. Released drug was measured using UV spectrophotometry and MIC determination. Steptococcus sanguis (Oxford strain), Streptococcus sanguis NCTC 7451, Escherichia coli NCTC 10416 and Bacillus subtilis. Cephalexin was readily released from injectable disc, but at low drug loading it was poorly released from acrylic. Cephalexin was released well from both matrices, however, the release became much better from acrylic. Within the first 10 days therapeutic concentrations of cephalexin were released from all discs. For cephalixin a drug load of 5% was necessary in acrylic and 3% is injectable cements to achieve therapeutic concentrations. For both matrices the activity of cephalexin was found to be slightly diminished after 10 days of storage and was almost lost after 1 month. In contrast cephalexin retained almost full activity for 3 months. Injectable cements are suitable matrices for delivery of cephalexin and cephalexin. The drugs under study were active against the growing strain for at least 10 days.

1. V. O. CEM, Experimental injectable cement, Lumis GmbH and Co KG, Germany
2. Simplex Rapid Clear®, Howmedica Ltd, UK
3. R. J. McCormick, N. Meredith and M. Sheriff (University of Bristol and UMDS, London, UK). The Effect of Low-Level Laser Therapy on the Healing of Oral Soft Tissues: A Pilot Study. A pilot study has been designed to investigate the effects of laser therapy on the healing of oral soft tissues. Forty conventional incidence illumination devices were used, half of the samples were exposed to laser therapy while the other half were left untreated. The samples were then evaluated using a laser Doppler flowmeter and a device that measures the blood flow. The results were used to compare the healing of the laser treated and untreated tissues. In conclusion, laser therapy appears to be effective in improving the healing of oral soft tissues.

This study demonstrates the potential of using laser therapy to improve the healing of oral soft tissues. Further research is needed to confirm these findings and to investigate the optimal parameters for laser therapy.

4. Video Associates Laboratory; 2 Transvision Incorporated; 3 Joint Photographic Experts Group

40 A BALLAS® (Dental Public Health, University of Birmingham, UK). Parental perceptions of oral screening and their children’s dental state.

A questionnaire was sent to the parents of all 5 and 6 year old children resident in Basingstoke. The aims of the study were to calculate the value placed by parents, on the recommendations of the dental school. A questionnaire was developed to assess the knowledge and beliefs of the parents about dental health and the role of the dental school. The questionnaire was sent to 200 parents and the results were analyzed to determine the knowledge held by the dental needs of their children. Parents were asked to rate the importance of dental care to their children and the results were analyzed to determine the knowledge held by the dental needs of their children. The results showed that the majority of parents believed that dental care was important to their children. However, only 50% of parents believed that dental care was important to their children.

In conclusion, the parents of children in Basingstoke have a positive perception of dental screening and their children’s dental care. Further research is needed to investigate the impact of these perceptions on the children’s oral health.
A study was undertaken of 7808 eight-year-old children resident in the city of Birmingham, using the standard BASCOM epidemiological diagnostic protocol. Positive consent was obtained from every parent or guardian, including permission to link the findings with the Dental Practice Board’s records as to whether each child was registered under the NHScaption scheme for the provision of primary dental care. The dental status of these 7808 children was recorded on the Birmingham School Dental Health Register (54.5%) was involved with those who were not (45.5%). Overall, there were only very small differences between the earlier state of registered and non-registered children. Combined results for the primary and permanent dentitions show that registered children had, on average, 0.60(SE±0.02) decayed teeth, 0.255(SE±0.02) filled teeth, 0.25(SE±0.02) filled teeth, 0.25(SE±0.00) missed teeth and 0.25(SE±0.00) filled teeth. However, 25% of those registered children in the scheme still had active decay which was not registered in the primary dentition.

Overall, children registered under thecaption scheme had slightly better dental health than those who were not registered. However, a third of all the children incaption had active decay which was not registered in the primary dentition.

We gratefully acknowledge support from Department of Health grant no. 129/001 for this research.

A study of 7808 eight year old children in Birmingham investigated the differences between children who were registered and who were not registered under the NHScaption scheme, in terms of their residential neighbourhood classification and ethnic background. Combined results for the primary and permanent dentitions show that the registered children in the scheme had, on average, significantly less decayed teeth, 0.60(SE±0.03) than 1.02(SE±0.03) of their non-registered colleagues. 1.02(SE±0.03). Registered Asian children in the most deprived neighbourhoods had the greatest increase in the average number of filled teeth, 1.2(SE±0.08) when compared with their non-registered counterparts, 0.7(SE±0.00). Unfortunately this group had the lowest proportion of children, 25%, who were registered in the caption scheme compared with 56% of the total sample.

The group of children who would benefit most from being registered under the caption scheme had the lowest proportion who were actually registered.

We gratefully acknowledge support from Department of Health grant no. 128/001 for this research.

Oral ascarossporophycous bacterial species are slow-growing, non-sporing, anerobic gram-positive bacilli rarely found in oral health but which make up a significant proportion of the flora of subgingival plaque in advanced periodontitis. The aim of this study was to determine the phylogenic and genetic relationship in the genus trapistreplosis. DNA samples were obtained from 38 strains of trapezospores isolated from various sources, including human periodontal disease, human tissue, and oral microorganisms. The NVS consists of two species, Streptococcus acidominus and Streptococcus defirctus, which can be differentiated from each other, and from these viridans streptococci, using routine tests or commercial streptococcal identification kits. Previous phylogenetic studies have been restricted to an examination of strains using a small set of tests to determine their ability to ferment carbohydrates and for the presence of pre-formed enzymes. To extend these studies we have examined S. defirctus ( strain 1) and S. acidominus (strain 39) strains for their ability to ferment carbohydrates and for the presence of pre-formed enzymes. Activities of these enzymes were studied in detail, e.g. 7-amino-4-methylcoumarin (AMC) and by fluorescence activities using 4-methylumbelliferyl (MUG) linked substrates. S. defirctus strains produced a wide range of pre-formed enzymes including hydrolytic, peptidasic, leucine, cysteine, and aspartic acid activity, while S. acidominus strains produced only hydrolytic, peptidasic, leucine, cysteine, and aspartic acid activity. These data provide additional phylogenetic characteristics for distinguishing between these two species and suggest that they have different nutritional requirements.

Oral ascharosporophycous bacteria were slow-growing, non-sporing, anaerobic Gram-positive bacilli rarely found in oral health but which make up a significant proportion of the flora of subgingival plaque in advanced periodontitis. The aim of this study was to determine the phylogenic and genetic relationship in the genus trapistreplosis. DNA samples were obtained from 38 strains of trapistreplosis isolated from various sources, including human periodontal disease, human tissue, and oral microorganisms. The NVS consists of two species, Streptococcus acidominus and Streptococcus defirctus, which can be differentiated from each other, and from these viridans streptococci, using routine tests or commercial streptococcal identification kits. Previous phylogenetic studies have been restricted to an examination of strains using a small set of tests to determine their ability to ferment carbohydrates and for the presence of pre-formed enzymes. Activities of these enzymes were studied in detail, e.g. 7-amino-4-methylcoumarin (AMC) and by fluorescence activities using 4-methylumbelliferyl (MUG) linked substrates. S. defirctus strains produced a wide range of pre-formed enzymes including hydrolytic, peptidasic, leucine, cysteine, and aspartic acid activity, while S. acidominus strains produced only hydrolytic, peptidasic, leucine, cysteine, and aspartic acid activity. These data provide additional phylogenetic characteristics for distinguishing between these two species and suggest that they have different nutritional requirements.

The nutritional content of trapistreplosis (NVS), members of the normal oral flora and associated with periodontal disease, is of considerable interest to periodontal microbiologists. NVS includes strains from various sources, including human periodontal disease, human tissue, and oral microorganisms. The NVS consists of two species, Streptococcus acidominus and Streptococcus defirctus, which can be differentiated from each other, and from these viridans streptococci, using routine tests or commercial streptococcal identification kits. Previous phylogenetic studies have been restricted to an examination of strains using a small set of tests to determine their ability to ferment carbohydrates and for the presence of pre-formed enzymes. Activities of these enzymes were studied in detail, e.g. 7-amino-4-methylcoumarin (AMC) and by fluorescence activities using 4-methylumbelliferyl (MUG) linked substrates. S. defirctus strains produced a wide range of pre-formed enzymes including hydrolytic, peptidasic, leucine, cysteine, and aspartic acid activity, while S. acidominus strains produced only hydrolytic, peptidasic, leucine, cysteine, and aspartic acid activity. These data provide additional phylogenetic characteristics for distinguishing between these two species and suggest that they have different nutritional requirements.
51

M PRING (Department of Oral and Dental Science, University of Bristol, UK)

Control of transcription factor expression by transforming growth factor β1 in rat oral keratinocytes.

The signal transduction pathways that elicit the diverse biological effects of TGF-β have not yet been determined. Previous studies in epithelial cells have linked the inhibition of cell proliferation to -cmyc and the elaboration of extracellular matrix to Jun-B. This study examined the effect of TGF-β1 on the transcription factors Jun-B and -cmyc in rat oral keratinocytes with variable degrees of cellular differentiation and a range of inhibitory responses to this ligand. Jun-B expression was upregulated in response to exogenous TGF-β1 in all cell lines (n = 7). The downregulation of -cmyc was cell line specific. TGF-β1 induced cell cycle delay by inducing cyclin D1 and cyclin E, and thymidine incorporation assays in 5 cell lines: cmyc expression was not downregulated despite growth inhibition by TGF-β1. The regulation of both Jun-B and -cmyc by TGF-β1 did not reflect the degree of cellular differentiation.

This work was supported by a grant from the Nuffield Foundation (NUF-UR994).

52

J RICHARDSON (Dundee Dental Hospital and School, University of Dundee, UK). Random and systematic variation among dental treatment decisions in vivo.

Several studies have examined the extent of variation among treatment decisions made by dentists. Many factors may contribute to disagreement, but in general two sources of variation are involved: systematic (e.g. differences in opinion about treatment need) and idiosyncratic. By using the present study to assess the relative contribution of the two types of variation in order to determine what strategies could be adopted to reduce disagreement. Twenty-five general dental practitioners were selected from 100 general dental practitioners (GDPs) and oral surgeons, had their teeth mounted in phantom heads on two separate occasions under standardised conditions. The hypothesis was that inter-dentist disagreement on treatment planning would stem from both systematic and random variation, but intra-dentist agreement would mainly stem from random sources. Combining all tooth surface-specific treatments together (extractions, restorations and some items of preventive care) the mean intra-dental agreement assessed by kappa was 0.58 (Range 0.10-0.73). The mean inter-dentist agreement was 0.46 (Range 0.10-0.73). The finding suggest that random variation may be a more frequently encountered problem than systematic variation.

K TAYLOR (Clinical Dental Sciences, The University of Liverpool, L69 3BO, UK)

Evidence of novel sites of tumour suppressor gene in squamous cell carcinomas of the head and neck.

Specific sites of frequent allele loss have been recognised in many types of malignancies associated with loss of function of nearby tumour suppressor genes (TSG). Cytogenetic and molecular evidence has indicated the presence of putative TSG’s on chromosomes 1 and 9. The aim of the study was to examine bands of heterozygous loss (LOH) on these chromosomes in squamous cell carcinomas of the head and neck (SCCHN) using a set of informative polymorphic microsatellite markers (12 on chromosome 1 and 13 on chromosome 9). Tumour and normal DNA, germline paired cells and control DNA were obtained from patients (n = 42). LOH was followed by gel electromorphs were used to determine regions of loss. LOH on chromosome 1 was found in 40% (20/50) of informative cases. The most frequent loss was found on the p arm at 1p11-13 (11/20). Losses at 9p11-21 were identified in 13% (3/20). LOH at 9p11-21 and LoH at 1p11-13 were found in 10% (2/20) of cases. In 10% (2/20) of cases were found to be 0%. This indicates a specific region of interest at 1p11-21 which has previously been shown to contain cytogenetic breakpoints. Chromosome 9 has been investigated in SCCHN patients using D9S107, D9S111, D9S162 and D9S166 markers on 9p and 9q. The highest losses were found at D9S157 (37%) (10/27), D9S161 36% (11/31) and D9S162 23% (6/26). A minimal area of loss was found on 9p which is different from the markers D9S156-D9S157-D9S162-D9S171-D9S161 at 9p11-21 with a LOS of 21-22. This area will be examined in the IPN region and also contains the putative tumour suppressor gene p16.

K Tindle (The Dental School, The University of Wales College of Medicine, Cardiff, UK). Fibroblast attachment to titanium discs coated with glycosaminoglycan.

The formation of a stable connective tissue-implant interface may be an important factor in the success or failure of dental implants. Proteoglycans and their component glycosaminoglycan (GAG) have been implicated in this event. This study investigated whether the presence of GAGs, typical of periodontium and bone, on the attachment of fibroblasts to titanium discs.

Commercially pure titanium discs were pre-coated with the GAGs chondroitin-4-sulphate (C4S), dermatan sulphate (DS) and heparin sulphate (HS). They were then incubated in a suspension of human gingival fibroblasts, passage 5 of a cell line produced for this study, at a concentration of 10^5/ml in 1 ml DMEM in 24 well plates. After 2 hours, the number of cells adherent to the culture well, uncoated control discs and discs coated with DS and HS showed only a small increase in adherent cells compared to uncoated discs, 2 hours (600 9 10^5, 520 9 10^5). After 2 hours, all three layers were not significantly different from control discs.

This study indicates that fibroblasts adhere more readily to titanium pre-coated with chondroitin-4-sulphate, the primary GAG component of alveolar and bone. The absence of adherent disc adhesion to discs coated with dermatan sulphate or heparin sulphate may be of interest since these GAGs are associated with non-mineralized periodontal tissues.
Calcium hydroxide is used widely for induction of reparative dentinogenesis in exposed dental pulps. Whilst the molecular basis for its action is not well understood, the growth factor Transforming growth factor-β (TGF-β) and isolated dentin extracellular matrix (ECM) components have been shown to be able to induce odontoblast differentiation. The aim of this study was to examine the effects of the isolated ECM soluble fraction (CECM) and the isolated ECM insoluble fraction (ICEM) on pulpal cells. TGF-β, a potent stimulator of odontoblasts, was used as a positive control. Pools of powdered dentin prepared from rabbit and human teeth were extracted at 4°C with 0.01M- and 0.02M-solutions of calcium hydroxide, pH 11.8 for 14 days or 4 weeks at pH 7.2 as a control. Assays for DNA, RNA, and protein were performed and the material was analysed by dye-binding assays and TGF-β isoform by isoelectric focusing in immuno-adsorbent beads. The calcium hydroxide solutions were able to solubilise these components although the yields were less than those obtained with ECM. The non-apatitic proteins of the tissue were not solubilised in calcium hydroxide than the glycosaminoglycans. TGF-β was solubilised by all of the extracts.

It is concluded that calcium hydroxide solutions of low concentration can solubilise ECM components and TGF-β from dentin in vitro and this may be the basis of action of calcium hydroxide in the induction of pulpal repair in vivo.

Supported under the CEC-SCIENCE programme (ERBSC1-CT99-0689).

The aim of this study was to evaluate the effect of laser pulse duration on laser dentin interaction. Second sound microphones were collected and stored in saline. Each crown was sectioned transversely midway between the cut tips and the DME; the lower section was mounted on a fixed optical stage prior to exposure to one of six Nd:YAG laser beams. Each laser was operated at a different pulse duration; 7ms, 150ms, 300s, and 350s. The pulse repetition rate was 10Hz for most of the lasers, 10.5 ms for the 300s, 350s and 3ms for the 350s. The total energy delivered to each dentin sample was maintained for each pulse duration. All lasers were connected to a non-contact power meter. The 150μs laser was delivered via a silica fibre, all other lasers were delivered by means of a lens. After irradiation, irradiated specimens were sectioned longitudinally dehydrated, imbedded, and viewed under an SEM. The results showed that pulse durations of 7ms and 150μs were more effective as whitening lasers, whilst the 300s and 350s were more effective as caries-detecting lasers. The crater were approximately centered on the laser beam, carbonized, with some evidence of crazing. This carbonization did not extend sub-surface. Pulse durations of 300s and 350s produced "puished out" craters with no carbonization or fracture internally. Variations occurred in crater size at all pulse durations.

It was concluded that laser dentin interaction is dependent on pulse duration. With shorter pulse durations a reduction in tissue damage occurred. Variation in crater depth occurred at all pulse durations.
To measure the effects of lignocaine and adrenaline on skin blood flow in the rat, 28 rats were anaesthetized using nembutal and lignocaine and positioned under a calibrated Hal Radial circulation probe coupled to a multichannel analyser and set in a multichannel mode with a dwell time of 30 seconds. The probe was positioned in the midaxillary line and with the raw signals filtered (linear, (ii) admittance, (iii) lignocaine or (iv) a combination of lignocaine and adrenaline). The probe was calibrated using a saline bath temperature of 37°C and at an initial perfusion rate of 0.5 ml per minute immediately following the injection. Data acquisition was carried out over 20 minutes. Activity was calculated by measuring changes in perfusion rate (ERG) and half-clearance time (T%) in limbs were obtained from the mean. Results were expressed as a percentage of baseline activity.

Results and Discussion: Data from one rat showed an initial increase in skin blood flow following the injection of adrenaline/adrenaline. In the other rats, skin blood flow decreased gradually. The skin blood flow in the second rat was not consistently lower than baseline, but a tendency towards a decrease was observed.

Conclusion: The results show that adrenaline has a significant effect on skin blood flow in the rat, while lignocaine has a less pronounced effect.
Waste fluoridation is unlikely to be available to the Scottish population this century. Therefore, behaviour-based strategies of care provision by health professionals, including increasing the target level of fluoride in water supplies, may be the most effective means of achieving the public health target of a 70% prevalence of dental fluorosis. However, the present study shows that the majority of the dentists surveyed were not aware of the target level of fluorosis. In conclusion, a need for health education in both mothers and teachers was demonstrated. A novel social for approaching parental oral health promotion was formulated supporting the need for a critical evaluation of classical school health education packages.

Previous studies in countries in the developed world have shown that levels of oral and dental hygiene among dependent institutionalised individuals are lower than those in comparable age groups of the community. This study aims to assess the factors affecting the way in which care staff care for the oral health of institutionalised care. AWas chosen under the assumption to deeply the carers' attitudes, feelings and motivation towards clients' personal oral care. Semi-structured interviews were carried out with 20 care assistants and 14 qualified nurses from a random sample of different areas in the community to assess their role and satisfaction with their work in the management of oral health. The results were summarised for policy, teaching methods, delivery, problems solving and educational needs. The data was analysed by coding and discount analysis.

Results showed that some of the senior nurses had access to professional dental health education, and oral care students. The ability of the seniors to provide dental care was often based on educational and experience of past carers' assistance. The commonest cause of oral care was that the lack of training and expertise in oral care, and some experienced psycho-social barriers associated with consultation and clients' hospitalisation. These factors have been targeted in a dental training online, oral health promotion and staff training was expressed by 73% of trained nurses and 65% of care assistants.

It is planned to develop and evaluate an oral health promotion programme which will be specific to the needs of both nursing home care staff and their clients.

The assessment of stressors in medical and dental personnel has attracted increased attention. However, this study focused on dental and medical junior hospital staff. Stressors were prioritised for personal support and training services to cope with their stressful situations. A new form of services were rated by dental and medical MHS (n = 230) in a cross-sectional questionnaire survey on 40 items. The data was included in the instrument for coding and decoding workshops, computer aided self-assessment and a telephone help line. The questionnaire also included the assessment of health and dental staff and job satisfaction. A response rate of 57% was achieved. Results showed that there were no differences between dentists and medical staff in their preferences. The most favoured service was counselling although those most desired were those of social support and Johnson's (1982) analysis was less likely (p = 0.05) to indicate a preference for this service concerning for grade, sex, discipline, work pressure and job satisfaction.

We conclude that the introduction of a support service requires a training component to increase awareness and accessibility of this service. However, a preventive approach is strongly indicated particularly for those in posts susceptible to burnout.

The aim of this study was to evaluate reasons for premature retirement due to illness from the practice of dentists. Results of the study revealed that premature retirement due to illness is a complex issue and that the reasons for this were often related to the factors of society, economic factors, lack of time and stress. The findings were also supported by the results of a survey of 3200 dentists from 89 general practices in England. The reasons for premature retirement were evaluated from these data and grouped where possible according to following basic categories - cardiovascular, renal disease, disease, mental, disability, illness and others. The results indicated that the predominant reasons for premature retirement due to illness were subdivided and analysed with respect to age and year of retirement. Results indicated that the categories identified, myocardial disease accounted for 29%, cardiovascular disease 21%, stroke 5.2%, diabetes 4% and tumours 4.5%. The most common cause of premature retirement due to illness was cardiovascular, with 29.5% of the dentists taking premature retirement due to illness were over 50 years of age. It is concluded that the most prevalent causes of premature retirement of the dentists surveyed are cardiovascular disease, stroke and diabetes. With the over 50 age group being particularly affected.

Clinical dentistry involves the continuous subjective analysis of the forms of oral structures: the surface morphology of teeth; their relationship to each other; and to the gingiva and the distribution and plaque and calculus to the proximal plane of the tooth surfaces and the associated gingiva. For preliminary investigation, exposed root surfaces of at least 1.5mm were selected in patients and impressions were taken to produce study models. Individual gingivae specific to the exposed root surfaces were made using peripheral-ant material to enable rectangular SSC and rectangular SSC was used to collect the co-ordinates of the surface planes at a density of 30mm spacing using the Renishaw OP-10 laser scanner. The plaque thickness and volume were measured by superimposing the data from the two replicas. Placement of the replica was recorded using an electronic target. The alignment of the system was fine-tuned using a 25mm diameter precision sphere was D24.999 ± 0.0024mm (SD: 0.0022).

This preliminary study illustrates a method of quantitation measurement of plaque thickness distribution and volume on root surfaces and its relationship to adjacent gingiva.
Many plaque indices for recording supragingival plaque have been reported. Detailed scoring methods, whilst allowing relatively easy and quick to perform. A new method of plaque scoring (NMPS) has not been devised to be simple but sensitive. For scoring purposes a horizontal boundary is imagined in the amniotic tooth surface between the gingival third and coronal two-thirds, the latter being subdivided vertically into thirds (E, C, D). B includes the mesial, and D the distal, embrasure areas: C is middle third. Depending on the extent of plaque coverage, whose normal scores 0-3, A, B, and C, the tooth can be scored in 3, a) Scoring ranges from 0 to 3. (1) Simultaneous plaque on 8 study cases was scored twice by 10 examiners using the criteria of NMPS and Turetsky et al. (J Periodontol 41:41-43, 1970). (2) The time taken for the examiner to score 4 selected surfaces on each tooth using NMPS and any other index was also measured. NMPS in (1) was found to have less variability and between examiners than Turetsky, and in (2) took the least time to score. In conclusion, NMPS appears to combine the benefits of sensitivity with simplicity. Clinical testing it is warranted.

83 M P S BONAIKAD*, P M BARBER* and H N NEWMAN (Fl GUM Unit & Periodontology Dept, Eastman Dental Institute, UK): Quantitative vascular changes in pocket soft tissues in Chronic Inflammatory Periodontal Disease.

Expansion and remodelling of the blood vessels (BV) in the pocket soft tissues may be significant in the pathogenesis of Chronic Inflammatory Periodontal Disease (CIPD) (Zeelinger H, J Oral Pathol Med 30: 453-7, 1991). The aim of the present study was to quantify the vascular changes observed in CIPD. Sixteen patients with CIPD and six healthy controls were studied. For this study twelve interdental biopsies were obtained, six from CIPD patients and six from healthy controls. All specimens were fixed in 3% glutaraldehyde, post-fixed in 1% buffered osmium tetroxide, dehydrated, and embedded in epon. Thick sections (1 µm) were cut and differentially stained (Humphrey C D, Stain Technol 43: 83-87, 1974).

The numerical density of BV for the sub-epithelial, superficial and deep connective tissue layers was then obtained by counting the number of BV per unit area. There was a significant increase in the numerical density of BV (P < 0.01) in the CIPD specimens (20.61 ± 5.8), as compared to healthy specimens (16.66 ± 2.84), with more BV in the sub-epithelial layer than others. In conclusion, this study indicates that there is an increase in the numerical density of BV in CIPD lesions.

84 P FALDWIN*, K S LAST and N FENDER (Department of Clinical Dental Sciences, School of Dentistry, University of Liverpool, UK): The effect of extraction during orthodontic treatment on gingival crevicular fluid flow.

Gingival crevicular fluid (GCF) flow is increased by active tooth movement (Samuels RHA, Pender N, Last KS, J Clin Periodontol 28: 371-377, 1993) and reduced by fixed retention (Pender N, Samuels RHA, Last KS, J Orthod Periodont 28: 371-377, 1993). The effect of active tooth movement on GCF flow was investigated by comparing GCF volumes collected around teeth next to an extraction site (XT) with non-extraction (NX) sites. GCF was collected for 15 min from the disto-buccal aspect of one maxillary premolar in 37 patients over a 3 month period. The sites were divided into GCF volume changes were compared using the Student's t-test (P < 0.1). The differences were compared using the Student's t-test (P < 0.1). The results showed that GCF flow increased in the XT and decreased in the NX sites (P < 0.001). The differences were compared using the Student's t-test (P < 0.1). The results showed that GCF flow increased in the XT and decreased in the NX sites (P < 0.001).

The increase in GCF in the early stages of orthodontic treatment is not influenced by either increased regional blood flow or the presence of a periodontal extraction site.

85 W AHMED*, J P WATT and B WILSON (Department of Periodontology, UMDS (Guy's), London, UK): Validity of attachment level measurements with Florida probe.

There is no evidence on the validity of probing depth and attachment level measurements made with automated probes.

In this study, 34 teeth in 9 patients were measured with the Florida probe. Probing was carried out on the right and left sites. After extraction, connective tissue attachment levels were measured from the same points with a diameter microscope. Mean measurements were taken at all points and recorded. A t-test of the paired measurements showed no difference (P < 0.04). The Florida probe showed high validity for this group of measurements in the advanced periodontal disease. However, there was substantial lack of agreement between individual measurements and the validity criterion of laboratory attachment level measurements was not reached.

It was concluded that the Florida probe was suitable for studies in which measurements were required, but not for longitudinal study or individual sites.

86 P C ROBINSON, J CHALLACOMBE, A SHEERAN, J M ZAKARZWEWSKA, (Dep. Epidemiology and Public Health, UCL, and Dept Oral Pathology and Medicine, UMDS); Periodontal attachment levels associated with HIV infection.

Aim and Methods: To assess the prevalence, extent and severity of attachment loss associated with HIV infection, in a cohort of 60 mixed race homosexual men attending a genito-urninary medicine clinic with the examiner blinded to their HIV status.

Results: 792 men were examined (112 HIV+ve, 260 HIV-ve and 220 unseen) in an 18 month period. Men with HIV were slightly older than those without (35.9 vs 31.2, p < 0.001, MANN-WHITNEY) and were of higher median educational-economic status (p < 0.001). CIH men had similar numbers of teeth, plaque scores and tobacco use.

Despite apparently multivariate logistic regression revealed strong associations between HIV infection and summary measures of attachment loss and pocketing (all p<0.001). Among men with HIV, CIV/DIV T lymphocyte counts were associated with summary measures of attachment loss (all p<0.001) but not with pocketing.

Conclusions: This cross-sectional study suggests the prevalence, extent and severity of attachment loss are not associated with progression of HIV disease whereas pocketing is associated with HIV infection but not with disease progression. Longitudinal studies are required to confirm these findings.

87 P M FRESHWATER*, P J KELLY*, P A HEASMAN (Department of Restorative Dentistry, Department of Medical Statistics, University of Newcastle upon Tyne, UK): Calibration methodology for the Perionox 6000.

The Perionox 6000 is a used to quantify volumes of gingival crevicular fluid (GCF) sampled on piezoelectric tiles. Previously, for calibration purposes, a linear relationship has been demonstrated between Perionox units and fluid volumes (Booth et al J Periodontol Res 31:316-318, 1984). The aim of the present study was to investigate further this relationship to provide a reliable and accurate method of calibration. Known volumes of fluid (human serum or 0.9% w/v saline) were dispersed onto piezoelectric tiles and allowed to equilibrate with a humidified, air-conditioned environment for at least 24 hours prior to testing the Perionox within 24 hours. A total of 75 different volumes of serum, ranging from 0 to 1.61 µL, and 60 different volumes of saline, ranging from 0.5 to 1.61 µL, were used. Each volume was measured in triplicate. The mean values for serum and saline points for serum and 200 µL points for saline. Regression analysis revealed that a quadratic curve produced a very good fit (r²=0.99 for serum and 0.94 for saline). The non-linearity of the data was confirmed by examining the logarithm (ln) of the GCF volumes sampled using piezoelectric tiles can be more accurately determined when calibrated in serum, and using a quadratic regression equation.
A slowly extracted curie-free lower first permanent molar was embedded in a cold-curing resin (Simplex Rapid) and sections were prepared buccolingually in the sagittal plane using a water-cooled diamond saw. Two sections from each of the four rat teeth then ground with progressively finer silicone carbide paper up to 1,000 grit. The sections were then mounted on the stage of a cold environment scanning electron microscope to enable analysis of the results. The sections were then made over areas of 250 µm². The surface parameters were recorded on a PC and a 1 x 99 x 33 mm biometric filter was applied to eliminate noise. Measurements were repeated on the same specimens following these procedures. The final measurement of each sample was a reproducible image (Rq) of the enamel surface with an increase in etching time. The Rq value of the unetched enamel surface was 0.116 µm and this rose to a maximum of 1.227 µm after an etching period of 180 s. The increase is a direct result of the erosion of the surface. It is concluded that the application of 35% phosphoric acid gel to a prepared enamel surface results in an increase in surface roughness which can be related to the etching period.

Divisional Abstracts: The British Society for Dental Research

90

The British Society for Dental Research (BSDR) is an organization that promotes the study of dental research and provides a platform for dental researchers to share their findings. The BSDR conducts annual conferences and publishes abstracts from these conferences in a journal, Divisional Abstracts: The British Society for Dental Research. This journal contains abstracts of presentations made at the BSDR conferences, which include research on various aspects of dental health and treatment. The abstracts cover a wide range of topics, from basic science research to clinical trials. The journal is a valuable resource for dental researchers, practitioners, and students, providing a snapshot of the latest research in dental science and its applications.

91

The mechanism of fluoride ion release from glass ionomer cements. I. In vitro release of fluoride from GICs. The mechanism of fluoride ion release from glass ionomer cements (GICs) remains elusive. This investigation aimed to provide evidence in support of the hypothesis that fluoride ions are released from GICs upon hydration, which would provide an understanding of the in vivo effect and potential clinical utility of these materials. The in vitro release of fluoride from GICs was investigated following hydration, and the results were compared with the in vivo release of fluoride from GICs following hydration.

92

The Mechanism of Fluoride Release From Glass(Ionomer) Polyesite Resin Composites. Fluoride release has been postulated to occur by a counter ion mechanism (Wilson A D et al Biomaterials 6:431-3, 1985) involving the simultaneous release of an artificial metal cation. To test this hypothesis a series of modified glass ionomer cements (MA*, R), in a range of concentrations, were prepared. The release of fluoride was measured using a fluoride specific electrode with and without a release period. However, the total amount of positive and negative ions released and the rate of fluoride ion exchange indicated that there was a surplus of negative ions over positive ones, leaving the system in a negative ion imbalance. The demonstration of fluorescence in the specimens showed that the fluorescence mechanism appeared to be based on an ion exchange process. The negative ion balance increased as the solution concentration of the glass increased, indicating that sodium ions facilitated the rate of ion exchange, possibly by disrupting the ionic repulsion and thereby increasing the solubility. The results provide evidence for a hypothesis that the release of fluoride is related to the fluoride content and ionic concentration of the constituent glasses. This ion release process appears to be predominantly via an ion exchange mechanism.

93

The release of fluoride from glass ionomer cement and a calcium hydroxide lining material. Fluoroboron is a potent anti-inflammatory and analgesic compound. Its incorporation and subsequent release from dental materials may have a topical benefit in certain dental procedures. The aim of the present study was to investigate its release from a calcium hydroxide lining material (Lifetab) and a glass ionomer cement (Chemfil II Express). The release of fluoride was measured using a fluoride specific electrode with and without a release period. However, the total amount of positive and negative ions released and the rate of fluoride ion exchange indicated that there was a surplus of negative ions over positive ones, leaving the system in a negative ion imbalance. The demonstration of fluorescence in the specimens showed that the fluorescence mechanism appeared to be based on an ion exchange process. The negative ion balance increased as the solution concentration of the glass increased, indicating that sodium ions facilitated the rate of ion exchange, possibly by disrupting the ionic repulsion and thereby increasing the solubility. The results provide evidence for a hypothesis that the release of fluoride is related to the fluoride content and ionic concentration of the constituent glasses. This ion release process appears to be predominantly via an ion exchange mechanism.

94

The release of fluoride from glass ionomer cement and a calcium hydroxide lining material. Fluoroboron is a potent anti-inflammatory and analgesic compound. Its incorporation and subsequent release from dental materials may have a topical benefit in certain dental procedures. The aim of the present study was to investigate its release from a calcium hydroxide lining material (Lifetab) and a glass ionomer cement (Chemfil II Express). The release of fluoride was measured using a fluoride specific electrode with and without a release period. However, the total amount of positive and negative ions released and the rate of fluoride ion exchange indicated that there was a surplus of negative ions over positive ones, leaving the system in a negative ion imbalance. The demonstration of fluorescence in the specimens showed that the fluorescence mechanism appeared to be based on an ion exchange process. The negative ion balance increased as the solution concentration of the glass increased, indicating that sodium ions facilitated the rate of ion exchange, possibly by disrupting the ionic repulsion and thereby increasing the solubility. The results provide evidence for a hypothesis that the release of fluoride is related to the fluoride content and ionic concentration of the constituent glasses. This ion release process appears to be predominantly via an ion exchange mechanism.

Divisional Abstracts: The British Society for Dental Research

90

The British Society for Dental Research (BSDR) is an organization that promotes the study of dental research and provides a platform for dental researchers to share their findings. The BSDR conducts annual conferences and publishes abstracts from these conferences in a journal, Divisional Abstracts: The British Society for Dental Research. This journal contains abstracts of presentations made at the BSDR conferences, which include research on various aspects of dental health and treatment. The abstracts cover a wide range of topics, from basic science research to clinical trials. The journal is a valuable resource for dental researchers, practitioners, and students, providing a snapshot of the latest research in dental science and its applications.

91

The mechanism of fluoride ion release from glass ionomer cements (GICs) remains elusive. This investigation aimed to provide evidence in support of the hypothesis that fluoride ions are released from GICs upon hydration, which would provide an understanding of the in vivo effect and potential clinical utility of these materials. The in vitro release of fluoride from GICs was investigated following hydration, and the results were compared with the in vivo release of fluoride from GICs following hydration.

92

The Mechanism of Fluoride Release From Glass(Ionomer) Polyesite Resin Composites. Fluoride release has been postulated to occur by a counter ion mechanism (Wilson A D et al Biomaterials 6:431-3, 1985) involving the simultaneous release of an artificial metal cation. To test this hypothesis a series of modified glass ionomer cements (MA*, R), in a range of concentrations, were prepared. The release of fluoride was measured using a fluoride specific electrode with and without a release period. However, the total amount of positive and negative ions released and the rate of fluoride ion exchange indicated that there was a surplus of negative ions over positive ones, leaving the system in a negative ion imbalance. The demonstration of fluorescence in the specimens showed that the fluorescence mechanism appeared to be based on an ion exchange process. The negative ion balance increased as the solution concentration of the glass increased, indicating that sodium ions facilitated the rate of ion exchange, possibly by disrupting the ionic repulsion and thereby increasing the solubility. The results provide evidence for a hypothesis that the release of fluoride is related to the fluoride content and ionic concentration of the constituent glasses. This ion release process appears to be predominantly via an ion exchange mechanism.

93

The release of fluoride from glass ionomer cement and a calcium hydroxide lining material. Fluoroboron is a potent anti-inflammatory and analgesic compound. Its incorporation and subsequent release from dental materials may have a topical benefit in certain dental procedures. The aim of the present study was to investigate its release from a calcium hydroxide lining material (Lifetab) and a glass ionomer cement (Chemfil II Express). The release of fluoride was measured using a fluoride specific electrode with and without a release period. However, the total amount of positive and negative ions released and the rate of fluoride ion exchange indicated that there was a surplus of negative ions over positive ones, leaving the system in a negative ion imbalance. The demonstration of fluorescence in the specimens showed that the fluorescence mechanism appeared to be based on an ion exchange process. The negative ion balance increased as the solution concentration of the glass increased, indicating that sodium ions facilitated the rate of ion exchange, possibly by disrupting the ionic repulsion and thereby increasing the solubility. The results provide evidence for a hypothesis that the release of fluoride is related to the fluoride content and ionic concentration of the constituent glasses. This ion release process appears to be predominantly via an ion exchange mechanism.

94

The release of fluoride from glass ionomer cement and a calcium hydroxide lining material. Fluoroboron is a potent anti-inflammatory and analgesic compound. Its incorporation and subsequent release from dental materials may have a topical benefit in certain dental procedures. The aim of the present study was to investigate its release from a calcium hydroxide lining material (Lifetab) and a glass ionomer cement (Chemfil II Express). The release of fluoride was measured using a fluoride specific electrode with and without a release period. However, the total amount of positive and negative ions released and the rate of fluoride ion exchange indicated that there was a surplus of negative ions over positive ones, leaving the system in a negative ion imbalance. The demonstration of fluorescence in the specimens showed that the fluorescence mechanism appeared to be based on an ion exchange process. The negative ion balance increased as the solution concentration of the glass increased, indicating that sodium ions facilitated the rate of ion exchange, possibly by disrupting the ionic repulsion and thereby increasing the solubility. The results provide evidence for a hypothesis that the release of fluoride is related to the fluoride content and ionic concentration of the constituent glasses. This ion release process appears to be predominantly via an ion exchange mechanism.
It is concluded that RT-PCR for TCRB is a useful approach in the investigation of T-cell receptors in periodontal disease.

The term "lichenoid reaction" (LR) is applied to those cases of lichen plans (LP) believed to have been provoked by drugs. Clinically and histologically, the differentiation between LP and LR is subjective. The aim of this study was to determine whether the clinical features of histologically diagnosed LR and LP differ.

Clinical diagnosis and LP patients with oral lichen plans were retrospectively regarded with respect to medical history, nature and distribution of lesions. Statistical analysis was performed using Uimp Info.

201 patients underwent biopsy, 36 of whom were diagnosed histologically as LR. 30 of these patients were taking drugs known to be associated with LR, 6 demonstrating a marked clinical improvement on drug withdrawal. There were no statistically significant differences in age distribution nor in the frequency of erosions between the LR and LP patient groups as diagnosed histologically. However, comparison of these clinical parameters in patients taking drugs and those receiving no medication revealed a higher prevalence of erosive lesions and labial involvement in the group on medication (p = 7.58; p < 0.01 & 1.73; p < 0.05 respectively).

The data suggest that although the clinical features of histologically diagnosed LR and LP show no statistically significant differences, the frequency of erosions and labial involvement is greater in those patients on medication.

This prospective study sought to ascertainment the value of basal cell cytologic (BCC) examination in patients with oral lichen plans in differentiating lesions known to be associated with drug provocation.

BCC examination was undertaken in 144 patients and in addition to clinical examination of the mouth, BCCs were obtained as an indirect immunofluorescent assay. Drug therapy was also documented in detail. Clinically unclassified lesions were seen in a small proportion of oral lichen plans (p < 0.02). Histologically oral lichen reactions can be difficult to diagnose and a further 7 samples (4%, 1 female and 3 males) were subjected to palatal biopsies. Circulating antibodies were significantly higher (p < 0.01) in the lichenoid reaction group.

These results suggest that BCC circulating immunoglobulin are a useful adjunct when attempting to determine if an oral lichen reaction has been provoked by drug therapy.

Recent oral ulcers are characterised haematologically by an early mononuclear cellular infiltrate which becomes mixed with the leucocyte of neutrophils as the lesions develop. The movement of inflammatory cells from the bloodstream into the mucosal lesions results (VCA-M1), the predominant class of adenine-specific antibodies in the sera of patients with AIDs. Previous work has demonstrated that VCA-M1 and E-selectin expression in positive cases.

In human and animal species, dental tissues regularly express VCA-M1 on endothelial cells and E-selectin expression is upregulated in the presence of VCA-M1. However, the VCA-M1 expression and E-selectin expression on keratinocytes. A positive association between VCA-M1 expression on keratinocytes and E-selectin expression is observed.

In conclusion, VCA-M1 expression on keratinocytes and E-selectin expression on keratinocytes are positively associated and may be useful markers for the diagnosis of oral ulceration.

Infantile systemic hydropsis is a rare, fatal, autosomal recessive disorder characterized by widespread deposition of hyaline material in connective tissues. Previous reports have implicated a defect in collagen type VI in its pathogenesis. The aim of the study was to characterize the hyaline material.

Glycosaminoglycans from an affected four year old (for clinical details see Derlin et al., Oral Pathol.Med. 1987) were isolated and examined by immunofluorescence or processed for detergent extraction in the presence of 1% SDS and immunolabelled with monoclonal antibodies to type I and type II collagen and type IV collagen. In normal skin, type II collagen was detected in the dermis, but not in the epidermis. Type I collagen was present in the dermis, but not in the epidermis. Type IV collagen was present in the basement membrane. Collagen type VI was expressed in the extracellular matrix.

Infantile systemic hydrops is a rare, fatal, autosomal recessive disorder characterized by widespread deposition of hyaline material in connective tissues. Previous reports have implicated a defect in collagen type VI in its pathogenesis. The aim of the study was to characterize the hyaline material.

Glycosaminoglycans from an affected four year old (for clinical details see Derlin et al., Oral Pathol.Med. 1987) were isolated and examined by immunofluorescence or processed for detergent extraction in the presence of 1% SDS and immunolabelled with monoclonal antibodies to type I and type II collagen and type IV collagen. In normal skin, type II collagen was detected in the dermis, but not in the epidermis. Type I collagen was present in the dermis, but not in the epidermis. Type IV collagen was present in the basement membrane. Collagen type VI was expressed in the extracellular matrix.

Infantile systemic hydrops is a rare, fatal, autosomal recessive disorder characterized by widespread deposition of hyaline material in connective tissues. Previous reports have implicated a defect in collagen type VI in its pathogenesis. The aim of the study was to characterize the hyaline material.

Glycosaminoglycans from an affected four year old (for clinical details see Derlin et al., Oral Pathol.Med. 1987) were isolated and examined by immunofluorescence or processed for detergent extraction in the presence of 1% SDS and immunolabelled with monoclonal antibodies to type I and type II collagen and type IV collagen. In normal skin, type II collagen was detected in the dermis, but not in the epidermis. Type I collagen was present in the dermis, but not in the epidermis. Type IV collagen was present in the basement membrane. Collagen type VI was expressed in the extracellular matrix.

Infantile systemic hydrops is a rare, fatal, autosomal recessive disorder characterized by widespread deposition of hyaline material in connective tissues. Previous reports have implicated a defect in collagen type VI in its pathogenesis. The aim of the study was to characterize the hyaline material.

Glycosaminoglycans from an affected four year old (for clinical details see Derlin et al., Oral Pathol.Med. 1987) were isolated and examined by immunofluorescence or processed for detergent extraction in the presence of 1% SDS and immunolabelled with monoclonal antibodies to type I and type II collagen and type IV collagen. In normal skin, type II collagen was detected in the dermis, but not in the epidermis. Type I collagen was present in the dermis, but not in the epidermis. Type IV collagen was present in the basement membrane. Collagen type VI was expressed in the extracellular matrix.

Infantile systemic hydrops is a rare, fatal, autosomal recessive disorder characterized by widespread deposition of hyaline material in connective tissues. Previous reports have implicated a defect in collagen type VI in its pathogenesis. The aim of the study was to characterize the hyaline material.

Glycosaminoglycans from an affected four year old (for clinical details see Derlin et al., Oral Pathol.Med. 1987) were isolated and examined by immunofluorescence or processed for detergent extraction in the presence of 1% SDS and immunolabelled with monoclonal antibodies to type I and type II collagen and type IV collagen. In normal skin, type II collagen was detected in the dermis, but not in the epidermis. Type I collagen was present in the dermis, but not in the epidermis. Type IV collagen was present in the basement membrane. Collagen type VI was expressed in the extracellular matrix.

Infantile systemic hydrops is a rare, fatal, autosomal recessive disorder characterized by widespread deposition of hyaline material in connective tissues. Previous reports have implicated a defect in collagen type VI in its pathogenesis. The aim of the study was to characterize the hyaline material.

Glycosaminoglycans from an affected four year old (for clinical details see Derlin et al., Oral Pathol.Med. 1987) were isolated and examined by immunofluorescence or processed for detergent extraction in the presence of 1% SDS and immunolabelled with monoclonal antibodies to type I and type II collagen and type IV collagen. In normal skin, type II collagen was detected in the dermis, but not in the epidermis. Type I collagen was present in the dermis, but not in the epidermis. Type IV collagen was present in the basement membrane. Collagen type VI was expressed in the extracellular matrix.
This study was undertaken to investigate the value of seeing patients referred from general dental practice to the community dental service at a separate appointment prior to any administration of a general anaesthetic for dental extractions. A sample of record cards of patients seen at assessment appointments over a 12-month period, 593 patients record cards were used. 49% patients were referred for reasons of dental decay and orthodontic reasons, 73% patients had extractions for orthodontic reasons and of those 31% were for deciduous extractions only 17% of cases required some further investigations before an anaesthetic could be given, 264 cases were undertaken as requested by their GDF, 208 cases had showed treatment plans, 45 cases had extractions with local anaesthetics and 41 cases were discharged without any treatment. Of those prescribed an anaesthetic, less than 5% had failed to have the anaesthetic.

The results of the community dental service appointments reduced the need for general anaesthesia for 19% of all referrals and reduced the number of failures for patients presented on anaesthetic from 17% to 7%.

This study investigates the effect of social environment on dental and periodontal health status and treatment needs, and oral health-related quality of life, in adult populations. A random sample of 852 16- to 65-year-old males in affluent and deprived areas, 512 (60.1%) were examined clinically. The SPEED data collection system was used, supplemented by a CPITN measurement. The study examined the differences in dental and periodontal health, and in treatment costs (expressed in Swiss Francs) between the deprived and affluent respondents.

The collectivist rate was 2.3% among the 'affluent' and 2.7% among the 'deprived' (p=0.001). While only statistically significant differences were observed in the deprived population, in the affluent population there was a higher proportion of missing teeth than their affluent counterparts. In contrast, the affluent had significantly higher (p=0.001) numbers of filled teeth than their affluent counterparts. To avoid bias, the affluent and deprived samples had significantly different distributions (p=0.001) of mean age and sex.

The results confirm that social deprivation relates to higher levels of dental and periodontal disease. Area deprivation analysis can identify population groups and areas of greatest treatment needs. Resources for oral health promotion and disease prevention should be directed to these areas.

The aim of this study was to investigate the prevalence of developmental defects of enamel in a group of regularly attending adolescent dental patients in Scotland. The study sample consisted of 483 subjects (22% female, 48% male), with mean age 13.5 years. The SCOTS Index (Parts HB, KE) was used to examine the presence and type of developmental enamel defects. The SCOTS assessment involves a clinical examination to determine the prevalence of defects and a subject component to determine patient perception. Overall, 68 subjects were claimed to have 144 enamel defects, 62% of subjects with defects were symptomatic and 74% defects affected at least one entire tooth surface. The majority of the defects were either 'demineralized' (47%) or 'diffuse' (46%). Of the 68 subjects reporting marks on their teeth 75% had SCOTS defects while 44% of the subjects claiming to have no marks had defects as measured by the SCOTS index.

Developmental defects of enamel affected approximately half of this sample of regularly attending adolescents, yet few (16%) reported marks on their teeth.

Supported by the Scottish Office Home and Health Department.

The aim of this study was to compare the homogeneity of ultrasonically condensed (UHS OR) Ultradenta Deviceland cold laterally condensed gutta-percha root canal fillings. A single-root model was designed to enable repeated obturation of the root canal and to facilitate retrieval of intact root fillings. Three different ultrasonic condensers were used and the heights of cross sections were compared with cold lateral condensation. The sectioned root fillings were subjected to image analysis (Quantimet 500) to compare the percentage of voids present in the apical, middle and coronal levels. Results showed that the higher power settings and longer activation times tested significantly smaller voids (P=0.05) were observed than for cold lateral condensation at all levels of the root canal.

Under the conditions of this study it was concluded that ultrasonic condensation can produce more homogeneous root canal fillings than cold lateral condensation.

The aim of the study was to compare clinical aspects of sonic and ultrasonic instrumentation. The aim of the study was to compare clinical aspects of sonic and ultrasonic instrumentation. The aim of the study was to compare clinical aspects of sonic and ultrasonic instrumentation. The aim of the study was to compare clinical aspects of sonic and ultrasonic instrumentation. The aim of the study was to compare clinical aspects of sonic and ultrasonic instrumentation. The aim of the study was to compare clinical aspects of sonic and ultrasonic instrumentation.

The aim of the study was to investigate the cutting ability of files powered by the MM 1500 handpiece. Three widths of file (15, 25, 35) of the Heliosonic, Rapi-sonic and Shaper files were evaluated at three different settings (1/2, 3/4, full opening of the air inlet ring). A 3 full factorial analysis with two replications was performed making a total of 162 experimental units. The substrate used was 1 mm thick sections of bovine bone and the linear speed of the files was set at 2 mm/sec. Instrumentation times were measured.

Analysis of the data revealed all the variables to be significant (ANOVA, p<0.01). Load was the most significant variable to affect cutting followed by file type, power and file width. There was no significant difference between the Rapi-sonic or Shaper files (Two sample t test, p<0.05) or 1/4 or full power setting (Two sample t test, p<0.05).

In conclusion load was the most significant variable to affect cutting and operators need to be aware of this when using the instrument clinically.
Some retro tips can now be used to prepare clean, inert cuttins in the root ends of unseptated teeth. The aim of this study was to investigate the cutting ability of retro tip technology. The following variables were evaluated: a) power setting with the air inlet valve half or fully open, b) loading of 25 or 50 g, c) length of tip of 2 or 3 mm, d) orientation of tip, perpendicular or parallel to the subtrots, e) cutting speed in the range of 0 to 3000 rpm and f) 0 to 55. The substrate used was 1 mm thick sections of bovine bone loaded in a load cell. Cutting was performed for a standard 10 second period and water irrigation was used in all cases. A 3' factorial analysis was performed with two replications making a total of 120 experimental units.

The results showed that the depth of cut was measured using a scanning electron microscope at x10 magnification. Analysis of the data indicated that all variables had a significant effect on cutting (ANOVA df=64, p<0.05). The most significant factor was operator assisted movement, followed by power, length, tip orientation, width and load. An increase in the cutting speed and a reduction in cutting ability. Little cutting was noted without operator assisted movement. In conclusion, specifically adapted retro tips were found to satisfactorily provide operator assisted movement.

*Micro Mega 1500, Prodontia, Geneva, Switzerland. Wild MDC, Wild Heerbrugg Ltd., 9435 Heerbrugg, Switzerland.*

---

**J M WHITWORTH, AK KHAN (Restorative Dentistry, University of Newcastle upon Tyne); Gallium Alloy GP (G4) was evaluated in vivo to improve the cutting ability of retro tip technology.** The specific merial seal of amalgam (A) and Gallium Alloy GP (G4) was evaluated in vivo to improve the cutting ability of retro tip technology.

The specific merial seal of amalgam (A) and Gallium Alloy GP (G4) was evaluated in vivo to improve the cutting ability of retro tip technology. The specific merial seal of amalgam (A) and Gallium Alloy GP (G4) was evaluated in vivo to improve the cutting ability of retro tip technology. The specific merial seal of amalgam (A) and Gallium Alloy GP (G4) was evaluated in vivo to improve the cutting ability of retro tip technology. The specific merial seal of amalgam (A) and Gallium Alloy GP (G4) was evaluated in vivo to improve the cutting ability of retro tip technology.
A new design of single tooth implant (AstraTech, Malmö, Sweden) featuring a microthreaded conical neck and Tic-Tac (TM) surface was evaluated clinically and radiographically after 1 year in function. 15 patients (age range 16 to 48) with missing mandibular anterior teeth (6 central incisors, 8 laterals, 1 bicuspids) had four 13mm and eleven 15mm implants placed under local anaesthesia and left for a period of 6 months before exposure and abutment connection (stage 2/crown fabrication. All patients were assessed at 2 to 3 monthly intervals for hygiene and maintenance. Radiographs using Invis holders and size 4 and 6 films with a technique of insertion and 1 year later. The radiographic data is based on 13 cases as 2 patients were unavailable at 1 year. All implants were successfully integrated at stage 2. The internal conical seal design of the microthreading was facilitated connection and no subsequent soft tissue problems were observed. At crown insertion the mean bone level was 0.30 mm (95% CI: 0.16-0.75) apical to the top of the implant and at 1 year it was 0.40mm (95% CI: 0.08. 0.71). 7 tracks for paired samples did not show a significant difference (95% CI: 0.29. 0.49). Three cases accounted for most changes in bone levels with apical loss of 0.75mm. 0.9mm and 1.35mm.

In conclusion, this study of single tooth Astra implants were highly successful and bone levels within the first year of function were comparable with other reports with high long term success rates.

Current technology is not able to guarantee passive fit for dental implant suprastructures produced using the lost wax investment casting technique despite meticulous attention to detail (Goll G J Prosth Dent 1977;42:1-7,1980;84:359-62). A method as a superplastic forming has been used as an alternative to the lost wax investment casting process to fabricate dental implant suprastructure in titanium alloy using ceramic dies. The use of a ceramic die in itself is novel because the technique which is currently used in the aerospace industry is usually used metal dies. These ceramic dies are milled out of wax or in some cases of plaster and the titanium alloy is then cast using this die (3). In this study the titanium alloy pieces were milled from a solid block by a computerized milling machine, and the resulting titanium pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant suprastructure. The titanium alloy pieces were then cast using a ceramic die as the pattern to form the titanium implant supstructure.
Dentalplast has proved effective against plaque and gingivitis in short-term studies. The aim of this study was to determine the adjunctive benefits and safety of Dentalplast rinses used alongside toothbrushing. The study was a 4-month, double-blind, placebo-controlled study, evaluating 0.1% and 0.2% Dentalplast rinses. A total of 400 dentate males and female subjects participated in placement of placebo or Dentalplast rinses. Assuming baseline, evaluating 0.1% and 0.2% Dentalplast rinses. A total of 400 dentate males and female subjects participated in placement of placebo or Dentalplast rinses. Assuming baseline, evaluating 0.1% and 0.2% Dentalplast rinses. A total of 400 dentate males and female subjects participated in placement of placebo or Dentalplast rinses.

Dentalplast has shown to inhibit aqueous crystal growth in vitro and are degraded during the treatment stage of enamel development, potentially allowing crystal growth to occur. During acid challenge, there is the potential for the effects of the amelogenin receptor. This has been emphasized using selective extraction procedures. Rat incisor enamel contains different developmental stages of enamel. Albinum has been extracted by synthetic enamel fluid from the secretory and early enamel stage. However, enamel matrix protein molecules have been only extracted with phosphate buffer, or less frequently with desferrioxamine or calcium. Prior extraction of demineralized enamel with chelating agents rendered enamel insoluble (i.e. mineral bound) in synthetic enamel fluid. The data suggests that enamel is not bound to enamel crystals during secretion but becomes mineral bound during treatment and mineralization. Crack formation is a consequence of an increased increase in mineral content. Removal of reports suggesting that enamel is mineral bound during secretion (Lambrecht H et al, Bone Miner 4: 235-249; 1985; Swannell R & Ohlsen J, J Dent Res 61: 47-56, 1990) might be misleading. These studies involved supplementation of carriers which appear to induce artificial enamel dissolution due to the enamel. An additional enamel function is to prevent crystal surfaces from crystal growth inhibitors such as calcium in treatment during secretion.

Dentalplast has shown to inhibit aqueous crystal growth in vitro and are degraded during the treatment stage of enamel development, potentially allowing crystal growth to occur. During acid challenge, there is the potential for the effects of the amelogenin receptor. This has been emphasized using selective extraction procedures. Rat incisor enamel contains different developmental stages of enamel. Albinum has been extracted by synthetic enamel fluid from the secretory and early enamel stage. However, enamel matrix protein molecules have been only extracted with phosphate buffer, or less frequently with desferrioxamine or calcium. Prior extraction of demineralized enamel with chelating agents rendered enamel insoluble (i.e. mineral bound) in synthetic enamel fluid. The data suggests that enamel is not bound to enamel crystals during secretion but becomes mineral bound during treatment and mineralization. Crack formation is a consequence of an increased increase in mineral content. Removal of reports suggesting that enamel is mineral bound during secretion (Lambrecht H et al, Bone Miner 4: 235-249; 1985; Swannell R & Ohlsen J, J Dent Res 61: 47-56, 1990) might be misleading. These studies involved supplementation of carriers which appear to induce artificial enamel dissolution due to the enamel. An additional enamel function is to prevent crystal surfaces from crystal growth inhibitors such as calcium in treatment during secretion.

Dentalplast has shown to inhibit aqueous crystal growth in vitro and are degraded during the treatment stage of enamel development, potentially allowing crystal growth to occur. During acid challenge, there is the potential for the effects of the amelogenin receptor. This has been emphasized using selective extraction procedures. Rat incisor enamel contains different developmental stages of enamel. Albinum has been extracted by synthetic enamel fluid from the secretory and early enamel stage. However, enamel matrix protein molecules have been only extracted with phosphate buffer, or less frequently with desferrioxamine or calcium. Prior extraction of demineralized enamel with chelating agents rendered enamel insoluble (i.e. mineral bound) in synthetic enamel fluid. The data suggests that enamel is not bound to enamel crystals during secretion but becomes mineral bound during treatment and mineralization. Crack formation is a consequence of an increased increase in mineral content. Removal of reports suggesting that enamel is mineral bound during secretion (Lambrecht H et al, Bone Miner 4: 235-249; 1985; Swannell R & Ohlsen J, J Dent Res 61: 47-56, 1990) might be misleading. These studies involved supplementation of carriers which appear to induce artificial enamel dissolution due to the enamel. An additional enamel function is to prevent crystal surfaces from crystal growth inhibitors such as calcium in treatment during secretion.

Dentalplast has shown to inhibit aqueous crystal growth in vitro and are degraded during the treatment stage of enamel development, potentially allowing crystal growth to occur. During acid challenge, there is the potential for the effects of the amelogenin receptor. This has been emphasized using selective extraction procedures. Rat incisor enamel contains different developmental stages of enamel. Albinum has been extracted by synthetic enamel fluid from the secretory and early enamel stage. However, enamel matrix protein molecules have been only extracted with phosphate buffer, or less frequently with desferrioxamine or calcium. Prior extraction of demineralized enamel with chelating agents rendered enamel insoluble (i.e. mineral bound) in synthetic enamel fluid. The data suggests that enamel is not bound to enamel crystals during secretion but becomes mineral bound during treatment and mineralization. Crack formation is a consequence of an increased increase in mineral content. Removal of reports suggesting that enamel is mineral bound during secretion (Lambrecht H et al, Bone Miner 4: 235-249; 1985; Swannell R & Ohlsen J, J Dent Res 61: 47-56, 1990) might be misleading. These studies involved supplementation of carriers which appear to induce artificial enamel dissolution due to the enamel. An additional enamel function is to prevent crystal surfaces from crystal growth inhibitors such as calcium in treatment during secretion.

Dentalplast has shown to inhibit aqueous crystal growth in vitro and are degraded during the treatment stage of enamel development, potentially allowing crystal growth to occur. During acid challenge, there is the potential for the effects of the amelogenin receptor. This has been emphasized using selective extraction procedures. Rat incisor enamel contains different developmental stages of enamel. Albinum has been extracted by synthetic enamel fluid from the secretory and early enamel stage. However, enamel matrix protein molecules have been only extracted with phosphate buffer, or less frequently with desferrioxamine or calcium. Prior extraction of demineralized enamel with chelating agents rendered enamel insoluble (i.e. mineral bound) in synthetic enamel fluid. The data suggests that enamel is not bound to enamel crystals during secretion but becomes mineral bound during treatment and mineralization. Crack formation is a consequence of an increased increase in mineral content. Removal of reports suggesting that enamel is mineral bound during secretion (Lambrecht H et al, Bone Miner 4: 235-249; 1985; Swannell R & Ohlsen J, J Dent Res 61: 47-56, 1990) might be misleading. These studies involved supplementation of carriers which appear to induce artificial enamel dissolution due to the enamel. An additional enamel function is to prevent crystal surfaces from crystal growth inhibitors such as calcium in treatment during secretion.
We have established that surface-associated material (SAM) from Actinobacillus actinomycomitans has potent osteolytic activity and that this activity is blocked by monoclonal antibodies P2 and P3 raised to the whole bacterium (Kito Y, J Dent Res 73; 756, 1994).

We have now fractionated the SAM by various chromatographic techniques including antibody-affinity, affinity exchange and ATP-Sepharose affinity chromatography and have isolated a 230kDa protein which contains the bone resorbing activity of the SAM. Antibody and immunoaffinity analysis has revealed that this protein has 95% homology with the molecular chaperone GroEL from E. coli and 85% homology to HPSE of mycobacterial tuberculos. The purified GroEL from both Actinobacillus actinomycomitans and Escherichia coli potently stimulated murine calvarial bone resorption. In contrast the mycobacterial GroEL (HPSE) from M. tuberculosis and M. leprae failed to promote bone resorption.

GroEL in A. actinomycomitans is a surface-associated protein with potent osteolytic activity.

---

The aim of this prospective qualitative electrophysiological (EMG) study was to investigate the association between maxillary muscle activity and freeway space at altered head positions. Forty adult subjects (20 males and 20 females) with Class I skeletal relations and average facial proportions underwent simultaneous bipolar EMG and skull base KCN blood recordings using a Myotronics 6-9 diagnostic system. EMG activity was recorded from the anterior and posterior temporalis muscles, masseter and digastric at rest in the natural head position and at 10, 20 and 30 degree head inclinations. Both the absolute and relative values between various reproducibility of the subjective measurement. It was noted that the freeway space varied at different head positions. Both masseter and digastic activity increased at head extensions greater than 10 degrees from natural head position. Masseter muscle activity reduced during fixation, while digastic activity again showed a significant increase but only beyond 20 degrees. Both the anterior and posterior temporalis muscles showed no statistically significant change in EMG activity as the different head positions investigated.

It is concluded that the size of the freeway space is maintained at different head positions and, of the maxillary muscles studied, masseter and digastic appear to be primarily responsible for the maintenance of freeway space.

Myotronics Inc, Seattle, USA.

---

Orthodontic appliances must resist shearing forces up to 100N during mastication. This in vitro study measured the shearing forces needed to dislodge small orthodontic appliances. Variables were adhesive type (auto-polymerised or light-cured), cure time (30s or 60s), attachment method (bracket base or direct bond) and bracket type (mask or undercut). Following previous work (Abdalla MS and Bock NF, J Dent Res 69: 161, 1990), all tests were conducted at 50% of the ultimate force. Auto-polymerised adhesive gave higher bond strengths after 24 hrs cure. Light-cured adhesive gave higher bond strength after 1 week cure. Auto-polymerised adhesive gave lower bond strengths on undercut base brackets. Interaction affected bond strength of 24 hrs and 1 week cure. The combination of variables that gave the weakest bond was auto-polymerised resin and undercut base brackets.

---

The aims of this study were to test the relationship between internal derangement of the temporomandibular joint (TMJ) (as measured with a standardised index) and generalised joint hypermobility in a British population.

Joint laxity (TMD) was measured with a subjective (using Beighton criteria) and objective (using Beighton criteria) method. Beighton criteria are very frequently used to assess TMJ hypermobility. The patients were required to perform 15 mandible movements, 2 with opening and closing; 1 with straight jaw movements (representation of the mylohyoid muscle) and 10 with the jaw movements. The patients were measured to determine any hypermobility of the temporomandibular joints. All the patients were measured for hypermobility and the results were recorded. The study was repeated on the same day for 3 months and the results were recorded. The study was repeated on the same day for 3 months and the results were recorded. The study was repeated on the same day for 3 months and the results were recorded.

---

This pilot study investigated plaque removal effects of chewing sugar free gum in fixed orthodontic patients. 30 participants were assigned to randomly assigned to three different chewing gum regimens: soft, medium and hard. The patients were provided with daily brushing/chewing regimens. The chewing gum regimens were: Group 1 chewed sugar free gum only, Group 2 chewed sugar free gum and Group 3 chewed sugar free gum for 5 minutes and brushed their teeth. All patients were disclosed at the start and their hygiene score recorded as the number of plaque-free surfaces/number of surfaces measured x 100. The individual cleaning regimen was then carried out prior to re-disclosing and scoring. Single factor ANOVA statistics revealed no statistical differences between groups for age, length of treatment or starting hygiene scores. Although the Group 2 brushing/chewing group 77% improvement in hygiene score. Pairwise sample t-tests showed improvements to be highly significant for all groups. No damage to any appliances was found. Although this study was small it determined differences between the fixed and indirect foods surfaces. It is concluded that chewing sugar free gum and toothbrushing together is significantly better than removing plaque deposit from fixed appliance patients than either toothbrushing or chewing gum alone.

---

Abstracts: Divisional Abstracts: The British Society for Dental Research 839
The aim of this study was to investigate the effects of nickel and cobalt on osteocalcin expression in vitro. Nickel(II) ions and cyclosporin (CsA) are both known to cause gingival overgrowth in many patients receiving this medication, although the effects of their combined administration is less clear. The aim of this study was to investigate the effects of Ni and Cs on proliferation of gingival fibroblasts in vitro.

Different human oral fibroblast lines were isolated by explant cultures of tissue removed during periodontal surgery or mucosal biopsy. Cells were stimulated with Ni or Cs for 24 hours both in the presence or absence of front of cell culture media. The proliferation of DNA synthesis by assay of uptake of the thymidine analogue bromodeoxyuridine (BrdU). Uptake was measured at 24, 48, and 72 hours after BrdU administration by cytochemistry. The cell lines showed marked variations in basal proliferation rate in untreated cultures. The lines tested did not show any response to either drug in the absence of serum. However, in the presence of serum the lines showed marked increases in proliferation and DNA synthesis of both Ni and Cs. EGCG (green tea polyphenol) showed inhibitory effect to both Ni and Cs. Inhibition of proliferation in one of the lines used, and the lines showed no significant response to either drug. The results demonstrate wide variations in responses to Ni and Cs increases cell cycle, line, and treatment conditions, and vice versa. The experiments were performed in DHT synthesis by human gingival tissue. In response to the culture supernatants of Ni, Pg and Cs were also reported to show additive effects. It was also shown that the inhibitory effect of DHT synthesis to human gingival tissue was affected by the addition of further factors present in serum. We conclude that the variations in responses may partly explain the differences in susceptibility to Ni and Cs in human gingival overgrowths.

The effects of the potent androgen 5α-dihydrotestosterone (DHT) on matrix tissue are well documented, DHT synthesis is elevated during inflammation and may have a role in wound repair processes. It was considered relevant to study the effect of culture supernatants derived from Ponderarum (Pg), Ponginvals (Pg) and A. Actinomycetemcomitans (Aa) on 5α-androstanodione metabolisation by human gingival fibroblasts. The results of this study add further support to the concept that the matrix tissue is a target for androgens in vivo and in vitro.

The anabolic effects of the potent androgen 5α-dihydrotestosterone (DHT) on matrix tissue are well documented, DHT synthesis is elevated during inflammation and may have a role in wound repair processes. It was considered relevant to study the effect of culture supernatants derived from Ponderarum (Pg), Ponginvals (Pg) and A. Actinomycetemcomitans (Aa) on 5α-androstanodione metabolisation by human gingival fibroblasts. The results of this study add further support to the concept that the matrix tissue is a target for androgens in vivo and in vitro.

The aim of this study was to detect and measure interleukin-1β (IL-1β) mRNA-expressing cells in human gingival crevicular washings (GCB) obtained from patients with periodontitis and healthy controls by in situ hybridisation. GCB were performed on 15 diseased sites (CT, PD3 mm) from 5 patients with adult periodontitis (AP) and 8 clinically periodontally healthy sites from 3 volunteers (U1a, PD3 mm). In situ hybridisation using digoxigenin-labelled oligonucleotide probes was carried out with 20 epithelial biopsy samples from 20 patients and control samples from 3 patients. The predominant probes were detected in healthy sites, ranging 1.7 ± 0.4% and 13.0 ± 3.0%, respectively. The percentage of IL-1β mRNA-expressing GCB was significantly higher in samples from patients with periodontitis compared with healthy controls. The IL-1β gene signal was detected in all individuals in 5 samples (2 healthy, 3 diseased). The amount of IL-1β mRNA expression in GCB was higher than that of IL-10 in all samples and there was a heterogeneity within the population of GCB and MNC in their allele to express the IL-1β gene. There was no significant difference in the proportion of IL-1β mRNA-expressing cells between the experimental and control groups. Plasma levels of IL-1β were not detected in any of the samples. These results indicate that IL-1β is predominantly produced by GCB in the gingival crevices of patients with AP and periodontally healthy controls.
153

R. LABELLA. (Department of Biomaterials, Eastman Dental Institute, University of London, UK): Characterization of Bis-GMA based resins containing monomer or dimethacrylate dimers.

Bis-GMA is normally mixed with low viscosity dimethacrylate dimers (DD) to reduce its high viscosity. In this study monoethacrylate dimethacrylates (MD) were compared to DD for a range of physical properties of the resins. Bis-GMA was added with 0.54% or 5.5% of BisEMA/MMMA (54, 74%) or BisEMA/MMMA/EGDMA (54, 45%, 85%) used as accelerators. The composites were cured for 45 s at 1500 mW/cm². Mechanical properties, such as flexural strength, were determined after 24 h. The results showed that Bis-GMA containing composites had significantly higher flexural strength than Bis-GMA containing DD composites. These results are consistent with previous findings that Bis-GMA containing composites have higher mechanical properties than Bis-GMA containing DD composites.

154

STATEG, J. WILLIAMS, J. J. BROWN, A. S. WILLIAMS (The Dental School, University of Newcastle upon Tyne): The effects of mastication on the surface characteristics of composite materials.

The aim was to determine whether temporary composite inlays had better wear resistance than conventionally placed composites and whether tooth location, preparation features or occlusal factors affected wear. A paired clinical trial comparing the two types of restorations (using a five-point hybrid composite) was carried out in 1989. The experimental preparation emergence after individual casts of each restoration was measured. Wear was measured using an indirect optical spectrophotometer with a computer program to determine the relative density of restoration.

A simple empirical formula was used to determine which factors affected wear. The factors were: (1) the presence of restoration wear, (2) the size of the restoration, (3) the relative density of the restoration, and (4) the tooth location. The results showed that the wear resistance of the composite inlays was significantly better than that of the conventional composites. The factors that affected wear were: (1) the presence of restoration wear, (2) the size of the restoration, and (3) the relative density of the restoration.

155

L. H. MAIR (Department of Clinical Dental Sciences, The University of Liverpool, UK): The clinical performance of three posterior composites and two amalgams after 10 years service: preliminary results.

A preliminary sample of 24 posterior composites (Clearfil Posterior, 1; Occlusal, 2; P-10, 1; and 16 amalgas (New True Dentistry, 1; Silena Nova, 1) were examined after two months of their use. The protocol for the placement and review has been previously described (Crawley, 1986, Arch. Oral Biol. 31: 833-837). The restorations were measured for wear and the results were compared to those obtained for the restorations of the same type and size.

In this sample many of the Occlusal restorations bad worn all around the margin. Although some of the restorations appeared to be worn more than 10 mm, the amalgam restorations were worn less than 10 mm. The results showed that the clinical performance of the restorations was good.

It is concluded that all the materials had provided adequate posterior restorations for the years.

156

A. A. ARAZI and A. HARRISON (Restorative Dentistry, Dental School, University of Liverpool, UK): Effect of the filler content on some physical and mechanical properties of a composite inlay material.

Consistent interest has been generated in the use of composite inlay materials and they are now being recommended for use in posterior teeth. It is recognized that the filler contents will influence the properties of the restorations (Hodson et al., 1988, J Prosth Dent 60: 367-374). The purpose of this study was to evaluate the effect of varying the content on translucency, hardness, and wear resistance, and the effect of the filler content on the properties of the restorations.

Influence of light intensity on polymerisation of three light cured composites.

Light-activated composites rely on adequate intensity of the light source to cause polymerisation through the bulk of the material. Material factors such as filler size and loading, resin composition and shade are influential in determining the effective depth of cure. This study compared upper and lower surface microhardness of 2mm thick and 4mm diameter samples of three light cured composites 1-3 cured with different light units. The samples were irradiated for 40s and 60s from a light guide tip. Light intensity was measured with a commercially available dental radiometer. Mean light intensity for the light activation units tested ranged from 101 to 723 (mW/cm²) at full power. Upper surface microhardness was increased by changing the light intensity. Lower surface microhardness was related to light intensity and the correlation between lower surface microhardness and light intensity was most pronounced with the microfilled composite 3.

Material composition is a very important variable at low light intensities in determining adequate polymerisation in bulk.

1. Herutan X, Kerr
2. Silux Plus, 3M Dental
3. Core-Elite, Easo Inc.

157

R. WASSEL*; J. MCDONALD, A. W. WALLS; A. KELLY (Restorative Dentistry, Dental School, University of Liverpool, UK): Evaluation of a resin cement by clinical and radiographic techniques.

One reason for the introduction of composite inlays was that the reduction of polymerization contraction effects should reduce post operative sensitivity. The aim of the study was to test the hypothesis that composite inlays produce less sensitivity than conventionally placed composites. 100 pairs of restorations (1 direct composite inlay and a conventionally placed composite) were inserted (60 placed as temporary restorations and 40 for use as permanent restorations) and the data collected. The restorations were scored for sensitivity by an observer (1 Direct Composite 2) and the conventional composite (3) placed as temporary restorations. The data collected were analyzed for statistical significance. The results showed that composite inlays produced significantly less sensitivity than conventional composite.

In this study, the results showed that composite inlays produced significantly less sensitivity than conventional composites.

158


Previous work by Haines (Orthodentistry and Kieferorthopädie 2, 560-565 1993) and Hobson et al. (J Dent Res 73: 801, Abst. 118, 1994) has indicated that oral bacteria can degrade dental composites.

This study investigated the effects of P. agglomerans on two commercially available dental composites (Silux and Helioform) using the method described in the ASTM standard method for the determination of the resistance to plastics to bacteria. Discs (10mm) were prepared according to the manufacturer's instructions and exposed to light for 45s in the presence of P. agglomerans for 18 days at 37°C. The composites were then tested for their resistance to degradation by soaking the samples in either distilled water (control) or the presence of Nutrient Agar (NA control) solution, or Nutrient Agar inoculated with 1X10⁹ viable cells/ml of P. agglomerans (ATCC 13838) (NA + P. agglomerans). After 3 weeks or 12 weeks, the samples were tested for their resistance to degradation by soaking the samples in either distilled water (control) or the presence of Nutrient Agar (NA control) solution, or Nutrient Agar inoculated with 1X10⁹ viable cells/ml of P. agglomerans (ATCC 13838) (NA + P. agglomerans). The results showed that the degradation of these composites was significantly increased in the presence of P. agglomerans compared to the control.

The results indicate that microbial degradation of composite occurs and affects the superficial layer of the material.

159

M. J. ABU KASIM and J. F. MCCABE (The Dental School, University of Newcastle upon Tyne, UK): The effect of thermocycling on the fatigue behaviour of dental composites.

This study investigated the effects of thermocycling on the fatigue behaviour of 2 hybrid composites: Silux Plus and Helioform and 3 hybrid composites: P50, Clearfil Photo Posterior (both light-cured) and Clearfil Posterior (chemically-cured) was exposed using a ball mill. Nine specimens (2 x 2 x 25mm) of each material was subjected to 125 temperatures of 5°C and 50°C for 5 hours, either distilled water (control) or the presence of Nutrient Agar (NA control) solution, or Nutrient Agar inoculated with 1X10⁹ viable cells/ml of P. agglomerans (ATCC 13838) (NA + P. agglomerans). The results showed that the degradation of these composites was significantly increased in the presence of P. agglomerans compared to the control.

The results indicate that microbial degradation of composite occurs and affects the superficial layer of the material.
161 Jow extended when buffering capacity and had reduced the weeks.

This investigation aims to assess the variation in stimulated saliva secretion rate and the buffering capacity of saliva over an eight month period. Eighty young women (aged 20-30 years) were selected, who had at least one smooth surface primary caries lesion which extended into the dentine and was considered to be active. The stimulated saliva secretion rate and the buffering capacity of the saliva were measured using the Dentabuff® system at baseline, four months and eight months. Considerable variations were observed in the stimulated saliva secretion rate. The average secretion rate at baseline was 55 ml/min, the average secretion rate at four months was 50 ml/min, and the average secretion rate at eight months was 45 ml/min. When the values obtained at baseline were compared with those obtained at four and eight months, it was found that the secretion rate had decreased significantly. The average buffering capacity of the saliva was 40 pH units at baseline, 60 pH units at four months, and 40 pH units at eight months. The lower buffering capacity of saliva at eight months compared with baseline was significant. When the buffering capacities of saliva at baseline and four months were compared, it was found that the buffering capacity of saliva had decreased significantly.

162 The fluoride active in most dentifrices available in retail outlets in Europe is either Sodium Fluoride, Sodium Monofluorophosphate, or Amino-Fluoride. The concentration of fluoride is over 1000 ppm in most of the dentifrices tested, but with a great variation. This fluoride has a significant role in caries prevention, but also has an effect on the enamel structure. The fluoride content of the saliva in the oral cavity is not well known, but it is known that the fluoride content of the saliva is lower than the fluoride content of the dentifrices. The results indicate that there is a significant variation in the stimulated saliva secretion rate and the buffering capacity of saliva over time. It is therefore recommended that these tests are repeated at least once a year to obtain accurate data on these patients exhibiting low values.

163 The fluoride uptake by human enamel from 21 European toothpastes.

The fluoride active in most dentifrices available in retail outlets in Europe is either Sodium Fluoride, Sodium Monofluorophosphate, or Amino-Fluoride. The concentration of fluoride is over 1000 ppm in most of the dentifrices tested, but with a great variation. This fluoride has a significant role in caries prevention, but also has an effect on the enamel structure. The fluoride content of the saliva in the oral cavity is not well known, but it is known that the fluoride content of the saliva is lower than the fluoride content of the dentifrices. The results indicate that there is a significant variation in the stimulated saliva secretion rate and the buffering capacity of saliva over time. It is therefore recommended that these tests are repeated at least once a year to obtain accurate data on these patients exhibiting low values.
169

WH THOSAPORN & G T CRAGG (Dept of Oral Pathology, University of Sheffield, UK): Immunohistochemistry (IHC) in the differential diagnosis of minor salivary gland neoplasms

Occasionally, the histological appearances in biopsies from minor salivary gland neoplasms present diagnostic problems. For example, the "cribiform" pattern typical of adenoid cystic carcinoma (ACC) may also feature as a component in monomorphic and pleomorphic adenomas, the polyposid mucous adenoma, and adenocarcinoma (PLGA). Given their widely differing biological behaviour, it is essential to distinguish reliably between these possibilities, and ACC is a diagnostic challenge. The role of IHC as an aid to differential diagnosis in such cases forms the basis for the present study. Representative, formalin-fixed, paraffin-embedded, tissue sections from 25 cases of each of the following were examined: ACC (n=29), PA (n=15), PLGA (n=30), basal cell adenoma (n=18), and minor salivary gland adenoid cystic carcinoma (n=29). The sections were evaluated for the expression of: (1) a panel of antibodies directed against: S-100 protein (n=30-100), vimentin (n=30-100), actin (n=30-100), and HMB-45 (n=20), (2) cytokeratin (n=20), (3) S-100 and/or MSA immunopositivity separated also from ACC. PLGA.

Immunohistochemistry in the differential diagnosis of minor salivary gland neoplasms.

1. Daijo Ltd, UK.
2. Vector Labs, UK.

170

AJC POTTS, MR BRICKLEY, J HAMMERTON & JB MATTHEWS (Dental School, University of Wales College of Medicine & University of Birmingham): Can a neural network predict focal lymphatic metastases from clinical and radiological data?

While a number of clinical, serological and imaging investigations are used to support a diagnosis of Sjögren's syndrome (SS) many patients require salivary gland biopsy to confirm the diagnosis. This study investigates the ability of a neural network to predict the histological features of SS.

Information was extracted from 164 patients referred to an Oral Medicine Clinic for investigation of suspected SS, comprising 134 with underlying connective tissue disease and 26 suspected of having primary SS. Data from 84 cases was used to train a neural network (Neural 1.2, Neural Computer Sciences, Southampton) which was subsequently tested with data from 80 cases. Variables examined included biochemical, serological, and radiological data. Diagnostic accuracy and predictive sensitivity were assessed using the receiver-operating characteristic (ROC) curve. The model used was constructed using a back-propagation algorithm and the Levenberg-Marquardt optimisation algorithm. The network was trained using 1000 epochs and cross-validated using 10-split cross-validation. A sensitivitv of 90% was used. The network was then tested on the remaining cases.

The results of the model were then compared to the clinical assessment of Sjögren's syndrome, using the American-European consensus criteria. ROC analysis was used to compare the diagnostic performance of the neural network with the clinical assessment.

The results indicated that a neural network can predict the presence of focal lymphatic metastases from clinical and radiological data and may eliminate the need for salivary gland biopsy in some patients.

171

J GISON*, M RIGGIO, D G MACDONALD & D WRAY (Glasgow Dental Hospital and School, Glasgow): The Identification of Mycobacterium paratuberculosis by PCR in oral granulomatous lesions.

Oral granulomatous lesions (OGL) are a condition characterised by oedema variably involving skin and mucosa. The condition is defined by clinical, presentation and the histological presence of lymphoepithelial and non-caseating epithelioid granulomas. After full medical investigation, a proportion of cases of OGLs can be reclassified as Crohn's disease, with or without gastrointestinal manifestations. tuberculosis or sarcoidosis and a significant number of cases have identifiable dietary and environmental aetiological factors. Paton D W H, Ferguson M J M, Forsyth A and James J M (J Oral Maxillofac Surg 23: 235-242, 1985) have suggested that Mycobacterium paratuberculosis and Crohn's disease (Sander son J D, Moes M T, Thad M L V and Harmon-Taylor J. Gut 32: 890-896, 1992), mucosal biopsies from 10 patients with OGL, but no clinical evidence of extra-oral gut Crohn's disease or sarcoidosis, were subjected to polymorph chain reaction (PCR) analysis to detect the presence of IS900 DNA sequences specific to Mycobacterium paratuberculosis. Two biopsies suggested positively by this technique.

It is concluded that Mycobacterium paratuberculosis may be present in some cases of OGL as an aetiological agent.

172

S SMITH*, S WARNAKULASIRIYA, N W JOHNSON (RCS Dental Sciences, King's College, London): Baseline knowledge of oral cancer and the effect of training on diagnostic accuracy for oral mucosal lesions, amongst 26 General Dental Practitioners (GDPs).

The rising incidence and high mortality of oral cancer in the UK have generated much interest in screening. The UK Office of Population Censuses and Surveys (1991) has reported that 1 in 6 people affected by oral cancer were aware of the disease. However, no such data exist for General Dental Practitioners (GDPs).

This study assessed General Dental Practitioners knowledge of diagnostic imaging techniques. A questionnaire was distributed to all GDPs across the South East of England. The questionnaire was a combination of multiple choice questions and open ended questions. The questionnaire was further subdivided into sections dealing with radiological investigations and biopsy techniques.

173

CG COGAN,7 T A GREGG and F KEE (School of Clinical Dentistry, The Queen's University Belfast and Public Health Medicine, Experience in the management of oral cancer and pre-cancer in Primary Dental Care.

Previous studies in N. Ireland have shown that epithelial dysplasia is diagnosed infrequently compared with squamous carcinomas (Gregg et al, Br Dent J, 173:234-236,1992). This is in contrast to cervical carcinomas. The incidence of dysplasia for oral numbers. This may indicate that potential malignant lesions are not being detected and referred for biopsy by GDPs. Aim: To determine the experience, usual management and referral strategies of primary care dentists in N. Ireland for oral cancer and pre-cancer.

Method: A postal questionnaire was sent out to 635 primary care dentists. Results: Final response was 67% (428/635). Malignancy was routine for 94% (402). White lesions (presumptive leukoplasia or lichen planus) were the most common with a median of 11 per year. Typical management for dysplasia was referral for biopsy (93%) and SCCs (9%); 12% (3) referred directly to hospital. Overall 62% of patients with suspected cancer was low (median 3) and 25% (107) of respondents had referred more than six. Of these less than one third were subsequently diagnosed as malignant.

Summary: Malignant examination is routine but overall experience of carcinomas and potentially malignant lesions is low. Suspicious lesions are referred early. These findings do not explain the previously low incidence of dysplastic lesions and questions the extent and existence of a clinically detectable pre-malignant phase in all cases of intra oral squamous carcinomas.

174


107 alcohol misusers (mean age 42.9 years; range 21-65; 80 male) attending 4 centres in South London were interviewed on alcohol consumption (weekly/monthly and their total audit scores). Nutritional status (body mass index, BMI and mid arm muscle circumference) was recorded. Each subject completed a dental and oral examination. Observations revealed that there were significantly more than 50 units per week and 80% greater than 100 units per week. Smoking and alcohol misuse were found to be related (93% reporting both habits). Plaque scores and mean subject pocket depths were not correlated to alcohol consumption but both smoking frequency (P<0.01), P<0.001) and duration (P<0.01, P<0.001) were. Overall mean DMFT was 15.4; age specific mean DMFT and tooth loss of the sample were closely similar to the UK Adult National Survey data (1988). The prevalence and severity of tooth wear and attrition were greater in the sample than the previous study, which is probably due to the increased use of alcohol misuse. Increasing tooth numbers and oral health were negatively correlated. In the sample, tooth numbers and oral health were. In the sample, tooth numbers and oral health were negatively correlated. In the sample, tooth numbers and oral health were negatively correlated. In the sample, tooth numbers and oral health were negatively correlated.

175

ROCHE S.A. (Unit of Oral Medicine, School of Dentistry, The University of Birmingham), Oral Health Needs of a Friul Elderly Population.

Birmingham's elderly population aged 75 years or more is estimated to be 64,300 (OPCS 1991). 34% of whom are registered with a general dental practitioner (GDP) for continuing care. (General Dental Service Quarterly report figures, April-June 1994).

The aim of this study was to assess the prevalence of oral mucosal disease in a frail elderly population. The participants were residents in nursing homes in North and West Birmingham. A total of 451 elderly people were screened by the same clinician for dental and oral disease. At the time of the survey, some were registered with a GDP under a continuing care contract. 34% (n=412) of those surveyed had conditions requiring treatment or regular monitoring. 9.4% (n=39) required new dentures. 25% (n=103), had clinically obvious oral mucosal disease. The most frequently presenting conditions were xerostomia (9.4% =39) and oral candidiasis (3.3% =12). 5 patients had ulcerative lesions, one of which was a carcinoma in situ.

Results suggest that the Nomenclature Nead for oral health provision is high among the frail elderly population in Birmingham, despite a low expressed need.

Screening programmes should be extended to identify unrest need amongst the frail elderly and access to appropriate oral health care provided.

176

J A BEELER*, L MOORE and F NEUMAN (Dept of Oral Sciences, University of Glasgow Dental School, UK): Incision of buccal epithelial cells with salivary basic protein-rich films.

Although protein-rich films (PRF) comprise two-thirds of the total protein in saliva, the levels in mixed venous saliva are very low. As it has been shown that some PRFs interact specifically with certain oral bacteria (Newman F suspected PRF component 134 with underlying connective tissue disease and 26 suspected of having primary SS. Data from 84 cases was used to train a neural network (Neural 1.2, Neural Computer Sciences, Southampton) which was subsequently tested with data from 80 cases. Variables examined included biochemical, serological, and radiological data. Diagnostic accuracy and predictive sensitivity were assessed using the receiver-operating characteristic (ROC) curve. The model used was constructed using a back-propagation algorithm and the Levenberg-Marquardt optimisation algorithm. The network was trained using 1000 epochs and cross-validated using 10-split cross-validation. A sensitivity of 90% was used. The network was then tested on the remaining cases.

The results indicated that a neural network can predict the presence of focal lymphatic metastases from clinical and radiological data and may eliminate the need for salivary gland biopsy in some patients.

The British Dental Journal 74 (3) 1995 Divisional Assessments: The British Society for Dental Research 843

Please note: The above text is an automatic transcription and may contain errors. It is intended for educational purposes only.

Expression of the oligosaccharide A\(B\) and \(H\) blood group antigens (Ag) in saliva has been attributed to mucins, glycoproteins which are not secreted by parotid glands. The aim of the present study was to determine whether parotid saliva contained these antigens and whether their expression varied with the activity of the gland. Whole saliva samples were collected under controlled conditions from healthy individuals (ages 20 to 40) of different blood groups, two samples were collected in 5 minutes using a saliva collector and the samples were stored at -20°C until analysis. Samples were thawed, centrifuged and the supernatant fraction was used for analysis. The samples were analyzed using a method based on a previously described method (Carpenter et al., 1983). A standard curve was constructed using known amounts of oligosaccharide A\(B\) and \(H\) antigens. The results were expressed as IU of antigen per minute.

To examine the relationship between antigen expression and the activity of the gland, saliva was collected from the same subject on two occasions, once at rest and once after the subject had chewed paraffin wax. The results were compared using a paired t-test.

The results showed that there was a significant increase in the expression of both antigen and activity of the gland. This suggests that the expression of blood group antigens in saliva is influenced by the activity of the gland.


B. D. HOBBS (Department of Orthodontics, Leeds Dental Institute & Dental School, University of Sheffield, UK): Circum-salivary hydration: are M\(_2\) receptors involved?

A common side effect of classical antipsychotic drugs (e.g. chlorpromazine) is dry mouth, which appears to be related to their anticholinergic effects. The anticholinergic activity of classical antipsychotics is responsible for their dry mouth side effects. However, the mechanism by which these drugs induce dry mouth is not well understood.

We recently reported that parotid saliva from healthy volunteers contains receptors for M\(_2\) muscarinic cholinergic receptors, which are known to mediate the anticholinergic effects of classical antipsychotics. The aim of this study was to determine whether these receptors are involved in the production of dry mouth side effects.

Parotid saliva was collected from healthy volunteers using a saliva collector and the saliva was analyzed for M\(_2\) receptor activity using a radioligand binding assay. The results showed that the saliva contained M\(_2\) receptors and that the receptor density was increased in saliva from patients with dry mouth.

These findings suggest that M\(_2\) receptors may be involved in the production of dry mouth side effects and that targeting these receptors may be a potential treatment for this side effect.

The investigation aimed to produce a Dental Anxiety Scale with high validity. Our modified version (MDAS) of the Cohs Dental Anxiety Scale (CDAS) added a question asking if participants had received dental injections. New multiple choice answers, in order of severity and the same for each question, were provided. Twenty-five dental nurses personally independently confirmed the order of the answers for the MDAS. On the CDAS seven subjects gave one sequence for the answers denoting increased anxiety. The other subjects placed them in a different order. Of 1392 dental patients, 13% expressed extreme anxiety about injections on the MDAS but were only "fairly" or less anxious about drilling.

Therefore, the CDAS, unlike the MDAS, could reliably discriminate only extremely high or low dental anxiety and would overlook patients who are very afraid of injections only.

187 The use of new technology in the oral health sector.

Three hundred and ten children, who were examined at school in Salford when they were 5 years old, were re-examined at ages 7 and 9 using BASCO criteria. The aims of the study were to find out how dental health changed over these four years and how dental services in the city were coping. The mean dmft at 6 was 3.15. At the age of 7 the dmft was 3.74 and the DMFT 0.35 (total 3.99). At the age of 9 the dmft was 3.43 and the DMFT 0.70 (total 4.13). The mean number of decayed, teeth regained and permanent, fell from 2.51 at age 5 to 2.43 at age 7 and 1.80 at age 9. When the city was divided geographically similar changes were recorded in all four sectors. The Care Index rose from 5% at age 5 to 11% at age 7 and 17% at age 9. It is concluded that the level of dental plaque increases most between ages 5 and 7. However the dental services had reduced the level of active disease and provided more restorative care.

188 Acceptance of Fuzzy logic in restorative treatment decision making.

"Fuzzy logic" is a theory which enables the acceptance of uncertainty, and their integration into day to day thinking. Fuzzy logic questions the positivist belief in dichotomies which may be expressed as a concept such as "healthy/dysfunctional". It postulates that most events, particularly in living organisms, are not "black and white" but "gray area". If this multifaceted universe is accepted, then treatment decision making becomes an extremely complex process. Good decision making will depend not only upon knowledge but also on a practitioner integrates experience and information, thereby bringing many other influences into the process. A qualitative study is described which sought to identify issues, other than the extent of pathology, which influence on a dentist's restorative treatment decision making. Content analysis of in-depth interviews with 20 randomly selected practitioners delineated ten themes of influence on restorative decisions. These were: self-esteem; patient preferences; reputation with colleagues; benefits to patients; knowledge of available treatments; professional fees/time; ethical conscience. These issues were divided into a taxonomy which relates to patient, professional and practitioner characteristics. The dentists felt that 'ethical conscience' and 'reputation with patients' most influenced their decision making, although self-esteem was highlighted as having a profound influence on the avoidance of false positive decisions.

The study indicates that an understanding of disease processes and available treatment options is an insufficient basis for treatment decision making.

190 The use of new technology in the oral health sector.

Increasing numbers of adults are retaining their teeth and wish to have a natural dentition for life (Todd JS and Lader D: "Adult dental health 1988 UK, HMSO"). Recession and root caries become an increasing problem with age, however, to date most caries-preventive material is targeted at children. Therefore, the overall effect of preventive materials on caries experience and health data collection in relation to the prevention of root caries is used by general dental practitioners in Scotland. In the first part of the study reported here 10 vocational trainees and 2 experienced general practitioners were appointed to collect and analyze the data. The amount and attitudes of the 12 GPs was determined using a series of projected slides, questions and discussion. Subsequently, 227 patients aged 35-54 years were examined in the practice surgeries within the same 10 practices. The prevalence of root caries and the surgeries was investigated. Patients were questioned on their knowledge and attitudes to caries, gingival recession, oral hygiene practices and the presence of sensitivity. Gingival recession was present on at least one tooth in nearly all the patients examined. Root surfaces aged 35-44 had root caries on 10% of surfaces, with 43% in those aged 45-54. Similarly, rooted root surfaces were found for 66% and 72%. Root caries prevalence in patients exhibiting good oral hygiene was 44%, with fair oral hygiene 51% and for those with poor oral hygiene 66%. In conclusion, the majority of adults were aware of potential recession but are unaware of appropriate preventive techniques. A high level of gingival recession and history of root lesions was reported.

191 The use of new technology in the oral health sector.

This investigation aims to determine the accuracy of counselling dental patients who smoke to reduce their tobacco consumption on account of its adverse effects on periodontal health. 98 habitual cigarette smokers attending the Newcastle Dental Hospital, who expressed a wish to reduce their cigarette smoking, were referred to the advice and periodontal care section. Results showed that those counselled reported a greater reduction in cigarette consumption during treatment and follow-up, compared with 44 control subjects. Smokers receiving counselling advice and periodontal health advice and periodontal treatment. 6% of control subjects reduced their cigarette consumption by at least one half, compared with 33% of control subjects who spontaneously reduced this level. The cessation rate in those counselled was 13.4%, compared with 6.2% in controls.

It is concluded that advice about smoking combined with dental health instruction can be an effective aid to reducing smoking in dental patients.

192 The use of new technology in the oral health sector.
Gingival crevicular fluid (GCF) has been shown to contain several processes derived from local lesions (Cox S W & Bay M J, J Periodontol 34: 525-358, 1963; Cox S W et al., Arch Oral Biol 27: 197-215, 1982). The aim of this study was to assess the contribution of cell-bound enzymes to measured GCF activity. GCF activity was collected from tissue samples and solutions obtained from the periodontal pocket. The samples were assessed for inflammatory cells using antibodies directed against CD4 (T4 lymphocytes), CD8 (T8 lymphocytes), C3d (complement), and CD68 (macrophages/microphages) and by Toluidine blue dye staining. The enzyme activity of N-acetyl-β-D-glucosaminidase was measured in 18 patients and N were identified in the human enzyme and cytochrome c oxidase activity was used as a control. The results suggest that GCF samples collected on paper strips from the matrix-embedded sites of 14 patients from at least 10 different lesions were analyzed. The enzyme activity of GCF samples was found to be significantly higher than that of the controls. While the probing depth was measured with a Florida probe at each site, the presence of bacteria was assessed at the time when the attachment level was measured by a novel two-way ANOVA. The results were significant and the specificity of the test protocol was determined to be 95%. GCF activity levels were found to be significantly lower in sites with more bacteria. The results indicate that GCF activity levels are associated with chronic periodontal disease.

Bacteriological processes thought to play a role in the pathogenesis of periodontal disease. A number of these processes have been described but only recently were identified (Hill E M et al., J Dent Res 66: 1822-1829, 1987). The aim of this study was to examine the pathogenicity of two different periodontal pathogens and to determine their ability to produce an inflammatory response in the host. The study was based on the measurement of the inflammatory response in the host. The results demonstrated that one of the periodontal pathogens was able to produce a significant inflammatory response in the host. This suggests that the periodontal pathogens are able to elicit an inflammatory response in the host. The results also suggest that the periodontal pathogens may be responsible for the inflammatory response in the host. In conclusion, the results suggest that the periodontal pathogens are able to elicit an inflammatory response in the host. Further studies are required to elucidate the mechanisms by which the periodontal pathogens elicit an inflammatory response in the host.

Dent Res 56: 1125-1132, 1987. The aim of this study was to examine the enzymes present in the periodontal pocket. The enzymes were assessed for their activity against a range of substrates including: (i) a specific substrate for the enzyme, (ii) a specific substrate for a related enzyme, and (iii) a general substrate for all enzymes. The results demonstrated that the enzymes present in the periodontal pocket were able to hydrolyze a range of substrates. The results also demonstrated that the enzymes present in the periodontal pocket were able to hydrolyze a range of substrates. In conclusion, the results suggest that the enzymes present in the periodontal pocket are able to hydrolyze a range of substrates. Further studies are required to elucidate the mechanisms by which the enzymes present in the periodontal pocket hydrolyze a range of substrates.

The aim of this study was to evaluate the presence of endogenous plaque-associated gingival inflammation, any differences in the level of P. gingivalis in the subgingival plaque of subjects categorized as susceptible or resistant to periodontal disease. The aim was to assess the presence of endogenous plaque-associated gingival inflammation, any differences in the level of P. gingivalis in the subgingival plaque of subjects categorized as susceptible or resistant to periodontal disease. The results demonstrated that the level of P. gingivalis was significantly lower in subjects categorized as resistant to periodontal disease. The results also demonstrated that the level of P. gingivalis was significantly lower in subjects categorized as resistant to periodontal disease. In conclusion, the results suggest that the level of P. gingivalis is lower in subjects categorized as resistant to periodontal disease. Further studies are required to elucidate the mechanisms by which the level of P. gingivalis is lower in subjects categorized as resistant to periodontal disease.
A. C. MURPHY * and R. G. HILL (Dept. of Materials Science and Technology, University of Limerick, Ireland): Fracture Toughness of Tooth Acrylic: Presently, acrylic teeth are prone to abrasive wear and fracture as manifested by chipping of the ide teeth. The optimization of the fracture toughness of tooth acrylic is an important problem. In this study, the influence of variations in the unloading stress and curing conditions on the fracture toughness of tooth acrylic was examined. In addition, the effect of using a polyester bead, based on an interpenetrating polymer network (IPN), was investigated. The polyester bead was added to ethylene glycol dimethacrylate (EGDMA), percent increase was found from 0% to 20%, the curing time was varied between 70% and 160°C. Double torsion tests were used to determine the fracture toughness. The polyester bead decreased, the increased curing content and curing time resulted in a slight increase in the fracture toughness. A significant decrease was obtained when 20% EGDMA was used, the test crack moved to stick slip fracture mode. The IPN material exhibited an increased fracture toughness due to crack deflection around the beads.

Curing time and temperature may have minimal effect on the fracture toughness and the EGDMA content has little influence except at high concentrations. IPN acrylic exhibs a small but significant increase in fracture toughness.

G. WOOLEY, S. E. NORTHWEST and R. VAN NOORT (Department of Restorative Dentistry, University of Sheffield, Sheffield S10 2TA): Torsional and tensile resistance of casted vs resin bonded cast NCP posts: This study compared the resistance to torsional and tensile loading of casted or resin bonded cast NCP posts. The post holes 9mm deep x 1.5mm diameter were prepared in 100 casted extracted human premolar teeth and randomly assigned to 5 groups of 20. An anti-rotation keyway 3mm x 4mm was used to cast posts produced from the groups. Identical casting patterns were used for parallel-sided, assorted acrylic and lucite posts. The casted posts were grit blasted with 50µm alumina and immediately cemented with: Group 1. Zinc phosphate cement to cast; Groups 4 and 5 for 1 and 3 respectively but with an anti-rotation keyway. Half the specimens were used for pure torsion mode at a speed of 3mm/min. Torsional loads were applied 180mm from the long axis to the remaining slices using a beam secured perpendicular to the core. Torsional data is normalized and expressed as a mean ± SEM of the average results. The greatest post failure values were obtained in the Group 1 specimens. Mean torsion at failure (Newtona) was 30.9466±3.3 (4), 25.598±0.03 (3), 17.799±29 (4), 20.9±15.6 (1) * significant difference p=0.05, Tukey's test. Mean torque load at failure (N) were: Group 1 434.2±16.3 (4), 284.97±9.2 (5), 323±16.3 (6), 315±7.4 (4), 799±55 (1) * significant difference p=0.001, Tukey's test. Resin composite denture bonded posts produced significantly more resistance to displacement under either of the loading conditions. 1.00 posts: Posterior West Yorks: 1.00 Tidental Yatsuyama, UK. 1.00 TzioDentistry, UK. 1.00 Acuna Dental, Japan. 1.00 Permum Ultraadent products, US. 1.00 Univa Ex Kuray, Japan.

P. M. RIGGIO*, D. M. MACKENZIE, A. LENOON, J. F. MACFARLANE and D. KINANE (University of Glasgow Dental School, Glasgow, UK): Identification of periodontal pathogens in subgingival plaque by PCR and culture methods: In this study the major periodontal pathogens, Actinobacillus actinomycetemcomitans (Aa) and Porphyromonas gingivalis (Pg) were identified in subgingival plaque samples by polymerase chain reaction (PCR) and conventional culture methods. The PCR primers for detecting Aa and Pg were derived from the leucotoxin A and fimbriation genes, respectively, and have previously been shown to be highly specific (Socransky et al.; Figueroa et al.; Stevens R H and Fine D H. Oral Microbial Immune B: 106-110, 1993; Westerman K and Cronin T). Detection of 100 samples using PCR identified Aa in 40 (24%) and Pg in 40 (24%) of the samples. By comparison, conventional culture methods identified Aa and Pg in only 25 (15%) and 25 (18%) of the samples respectively. Additionally, only 5 samples harbored both Aa and Pg.

It is concluded that PCR is a more sensitive than conventional culture methods for detecting Aa and Pg in subgingival plaque samples.
Different sampling techniques for bacterial recovery from root canals and periodontal tissues have been used over the years. The paper point paper has proved to be a reliable and reproducible means of sampling from these sites. It is commonly used to compare plaque cultures from different patients (P) and P. gingivalis (P.g.) using the direct inoculation of the paper point to create pre-reduced solid media with (b) into a reduced transport fluid (RTF). Dilutions of P. and P.g. suspensions in 0.5% saline were made and successive serial dilutions were performed until 10^{-3} dilutions for 1 min. and then inoculated onto the pre-reduced FCA agar plates. The RTF was by inoculating separate paper points in each dilution for 1 min. and transferring to tubes with 1 ml of RTF. The tubes were incubated for 16 h. Serial dilutions were performed until 10^{-3} dilutions using RTF. P.g. was recovered from the standard suspension up to 10^{-3} dilution using the direct inoculation, and from standard suspension and 10^{-3} dilution using the RTF. It is concluded that recovery of P.e. and P.g. is possible by either technique. However the number of the sample is critical to their isolation and hence to their recognition in the clinical isolation.

The aim of this study was to determine whether Lipid-A-associated proteins (LAP) from Porphyromonas gingivalis and Prevotella intermedia secrete from the host and if these can stimulate human gingival fibroblasts (hgf) or a human myoendothelial cell line (Mono-Mac-6) to release interleukin-6 (IL-6). Three different monoclonal antibodies (mAbs, J. Biol. Chem. 275:291-2911; 2003) and the Lipopolysaccharides (LPS) extracted from human using the hot phenol-water method of Westphal and Janke (Anal Carbohydr Chem. 3(2):91). These mAbs were used to determine if LAPs from P.g. and LPS from Porphyromonas gingivalis stimulate IL-6 release from hGF in a dose-dependent manner over the concentration range 10^{-6}-10^{-3} LPS was less potent than LAP at stimulating release of IL-6. In contrast, LAP was found to stimulate MP from both groups of organisms and the LPS from both groups of organisms were found to induce IL-6 release. LPS failed to stimulate cells to release IL-6, confirming that the active components were proteins. In conclusion, LAPs from Porphyromonas gingivalis and Prevotella intermedia were able to stimulate Mono-Mac-6 cells to release IL-6, whereas both LAP and LPS from P.g. were able to stimulate IL-6 release from MP. However, the stimulation of cytokine release by LPS may be relevant to the pathogenesis of chronic periodontal disorders.

The aim of this study was to assess the effect of periodontal therapy on specific serum antibody concentration, expressed as titre, and antibody binding strength, expressed as relative avidity. The immune responses to Porphyromonas gingivalis and Actinobacillus actinomycetemcomitans (Aa) were studied in 41 patients before and after therapy. IgG avidities (expressed as titres) to both species were measured by ELISA and relative avidity was measured by titracycline elution in seven adult periodontal patients before and after therapy. IgG avidities (expressed as titres) to both species were measured by ELISA and relative avidity was measured by titracycline elution. The Aa IgG avidities were from 1:150 to 1:500, whereas the P.g. IgG avidities were from 1:10 to 1:100. P.g. IgG avidity was significantly different from Aa before and after therapy (p<0.01). More specifically, when patients were dichotomized into sub-groups which had originally been either Aa or P.g. IgG avidities were measured by ELISA (units) increased from 1:25 to 1:75 (p=0.012). More specifically, when patients were dichotomized into sub-groups which had originally been either Aa or P.g. IgG avidities were measured by ELISA (units) increased from 1:25 to 1:75 (p=0.012). More specifically, when patients were dichotomized into sub-groups which had originally been either Aa or P.g. IgG avidities were measured by ELISA (units) increased from 1:25 to 1:75 (p=0.012). More specifically, when patients were dichotomized into sub-groups which had originally been either Aa or P.g. IgG avidities were measured by ELISA (units) increased from 1:25 to 1:75 (p=0.012). More specifically, when patients were dichotomized into sub-groups which had originally been either Aa or P.g. IgG avidities were measured by ELISA (units) increased from 1:25 to 1:75 (p=0.012). More specifically, when patients were dichotomized into sub-groups which had originally been either Aa or P.g. IgG avidities were measured by ELISA (units) increased from 1:25 to 1:75 (p=0.012).
217 Preosteoglycans are known to play an important role in the mineralisation process, acting either as promoters or inhibitors. In this study the binding affinity of a variety of constitutent glycosaminoglycans (GAG) to hydroxyapatite (HAP) was studied. GAG (10-1000 g/ml) at 0.25M sodium acetate (pH 4.5) were concentrated by dialysis and a 1M acetate solutions (pH 4.5) for 1 hr. Unbound was removed using the same sodium acetate buffer and the total amount of GAG bound was determined by dimethylthyl blue assay. The relative affinities of the different GAG remaining bound to HAP was investigated by examining their release in a 0.1M sodium phosphate gradient. Biding isotherms were constructed for chondroitin 4 sulphate (CS), dermatan sulphate (DS) and chondroitin 6 sulphate (C6S) and were indicative of Langmuir type adsorption. Differences were noted between the description profiles of CS, DS and C6S. With each GAG a number of elution peaks were identified.

A higher ionic strength was required to elute the DS species.

These results point to the importance of a variety of binding forms of each GAG or the differing orientation of these forms to yield different complexes with HAP. The CS 4-sulphate co-ordinated of the GAGs is known to vary and may in part explain these findings.

219 Marfan syndrome, a heritable-disproportionate disorder characterised by skeletal, cardiovascular, and ocular deformities has been linked to defects in the glycoprotein fibrillin, Marfan syndrome and its skeletal abnormalities found in this condition are thought to play an important role in the function of fibrillin in skeletal tissues, and this report examines the ability of a variety of skeletal cells to synthesize and secrete fibrillin. Bone-derived and cartilage-derived cells exhibited characteristic morphologies and different mineralizing capacities. Both osteoblastic and chondroblastic response was identified in the osteoblasts and osteocytes and cartilage cell cultures indicating the potential role of fibrillin in the skeletal development.

This work was supported by the Arthritis and Rheumatism Council.

220 Impression can be made by using a X-ray microtomograph to determine the mineral density changes resulting from laser ablation. No sample containing ablation area was cut and polished to examine the effect of laser ablation on the dentine dentine. 20 XMT transverse sections were taken at 100 µm intervals along the tooth rod using Agfa radiation at a resolution of 50 µm, with a section thickness of ~15 µm. A series of laser impacts were made on the natural surface of the enamel using a 1.2, 1.6 and 2.0 µm laser. XMT images were taken at each stage and the extent of the extent of the laser on the mineral concentration at each pixel formed the image was calculated by comparison of the initial and final XMT images.

In conclusion XMT can provide a quantitative, non-destructive measure of the changes in mineral concentration of dental hard tissues following laser application.

221 C. R. MERCER* and P ANDERSON (The London Hospital Medical College, Turner Street, London E1 2AD, UK): X-ray microtomographic quantification of the effects on enamel following CO2 laser application.

The aim of this study was to investigate the possibility of using X-ray microtomography (XMT) to quantify the mineral density changes resulting from laser ablation to enamel. A rod containing enamel sections was cut and polished to examine the effect of laser ablation on the dentine.

20 XMT transverse sections were taken at 100 µm intervals along the tooth rod using Agfa radiation at a resolution of 50 µm, with a section thickness of ~15 µm. A series of laser impacts were made on the natural surface of the enamel using a 1.2, 1.6 and 2.0 µm laser. XMT images were taken at each stage and the extent of the extent of the laser on the mineral concentration at each pixel formed the image was calculated by comparison of the initial and final XMT images.

In conclusion XMT can provide a quantitative, non-destructive measure of the changes in mineral concentration of dental hard tissues following laser application.

222 W A COULTER*, P J BURKE and S W CHEUNG (School of Clinical Dentistry, Queen's University Belfast and University of Manchester): An audit of aesthetic practice in general dental practice.

The use of a steam autoclave has been advised as a means of sterilising instruments in dental surgery. A number of factors such as improper wrapping, inadequate pre-sterilization cleaning, or lack of maintenance equipment may interfere with the sterilization process and failure rates of 15% have been quoted in the USA (Puleck C et al, J Endods 15: 206-209, 1986). Few hundred dentists in Northern Ireland were offered the opportunity to test their autoclaves on two occasions using Assed biological spore strips and requested to complete a questionnaire regarding the sterilization equipment.

There was a 25% response rate with 4% showing autoclave failure. Autoclaves were used on average 2 times per week. Staff were asked to check their autoclave every cycle and to monitor performance. A questionnaire was distributed with the strips. Seventyseven percent of CPS and 68% of DDS have had formal training on autoclave sterilization control. A monthly update on cross-infection would be considered beneficial by 80% of respondents.

It is concluded that periodic testing of autoclaves using biological indicators in general dental practice is important. A questionnaire was distributed with the strips. Seventyseven percent of CPS and 68% of DDS have had formal training on autoclave sterilization control. A monthly update on cross-infection would be considered beneficial by 80% of respondents.

218 The role of alveolar bone proteoglycans (PG) has not been described in detail although their importance as markers of time activity in revivieral fluid and in the mineralisation process has been established. There are insufficient data regarding the interaction of these factors and, in sheep alveolar bone has been used as a model system. PG were extracted from EDTA demineralised sheep alveolar bose under dissociative conditions using 6M guanidine chloride in the presence of pronase to prevent proteolytic digestion to the primary structure of PG. By the extraction of PG using an esterase inhibitor, a 110S-120S molecule was removed, using a step-wise salt gradient and anion on a Resource-Q column with FPLC. PG rich fractions were analyzed for GAG, proteins, amino acid composition and molecular size. Chondroitin sulphate was found to be the predominant GAG, representing 16.5 ± 4.1 % of the PG molecular weight. Examination by SDS-PAGE identified two chondroitin sulphate species with the molecular weights of 76 and 59kDa respectively. The core proteins had molecular weights of 49kDa for both PG. Western blotting with monoclonal antibody CS-56 confirmed the presence of chondroitin sulphate. Fourier-transform infra-red spectroscopy identified the sulphate ions of chondroitin 4- and 6-sulphate, the 4-sulphate isomer predominating.

Amino acid analysis showed the PG to be rich in asparagine, glutamate, glycine and leucine, but significantly low in cysteine and methionine. As a load point 0.05-0.4 was confirmed for the protein core. Similar biochemical data has previously been obtained for human alveolar bone PG and confirms the value of a sheep model in future determination of the biological roles played by PG within extracellular matrices, in particular mineralisation.
In conclusion: soy infant formulas and standard infant formulas show equal acidogenic potential in adults. It is possible that the mode of conservation is the most important determinant of cariogenic potential of infant formulas.

1Cow & Gate Nutrition Ltd

---

Bite force was measured in a group of Caucasian and West Indian children by a device constructed at King's College School of Medicine and Dentistry. The sample consisted of 20 in each ethnic group, with equal distribution of sex and age range of 1-16 years. Prior to measurement of bite force the validity and reliability of the bite force measuring device was tested and established against a conventional machine. The results show that the measurement of bite force by the constructed device was close to that of the tensiometer.

Although the cephalometric measurements between the two groups showed expected differences, no statistically significant difference was found in the maximum bite force between the groups. The male subjects in the sample showed higher bite force than the females.

---

225 A G WALTON*, P J MOYNIHAN and W G WRIGHT (The Dental School, University of Newcastle upon Tyne, UK): The effect of soy infant formula on the pH of dental plaque.

Infant soy infant formulas offer an essential substitute for standard baby milk formulas for children who are cow’s milk intolerant. Although the carbohydrate content of both formulas is the same, there has been concern that soy infant formulas containing glucose syrup may cause dental caries. In this study we aimed to compare the effect of soy infant formula (Infanta) and standard (Premier) infant formulas on the pH of dental plaque. Twenty adult volunteers refrained from oral hygiene for 48 hours. Pooled plaque samples were obtained and pH measured before and at timed intervals after rinsing with the various infant formulas. Statistical analysis of the pH results showed no significant difference among the groups (P>0.05)

226 E LYNCH*, N D JOHNSON, D P NAIRKTON and M GROUVEL (Department of Conservative Dentistry, and Information Research Group), LIMC, UK: (Clinical practice in general dental practice and the provision of evidence-based care)

A microbiological evaluation of the effect of different saliva formulations on mouth hygiene was conducted. The results suggest that some formulations may be beneficial in the management of dental plaque.

---

D PINKEERTON* and N PENZER (School of Dentistry, The University of Liverpool): The perception of non-accidental injury: a pilot study.

Dentists are requested to define whether particular injuries, frequently delivered to young children, have occurred as the result of birth or other non-accidental injury. This small study was designed to examine the abilities of members of the medical and dental professions to recognise non-accidental injuries from photographs. Some photographs were also shown to an unselected group of lay people. Sixteen photographs were presented to each of 40 individuals. Twelve of these photographs were of injuries caused by dental biting. The type of injury varied from close-up views of teeth arranged as bite marks to patterns of bruising confined to the shape of a dentition. The remaining photographs were all photographs of non-accidental injury of known cause but not of a dental aetiology. The lay people were, mean sex, 46.7 (±5.9) years old, and the dentists mean age was 50.2 (±5.6) years old. The results showed that the dentists were significantly better than the lay people in identifying the cause of injury to the patient. Conclusion: dental professionals perform better than lay people in identifying non-accidental injury from photographs.

228 R BURN-MURDOCH (Physiology Division, St. Thomas' Hospital, London SE1 7ER): The scoring of tips imputed incisors when the adjacent incisor is unimputed.

When a lower incisor is unimputed, rates should be imputed incisors by using a method similar to that described for the upper incisors. This method has been used for many years and has been found to be accurate and reliable. The method is based on the principle that the lower incisors are not imputed more frequently than the upper incisors. The method involves the use of a specially designed chart which shows the relationship between the upper and lower incisors. The method is simple and quick to use and has been found to be accurate and reliable.

---

229 S HADI-BAGHERI* (Department of Orthodontics, King's College, London, UK): A comparison of bite force in a group of Caucasian and West Indian children.

Bite force was measured in a group of Caucasian and West Indian children by a device constructed at King's College School of Medicine and Dentistry. The sample consisted of 20 in each ethnic group, with equal distribution of sex and age range of 1-16 years. Prior to measurement of bite force the validity and reliability of the bite force measuring device was tested and established against a conventional machine. The results show that the measurement of bite force by the constructed device was close to that of the tensiometer.

Although the cephalometric measurements between the two groups showed expected differences, no statistically significant difference was found in the maximum bite force between the groups. The male subjects in the sample showed higher bite force than the females.

---

230 P J BAGGETT, I C MACKIE and H V WORTHINGTON (University of Manchester, UK): An investigation into the working length of non-vital incisor teeth in children.

There is a growing concern in dentistry about patients exposure to radiation and recently there has been a significant revision of the estimates of the risks from exposure to ionising radiation.

The object of this study was to validate a tactile technique involving paper points for measuring the working length of non-vital incisor teeth and compare it with the traditional diagnostic radiographic technique.

The method was to measure non-vital incisor teeth of children attending the Trauma Clinic in the Department of Oral Health and Development. Two operators were involved in measuring 35 incisor teeth. The results showed that in 95% of cases the estimated working length was within 0.2mm of the radiographic diagnostic length.

It is concluded that diagnostic radiographs are no longer necessary in the majority of cases involving endodontic treatment of incisor teeth in children. However, if a tooth has been or open drainage a diagnostic radiograph is still required.

---


This study aimed to assess the potential of the Peribone to quantify tooth mobility in children and to establish baseline values for normal tooth mobility in healthy children. One hundred and sixty children, with equal numbers of boys and girls aged between 9 and 16 years took part in the study.

The four upper permanent incisor teeth were tested and 20 Peribone readings were taken at different times. In all 2000 measurements were collected and analysed.

The results showed that there was evidence of some systematic error as the first Peribone readings were significantly higher than the second for three of the teeth (paired t-test (p<0.05). Although these differences were statistically significant the actual differences were small amounting to no more than 0.21 of a Peribone unit. Peribone readings were lower for girls than boys of the same age (paired t-test). A negative correlation existed between the Peribone reading and the age of the child. As the child gets older the Peribone reading decreases.

It is concluded that the Peribone has potential as a special test for use in nondiabetic dentistry. The initial steps for producing reliable baseline figures have been achieved. However, further research is required before the Peribone becomes an accepted part of the nondiabetic's armamentarium.

---


The validity of pulp testing in juveniles is uncertain. This study tested the reliability of pulp testing juveniles, with at least two-thirds of root intact. One hundred children aged between 7 and 11 years attending the Department of Paediatric Dentistry were tested using two pulp testing methods: histidine and electric pulp testing (EPT) and compared with sham tests. Children were allocated by a minimisation technique to each method of pulp testing. The results of this study were compared to the RC, or EPT test, and to the appropriate sham test from 1-10 on a visual analog scale (Abu-Saad, E, Pain, 12 165-171, 1984). The results showed that there were no statistically significant differences between the RC test (3.512.6) and sham EPT test (0.51.5) scores (Paired t-test, P<0.001) and between the RC test (3.512.6) and sham EPT test (0.51.5) scores (Paired t-test, P<0.001). To eliminate the possibility that these results may be due to chance, the gingiva the RC, or EPT, and sham tests were repeated following a topical application of a 5% lignocaine local anaesthetic paste. The results obtained were not statistically different from those obtained before the topical anaesthetic application.

In conclusion, pulp testing of deciduous caries in 7-10 year old children is a valid technique.
This study aims to assess the extent to which children referred for extraction under general anaesthesia could be treated with intradental sedation and local anaesthesia. Fifty-four patients mean age 7 years 7 months were included. After explanation, the children were sedated with intradental sedation to a standard technique (Crowfoot A.T., IOD 68: 395-398, 1990). Local anaesthetic sedation and local anaesthesia was completed in forty patients. Patient details (including referral source and previous dental history), time taken, number of extractions and reasons for failure were recorded. After the parent was asked to complete a questionnaire to assess the child’s pain and parents’ satisfaction. Treatment was completed for forty patients (75.5% of the total). Thirty-eight of the patients were referred from general dental practitioners and forty-eight had constant or occasional pain from their teeth. Results showed that a mean of 1.4 extractions per patient were completed at 53 of 64 visits in a mean time of 36.34 minutes. 79.7% of parents indicated that they would opt for this form of treatment if their child required further extractions in the future.

It is concluded that intradental sedation and local anaesthesia is a feasible alternative to general anaesthesia for extractions in children and that parents found it an acceptable form of treatment.

It has recently been suggested that a ‘smear’ of toothpaste should be used by pre-school children rather than the commonly recommended pea-sized amount (Rock W.P., BJD 177: 17-20, 1994). The aim of this study was to investigate the influence of instruction (pea or ‘smear’), nozzle shape (flat or round) and type of toothpaste (izer gel or opaque past) on the amount of toothpaste dispensed for pre-school children. Fifty-three mothers of pre-school children took part. Each undertook eight tests, combinations of instruction, nozzle and toothpaste type in random order, and ‘opted’ for placebo (toothpaste) or test material (toothpaste) on each occasion. It was found that the instruction to use a pea-sized amount produced a mean weight of 0.30g (SD 0.15), whilst the mean for ‘smear’ was 0.32g (SD 0.21). A four way analysis of variance was carried out with subjects, instructions, nozzle shape and toothpaste type as factors. Significant differences were found between subjects, instruction and toothpaste type (p < 0.05). A ‘smear’ was generally interpreted as a thin layer covering the bristles.

It is concluded that the instruction will result in less toothpaste applied than ‘pea’ and that the type of toothpaste influences the amount dispensed.

The aim of this study was to assess the periodontal condition and to determine the prevalence, extent and severity of periodontitis in a group of elderly subjects in Benghazi, Libya as part of a larger epidemiological investigation. 100 dentate subjects were examined for probing depth (PD), clinical attachment level (AL), recession, mobility, plaque, supragingival calculus and bleeding on probing. An oral hygiene score was also completed. The criteria were selected according to the criteria of the World Health Organization (1981) and the American Academy of Periodontology (1982). Mean age of the sample (90%) were symptomatic dental attendants; the remaining 10% reporting that they had never visited a dentist. 43% reported using a toothbrush to clean their teeth with 20% indicating that they brushed at least once a day. The mean PD was 2.1 mm and mean AL was 4.0 mm on bio-focal sites. Mean buccal recession was 2.2 mm. 20% of the study group had at least one tooth with a shallow pocket (PD > 4 mm), while 14% had at least one deep pocket (PD > 6 mm) had mild or moderate disease (AL 4-6 mm), while 59% had at least one AL (AL > 7 mm). It is concluded that use of pocket depth alone would have greatly underestimated the prevalence and severity of periodontitis in this study group.
The aim of this study was to determine whether the Ni/YAG laser energy of 50 and 80 mJ at 10 pulses per second (pps) was capable of improving the clinical parameters associated with periodontal disease. These energy settings were chosen as previous works indicated that higher values would damage root surfaces and that 80 mJ had an in vitro bactericidal effect. Eighty periodontal patients' sites were randomly assigned from 2 articles in periodontitis were randomly placed in one of the four treatment groups: 1) laser treatment at 50 mJ, 10 pps for 3 minutes; 2) laser treatment at 80 mJ, 10 pps for 3 minutes; 3) scaling and 4) placebo. The laser parameters were set by monitoring the temperature increase at the focusing distance of the Ni/YAG laser using a thermocouple set at the periphery of the fibre. The temperature increase was at a maximum of 2.8 (0.9); 3 m. This strength was measured daily. The hand scaling at 80 mJ and 10 pps treatments showed a significant reduction in total CFU compared to the baseline (p<0.01), which was sustained only in the scaling group until week 5. Electron microscopy demonstrated that most hard teeth still had a protective biofilm, and no hard damage was observed on root surfaces.

This study demonstrated that application of Ni/YAG laser powers of 50 mJ and 80 mJ failed to improve the clinical and microbiological parameters of periodontal disease.

The properties of a glass-ionomer cement (GIC) are mixing operator dependent (Wason EW & Nicholson EW, Clin. Mater. 13, 169-172, 1994) and encapsulation may complicate the final physical properties of the cement. This investigation described the effect of an alternative mixing technique, the turned mixer, on compressive strength. Five glass-ionomer cements, varying between inorganic filler content to hardening time and cure depth, were mixed by hand (spatulate on a glass block) or by hand (for the initial setting of the powder) followed by turntable mixing. The resulting pastes were used to pack compressive strength moulds (12mm x 6mm diameter) that were subjected to a compressive strength load at a failure in compression was then determined. The strength of a material was enhanced if it had a reasonable powder/liquid ratio and reasonable setting speed (E, F). In this situation turntable mixing made a major improvement in the compressive strength. The tendency was to find that the mix was very easy to mix (A, F), then hand-mixing was sufficient to achieve a good dispersion and if the material was very hard to mix (D) then setting of the powder was all that could be achieved in the working time. In these two situations there was no difference in measured compressive strength between hand-mixed and turntable mixed specimens.

Cement prepared using the turntable mixer were at least as strong bond (in some cases stronger) in compressive strength compared to hand-mixing.

The elastic and viscoelastic properties of glass ionomer cements change significantly with natural aging longer than 24 hours. Literature results are not reported at these longer times. This study compared adhesion to enamel (24 h) and at 2 years, 1 site. Both enamel types were selected, a powder/liquid retrograde(A) and a capulated metal-reinforces glass ionomer cement(B). Specimen procedure followed that of Aboob and a Jenkins Br Dent J 131, 179, 1986. The enamel substrates were polished. A 12 mm diameter hole was made in the enamel(1) and occlusal dentine(2) of extracted human 3rd molars. All surface were washed and dried. Post-adhesive bonding agent was applied and the enamel and dentine specimens were acid etched (37% phosphoric acid 30 seconds) and air dried. A 4mm thick disc of each cement was made. Each disc was placed on the enamel and dentine specimens and the excess cement trimmed away. The cement was polymerised using a Eurotronic light emitting diode (LED) light-curing device with a curing light from 400-470 nm. The resulting specimens were aged in distilled water at 37°C, using a cross-head speed of 1mm/min. All cement specimens were stored in 37°C water for 24 hours, and then were conditioned for 50.6 and 44.4 weeks. The conditioned specimens were used for fracture testing. The fracture toughness was determined using a single edge precracked beam (SSCP) method. The fracture toughness was calculated using the following equation:

\[ K_{IC} = \frac{3P^2a}{2B \delta^2} \]

where \( P \) is the load at failure, \( a \) is the crack length, \( B \) is the specimen thickness, and \( \delta \) is the crack opening displacement. The specimens were then cut into 3mm wide and 3mm high sections and the fracture toughness was calculated using the following equation:

\[ K_{IC} = \frac{3P^2a}{2B \delta^2} \]

where \( P \) is the load at failure, \( a \) is the crack length, \( B \) is the specimen thickness, and \( \delta \) is the crack opening displacement. The specimens were then cut into 3mm wide and 3mm high sections and the fracture toughness was calculated using the following equation:

\[ K_{IC} = \frac{3P^2a}{2B \delta^2} \]
In the present study single phase homogenous glasses have been synthesized with negligible fluorine weight loss, during the firing procedure. In some of the glass compositions, the phosphate and fluorine content have been varied, while in others the glass composition has been altered. The silica/alumina ratio within the glass network has long been regarded as parameter controlling cement formations and properties. Cement mechanical properties have been evaluated as follows: an increase in the strength of the cements was found to have a significant effect on the compressive strength (c) and on the setting characteristics of the cements formed. Increasing the phosphate content by only 6 wt%, reduced the 24 hour compressive strength values from 1300 MPa to 474 MPa, increasing the fluoride content across a series of glasses resulted in the compressive strengths going through a maximum, with a further increase leading to a slight reduction in strength. Altering the silica/alumina ratio was found not to be as significant as varying either the phosphate or fluoride content of the glass compositions.

It is concluded that the high fluoride containing glasses yielded the highest compressive strength with weight ratios ranging from 170-190%Pa for 24 hours.

This study was funded by the Brit-Euro Schaume Procedure No. BS5603 Contract BR2:349.

Bacteria in biofilms are known to be less susceptible to antimicrobial agents than their planktonic counterparts. The purpose of this study was to determine the susceptibility of biofilms of Streptococcus gordonii from periodontally healthy sites to different antimicrobial agents. A constant depth film former (CDFS) was used to grow biofilms of S. gordonii in an aerobic atmosphere using a chemical broth as the nutrient source. The biofilm, as well as planktonic cells, of the organism were exposed to 0.2% (w/v) chlorhexidine gluconate (CHG), 0.2% (w/v) triclosan, and 0.125% (v/v) FCF (octylphenol ethoxylate). Biofilm grown cells of S. gordonii exhibited a lower susceptibility to both antibiotics than planktonic cells. No viable bacteria were detected after 3 hrs exposure of planktonic cells to either antibiotic whereas bacteria in biofilms survived a 4 hour exposure. CHG achieved kills corresponding to a 2 log, reduction in the viable count of biofilms containing 10 CFU after 5 mins, the corresponding killing rate for CHG was 1 log, reduction. However, on a colony basis, CHG was less effective than the two antibiotics. In contrast, MIC values showed CHG to be more effective than CPF against S. gordonii.

The results of this study have revealed that biofilm-grown cells of S. gordonii are less susceptible to CPF and CHG and that CPF and CHG are not reliable predictors of the relative effectiveness of CPF and CHG against biofilms of the organism.

It has been proposed that the pathogenicity of the "Streptococcus milleri" group is enhanced in polymylin infections by the presence of gram-negative anaerobes, in particular Prevotella intermedia. However, there would not appear to be any information concerning the occurrence of a similar but FP13 anaerobic relationship between these bacterial species within the polymicrobial oral infections. The microbiological reports of 198 consecutive aspirative infections processed in the oral microbiology unit were examined. Specimens had been obtained predominantly by needling aspiration biopsy and were sampled from 150 patients representing 89 different cases of various oral infections. Routine identification methods, the rapid ID 32 STREP system, had been employed. Strains of SMG were cultured from 43 of the infections studied (21/146 acute abscesses, 6/11 chronic abcesses, 1/11 cases of postoperative abscesses, 1/11 oroantral fistulae, 15/22 miscellaneous infections). The SMG isolates comprised of 19 strains of S. intermedius, 16 strains of S. constellatus and 8 strains of S. anginosus. Determination of average odca

In conclusion SAM from A. actinomycetemcomitans contains a low molecular weight anti-proliferative protein whose activity can be neutralized by a protein of sera from patients with LJP.

Surface-associated material (SAM) from A. actinomycetemcomitans NC147910, obtained by salivary extraction, produces a dose dependent inhibition of [3H]dihydrouridine incorporation by a number of cell types in vitro. Azonic exchange experiments show that the exchange activity dilute as a low molecular weight component (<20kDa), which is susceptible to heat and trypsin. The purpose of this study was to determine if the exchange activity could be neutralized by sera from patients localized juvenile periodontitis (JLP). Dilutions of sera from patients with JLP and healthy controls, 4/11 cases of postoperative abscesses, and 1/11 oroantral fistulae, containing presence of SAM (500ng/ml), and the proliferation measured by measuring incorporation of [3H]dihydrouridine. However, the exchange activity was not associated with presence of SAM.

In conclusion SAM from A. actinomycetemcomitans contains a low molecular weight anti-proliferative protein whose activity can be neutralized by a protein of sera from patients with LJP.

A Continuous Culture Plaque (CCP) biofilm system was developed, utilizing a 9-member oral bacterial consortia grown on a micro-plate based in an anaerobic primary chamber. The CCP was continuously inoculated with flow cells for growth of biofilm populations on hydroxyapatite disks. This allowed evaluation of growth and fresh growth medium were varied to determine the effects of dilution rates on biofilm development. Indications that at high dilution rates the facultatively anaerobic species (streptococci, lactobacilli) is able to dominate, while at lower dilution rates the facultatively anaerobic species were low whereas increased levels of electron sink products (succinate, lactate) were produced. Success relating to the organ of the produced characteristic increase in biofilm populations of acidic species (S. mutans, Lactobacillus) and Yellonella parae, and lactose production increased, conversely with T. intermedia. These data demonstrate that biofilms produced in the CCP system responded with characteristic increase in biofilm populations of acetic species (S. mutans, L. acidophilus) to the organ of the produced characteristic increase in biofilm populations of acidic species (S. mutans, L. acidophilus).

The data presented in this study are a first attempt to evaluate biofilm growth in a defined system, and the system may be useful for future studies in plaque ecology and physiology.
The aim of this study was to determine whether hypercannellae during infancy has any influence on mineralisation of the deciduous enamel. Five enucleated incisors were collected from children with Williams Syndrome. Features with the syndrome include an elf-in-face, mental retardation, cardiac anomalies and infantile hypercannellae. Five teeth, macroscopically and microscopically normal, from a child with Williams Syndrome were also studied for comparison group. The teeth were embedded in PMMA, the blockout cutout highly, lightly polished, and coated with carbon. Quantitative backscattered electron analysis (Zeiss DSM692, 200 kV) was used to evaluate the mineral density in the enamel. On an arbitrary grey level scale, the value for normal control dentine was 134.8, the mean grey level for the HCS group enamel was 206.4 (S.D. ± 3.7) and for the reference enamel was 210.5 (S.D. ± 2.7). Comparison using T-Test showed the difference was not significant. There was no evidence of cleft of hypoplasia and hypomineralisation, as found in some hypocalcified DFM teeth in a previous study (Fawcett M et al, Am Embryol 189:375-381, 1994), in any of the HC or reference teeth studied.

These findings suggest that hypercannellae during infancy does not affect mineralisation of the deciduous enamel or that the hypercannellae occurs after the deciduous incisors have completed mineralisation.

The role of albumin in the biology of whole body protein metabolism. Recent data has demonstrated that serum albumin is a major neo-enzymogenic component in developing enamel. Albumin is a known inhibitor of hydroxypatite crystal growth and studies have demonstrated that it must be degraded and removed from the tissue prior to secondary crystal growth. Failure to do so could conceivably result in impaired maturation and the subsequent eruption of white hypomineralisation. The aim of this study was to investigate the presence of albumin in deciduous white spot hypocalcified, human molars with obvious white spots were obtained from the Dundee Dental Hospital and the University of Dundee Dental Hospital. Enamel sections were prepared and either a) lightly etched using 35% phosphoric acid for 15 sec, blocked using wax base flow and reacted with polyclonal antibodies to human serum albumin followed by a second antibody conjugated to 1μm gold, or (b) embedded in paraffin, sectioned (4μm) and reacted with polyclonal antibodies. In each case controls were performed using the following antibodies: Immune serum, Control serum, and a mAb directed against the OVA antigen. Western Blotting using the same antibody probe showed cross-reactivity at Mr = 66kDa (presumably intact albumin) and Mr = 43kDa (cleaved product). Little cross-reactivity was seen in sound enamel using either technique. The results indicate a possible role for albumin in the aetiology of white spot hypocalcified. This may result from a failure of the normal mechanism operating to remove albumin prior to secondary crystal growth or due to ingress of albumin into the tissue during the maturation stage.
265  

M. BAMBERG*, Z. ZAMBAN and M. HARRIS (Dept. Maxillofacial Surgery, Eastman Institute of Oral Health Sciences, London): Investigation into the effect of posture and anesthetics on orthodontic registration for orthognathic surgery planning. Aims were to investigate the differences in occlusal inclination (mesial-incisal) and occlusal contact position (OC) in: a) upright and supine postures when awake, and b) supine under general anesthesia, for orthognathic surgery planning. The results were compared with the Richey gold plate. Records were collected from 10 patients: 5 male and 5 female, aged 10-60 years. The data was analyzed using SPSS. The results showed no significant difference between the upright and supine postures, but there was a significant difference between the upright and supine postures under general anesthesia. The Richey gold plate was less accurate than the orthodontic registration method. One implication is that orthodontic registration may be a more accurate method for planning orthognathic surgery. 

266  

M. HARRISON* and J. SHEPHERD. An investigation of potential facial protection conferred by cycle safety helmets. Department of Oral Surgery, Medicine and Pathology, University of Cardiff, Cardiff, UK.  

Cycle safety helmets are designed to protect head injury, but they may also protect the facial structures. A non-destructive method was developed for assessing the potential of helmets to protect the facial structures. Conventional digital x-ray was used to measure the extent of the shadow cast onto the facial surface of a mannequin headform by a helmet when illuminated by a plane light source. Measurements were taken over a range of angles of incidence of the helmet to the headform. For each combination of angles, the shadowed area represented the zone of potential facial protection conferred by the helmet in an impact with a plane surface. Twelve helmets were assessed and one helmet was shown to protect only the anterior structures. Wide variation was found in the contour of the facial aperture, ranging from the minimum inferior extension demanded by international standards, to well-defined inferior extensions providing protection to the oral cavity and otophygic arches. Build of the helmet at the aperture was found to contribute greatly to the problems. The helmet standards for cycle helmets should be changed to incorporate this potential protective effect. Supported by the Health Scheme for the Development of Health and Social Research, and the Royal College of Surgeons of Edinburgh.

267  


A fully connected back propagation neural network was trained to make third molar treatment decisions using a training set of clinical information for 118 patients (29 female, 40 male). Training was stopped when a previously obtained error minimum was reached. Clinical information from 178 patients (368 lower third molars) was used to test the network on a test set of clinical information. The network was used to derive an ROC curve for the system which was then compared to those derived from 3 consultant oral and maxillofacial surgeons. The network achieved an ROC curve area of 0.903 compared to values ranging from 0.857 to 0.943 for the consultants. The areas beneath the ROC curves were assessed statistically to determine whether performance between the network and each consultant differed. The network performed as well as one consultant and significantly better than the other two consultants when making third molar planning decisions using the test set of clinical information. The results indicate that neural networks have an important role in informing clinical decision making in this area.

268  

RA ARMSTRONG*, MR BRICKLEY, MJ JONES. Dept. of Oral Surgery, Medicine and Pathology, University of Cardiff, Cardiff, UK: Treating strategies for lower third molars following orthodontic care. 

Fabrication of the lower incisor teeth has been advocated as a reason for the removal of lower third molars. The results of making decisions to remove teeth on this basis is the opinion of the referring orthodontist. Despite this, the criteria that this group employs are unknown. The study was undertaken to investigate this issue. Dental records of 15 completed orthodontic cases were presented to orthodontic specialists who were requested to choose a management strategy for the lower third molars present, to predict the final position for each lower third molar and to indicate on a visual analog scale the strength of their decision. This study was undertaken to evaluate the orthodontists' and their indications for the removal of lower third molars. Orthodontists were more likely to review patients routinely at a specific age (16 - 21 years) or to refer the patients to their own practitioners for third molar management. Orthodontists within the Community Dental Service were divided between review at a specific age and referral for a specialist oral surgery opinion. Fabrication of the lower incisor teeth was rarely (0.14%) cited as the reason for referral to a specialist oral surgery department across all specialties. In conclusion, there is no evidence that the fabrication of the lower incisor teeth is an indication for third molar removal following orthodontic treatment within the sample population in this study.

269  

N WILLIAM*, S PAPAS, N MCCREE (Department of Oral and Maxillofacial Surgery, University of Manchester (UK)): A Study of Graft Assisted Oesophageal Regeneration in Iatrogenically Atracomaesthesiated Teeth. 

Correct current indications that Graft guided tissue reintegrationay significantly improve bone healing. (1) Verical cone biotection were used to established its application in the management of atrophic teeth. The success of the apacectic procedure will be significatly increased if complete bone healing can be achieved. The study involved a randomised sample of 100 atrophic teeth, 50 in the control, 50 in the test group. Post-operative radiographs were taken at 6 weeks and 12 weeks to assess bone healing. The success rate in the test group was 85%, while in the control group it was 60%. These preliminary results suggest that Graft can be used successfully in the management of atrophic teeth and bone repair improves results of treatment. 


270  

P J TERENCE. (Department of Dental Surgery, University of Manchester (UK)): Double labelling of oral mucosa - a quantitative assessment of epithelial cell activity. 

Epithelial dysplasia in oral lesions is classified histologically into mild, moderate or severe, but these criteria are not always reliable and carcinomas are not always clearly distinguished from their pre-malignant counterparts. In this investigation a new double labelling technique was carried out, utilizing standard and tritiated thymidine labelling in the same tissue, to assess the activity of epithelial cells using autoradiographic and immunocytocenical analysis of excited oral mucosa. Labelling of epithelial cells demonstrates that only a small proportion of cells are actually dividing and that the majority of cells are quiescent. An immunocytochemical study of epithelial cell activity. Results showed consistently reliable labelling and scoring of biopsy material for total and abnormal oral epithelium, with enhanced scores in malignant tissue. 

It is concluded that double labelling allows quantitative assessment of epithelial cell activity in oral lesions. This method allows the production of a safer diagnostic tool which may be used to assess at risk areas and may provide a more accurate method of assessing malignant potential in oral mucosa. 

271  

C LONGBOTTOM* and K ROBOTI (Department of Dental Health, University of Dundee, UK).: Comparison of panoramic tomography and radiography for assessing dental development. 

The aim of this study was to compare dental panoramic tomography (DPT) and full-mouth radiography (RVG) for the dental developmental assessment of children in the mixed dentition stage. The areas of comparison were: a) clinical utility of the radiographic information, b) the radiation exposure dosage, c) the accessibility of the procedures, and d) the total imaging acquisition time. Of the 25 study children (aged 6 to 12 years) 50 were examined using DPT and 25 using RVG. It was found that DPT was superior to RVG in terms of clinical utility (p < 0.001 - chi-square test), acceptability to patients and protocols (p < 0.01) and total imaging acquisition time (7.5 vs 37 minutes), but the calculated radiation dosage of full-mouth RVG was 27% of the DPT dose. 

It is concluded that a full-mouth radiography technique, using currently available equipment, is an accurate, cost-effective panoramic tomography for dental developmental assessment of children in the mixed dentition stage.

272  

JH NUNN*, N HUNTLEY, LA P AND PG GORDON (Department of Child Dental Health, Newcastle University, UK): Assessment of dental maturity from radiographs in children with renal disease and a control group. 

It has been a common observation that children with chronic renal disease 'suffer delay in skeletal maturation' such that they lag behind their peers in height. This study aimed to assess dental maturity using the Demirjian index in comparison with chronological age for a group of children with chronic renal disease and a control group. The latter were matched for age (within a month) and sex. The Index is generated by staging the development of seven mandibular teeth from an orthodontogram, taking into account missing teeth. The procedure involves converting an 'age' using linear regression analysis. The two methods used were the same, but the index used was the 'index'. 

The results from this study indicate that for the renal children their dental maturity as assessed by the Demirjian index was significantly behind their chronological age (20 months). However, this is not the case for the control group, where the renal children were 14 months older than their chronological age. 

Comparing the Demirjian ages between the renal and control children it never revealed any significant difference (0.0 month). It is concluded that children with renal disease do not suffer any significant delay in their dental maturation.
The dental status and health attitudes of children with Epithelial Dysplasia Bullous (EDB) was investigated at several dental health care services. Pulpal and periodontal health assessments were made on children with clinical features of EDB. A recovery group was assessed allowing for the evaluation of the clinical features of EDB. The results concluded that a significant number of children with EDB did not have the clinical features of EDB. The study results were similar to those of other studies and the authors concluded that a significant number of children with EDB did not have the clinical features of EDB.

The chemical bleaching of discoloured non-vital teeth is an acceptable alternative, as a function of the mean patients, as a function of the mean patients, as a function of the mean patients, as a function of the mean patients, as a function of the mean patients.

The study of EDB to compare the mean SWT indices and components of samples of 14-15 year old subjects registered with general dental practitioners under the age of 14 years under capitation and fee-for-item.

The study of EDB to compare the mean SWT indices and components of samples of 14-15 year old subjects registered with general dental practitioners under the age of 14 years under capitation and fee-for-item.

The study of EDB to compare the mean SWT indices and components of samples of 14-15 year old subjects registered with general dental practitioners under the age of 14 years under capitation and fee-for-item.

A substantial majority of general dental practitioners in the three areas graded parental system under capitation arrangements. However, the percentages of children receiving anticipatory or preventive restorations were low.
J Dent Res 74(3) 1995
Divisional Abstracts: The British Society for Dental Research

281
LMD MACHIEBSON and VI Binnie (Department of Adult Dental Care, University of Glasgow, UK): A survey of general anaesthesia, sedation and reassessment in general dental practice.

The Post Willie Report, published in 1990, made recommendations with regard to general anaesthesia (GA) sedation and reassessment in dentistry. The aims of this study were to examine the level of provision of GA and sedation by general dental practitioners (GDPs) a few years after the publication of the Report and to estimate the degree of compliance of GDPs with a number of its principal recommendations.

A questionnaire was sent to 268 GDPs in two Health Boards in Scotland, and a response rate of 60% was achieved. Thirty-three GA cases recorded by respondents were considered as 100%, indicating that they had provided providing an GA service since the immediate pre-Post Willie years (9%). GDPs had increased their use of GA by 9% and 7%, respectively. Almost all the respondents reported that they had been trained in cardiovascular and respiratory complications associated with sedation and noted that they had been trained in the use of GA and were increased the use of GA over the years. Stiffness of the survey indicated that they were encouraged the emergency drugs and derivatives were used. The Post Willie Report, 17% expressed concern regarding the length and content of the drug list.

If the recommendation that sedative techniques be used as an alternative to GA is to be realised, improvements in training at both undergraduate and postgraduate levels will be required. Additional training programs for general practitioners are now in preparation with opinions expressed elsewhere. Further consideration is perhaps required to determine whether a curtail list of "essential drugs" would be adequate.

283
MJ PRENDERGAST, J F BEAL and S A WILLIAMS (Dental Public Health Unit, Leeds Health and Leeds Dental Institute): Deprivation and dental health in 5 year-olds in Leeds, UK.

This study investigated the relationship between material deprivation, dental health and related behaviour in 5 year-old children from the Leeds health district in 1994. Stratified cluster sampling of primary schools was used to obtain a sample of one third of the 5 year-old population. Examinations were carried out by school trained and calibrated examiners using standard criteria. The children were assigned to one of 5 bands according to the rank of the Townsend deprivation index for the examination district in which they lived. Caries experience increased significantly with deprivation. Median for each band was a higher mean depth than their counterparts (4.8 compared with 3.21, P<0.001). In Asian children deprivation was confirmed by religious and cultural differences. Muslim Asians had higher caries experience (drift 4.63) than non-Muslims (drift 2.08, P=0.001) and were more likely to live in deprived areas.

This study suggests that the Townsend index of deprivation could be used as an indicator of dental health and related behaviour in planning services and targeting dental health promotion.

285
L. Seow, J. Wickers, A. McDonald, D. Davies, G. Pearson (Conservation Department, Eastman Dental Institute, UK): An investigation of the flexural strength of IPS-Empress, In-Ceram and Viatadur Alpha porcelain.

This study aimed to compare the flexural strength of 1.25mm thick discs of IPS-Empress' (a leucite-reinforced glass-ceramic) and In-Ceram' (a high alumina porcelain) with that of conventional feldspathic porcelain, Viatadur Alpha. The effect of layering veneer porcelain on the flexural strength of IPS-Empress and In-Ceram was also investigated. Porcelain discs of various core thicknesses of In-Ceram and IPS-Empress were also evaluated. Core thicknesses investigated were 0.50, 0.75 and 1.00 mm for IPS-Empress and 0.50 and 1.00 mm for In-Ceram. The mean flexural strength of IPS-Empress and In-Ceram were 3.25 and 3.75 MPa, respectively. The mean flexural strength of the IPS-Empress and In-Ceram was found to be significantly higher than that of the feldspathic porcelain, Viatadur Alpha. The difference of flexural strength between IPS-Empress and Viatadur Alpha was 0.05 MPa. The effect of layering veneer porcelain on the flexural strength of IPS-Empress and In-Ceram was not significant.

It is concluded that IPS-Empress did not offer any advantage over conventional feldspathic porcelain and In-Ceram was stronger than either material.

286
R.D. SHAW, V. FIDDOCK and A.J. BULTHUNDP (Restorative Dentistry, University of Manchester, UK): An evaluation of the fit of porcelain inlays.

This investigation compared two methods of assessment of the fit of porcelain inlays. Simulated metal-ceramic-dital cavities were prepared in ten pretar blocks using a computer-controlled milling machine. Twelve porcelain inlays were produced per block. The following variables were investigated: use of die or indirect preap; type of (general) material. Restoration fitting accuracy was assessed by the impression weath method and by image analysis of sectioned replicas. Results indicated that the impression weath technique resulted in a mean st of 1.00 mm and a range of 1.57 mm for the 57 samples. Image analysis showed a slightly mean fit of less than 70m for all samples. The use of the spacer created a greater internal relief at the 1% level of significance. There were no significant differences between different methods of porcelain application or refractory materials.

It is concluded that the use of the spacer resulted in a poorer fit of porcelain inlays. No statistically significant differences in fit were detected between two investigar materials, not between different build-up methods. The impression weath technique did not prove to be sensitive enough to detect differences in processing parameters.

287
M. O'SULLIVAN, A. McDonald, D.J. Setchell and R. Glover (Conservation Department, Eastman Dental Institute, UK): Porcelain veneers: Marginal opening by various clinical/technical bases (on refractory dies).

This study compared the marginal opening produced by two operators using three different techniques when fabricating porcelain veneers for six maxillary anterior teeth by refractory die method. The first technique involved fabrication of six veneers on an unanesthetised cat, the units being separated only before glazing. The second involved sectioning the refractory cast into individual dies in the laboratory. The third utilised a plastic strip placed between the teeth during the fabrication of the veneers. Veneers were fabricated, then produced 72 surfaces (maxillary and distal) for measurement. A Reflex Microscope was used to measure the marginal gaps using silver powder for visual contrast. Measurements were recorded at 10 sites (4 sites) along the remaining metal and distal surfaces. Smallest mean marginal openings were recorded when the plastic strips were utilized, both in the contact zone and the other sites (0.55 and 7.5 mm respectively). The greatest mean marginal opening was recorded on the contact zone for both areas (16.4 and 129.5 mm). The laboratory sectioned model revealed second (105.5 and 91.7 mm). The difference between the mean results from the two operators was greatF. Using a single modified technique for the plastic strip method.

It is concluded that the interfacial placement of a plastic strip at the impression stage may improve marginal accuracy of porcelain veneers.

288
N JA GREY, V FFIDDOCK and M A WILSON (Dept of Restorative Dentistry, University of Manchester, UK): Strength of ceramic crenoms determined on brass dies: Effect of luting material.

Traditionally, acid-base reaction cements have been used to lute metal and ceramic crowns. However, cements based on zinc oxide are essentially opaque due to residual powder and may have a very low pH. Based on the composition of zinc phosphate (Gp) and zinc based composite (Gp). The mean compressive loads to failure were 980 vs 94 N and 1915 vs 602 N, respectively, with no significant difference at the 0.01 level using Student-Newman-Keuls multiple range test. It is concluded that when Empress crowns were bonded to failure on brass dies, no significant effect on stress due to the metal material was determined. Further studies are required using suitable bonding conditions similar to natural tooth structure.

1. Empress, Ivoclar-Vivadent, Schaan, Liechtenstein
2. De Trey Zirkon, De Trey-Dentsply, Weihburg, UK
3. Variofin, Vivadent, Schaan, Liechtenstein
Accuracy in cast restorations demands a stable removable die system. This study compared the performance of three commercial die systems the Ney-Pin®, Pitfix® and Bi-Pin®. Each die cast containing four milled metal dies was constructed, the inner dies represented prepared teeth and the outer dies represented natural teeth. Thirty identical working casts for each pin system were made in Type IV stone. The decision points on each die were measured using a Reflect Microscope under the following conditions: a) casts sectioned, b) casts sectioned but die removed, c) casts sectioned and die removed and replaced 30 times, and d) casts undamaged, die removed and replaced 30 times, followed by loading. Sectioning the casts did not affect the position of the die. Removal and replacement of the dies thirty times produced an occlusal displacement of 45 dies. Values were [mean (SD)] in micrometers: Ney-Pin 70 (49), Bi-Pin 150 (152) and Pitfix 77 (90). The effect of later loading affected the Ney-Pin and the Bi-Pin more than the Pitfix pin.

It is concluded that the process of separation and removal of the dies produced on a commercial die system, with no visible trend to any compensative performance of any pin system. All these dies systems should be considered incapable of maintaining the position of the dies through out laboratory procedures.

1. Ney-Pin, Chapter 10, Ltd, USA
2. Pitfix, Whaledent International, New York, USA
3. Bi-Pin, Orthodontal Dental Ltd, UK
4. Suprapaste, Kerr K.U.L Ltd
5. Reflect Microscope, Reflectometer Ltd, Somerset, UK

The purpose of this study was to compare the physical properties and handling characteristics of a galium alloy (G) restorative material and a widely used dental amalgam (A). Using new ISO standards (ISO 1569: 1986) tests were carried out for both materials. The dimensional change on setting for G was 0.09 (0.04)% from initial casts of 0.04 (0.03)% for A. Compression testing determined a modulus of 45.5 (10.5) GPa (1.05 (15), G, 23 (45) 138 (158) MPa, 1.24 (56) 35 (35) MPa). Differences between G and A were investigated using t-tests.

G has greater setting expansion (P = 0.05) and less creep (P = 0.05) than A. There was no significant difference in strength. The handling characteristics of G were considered acceptable.

Galium alloy GP (Tokuriki Honen Co, Japan). Disparity dental amalgam (Johnson and Johnson Co, NJ, USA)

**A Houghton**, B Oyabori, A Frazer, RM Grieveley, RD Russell and BM Stringer (Dept of Oral Pathology and UMBC, University of Sheffield): Implantation of human osteoblast precursor cells is known to be associated with bone formation. The reasons for bone loss remain obscure although cytokines and growth factors released locally from inflammatory and other cells are likely to play important roles (M Alexander et al. Curr Opin in Periodont 1993: 6-15). Also, the bacteria found in periodontal pockets may provide a constant stimulus that have direct effects on bone cells, serum and bone loss (PM Loosmore et al. Inte and Intra 42: 1289-1297, 1994). In order to study the role of such a stimulus, we have used the direct role of bacterial agents on bone growth and function, we have produced differentiating human osteoblast precursor cells through the use of prostaglandin endoperoxide synthetase inhibitors. This method was reported to the BSRD in 1994. Preliminary characterization of clones which have grown for over a year in culture, show the cells to retain features expected of an osteoblast precursor phenotype. In addition, the cells maintain regular secretory pathways and respond to local paracrine-like stimuli, which they substantially upregulate their alkaline phosphatase activity. Our results, the cytokine-growth factor studies of the clones indicate that the clones maintain the IL-6, GM-CSF and TNFα, as well as the matrix protein collagen type I. After 7 days of deamination, IL-6, IL-8 expression is last along with GM-CSF, TNFα and collagen type I. IL-6 and IL-8 expression, however, is maintained. Furthermore, expression of IL-4 or IL-9 is seen at any stage. Interestingly, the cytokine/growth factor profile seen after treatment with deaminating agents reflects the profile we see of differentiated human osteoblast-like cells in primary culture. We conclude that we have been able to develop human osteoblast precursor cell lines that are capable of further differentiation in the presence of growth factors. Our attention to use these cells as tools to study the molecular and cellular basis of the bone loss seen in periodontal disease.

**B J M Stringer** and George Foster (Department of Oral Pathology and MORID, University of Wales): Immunolocalization of the FOLP1 gene product with a monoclonal antibody reveals the presence of FOLP1 in human dental follicle cells. The FOLP1 protein is localized to the external basolateral membrane of dental follicle cells, which is consistent with the reported secretory properties of this molecule. These findings suggest that FOLP1 may play a role in the regulation of tooth development and maintenance. Further investigation is necessary to determine the precise role of FOLP1 in dental follicle cells.

It is well recognized that p53 plays a major role in the pathogenesis of many cancers. In oral cancer in particular, p53 has been shown to be associated with squamous cell carcinomas, verrucous carcinomas and other oral neoplasms. Additionally, p53 has also been demonstrated in premalignant lesions of the mucosa such as oral lichen planus, leukoplakia and epithelial dysplasia. However, little is known about the role of p53 tumor suppressor gene in the oral cavity. The study aims to investigate the role of p53 in the pathogenesis of this disease. We evaluated the expression of p53 in tissue samples using immunohistochemical staining. Our results demonstrated that in p53, the oral cancer was localized to the tumoral cells of all squamous cell carcinomas studied, mostly in the basal layer and in the area of the tumor necrosis and in the lumen and lumen alike. With regard to the skin lesions taken from sun exposed sites, all were positive. We conclude that the aberrant expression of p53 is associated with the pathogenesis of oral squamous cell carcinoma. Our results suggest that p53 overexpression is an early feature in the onset of the disease process. Furthermore, our observations on skin carcinomas indicate that overexpression of p53 may be a marker for the early stages of carcinogenesis.
Diffuse non-epidermolytic palmo-plantar keratodermas (NEPK and tyloticus) is associated with oesophageal cancer in a large Liverpool family (Hollow-Ewans syndrome). There is evidence that mutations in keratin genes underlie multiple diseases characterized by palmo-plantar keratodermas with or without epidermolytic hair. Owing to the site of hyperkeratotic lesions, keratins 6, 9, 16 and 17 are implicated. Three families have been studied for the presence of keratin mutations using a polymerase chain reaction (PCR) approach. The families are from the United Kingdom and Germany, and the patients had keratosis pilaris atrophicans follicularis et papulosa variegata. The regions of the keratin genes were amplified using oligonucleotides designed to the respective regions. The products were then analysed by electrophoresis and digestion with restriction enzymes. In all families, the patients had evidence of keratin 9 mutations, with mutations in codons 12 and 17. The mutations were found in codons 12 and 17 of keratin 9 in 27 of 30 cases of the UK family, using a competitive reverse transcription PCR technique. We also investigated the possible correlation between the presence of keratin mutations in the UK and German families. In the UK family, a large number of keratin mutations were found, but the correlation was not as strong as in the German family. In conclusion, the presence of keratin mutations in these families suggests a common mechanism of keratin instability. However, further studies are needed to clarify the role of keratin mutations in the pathogenesis of these diseases.

The presence of the tylosis oesophageal cancer gene is located in a 450 region of the arm of chromosome 17, situated telomeric to the human keratin gene cluster. Supported by the North West Cancer Research Fund.

Mutations of the p53 tumour suppressor gene (TSG) is the most common genetic abnormality identified so far in human cancer. Alteration of normal p53 TSG function may also occur as a result of binding of human papillomavirus (HPV) E6 and E7 TSG protein. The objective of this study was to determine the prevalence of HPV and p53 TSG alterations in squamous cell carcinomas of the head and neck. The prevalence of HPV in 64 SCCN was determined using HPV general and specific primer-mediated PCR. HPV 16 alone was detected in 13/64 (20%) SCCN. The prevalence of HPV did not correlate with clinicopathological parameters. Genetic alterations in exons 4-9 of the p53 TSGs were examined using single strand conformational polymorphism analysis (SSCP) in 29 SCCN. None of which were HPV 16-positive. Two of 7 (29%) HPV-positive and 32/14 (22%) HPV-negative SCCN contained alterations in the p53 TSG. Initial studies of the p53 TSG in dysplastic oral lesions have been carried out immunohistochemically, indicating the usefulness of the antibody D1. Detection of the p53 TSG was detected in 24/40 (60%) dysplasias with highest expression in severe dysplasia. The expression of HPV 16 and genetic alterations in the p53 TSG do not appear to be mutually exclusive and may be important in the pathogenesis of a subset of SCCN.

The major phospholipid of Lactobacillus is known to be phosphatidylglycerol; yet nothing is known concerning the particular analogues present. The aim of the present study was to examine in detail the phospholipid profile of strains of Lactobacillus by extracting lipids and analysing them using fast atom bombardment mass spectrometry (FAB MS). In addition to simple FAB MS, which provide data on the molecular mass of phospholipids, several techniques were used to provide further information on the molecular structure. The major phospholipids found were of m/z 723, 747, 753, 761, 773 and 787 which are consistent with the presence of the following phospholipids: PGc3(1)-1, PGc3(1)-2, PGc3(2)-1, PGc3(2)-2, PG3(3). Major peaks found with the presence of carbohydrate moieties associated with phospholipids were of m/z 285, 286, 287, 255, 227 211 which were consistent with the expected presence of c4-c6, C5-C6, c5-C6, C6-C6, C8-C6, C9-C6, respectively. Many minor peaks also were recorded. Quantitative differences were noted between species. The profile of phospholipids displayed by Lactobacillus is unique to the genus. It is concluded that the combination of methods used in this study is diagnostically significant for Lactobacillus.
Divisional Abstracts: The British Society for Dental Research

J Dent Res 74 (3) 1995

305 DMA ANDREWS, HN SHAH & SE GHARBA (Department of Microbiology, Eastman Dental Institute, London): Characterisation of an infective bacterium from Fasculobacterium varium and its potential as a cloning vector.

Present report concerns cloning of two aerobic Fasculobacterium species, namely F. varium and F. buccalis, in a cloning vector plasmid that has been shown to carry the enzyme Fasculobacterium varium and its potential as a cloning vector.

306 VJ HELLMAN, SE GHARBA, DR CLARKE & HN SHAH (Department of Microbiology, Eastman Dental Institute, London): Construction of a dual origin plasmid for cloning and expression in both Fasculobacterium varium and Escherichia coli.

Repression of virulence genes of passive periodontal pathogens has presented considerable problems and some such as the proteasome, Fasculobacterium varium, is induced by host factors thereby reducing its virulence. In addition, the study of these genes in both Fasculobacterium varium and E. coli may provide useful insights into the pathogenesis and treatment of periodontal disease.

307 HN SHAH & SE GHARBA (Department of Microbiology, Eastman Dental Institute, London): Characterisation of an infective bacterium from Fasculobacterium varium and its potential as a cloning vector.

We have previously found that the Fasculobacterium varium strain from F. varium and F. buccalis, in a cloning vector plasmid that has been shown to carry the enzyme Fasculobacterium varium and its potential as a cloning vector.

308 SE GHARBA & HN SHAH (Department of Microbiology, Eastman Dental Institute, London): Characterisation of an infective bacterium from Fasculobacterium varium and its potential as a cloning vector.

Fasculobacterium varium has been isolated from the oral cavity of a patient with periodontal disease. The organism was identified by biochemical and molecular methods and found to be a member of the Fasculobacterium varium group. The isolates were further characterised by nucleic acid hybridisation and by DNA-DNA hybridisation.

309 F E SMITH & N PENDRICK (School of Dentistry, The University of Liverpool): Functional assessment of fixed appliance treatment outcome.

The aim of this study is to investigate features of treatment with fixed appliances which may be associated with the treatment outcome. A cohort of 252 consecutive patients treated with dual arch fixed appliances (FA) at the University of Liverpool were assessed using a standardized questionnaire at the start of treatment and after an average of 12 months.

310 S RABIN, P BENNINGTON & EN RORROCKS (Departments of Orthodontics, Eastman Dental Hospital and Institute, London): Cephalometric comparison of soft tissue changes between two non-extraction treatment modules.

Functional appliances are often used in the treatment of Class II malocclusions with the aim of improving the profile. This retrospective cephalometric study compared the soft tissue changes in Class II division 1 cases treated in two non-extraction modules using fixed and functional appliances.

311 S RABIN, P BENNINGTON & EN RORROCKS (Department of Orthodontics, Eastman Dental Hospital and Institute, London): Cephalometric comparison of soft tissue changes between two non-extraction treatment modules.

The use of functional appliances in the management of Class II malocclusions is intended to encourage favorable mandibular growth to achieve significant occlusal improvements. The aim of this study was to compare the skeletal and soft tissue changes occurring in Class II division 1 cases treated using two different non-extraction treatment approaches.

The results showed significant differences between the two groups. There was a reduction in overbite and overjet which were associated with a decrease in the mandibular plane angle and an increase in the maxillary plane angle. This was associated with a significant increase in the mandibular plane angle and a decrease in the maxillary plane angle.

312 J C HUNTER, S D SPRINGATE & N P HUNT (Department of Orthodontics, Eastman Dental Hospital and Institute, London): Cephalometric comparison of soft tissue changes between two non-extraction treatment modules.

This investigation examined the arch dimensions, incisor relationships and facial morphologies of two groups of professional using and non-users of functional appliances. Two study groups, comprising 21 French horn players (mean age 32 years, range 17-45 years) and 21 clarinet players (mean age 33 years, range 19-48 years), were selected from a total of 78 players. The main finding was that the mean mandibular plane angle was significantly greater in the non-users group and that the mean maxillary plane angle was significantly greater in the users group. The mean mandibular plane angle was significantly greater in both groups, particularly the functional group, but there was no significant difference between the groups.

In conclusion, functional/ fixed appliance therapy tended to decrease profile convexity in a greater extent than fixed appliance therapy alone, but not at a statistically significant level. Non-extraction treatment had not significant effect on the nasolabial angle.

313 S RABIN, P BENNINGTON & EN RORROCKS (Department of Orthodontics, Eastman Dental Hospital and Institute, London): Cephalometric comparison of soft tissue changes between two non-extraction treatment modules.

The use of functional appliances in the management of Class II malocclusions is intended to encourage favorable mandibular growth to achieve significant occlusal improvements. The aim of this study was to compare the skeletal and soft tissue changes occurring in Class II division 1 cases treated using two different non-extraction treatment approaches.

The results showed significant differences between the two groups. There was a reduction in overbite and overjet which were associated with a decrease in the mandibular plane angle and an increase in the maxillary plane angle. This was associated with a significant increase in the mandibular plane angle and a decrease in the maxillary plane angle.

In conclusion, the two treatment approaches showed similar reductions in the sagittal relationships of the mandible to the maxilla, however the means by which it was achieved varied between the groups.

It is possible for people with varying malocclusions and facial morphologies to compensate for morphological deviations and successfully play the French horn or clarinet at the highest level.
One of the many goals of orthognathic surgery is to produce an aesthetic, balanced, and functionally efficient occlusion. However, studies to measure the effects of surgery on occlusal performance are few in number. The aim of this investigation is to study the response of mandibular incisor tooth movement to the prevention of maximum occlusal force, in relation to the surgical correction of vertical facial deformities.

Occlusal force was measured in 42 patients (25 long face, 17 short face) prior to any treatment, and 12 months after surgery. Despite more pronounced changes in incisor position from the preoperative level, the long face group increased their force to a level, on average, 130% greater than their initial values. It is concluded that orthognathic surgery is successful in improving bite force in long face patients but that correction of short face deformity can lead to a reduced maximum occlusal force for at least one year following operation.

The aim of the study was to compare the non-pulpal component of laser doppler flowmetry (L.D.F) recordings of dental pulp blood flow made using five different recording methods reported in the literature. L.D.F. recordings were taken from permanent maxillary incisors in 23 patients (six females, 17 males) of mean age 23.4 years. Laser doppler flowmetry was performed using a VAS (visual analogue scale) and a short form Manchester Outcome Questionnaire. The results were compared with clinical examination and palpation of the teeth with a VAS. The number of teeth sensitive to air blast was recorded. The procedure was repeated exactly two days later. Reproducibility was assessed using proportional limits of agreement (Lowe & Atkins, 1986). The repeated measurements were distributed between the lower and upper incisors (BLand JM & Allan DG, Lancet 1986; 1:307). The laser stimulus (LA) was 50% + 4.7% appeared more reproducible than other single tooth stimuli, with controlled RfL (LA- 91% + 80%) and air flow (LA- 95% to + 80%) better than air blast (LA- 146% to + 119%). The number of teeth sensitive to air blast showed absolute reproducibility. All methods used on single teeth showed relatively poor reproducibility and potential danger to test and retest the subject that assessing multiple teeth may be a more powerful statistical approach in clinical trials.

This work was supported by Unilever Dental Research.
Previous studies have suggested that the privileged nature of fetal wound healing in some animals is reflected in vitro in a differential ability to induce fibroblast populated collagen lattices (FPCLs) or explants (Kilic et al. 1999; Kim et al. 1999). We wondered whether the privileged nature of intrauterine wound healing is related to differential contractile properties of fibroblasts by studying the ability of intra- and extramural fibroblasts to re-organize an FPCL in vitro. Oral mucosal or dental fibroblasts, derived from child or adult tissues (1:3@21P) were used. Both intra- and extramural fibroblasts demonstrated a significantly greater contractile ability than dental fibroblasts (p<0.01). These differences were not reflected by differences in DNA synthesis or cell number between intra- and extramural fibroblasts. Child fibroblasts exhibited significantly greater contractile ability than adult fibroblasts (p<0.01). Contractile ability increased with increasing P number as at P1, irrespective of dose age or tissue of origin, fibroblasts demonstrated no differences in their ability to contract collagen lattices (p=0.05).

It was concluded that specific phenotypic differences exist between intramural and extramural fibroblasts. Intrauterine fibroblasts demonstrated a greater ability to re-organize their surrounding extracellular matrix—a factor which may be important in wound healing.

**Reference**


**Abstract**

The role of basement membrane proteins in the contractility of fibroblasts was studied in vitro. The authors examined the contractility of fibroblasts isolated from the gingiva of healthy volunteers and from patients with periodontal disease. They found that the contractility of fibroblasts from healthy volunteers was significantly greater than that of fibroblasts from patients with periodontal disease. The authors concluded that the differences in contractility are due to differences in the basement membrane proteins present in the tissue. This study provides new insights into the mechanisms underlying wound healing and tissue repair.

**Keywords**

- basement membranes
- fibroblasts
- contractility
- periodontal disease
- gingivitis

---

**References**


---

**Discussion**

The role of basement membrane proteins in the contractility of fibroblasts is a critical aspect of wound healing and tissue repair. The study by BRECKON et al. (1995) provides new insights into the mechanisms underlying these processes. The authors found that the contractility of fibroblasts from healthy volunteers was significantly greater than that of fibroblasts from patients with periodontal disease. This difference in contractility is likely due to differences in the basement membrane proteins present in the tissue. Understanding the mechanisms underlying these differences is crucial for the development of new treatments for periodontal disease and other wound healing disorders.

**Conclusion**

The study by BRECKON et al. (1995) demonstrates the importance of basement membrane proteins in the contractility of fibroblasts. Further research is needed to understand the complex interplay between these proteins and their role in wound healing and tissue repair.

---

**References**


---

**Further Reading**

329

I and being Supported by
presumed ethnicity.

Carieacreene
Severni
1993
1994
Turkey:

331

Several studies have investigated risk factors for oral cancer, fewer have considered precancer. Records accumulated from 1975 to 1995 of dental hospital patients with histologically confirmed oral dysplasia provided the opportunity for a retrospective case-control study of the association of oral cancer and anamnesis of smoking and drinking alcohol. Seventy sets of case notes were available and each case was matched to a control on the basis of age, sex, and smoking habits. Patients with dysplasia were as follows: 4.6% had no recorded S. mutans, 33.2% had a positive test (<10,000 CFU/ml), 27.7% had levels 2 or 3 (<250,000 CFU/ml) and 34.3% had levels 4, 5 or 6 (>250,000 CFU/ml). In conclusion, 34.3% (158) of the children investigated had a positive test of 1 or more sites. This difference was statistically significant (p =<0.05) when those subjects who drank spirits were removed to participate in a 1 year clinical trial of a chlorhexidine varnish. Supported by Knowable Therapeutics, Toronto, Canada.

332

As in vitro method has been developed which simulates the forces generated on teeth and jaws by toothbrushing during use. This enables ranking for possible soft tissues due to cause brushing pressure.

The method utilizes a cantilever beam with differential strain gauges attached. These are connected in a full Wheatstone bridge arrangement to a data recording instrument set to measure peak forces generated by each brushing event. The peak force is calculated from the free end. The bristle face of the toothbrush is set parallel to the beam. It brushes across the simulated teeth at predetermined loads. The resultant peak forces generated as the beam deflects. The peak forces generated are measured as the peak of the total deflection as the toothbrush is loaded. These forces can be determined using a computer and are expressed in Newtons (N) or Pascals (Pa).

The method is a simple, reliable, objective tool which can be used to assess the brushing pressures generated by toothbrushes. It is suitable for both manual and electric toothbrushes. The method has been found to be reliable and reproducible. It has been used to evaluate the brushing pressures generated by a wide range of toothbrushes.

333

The aim of the present study was to assess the effects of 2% minocycline gel on pocket probing depths.

The subjects were 50 patients aged 18 to 65 years with at least two sites with pocket probing depths of 5 mm or more. The patients were randomly assigned to one of three treatment groups: Group A received a 1% minocycline gel for 4 weeks followed by 2 weeks of placebo treatment; Group B received 2% minocycline gel for 4 weeks followed by 2 weeks of placebo treatment; Group C received placebo gel for 6 weeks.

The results showed that the minocycline gel significantly reduced pocket probing depths compared to placebo. The reductions were greatest in Group B, which received the highest concentration of minocycline. The reductions were also statistically significant compared to the baseline measurements taken at the start of the study.

334

This study measured the shear stress on the root surfaces of extracted teeth, with and without the application of a scaling gel. Six extracted teeth with linear deposits of scaling gel on the root surfaces were prepared for analysis with a cuspal surface area of 3 mm². Each tooth was divided into two 90° segments to give two equal samples. Twelve matched samples were mounted in epoxy resin. A digitized image was then obtained of each sample. The images were analyzed using a computer program to assess the forces generated by toothbrushing.

The results showed that the forces generated by toothbrushing were significantly greater in the presence of scaling gel compared to the control samples. The forces were greater in the presence of scaling gel due to the greater thickness of the deposits.

It was concluded that the force generated by toothbrushing is significantly greater in the presence of scaling gel compared to the control samples. This has implications for the effectiveness of plaque control measures and the prevention of periodontal disease.

336

The aim of this study was to compare the effects of 2% minocycline gel and mechanical treatment on the plaque vitality of subjects with adult periodontitis. A split-mouth study was conducted with 30 subjects. The study was divided into two phases: phase I involved the use of 2% minocycline gel for 4 weeks, followed by a 2-week period with placebo gel, and phase II involved mechanical treatment alone. The results showed that both treatments significantly reduced plaque counts and the percentage of sites with bleeding on probing.

It was concluded that both 2% minocycline gel and mechanical treatment are effective in reducing plaque counts in subjects with adult periodontitis. However, further studies are needed to determine the long-term effects of these treatments.
Previous studies (Jackson et al. J Dent Res 71 711-716 1992) have demonstrated that antimicrobial agents rendered less effective by plaque inhibition at initiation of treatment. The effect of combinations of antimicrobial agents and fluoride has not previously been reported. The aim of the present study was to determine the effect of combinations of the antimicrobial agents CHX, TPC, and fluoride on the growth of plaque microorganisms. CHX, TPC, and fluoride solutions were tested in vitro by W. Ross and colleagues described Duft et al. (J Dent Res 33 380 1983) Subjects abstained from food and hygiene for 24 h and from all food and drink for 6 h prior to plaque sampling. Thirty minutes following rinsing with the test agents the subjects rinsed with a 1% sucrose solution. Plaque was sampled 10 min after the challenge and the plaque was examined with a microtome and stained. The studies were double-blind and cross-over in design. Throughout the study the subjects used a low-fluoride toothpaste in place of their normal toothpaste. The test mouthwashes were presented in a balanced randomized order with an interval of at least one week between rinses each time. The results demonstrated that the post challenge plaque pH was significantly higher (p<0.02) after rinsing with the mouthwash containing the antimicrobial agents or fluoride compared with rinsing with the placebo mouthwash. The placebo TFP was further elevated following rinsing with combinations of the antimicrobial agents and fluoride compared with rinsing with the agents alone (p<0.05). Since Meisnering (Caries Res 15 206 1981) has demonstrated a negative correlation between caries increment and post challenge plaque pH it can be concluded that combinations of antimicrobial agents and fluoride may be more effective at reducing caries increment than fluoride alone.

The aim of this study was to investigate the use of commercially available mouthwashes in three different patient groups. The subjects were selected at random from three different groups: I, 75 regular attenders in a periodontal clinic; II, 75 regular dental attenders and III, 75 Health Care Workers. Calculated age range and male/female ratio was 1:1 groups I and 1.1:1.4 groups II and III. 18-64 and 4.5. 7.7. History of mouthwash use per group was 50.5% group D, 47.5% group (D) and 47.5% group (I) reporting continued use of a mouthwash. Data collected concerning recommendation for mouthwash use showed that in group 1 the main influence was the dentist (45.8%), in group III and III television was the main influence (46%). Respondents of group I and III showed that the main reason for group I to be prevention of periodontal disease (43.9%) with group 11 (29.7%) and III (45.8%) reporting the main reason be "refreshment of the mouth". For 50.0% of all "users" frequency was noted to be 2 or more times a day. Highest use was observed in groups I and III. Results showed there is a considerable decline in the use of mouthwash in all 3 groups. Each group had different influencing factors for mouthwash use.

The inhibition of bacterial attachment to the tooth surface is one possible approach to plaque control. This study evaluated in vivo the plaque inhibitory action of a novel copolymer reported to have considerable anti-adhesive properties in vitro. The study was a single blind, 5-treatment, randomized Latin square crossover design, incorporating balance for carry-over effects. The films were the 1% anti-adhesive (A), the anti-adhesive with 0.02% chlorhexidine (B), a 0.2% chlorhexidine rinse product (C), an essential oil/plasticene rinse product (D) and water (E). 15 volunteers were randomly divided into 5 groups of 3. 3 days of plaque accumulation with free, unstained toothbrushing and rinsed twice daily, under supervision, with the allocated formulation. On Day 5 plaque was scored by index and area. Washout periods were 24 h. Alcohols or combinations with chlorhexidine the anti-adhesive agent showed no effects greater than water. The chlorhexidine rinse was significantly more effective than the essential oil/plasticene rinse and the water rinse. The results demonstrated that the anti-adhesive monomer would be of no value in inhibiting plaque regrowth.

This investigation compared the ability of three detersigents (Sodium laurel sulfate (SLS), Tween 20 and Sodium Saccharin (SS)) to inhibit stain caused by chlorhexidine mouthwash (Comodry). Peroxigels, to which were exposed to saliva, were dried and stained with chlorhexidine for the control group for 2 minutes, and then immersed in tea for one hour. The blocks were allowed to dry and the optical density after each soaking determined using a spectrophotometer at the incident maximum for tea (595 nm). This cycle of immersion and staining was continued over a period of 7 days (23 cycles), until the mean optical density of the control blocks reached a level of 2.5. Results showed that there was no significant difference between SS (OD = 2.4), Tween 20 (OD = 2.41) and the control (OD = 2.4). However, significantly less stain was found with SLS (OD = 0.317) compared to the other detersigents and control.

It may be concluded that SLS has a good inhibitory effect on stain caused by chlorhexidine (Comodry) and that the other two detersigents did not have this property.

Despite use for many years in dentistry, little is known of the antimicrobial or plaque inhibitory properties of oxidising agents. The aim of this study was to compare the effects of peroxycarbonate and peroxycarbonate-mucosalithium with salines and a chlorhexidine rinse for effects on plaque roughness and salivary bacterial counts. The 4 day plaque regimen and tooth surface area were randomized, crossover design balanced for residual effects and employing 18 healthy dentate volunteers. From a zero plaque baseline volunteers rinsed with elicited products for the control blocks, and then immersed the blocks in tea for 1 hour. The blocks were stained every 2 days. All blocks were scored by index and area. Anti-bacterial effects were determined by recovering salivary bacteria counts immediately before and up to 7 hours after single rinses. From the data, bacterial counts were significantly reduced at 7 hours after treatment. The maximum reduction on day 2 in the peroxycarbonate > saline with most differences reaching significance. Bacterial count reductions were significantly greater at all time points with chlorhexidine than all other agents except the oxidising agents reductions but at no time point did this reach significance from saline. It is concluded that the oxidising rinse have potential as plaque inhibitors but the mode of action may not be through a direct antibacterial effect.
The mechanism by which chlorhexidine causes staining of tooth can be debated. However, chlorhexidine will precipitate dietary chromogens onto surfaces both in vitro and in vivo. The aim of the current study was to determine whether 4 different brands of toothpaste containing chlorhexidine, or their propensities to causes staining on chlorhexidine treated acrylic surfaces. Braces of tea and coffee were obtained from supermarket outlets and infusions prepared as 100 ml of boiled water. Five subjects were observed from the same subject. Acrylic specimens, with or without saliva pre-treatment, were exposed to 0.2% chlorhexidine solution for 2 minutes, washed and placed into the respective beverages for 90 minutes, washed and exposed to a spectrophotometer. The cycle was then repeated until one group of specimens exceeded an optical density of 2. There was a marked difference in the staining produced by the different brands of tea, the least being noted with Earl Grey with approximately 50% of the optical density readings of a group of well known tea brands. Lassan Souchong and Darjeeling late intermediates in the range of staining potential. For coffee, of the instant brands tested, there was less variation in staining and overall the stain by coffee was less than that seen by most tea brands. Increasing the concentration of coffee increased the staining produced. It is concluded that advice on how long tea intake may help reduce staining during the short term to medium term clinical uses of chlorhexidine.

Staining of teeth and soft tissues is a well known side effect with chlorhexidine mouthwashes. The aim of this study was to determine (1) whether a co-polymers anti-adhesive agent would prevent staining of a low concentration chlorhexidine rinse and (2) if an essential oil/chlorhexidine rinse could be used in the home care market. The study was a single blind, 5 treatment randomised Latin square cross over design, incorporating balances for carry-over effects. 15 volunteers rinsed randomly with the anti-adhesive agent (A), 0.02% chlorhexidine and anti-adhesive rinse (B), 0.2% chlorhexidine rinse (C), 0.2% chlorhexidine and essential oil (D) and a control group (E). On day 1 of each study period, subjects were attended five times, and whilst omitting all other oral hygiene procedures, rinsed eight times a day with the allocated rinse, followed by a rinse with warm black tea. On day 4, subjects were free to use fluoride toothpaste, mouthwashes and mouthrinses (other than the allocated rinse). Tongue staining was significantly increased with the chlorhexidine compared to the essential oil/chlorhexidine rinse (both tongue stain area C = 0.40, D = 0.27, p<0.05). It was therefore significantly increased compared to the other 3 rinses (tongue stain area A = 0.04, B = 0.25, E = 0.10, p<0.00). The anti-adhesive/chlorhexidine rinse produced no more staining than the anti-adhesive or water rinse. It is concluded that this inhibition of staining may be due to variation of chlorhexidine activity by the anti-adhesive. Study sponsored by Imperial Chemical Industries, Maidstone, U.K.
We conclude that site specific wax coating and a paramagnetic contrast medium permit magnetic resonance imaging in study of periodontal movement through human root dentine.

We gratefully acknowledge support from The Royal Society (Research Grant 574005/G501)

The aim of this study was to evaluate the effect of ion lime and temperature on electrochemical impedance measurements on human enamel. Sections of healthy enamel were cut from the palatal aspect of five freshly excised teeth. Electrochemical impedance measurements were made with sections equilibrated in two different buffered electrolytes Sodium Chloride (NaCl) and TetraethylAmmonium Chloride (TEAC) both with a concentration of 1M. After equilibrating the sections in NaCl for 72 hours, the impedance spectrum of each section was characterised at various temperatures and frequencies. With the 100M and 1kM frequencies were measured in an immunological cell and an alternating potential of 50mV was applied over a range of frequencies from 10Hz to 10kHz. The sections were then rinsed thoroughly and immersed in TEAC solution for 72 hours and the impedance measurements repeated. The results confirmed that the measured electrical impedance spectra behaved appropriately for variations in temperature with DC resistance values increasing as temperatures

The aim of this study was to evaluate the effect of ion lime and temperature on electrochemical impedance measurements on human enamel. Sections of healthy enamel were cut from the palatal aspect of five freshly excised teeth. Electrochemical impedance measurements were made with sections equilibrated in two different buffered electrolytes Sodium Chloride (NaCl) and TetraethylAmmonium Chloride (TEAC) both with a concentration of 1M. After equilibrating the sections in NaCl for 72 hours, the impedance spectrum of each section was characterised at various temperatures and frequencies. With the 100M and 1kM frequencies were measured in an immunological cell and an alternating potential of 50mV was applied over a range of frequencies from 10Hz to 10kHz. The sections were then rinsed thoroughly and immersed in TEAC solution for 72 hours and the impedance measurements repeated. The results confirmed that the measured electrical impedance spectra behaved appropriately for variations in temperature with DC resistance values increasing as temperatures

The aim of this study was to evaluate the effect of ion lime and temperature on electrochemical impedance measurements on human enamel. Sections of healthy enamel were cut from the palatal aspect of five freshly excised teeth. Electrochemical impedance measurements were made with sections equilibrated in two different buffered electrolytes Sodium Chloride (NaCl) and TetraethylAmmonium Chloride (TEAC) both with a concentration of 1M. After equilibrating the sections in NaCl for 72 hours, the impedance spectrum of each section was characterised at various temperatures and frequencies. With the 100M and 1kM frequencies were measured in an immunological cell and an alternating potential of 50mV was applied over a range of frequencies from 10Hz to 10kHz. The sections were then rinsed thoroughly and immersed in TEAC solution for 72 hours and the impedance measurements repeated. The results confirmed that the measured electrical impedance spectra behaved appropriately for variations in temperature with DC resistance values increasing as temperatures

The aim of this study was to evaluate the effect of ion lime and temperature on electrochemical impedance measurements on human enamel. Sections of healthy enamel were cut from the palatal aspect of five freshly excised teeth. Electrochemical impedance measurements were made with sections equilibrated in two different buffered electrolytes Sodium Chloride (NaCl) and TetraethylAmmonium Chloride (TEAC) both with a concentration of 1M. After equilibrating the sections in NaCl for 72 hours, the impedance spectrum of each section was characterised at various temperatures and frequencies. With the 100M and 1kM frequencies were measured in an immunological cell and an alternating potential of 50mV was applied over a range of frequencies from 10Hz to 10kHz. The sections were then rinsed thoroughly and immersed in TEAC solution for 72 hours and the impedance measurements repeated. The results confirmed that the measured electrical impedance spectra behaved appropriately for variations in temperature with DC resistance values increasing as temperatures
Optical studies have consistently suggested that the mineralisation event takes place within the osteocyte. However, there have been few attempts to reconcile this with transmission electron microscopy (TEM) studies which consistently described an extracellular event involving either dystrophic sites on collagen or specific vesicles. This study set out to investigate the nature of the bone mineral and its manner of formation using techniques designed to preserve the chemical integrity of bone. With this goal in mind, 1.5-day-old fetal rat calvaria were demineralized in EDTA, and then washed for 5 months to remove glycosaminoglycans. Alkaline phosphatase was measured in the presence of calcium and phosphate. The mineralised matrix was stained in a fine granular pattern. At high magnification, the granulosity was assigned to a complex microcrystallisation of mineralised microstructures measuring up to 1 micron in diameter. At the same time, this was not confined to the extracellular matrix and discrete mineralised microstructures, measuring up to 1 micron in diameter, were also evident in osteocytes.

The evidence suggests that the mineralisation event takes place within the osteocyte, that the bone cell has the form of microcrystals and that the microcrystals are exported and assembled into a complex microcrystallisation. This study was supported by Colgate Palmolive and the MRC.

The nature of the bone salt and its manner of formation remains the subject of debate. It is, however, generally recognized that the bone mineral is easily altered by histological preparation. This study set out to examine bone using techniques designed to preserve the in vivo character of the bone mineral and to examine bone using techniques designed to preserve the in vivo character of the bone mineral and to examine bone using techniques designed to preserve the in vivo character of the bone mineral and to examine bone using techniques designed to preserve the in vivo character of the bone mineral. The bone mineral was studied in three ways: by transmission electron microscopy, by scanning electron microscopy, and by polarized microscopy. The bone mineral was studied in three ways: by transmission electron microscopy, by scanning electron microscopy, and by polarized microscopy. The bone mineral was studied in three ways: by transmission electron microscopy, by scanning electron microscopy, and by polarized microscopy. The bone mineral was studied in three ways: by transmission electron microscopy, by scanning electron microscopy, and by polarized microscopy. The bone mineral was studied in three ways: by transmission electron microscopy, by scanning electron microscopy, and by polarized microscopy.
368

L. APPLETON*, M. COOK*, and E. BOSTJEN* (Clinical Dental Sciences, The University of Liverpool, UK; Sheffield Hallam University, Liverpool University, Manchester, UK) - Tooth as indicators of environmental exposure.

It is well known that the mineral phase of calcified tissues sequesters trace elements during their development. The objective of this study was to determine if the dentine of teeth can be used as a biocentric indicator of environmental exposure.

369

D.C. ATTIRILLI, A.S. BINKHORN, R.M. DAVIES, M.R. DICKINSON and T.A. KINNS (Dental Health Unit, Department of Laser Photonics, University of Manchester, UK; Erbrum: YAG and Holabum: YAG Laser Ablation of Dentin.

Erbrum: YAG (2.94J/cm²) and Holabum: YAG (2.4 J/cm²) laser radiation has been suggested as being suitable for modification of hard tissues. The Er:YAG laser is of particular interest as it's wavelength coincides with the peak of the dental water absorption curve.

The aim of this pilot study was to determine in vitro the latest heat of ablation for dentine for both lasers and to compare their efficiencies.

Extracted teeth were cut in slices of thickness ranging from 0.75 to 2.5 mm. Radiation was focused using an 85 mm CaF₂ lens. Laser heat data were obtained by cutting slabs into blocks of dentine, and calculating the volume absorbed for known energy inputs. Specimens were mounted on a translation stage, and traversed back and forth in the focal plane of the beam.

The laser heat of ablation on dentine for Er:YAG and Ho:YAG were 535 J/cm² and 352 J/cm² respectively. The differences between the groups were significant (p<0.01) using Mann-Whitney U test.

It is concluded that in vitro Erbium:YAG laser radiation is more effective than Holmium:YAG radiation for removal of dentine.

370

D. DEVLIN**, C. CASH, G. GARLAND, N. WATTS (Depts of Dental Medicine and Surgery and Division of Biological Sciences, University of Manchester, UK) - Viscoelasticity of dentine.

The aim of this study was to investigate the viscoelasticity of bone from the distraction of dentine under a force. The compressive test on the bone from the distraction of dentine was reduced less than in control rats. 13 dentine and 11 control animals were killed mentally over a period of time. The bone was then measured for the dilatation of the bone. The results were that the bone was reduced less than in control rats. 13 dentine and 11 control animals were killed mentally over a period of time. The bone was then measured for the dilatation of the bone. The results were that the bone was reduced less than in control rats. 13 dentine and 11 control animals were killed mentally over a period of time. The bone was then measured for the dilatation of the bone. The results were that the bone was reduced less than in control rats. 13 dentine and 11 control animals were killed mentally over a period of time. The bone was then measured for the dilatation of the bone. The results were that the bone was reduced less than in control rats. 13 dentine and 11 control animals were killed mentally over a period of time. The bone was then measured for the dilatation of the bone.
The aim of this study was to compare patient perceptions of different types of fixed anterior restorations photographed in the same patient's mouth. Three comparisons were made: 1) bridge ceramic v all ceramic, 2) NHS metal ceramic v private metal ceramic, and 3) metal ceramic (cervical buccal contour) v metal ceramic (overbuilt buccal contour). Two patients were used for the study, one represented the upper arch and the other the lower arch.

Six restorations were fabricated for each patient and then each was photographed in situ. A total of 105 patients from three different locations viewed the photographs and completed a questionnaire. In comparison 1, most people thought the all ceramic was more natural and preferred these restorations. With the bridges, more people thought the metal ceramic was more natural and this was also their preference. In comparison 2, for both the crown and bridge comparisons, respondents thought the private metal was more natural but the NHS wire was their preference. In comparison 3, for both the crowns and bridges, respondents, more people thought the restorations with normal margin were of a higher technical standard and these were preferred.

Shade and colour of the restorations were the most important factor in the patients' assessment.

Shade and colour of the restorations were the most important factor in the patients' assessment.

Locally sensitive parching, for special need clients, requires purchasers [DH/PHA] to engage in local consultation on service availability with providers [Trusts] so that dental services for this patient need to be more accessible.

The aim of this study was to assess the provision of general dental services for special need clients in the boroughs of Lambeth, Southwark and Lewisham. 126 general practitioners were invited to take part. The principal group was the establishment of a questionnaire. 107 practitioners responded giving a response rate of 85%. Half of the GPs were willing to provide special dental services for people with special needs. The results showed that general dental practitioners were significantly more willing to provide such services than people with special needs.

In this study, we assessed the treatment of caries in children of 0-3 years of age in the Department of Paediatric Dentistry, School of Dental Medicine, University of Pennsylvania. We evaluated the effectiveness of different procedures for the treatment of caries in this age group. The study population consisted of 100 children, aged 0-3 years, who were referred to the Department of Paediatric Dentistry for treatment of caries.

The aim of this study was to investigate the effect of fluoride on the rates of dental caries in children. Fluoride was applied by dental providers to the teeth of children in the community dental service (CDS). A questionnaire to establish fluoride patterns was distributed to 179 CDS in two South West Thames Region districts. In addition, dental records of referred children were reviewed. The conclusions were that fluoride was effective in reducing the rate of dental caries in children who received it. This is consistent with previous findings.

The aim of this study was to determine the dental information needs of adolescents and investigate the relationship of their desire for information with adolescents' opinions of who decides to make an appointment with the dentist (e.g. parent or child). 158 adolescents of similar age and living in a similar social and economic environment were interviewed. The study was administered including questions about information needs and past experience. The results showed that adolescents are interested in finding out more information about different aspects of dental health which includes especially: how to keep their teeth for life, for good appearance, to have a good bite, to keep up their ternsure, and to avoid toothache.

These children expressed a desire to know more about certain dental matters. Information needs of young people are important because knowledge from this study may help those working with adolescents to provide useful information for dental information in this group has possible implications for future patterns of seeking dental care.

Barriers to Dental Care for Adolescents from a Minority Ethnic Background

This investigation aimed at providing information on the self-reported barriers to dental care by the five major minority ethnic groups resident in the City of Birmingham. Using a quota sample the communities, Black, Indian, Pakistani, Bangladeshi and Chinese were included in the study. 916 face to face interviews were completed (approximately 380 in each group). Interviewees were completed by a market research company in August 1994, using a pre-tested interview schedule. The sample was based upon: residency, ethnic group, age, and gender.

The availability of appropriate, culturally sensitive dental care for patients from this study was considered important for all groups, with the exception of the Black community. Whereas the Chinese community thought that cultural and/or religious understanding from their dentist was of little importance, a majority of Indian (75%) and Pakistani (70%) respondents believed this to be very important. All ethnic groups, with the exception of the Bangladeshi community, showed a higher level of dental attendance ranging from 65% to 80% within the last two years. When these data were considered separately by age group, significant differences in age group age between ethnic groups were often apparent. For example, the Chinese community showed a significant increase in dental attendance for patients from age 16 to 19.

It was concluded that there were significant barriers to dental care for adolescents from a minority ethnic background.
The aim of this study was to examine the relationship between tooth brushing behaviour and dental fluorides in primary teeth. The three-year study was undertaken in North West (p < 0.01 ppm F) on 416 adolescents aged 15 years at the final examination. Dental fluorides was recorded using the TFP index from photographs. Subject scores were considered for both the 1st and 2nd premolars and based on the examination of TFP index. At the baseline examination, the subjects were asked to rate their usual brushing frequency on their worldiy brushing frequency, their rinsing method (with or without a brush) and the amount of paste they used. Each subject was supplied with toothpaste and randomly allocated to formulations containing either 1000 or 1500 ppm F (NaF in silent base). Using a multinetic model regression the relationship between the four tooth brushing variables and the prevalence of dental fluorides was assessed. The prevalence of dental fluorides for premolar teeth was low. No relationship between use of fluoride toothpaste loss in the development period of teeth and dental fluorides could be demonstrated.

For children there are few validated psychometric measures of dental anxiety. Those that exist may indicate fear and not lead to inaccuracy with regard to the child's dental fear status. The study reported here was designed to test the validity of use of several of the factors in the children's dental fear status and 100 children consecutively attending a community clinic were asked to complete the validated Dental Fear Survey Schedule for Children. The dental examination both dental nurse and dentist separately assessed the subject's dental fear using Scherer and Nakamura's checklist (94). No significant differences were found in the mean scores for the different subcategories. This study was to determine whether or not there was a significant difference in the prevalence of dental fluorides for 1st and 2nd premolars. The data from the children, dental and dentin damage were considered for each group of data to two variables of exploratory dental fear. These were a past treatment and a treatment for the dental management. The diagnosis of dental fluorosis was confirmed using cephhalometric analysis (Kasmin, J. B. Br. J. Orthod. 12, 193-201, 1985). The results of the study show that the prevalence of tooth size may play a role in the dental management. The results of the study show that the prevalence of tooth size may play a role in the dental management. The results of the study show that the prevalence of tooth size may play a role in the dental management. The results of the study show that the prevalence of tooth size may play a role in the dental management. It was concluded that tooth size may be a factor in the dental management. The prevalence of tooth size may play a role in the dental management. The prevalence of tooth size may play a role in the dental management. The prevalence of tooth size may play a role in the dental management. It was concluded that tooth size may be a factor in the dental management.
392 JPM CRAWFORD* and MJ ALDRICK. (Division of Child Dental Health, University of Bristol, UK; and The University of Queensland, Brisbane, Australia):  
A genetic classification for amalgamator hypersensitivity.  
Clinical and laboratory evidence has shown phenotypic variability in both the autosomal and X-linked forms of AI and locus heterogeneity in the X-linked form(s) (XAI) of AI. A classification based primarily upon phenotypic criteria, at whatever level, must therefore be unsatisfactory for the future. We have attempted to produce a classification based on genetic findings together with the resulting biochemical changes and the mode of inheritance as the primary qualifiers. Phenotypic information can then be included, while accepting that variable expression will result in some ambiguity of description between the groups. Applying this to datasets in the AIHI archive to the XAI version of XAI results in:  
Genetic forms:  
AIHI, Xp22.3-p23.  
Mutilations:  
1p deletion, some mutations.  
Biochemical changes:  
premature termination of translation.  
Radiographic changes:  
X-linked.  
Phenotypes:  
Amelogenesis imperfecta, hypoplasia and poly hypomineralisation, vertical banding in females.  
(Aldred et al., Hem Genet 1992; 90:41)  
It is important that such a scheme, or development of it, is agreed as the basis for the future definition of cases. This would eliminate the unhelpful and repetitive refinement of existing systems. It should be possible to extend this hierarchical concept to other inherited disorders.

394 DE BOYD* and TA BREGG (The Queen's University of Belfast, Royal Belfast Hospital for Sick Children): A Prospective Study to Evaluate Treatment of Avulsed Teeth.  
This prospective study aims to evaluate a treatment policy for accidently avulsed and subsequently replanted teeth, and also to determine which factors flavours of presentation are the best indicators of prognosis. A data entry form is used to record information which is transferred to a computer database for analysis. Preliminary examination of the data has been carried out for the period 1990 - 1994. There were 41 teeth avulsed in 35 patients. The common cause of tooth avulsion was a cyclist accident (65%), most teeth were avulsed at 4 p.m. (39%) and most teeth were avulsed in the summer (61%). An upper central incisor was the tooth most commonly avulsed (65%). Outcomes of avulsion are described in terms of:  
1. Malignant: all teeth were lost, no patient was reported to exert an influence on prognosis.  
2. Malignant: tooth with open spaces suffered less resorption than those with closed spaces (p<0.005). 2) more than five minutes of dry storage was critical regarding the subsequent radiographic image which the tooth was placed (p<0.05). 3) occurrence of root resorption increased when time in the socket was excess of one hour (p<0.01). 4) a prescription of systemic antibiotic at repituation reduced the occurrence of root resorption, 5) root resorption was not related to splinting time, 6) pulp extractions within 21 days did not reduce caries.  
A review of root resorption in teeth with open spaces, but did reduce this tooth with closed spaces. Conclusion: A) Results 1, 3, and 4 are not new findings and confirm reports found in the current literature. B) Results 2, 5, and 6 are not new findings previously reported in the literature. C) The results confirm that the incidence of root resorption is increased in root canal teeth whereas other trends found will also demonstrate statistical significance.

396 P AOARWAL, R BARNFATHER, P M CRAWFORD, T WRIGHT (University of Washington, Seattle, WA, USA): Dental 'First Aid' Knowledge of Sports Trainers in North Carolina, U.S.A.  
Previous work with school sports staff (Newman L, Crawford P, Bemal, Dent Trauma 1991; 7: 225-8) highlighted lack of knowledge of the management of dental sports injuries. An education programme has previously been established amongst sport coaches and trainers in North Carolina to cover these cases. This study was intended to assess the dental first aid knowledge of this letter group.  
A postal questionnaire was sent to sport coaches and trainers in schools and colleges in three areas of North Carolina. The questionnaire included general dental questions and dental knowledge of the NC programme. Two case studies were used to assess therapy in which they would manage specific types of dental injury. Of the 70 respondents (30 males and 40 females), further training in dental first aid 46% had dealt with some form of sports related dental trauma. The two case studies involved a fractured tooth and an avulsed tooth, the correct response rates were 61% and 14% respectively.  
Simple dental injuries may be managed using a degree of common sense. However, more complicated injuries require more professional knowledge. Despite a state-wide education programme, sport coaches continue to have inadequate knowledge for appropriately managing complex dental trauma.

397 MT ROSEY, L SHAW, C GORDON, KELLY DA (Dep. of Paediatric Dentistry, University of Birmingham and The Liver Unit, Childrens Hospital, Birmingham, UK): Does Cygomycetosis influence the effect of Cyclopia A on the gingival tissues?  
The effect of Cyclopia A on the gingivae is well known but research into the nature of the association has had conflicting results. It has been suggested that co-factors may be involved, one of these is cygomycetosis (CMV). The aim of this study was to determine if cygomycetosis (CMV) influenced the effect of Cyclopia A on the gingivae in children who have received transplants. Sixty children taking Cyclopia A post liver transplants were examined. An index of Seven-point gingival index was formed and compared within the same group and against the CMV status of the patient recorded. The association between the presence and the level of gingival hyperplasia and CMV infection was examined by chi-square test and the contingency coefficient calculated. The index was used to examine the association between the following: Cyclopia A and the level of gingival hyperplasia. There were 29 males and 31 females, mean age 3yrs 9moths (range from 9 months to 12 yrs), mean time post transplant was 1 year 5 months (range from 1 day to 5 years). A was 162.31±8 mg/dl (range 0 to 413±g/dl). No significant association was found between CMV infection and neither the presence nor the level of severity of gingival hyperplasia [Odds ratio 79 ± 37; contingency coefficient 1.4]. There was an association between CMV and the level of dielectric Cy in females and the level of severity of gingival hyperplasia. The results of this study have shown no association between CMV and Cyclopia A medication on the development of gingival hyperplasia.

398 X IOANNIDIES, JPM CRAWFORD, K DUNCAN, RW VOWLES. (Division of Child Dental Health, University of Bristol, UK): Age changes in lingual frenum in teenage children.  
Children may be referred for the surgical removal of a band of tissue below the tongue binding it down to the floor of the mouth known as tongue-tie (ankyloglossia). This usually requires a general anaesthetic for it to be carried out in young children. We attempted to produce a classification based on genetic findings together with the resulting biochemical changes and the mode of inheritance as the primary qualifiers. Phenotypic information can then be included, while accepting that variable expression will result in some ambiguity of description between the groups. Applying this to data in the AIHI archive to the XAI version of XAI results in:  
Genetic forms:  
AIHI, Xp22.3-p23.  
Mutilations:  
1p deletion, some mutations.  
Biochemical changes:  
premature termination of translation.  
Radiographic changes:  
X-linked.  
Phenotypes:  
Amelogenesis imperfecta, hypoplasia and poly hypomineralisation, vertical banding in females.  
(Aldred et al., Hem Genet 1992; 90:41)  
It is important that such a scheme, or development of it, is agreed as the basis for the future definition of cases. This would eliminate the unhelpful and repetitive refinement of existing systems. It should be possible to extend this hierarchical concept to other inherited disorders.

399 V E HARRISON, S GIBBET (Department of Paediatric Dentistry and Department of Public Health and Community Dental Education, KCSMD, London, UK): Dentists' attitudes to and practices of reporting child physical abuse.  
The aim of the study was to investigate the reporting by dentists of cases of suspected child physical abuse and factors that deter them from reporting. A postal questionnaire was sent to all the General Dental Practitioners (GDPs) and Community Dental Practitioners (CDPs) in London (n=700). The areas selected were those where they had high rates of registration of children on the Child Protection Registers. The questionnaire was based on previous studies conducted in America (Sokler D et al. JADA 47: 24-26, 1975; Malcov B J Dent Child 49: 159-194, 1992). The GDPs and CDPs were asked to report their views on the usefulness of a national register to coordinate investigations into allegations of abuse, sanctions, guidelines, reporting and possible deterrants to reporting. 44.3% of the dentists replied to the questionnaire, and of those who responded, 32.7% had seen a child patient where they were suspicious of child abuse in the last year. Of those who replied to the questionnaire, 24.3% of dentists would report a case. Significantly more CDBs had both seen cases where suspicion was aroused, (p=0.001) and had reported cases (p=0.001) than had GDPs. The most common factors identified that may deter a dentist from reporting were a lack of knowledge of child physical abuse, both in the ability to diagnose a case of abuse and in the management of such a case.  
It was concluded that dentists are suspicious cases of suspected child abuse, but that few are reported. Further training of all dentists, but particularly GDPs is necessary. As an interim measure there should be local guidance devised for the use of GDPs.

During cavity preparation and restoration, cracks may be induced by mechanical stress in the adjacent enamel. The aim of this study was to determine whether such cracks can be visualised by a reflection-interferometry technique. Metal-occluded-distal cavities were cut in 12 surgically extracted unerupted human third molars with diamond burs. The occlusal surfaces were polished with 12 mm diameter diamond burs, 4 with composite resin 2 and left unfilled. All teeth were extracted with methacrylar/cellulose fibre inlay. The cavities were examined with a microscope (Leica Mikroskopie, model: Wild M 845; 34G-393, 1977). Bevel crowns the crowns was ground off, the specimens were etched, washed, freeze-dried and examined by scanning electron microscopy. Despite artefacts attributable to surface factors such as lack of post-erosive preparation or the extraction procedure were observed, replicas of 3 types of void specifically associated with restorations were identified: (1) a marginal space between amalgam and enamel; (2) cracks radiating from the restoration; (3) cracks extending from the fracture and parallel to the cavity margin. All cracks followed previous junctions. We conclude that cracks form in enamel during cavity preparation/retention and may be visualised by reflection-interferometry. These cracks may influence long-term retention of restorations and initiation of recurrent caries.

Diaperallyso, Tyan. 2Primas TPH, Dentaly.
400

When, as a result of caries or trauma, extensive tooth destruction has occurred, auxiliary retention of plastic restorative materials is often considered. This usually takes the form of self-adhesive resins as these are considered to bond directly to dentine on the one hand and the periodontal membrane on the other. One possible hazard to the pulp is the temperature rise that may result during the polymerization. The object of this pilot study was to test the heat generated during polymerization of pin channels using 0.67 mm twist drill (Widmer regular size lii pin) in a KaVo intra oral heating source, 45°C being considered to be the upper safe limit for tooth pulp vitality.

Seventeen teeth from three patients (mean age 37±7 yrs, range 16-54) were selected for the study, which was conducted in the Dental Department of the University of the West Indies, St. Augustine Campus, Trinidad, W. In all, 42 pin channels were prepared using stainless steel burr (410S) of the size of the pin to be used, 0.67 mm

401

The aim of this study was to assess, by means of SEM and microangiography, the effects of an Nd:YAG laser on artificial white spot lesions in enamel. Ten lower molars extracted for orthodontic purposes had two horizontal artificial white spot lesions created on the buccal surfaces, using cotton swabs impregnated with 10% NaF gel. The lesions were then treated for 1 second with the Nd:YAG laser or a laser beam from a He-Ne laser, 2.396 mm in diameter. The lesions were examined using a light microscope and a laser Doppler flowmeter.

402

Chemomechanical caries removal of endangered dentine using a NaOCl-based technique: a pilot study

403

The nature, rate and extent of salivary reduction consumption (e.g. that of pyruvate, urate, inorganic ions, etc.) by patients present in tooth whitening preparations reflect their existing capacity, a parameter of much relevance to their therapeutic and aesthetic actions. Therefore, high resolution proton (1H) NMR analysis was used to investigate chemical modifications arising from equilibrium of human saliva with the environment of oral and perioral inocula (CP, 0.10% (W/W) and peroxidase 50 U/50 ml). Unstimulated salivary samples obtained from volunteers (n=10) were centrifuged, the supernatant removed, and an appropriate volume prepared from each sediment that was administered for 6 hours to 5 H NMR analysis. The results obtained demonstrated (1) complete consumption of salivary pyruvate (from a mean value of 1.30 x 10³ mmol/dm³ in the unstimulated) by a pyruvate-consuming bacteria (e.g. H2O); (2) an oxidative deamination reaction; (3) reduction of salivary urea levels and (4) in the presence of antibodies (e.g. trypsin and catalase) by salivary macroenzymes.

404

The Electronic Caries Monitor (ECM) can be used to detect the presence or absence of fissure caries over the whole fissure system by first covering the surface with a conducting medium. The presence of fissure caries in the first series at site vitreous due to the method. 25 plaster and one permanent molar were tested in vivo and then re-tested in vitro. Two groups of caries were used with a similar correlation coefficient of g = 0.75. The in vivo readings were then repeated giving a correlation coefficient between the two readings of 0.62 to 0.77. The greatest variation in readings occurred with highest ECM readings decreasing towards the enamel, lower readings which are thought to repel demineralisation were very repeatable.

405

The aim of this study was to determine the possibility of using the differential absorption across the absorption edge of Sr to determine simultaneously the projected mass of enamel mineral and of Sr diffused into a section of enamel. Sections 300 μm thick, cut from human molars, were immersed in SrSO₄ solution for 5 days. Scanning microangiography, with an energy dispersive spectrometer coupled to a SEM, was used to determine the X-ray attenuation at 15.27 and 16.17 keV over areas of 1 x 1 mm² in 10 μm steps. As Sr has an energy shift in absorption at 16.106 keV (the Sr K absorption edge), the difference in absorption across the edge could be used to calculate the projected mass of Sr per unit area of section. The contribution of Sr was then subtracted from the observed absorption to determine the contribution due to enamel mineral alone, and hence the projected mass of enamel mineral per unit area of section. As expected, the Sr level was elevated within the region where the mineral content was reduced.

406

The aim of this study was to investigate fluoride uptake and release of two glass ionomers subjected to solutions containing three different fluoridating concentrations. The two materials were Viflron® Teeth from Two Glass ionomers and Chemfil® superfine. Ten discs, 6 mm diameter with a thickness of 1.5 mm were made for each material. Test samples were exposed daily to either a 250 ppm, a 1000 ppm, or a 2500 ppm solution for 24 hours. Control samples were exposed to deionized water only. Samples were then allowed to dry and then immersed in 2 ml of fresh deionized water for 16 hours at 37°C. All solutions were changed daily. Fluoride release was assessed over a 20 day period. Immediately after changing solutions, 1 ml of the solution was removed from each sample and carried out using a fluoride ion-selective electrode (Cramer et al. Caries Res 1994:28:322-329). The test samples, exposed to the 1000 ppm and a 2500 ppm fluoride solution, consistently released more fluoride into the bathing solution than did the control samples at all time points from day 1 to day 20. The values for the 1000 ppm fluoride samples ranged, at day 1, from 410 ppm to 1000 ppm, and at day 20, from 150 ppm to 290 ppm. The 2500 ppm fluoride solution was also effective in releasing fluoride but the release was lower. The 2500 ppm fluoride solution, Chemfil Superfine, released 15.23% (±3.63) day 1 with the comparable Viflron at 15.36% (±1.61) for Viflron Sense and Chemfil Superfine 10.3% (±1.76) for Viflron, Day 20. After immersion in 2500 ppm fluoride solution, Chemfil Superfine specimens released 15.23% (±3.63) day 1 with the comparable Viflron. The highest release was Viflron Sense and Viflron Superfine 11.84% (±1.58). For the total amount of fluoride released over the 20 day period, analysis of variance showed that there was a significant fluoride dose response (F=100.02) and that there were significant differences between the materials (F=0.06).
Carbonated drinks are known to be detrimental to dental hard tissues. Diet carbonated drinks, which have been replaced by Nutrament, are a means by which the cariogenicity of soft drinks is being addressed. This study assessed the change in both plaque and salivary pH after rinsing with either a regular or diet carbonated drink. The drinks tested were the diet and regular types of Coke, Cola, Pepe Cola, and Fru Fru.

The control was done using phosphoric acid (10% HC1) to simulate the most extreme conditions. After the drinks were rinsed, the pH of the soft drinks was 5.4. Five, 10 samples of each drink were left on the bench for 3 hours, which allowed all the CO2 to be blown off. The pH of all drinks did not change significantly, despite the fact that the soft carbonated drink was phosphate (Ni and Na), the hard drink contained citric acid (0.2% F). Six subjects, who had grown overnight fasted plaque, rinsed with 10 ml of each drink on 4 different occasions. For the two controls, the Nutrament produced little change in both plaque and salivary pH on any occasion. Rinse with the deionized water, however, produced a slight decrease in pH during the initial 5 min, but had recovered its initial value by 15 min. For the test drinks, results showed that the sugar-containing drinks always caused a drop in plaque and salivary pH, whereas the diet equivalent drinks had no net pH effect. This study indicated that diet soft drinks may be considerably less detrimental to the hard dental tissues than their regular equivalent. Frequent consumption, however, may still pose a dental erosion due to their low intrinsic acidity.
874 Divisional Abstracts: The British Society for Dental Research

416 F B ROBINSON*, B J MILLAR, J TAYLOR (King's College Dental School, London): Assessment of UCAS forms as a predictor of dental student performance.

The aim of this study was to assess whether certain criteria on prospective dental students' UCAS application forms could help predict their undergraduate performance. Details provided by UCAS included the candidate's type of school, their best grades, and an Audit Officer's report. Pencil and paper examination results in anatomy, biochemistry, physiology, and pharmacology, were used as a measure of academic achievement. The continuous assessment data from the UCAS application forms included the student's patient treatment quality, attendance, work volume, completion rates, and variety of procedures. Using these data, the students were divided into three groups, based on their examinations. There was no significant difference between these groups in terms of their statistics on the UCAS application forms. The further analysis according to the CPITN scores was increased with age, but more than half (63%) of the sample had a CPITN score of 3 or less at one sextant, and 69% of the older age groups (over 17 years). The results of these analyses showed that there was little evidence of associated tooth loss in the sample.

Caries levels were low but pericoronal caries is a more important issue for the maintenance of the dentition among the adults of the region.


There is concern that caries levels may be increasing in parts of the world where it was previously thought to be low. The aim of this study was to assess oral health among a convenience sample of adults resident on the Indo-Nepalese border. The sample consisted of 152 male and female subjects. They were examined in Chai, a village at the village health clinic and at the Mission's hospital. The examination included at least two sextants, and the results were presented as caries scores. There were no significant differences in caries scores between the sexes. The percentage of decayed teeth was 7.9% for females and 3.4% for males. The mean number of decayed teeth was 1.7 for females and 1.0 for males. These results are consistent with previous studies in the region.

419 S A WILLIAMS, R M SUMMERS*, A MOHAMMAD and I AHMED (Dept of Child Dental Health, University of Leeds, UK): The use of tobacco and ‘pan’ among Bangladeshi youth.

In the Indian sub-continent, oral cancer is the commonest form of malignancy, 99% of which is caused by local forms of tobacco use and/or ‘pan’ (betel leaf + nut + lime). A high prevalence of betel quid chewing occurs among first generation Bangladesh women aged over 25 years, now resident in the UK. The number of quid chewers in the UK is now estimated to be 500,000. This study aimed to investigate the use of tobacco and ‘pan’ in an urban Bangladeshi community in Leeds. The use of tobacco and ‘pan’ was assessed in a sample of 500 women aged over 25 years. The results showed that the prevalence of quid chewing was 22.3% and the prevalence of ‘pan’ chewing was 16.6%.

420 H J WILLIAMS & S A WILLIAMS* (Dept. Psychology, University of Surrey & Leeds Dental Institute, University of Leeds, UK): The use of ‘pan’ among young Bangladeshi & UK-born Bangladeshi people.

Since a high prevalence of betel quid (pan) chewing occurs among older first generation Bangladeshi (B) women in the UK (Summers et al. Community Dent Health 12: 11-16, 1994), this study assessed the use of the quid in younger Bangladeshi females in Leeds. Semi-structured interviews were held in community settings in West Yorkshire in English for 67 people (36 males, 31 females), aged mean 17.3 years (range 12-24 years). The 37 B-born had spent, on average, 13.7 years in the UK compared with 13.9 years for the 30 UK-born, since all but one of the 30 were born in the UK. The results showed that 74% of the sample had chewed at least once, and 42% regularly chewed. These findings were consistent with previous studies in the UK. The median age of the sample was 18 years (range 13-25 years). The results showed that there was little evidence of associated tooth loss in the sample.

Caries levels were low but pericoronal caries is a more important issue for the maintenance of the dentition among the adults of the region.

421 S KIVAN, S A WILLIAMS & M J PRENDERGAST (Leeds Dental Institute, University of Leeds, UK): Gender differences in oral health experiences and status among first year dental students.

A previous study among first year medical and dental student found few differences in background, attitude and caries experience (Gyi et al., J Dent Res 70(10):805-813, 1991). This study aimed to identify gender differences in dental experience and health status of first year dental students. The sample consisted of 500 students aged 18-22 years, with 250 males and 250 females. The results showed that there were no significant differences in caries levels between the sexes. However, there were significant differences in the use of tobacco and ‘pan’ chewing, with males being more likely to chew than females.

422 S BOSWORTH*, S Kwan & S A WILLIAMS (Northallerton Health Services NHS Trust & Leeds Dental Institute, University of Leeds, UK): An inquiry into social class differences in dental experiences of dental students.

Social background is strongly associated with oral health and related behaviours. This study aimed to explore past dental experiences of first year dental students at Leeds by social class and by family association with doctors and dentists. During the year 1989-90, 275 students (age 17-21 years) completed a questionnaire and were socially classified. Of these, 188 students came from Social Class I-II (40%) and Social Class III (60%). Nine groups (IV-VI, Group B, 38 were sons and 50% of the sample were daughters of doctors and dentists (Group C). Results for Groups A & C, respectively: mean age 19.1 (years) (40%); reported 6 monthly dental checks (79%, 68%, 18%); dietary changes (39%, 30%, 37%) or fear of dental visits (40%, 39%, 50%), 65% of the sample had experienced some pain in the mouth (53%, 52%, 50%), and ulcers (51%, 49%, 33%) or used topical anesthetic cream (50%, 41%, 20%), oral treatment provided (51%, 45%, 33%) and oral hygiene advice (67%, 58%, 60%). Mean DMTF scores were 3.1, 4.3, 7.0 and mean DF scores 1.4, 4.5, 8.2. The number of females students were 1.40, 51.6 respectively.

It is concluded that, among this self-selected group, there are no statistically significant differences in past dental experiences reported. However, there is some variation in caries treatment and experience received.
List is known of the incidence and nature of dental emergencies experienced in young adult populations. This paper reports 4-year data collected in the running of a student emergency dental service (SEDSS) at the University of Manchester. Students presenting at the unit complete a questionnaire providing personal and dental details and reasons for treatment are recorded. Since the inception of the unit, data has been collected in respect of 3600 patients - data handling and analysis being computerised. The results indicate the annual demand for emergency dental care amongst the student population is at least 39 episodes per 1000 students. No significant differences have been identified between male and female and home and overseas students in terms of DMFT and CPTFR scores except in relation to the periodontal treatment needs of mature overseas students. Theconcerts were related to facial trauma and pulpitis symptoms (40%), followed by periodontal (19%) and periodontal conditions (11%). Treatment which is generally palliative rather than definitive involves temporary dressing (23%), local measures and prescriptions (55%) or in many cases advice only (7%). It is concluded that the incidence of dental emergencies experienced at the student population served by the SEDSS unit is relatively high, but that most of the most serious problems are of a simple nature requiring routine treatment. A SEDSS unit may be found in its potential element of a University's medical and welfare services for students.

The aims of this study were to develop and evaluate an index of Dental Treatment Experience (DTE). The DTE index was developed for a group of dental experts with the aid of the Nominal Group Technique. The index scored a sound tooth, a tooth with a single surface filling, a tooth with multiple surface fillings, a crowned tooth, a tooth restored by a bridge, a tooth restored by an implant and a tooth with a root filling. The index was calculated on the basis of the above criteria and was then standardised. The DTE index was found to be moderately suitable for its intended purpose, and was found to be useful for the rapid assessment of dental treatment needs.

To investigate the changes in the numbers, sources, and pattern of emergency treatment for patients which have occurred following the introduction of the new dental contract and the publication of the Framework pro, a longitudinal study was undertaken to investigate new patient presentation at the primary care unit of the Cardiff Dental Hospital in 1989, 1993 and 1994. 500 consecutive new patients attending the primary care unit were interviewed in May/June in each of the years 1989, 1993 and 1994; data were entered and processed using the SPSS statistical analysis system. Over the three years studied, the number of new patients seen increased by 45% and the proportion of patients in the different categories of treatment need appeared to be stable. A comparison was made of the DTE index calculated for each patient. The differences were found to be statistically significant.

The aims of this study were to validate dental practitioners' reasons for extracting teeth against independent clinical measurements. Twenty-four mouths from the Greater Manchester area were provided extractions from adult patients. For each extracted tooth the patient's age, gender and dental attendance were recorded, along with the reason(s) for extraction. 309 teeth were examined independently for caries, fillings and calculus. Evidence of caries was found on all the 110 teeth where caries was given as the primary reason for extraction. 80 teeth with a single reason given for extraction (either periodontal or caries) were randomly selected, stained, and the maximum loss of attachment measured. There was significantly more loss of attachment on teeth extracted for periodontal reasons (mean difference 3.7mm) than for caries (mean 6.8mm). (p<0.001). Loss of attachment was also found to be positively associated with the age of the patient, but not with gender or dental attendance.

The general dental practitioners' reasons for tooth extraction are valid.

Since a high prevalence of betel quid (pan) chewing occurs among elderly Croatian (Dalmatian) villages in Croatia, it was necessary to investigate a younger English-speaking population by country of birth.

Methods: Patients attending a facial pain clinic were asked to complete questionnaires measuring pain and mood prior to clinical examination. Kendall rank correlation coefficients were calculated to establish which factors related to acceptance of treatment.

Results: Pain severity, depression and anxiety were positively correlated with treatment uptake, while no significant correlation was found with age. Of physical factors, only concurrent neck pain was significantly associated with treatment uptake (r = 0.20; p<0.05) this may merely relate to the severity of the condition.

It is concluded that severity and mood influence treatment uptake rather than physical factors associated with chronic idiopathic facial pain.
432 S HARRISON*, C HOPPER AND M HARRIS. (Depts. Maxillofacial Surgery, Eastman Dental Hospital and University College London Hospitals): TMJ Arthroscopy: outcomes at 3 months.

The aim of this study was to assess the outcomes in patients following TMJ arthroscopy. All patients undergoing TMJ arthroscopy were assessed clinically and then complete a set of standardised questionnaire to assess pain, restricted movement and the use of medication. Of 46 patients, 12 patients were lost to follow-up, leaving 34 patients to complete the follow-up questionnaire at 3 months postoperatively.

The symptoms were assessed using a five-point scale ranging from excellent to poor. Mean follow-up was 3 months (SD 1.4 months). The questionnaire was administered by phone interview. The mean follow-up was 3 months (SD 1.4 months). The questionnaire showed that 34 patients had some improvement in their symptoms. The mean score was 4.0 (SD 1.4) at 3 months postoperatively.

433 COWEPP EG, ARMSTRONG RA, EVANS DJ, BRICKLEY MR, SHEPHERD JP. (Oral Surgery, Medicine and Pathology, UWCW, Heath Park, Cardiff CF4 4XY, UK): Patient perception of the costs and benefits of the third molar surgical removal

The third molar surgical removal has become increasingly popular in recent years. The aim of this study was to assess the patient's perception of the costs and benefits of the third molar surgical removal. A total of 100 patients were recruited for the study. The patients were divided into two groups: Group A (patients who had the third molar surgical removal) and Group B (patients who did not have the third molar surgical removal).

The results showed that the patients who had the third molar surgical removal were more satisfied with the outcome of the procedure than the patients who did not have the procedure. The patients who had the procedure were more satisfied with the results of the operation.

434 D RUSSELL*, P A BAGIONI AND P J LAMITY (School of Clinical Dentistry, The Queen's University of Belfast, UK): Host generation during pin chamber preparation.

When, as a result of caries or trauma, extensive tooth destruction has occurred, retention of plastic restorative materials is often necessary. This usually takes the form of self-filling dentine paste which has to be carefully placed to avoid ingress of the dentine to the pin on the one hand and the periodontal membrane on the other. One possible hazard to the pulp is the heat generated during the preparation of the pin chamber.

The object of this study was to measure the temperature generated during preparation of pin chambers using 0.06-mm radius drill (Widelog regular size pin) in a K-Vo intraoral 68°C heat source in 10 patients undergoing extraction of teeth. The drill was inserted into a K-Vo 68°C heat source and the temperature was measured using a thermocouple connected to a digital thermometer. The temperature was measured at the time of initial drilling and the mean temperature was recorded.

The results showed that the temperature generated during the preparation of the pin chamber was 68°C, which is within the safe limit for the pulp. This study indicates that the heat generated during the preparation of the pin chamber is not a significant hazard to the pulp.

435 S LAMOTTO* and I KAPAGODITIS (Department of Dental Medicine and Surgery, University of Manchester Institute of Science and Technology): Factors affecting patient satisfaction after orthognathic surgery.

This paper evaluates some of the factors that may be important in patient satisfaction following orthodontic treatment. A questionnaire was developed and a number of patients were surveyed. The questionnaire was administered to the patients at the time of their orthodontic treatment. The results showed that the most important factors affecting patient satisfaction were the aesthetic outcome, the duration of treatment, and the level of satisfaction with the final result.

The results indicated that the aesthetic outcome was the most important factor affecting patient satisfaction. The duration of treatment was also important, with patients who had longer treatment times being less satisfied with the result. The level of satisfaction with the final result was also significant, with patients who were more satisfied with the final result being more satisfied overall. In conclusion, the aesthetic outcome, the duration of treatment, and the level of satisfaction with the final result are all important factors affecting patient satisfaction after orthognathic surgery.
Acute alcohol exposure is a common finding in trauma patients. This study investigated the potential interaction of transforming growth factor-beta (TGF-β) and alcohol in the regulation of collagen synthesis and the dermal wound healing process. The effect of alcohol on basal and TGF-β-induced collagen synthesis was studied in vitro in human dermal fibroblasts. Cultures of dermal fibroblasts were established, and maintained in DMEM at 5% CO2 in a humidified atmosphere. Collagen synthesis was assessed by two different methods: (i) radioimmunoassay and (ii) Western blot analysis. Measurements persisted for at least 36 hours. Significant differences were seen in both measurements, with alcohol reducing collagen synthesis by 30-40%.

The majority was examined in the presence of 0.1-36% alcohol (Mann-Whitney U-test, P < 0.05). The proportion of spontaneously active units appeared higher at short recovery periods, while the proportion of units that were sensitive to mechanical stimulation was significantly higher at short recovery periods (Mann-Whitney U-test, P = 0.05). A spontaneous activity recorded at 5% of the units with discharge rates of 0.1-2.9 impulses s⁻¹. The proportion of spontaneously active units appeared higher at shorter recovery periods, and the proportion of units that were sensitive to mechanical stimulation was significantly higher at shorter recovery periods (Mann-Whitney U-test, P = 0.05). The majority of the spontaneously active units (92%) was also mechanically sensitive. There was no significant difference between the two groups, with median 3 mm² without (or 30 mm²) spontaneous activity (P > 0.05) or with (31 mm²) spontaneous activity (P > 0.05).

These data reveal that some changes in lower limb motor neurons are spontaneous and mechanically sensitive and the incidence of such units appears higher in the early stages after injury. Supported by the Wellcome Trust.

The skin was measured to explore the exposure to nitrous oxide of staff during dental general anesthesia procedures and to investigate the activity of a scavenging system to reduce these levels. Nitrous oxide levels were measured over a one-week period using diffusive sampling techniques (Elmore E, Claremont, California, dental surgery, nursing sister). Separate measurements were made in the morning and afternoon sessions giving 10 measurements for each staff group. Details of odour, local anaesthesia, and amount of nitrous oxide were collected (Molynex Vet, Claremont, California, dental surgery, nursing sister) to assess the impact on the anaesthetist, dental surgery, and nursing sister. Separate measurements were made in the morning and afternoon sessions giving 10 measurements for each staff group. Details of odour, local anaesthesia, and amount of nitrous oxide were collected (Molynex Vet, Claremont, California, dental surgery, nursing sister). Separate measurements were made in the morning and afternoon sessions giving 10 measurements for each staff group. Details of odour, local anaesthesia, and amount of nitrous oxide were collected (Molynex Vet, Claremont, California, dental surgery, nursing sister).

The scavenging system was effective in reducing nitrous oxide levels.

Lingual nerve damage during third molar surgery may sometimes be attributed to the elevation of a lingual flap and suction of a Howarth’s personal technique. This technique is intended to protect the nerve from more serious damage but its efficacy has not previously been evaluated. This study has compared the incidence of temporary and permanent lingual nerve injury following 773 operations randomly allocated to be carried out with or without lingual flap retraction. The surgery was carried out under local or general anaesthesia by hospital staff surgeon, who was the lead investigator of the study. Each procedure was recorded and the outcome determined at review appointments approximately 6 weeks post-surgery. A week later sensory distribution was recorded in 200 cases (26.2%) and 100 cases (25.9%) resulted in lingual sensory disturbance following 20 operations (6.9%) and persisting following 3 operations (0.9%). Lingual nerve damage was identified in 1 (0.4%) and 2 (0.5%) patients following the operation. The surgery was performed using a Diode modified Omnicare surgical light source, without any form of myostomy. ECG recordings and arterial blood pressure were recorded before, during and after surgery. The results of the study showed that the technique is one of the most effective methods of protecting the lingual nerve during third molar surgery, and it is recommended for clinical practice.

We conclude that adjuvant lingual flap retraction reduces the incidence of temporary lingual nerve injury and does not increase the incidence of permanent injury. These data suggest that where possible, lingual flap retraction should be avoided.

The results of this study suggest that these bar staff were not at increased risk from hepatitis B infection. However, these staff members have shown signs of change from glassware workers. This emphasizes the need that has been expressed in a previous report (Shepherd JP et al, Injury 1943; 21:229-232, 1956) for introduction of a code of practice regarding glassware workers.

The results of this study suggest that these bar staff were not at increased risk from hepatitis B infection. However, these staff members have shown signs of change from glassware workers. This emphasizes the need that has been expressed in a previous report (Shepherd JP et al, Injury 1943; 21:229-232, 1956) for introduction of a code of practice regarding glassware workers.

The results of this study suggest that these bar staff were not at increased risk from hepatitis B infection. However, these staff members have shown signs of change from glassware workers. This emphasizes the need that has been expressed in a previous report (Shepherd JP et al, Injury 1943; 21:229-232, 1956) for introduction of a code of practice regarding glassware workers.
A number of our patients have occurred in the last 10 years. This study characterized these changes between 1983 and 1993 and evaluated the potential in-patient resource benefits of treatment with rigid fixation versus intermaxillary fixation.

A cross-sectional study was undertaken of the presentation and management of fractured mandibles over 10 years (1983-1993) in Cardiff. Demography of patients in both years was similar; the majority were male (81.4% vs 83%) and 50% of the patients presented for treatment between the hours of 10PM and 5AM. There were marked differences in the numbers of patients waiting more than 24 hours for an operation (46%, 1983; 34%, 1993) and out-of-hours operating (60% of operations in 1983; 41% in 1993). Changes in the management of treatment included a decrease in the use of intravenous sedation or general anaesthesia (IQA) and an increase in internal fixation using bone plates (26% in 1983; 53% in 1993). Total in-patient stay did not change in the 2 years (mean = 3 days) and there was no difference in duration of stay between treatment modalities (internal versus intermaxillary fixation).

These data show how the management of trauma patients has been made more efficient and effective to the rationalization of multifaceted trauma services and by the introduction of new methods of treatment.

The increase in [Ca\(^{2+}\)] which links stimulus to secretion in salivary acinar cells is a complex process. Reuptake of Ca\(^{2+}\) from extracellular stores (Taubmann et al. 1992) and reuptake into intracellular stores have been measured [Ca\(^{2+}\)] using microelectrophoresis techniques in order to investigate the extent to which thygipagin is able to mobilize Ca\(^{2+}\) in salivary acinar cells. In the absence of extracellular Ca\(^{2+}\), 3µM thygipagin caused a transient increase in [Ca\(^{2+}\)] which peaked at 190 ± 4µM (n=8) following exposure to thygipagin, stimulation by acetylcholine (200nM-3µM) did not increase [Ca\(^{2+}\)]. Further experiments using 1µM thygipagin, repeated stimulation to 500nM ionomycin, which is able to release all Ca\(^{2+}\) contained in intracellular stores, produced only a small increase in [Ca\(^{2+}\)] (<100nM, n=4). Together these data demonstrate that thygipagin is able to mobilize almost all the releasable Ca\(^{2+}\) sequestered within the cells including all that is normally releasable by acetylcholine.

We conclude that thygipagin is an effective tool for exploiting intracellular Ca\(^{2+}\) stores in salivary acinar cells which may be used to elucidate the mechanisms which underly the changes in [Ca\(^{2+}\)] involved in stimulus secretion coupling.

P.M. SMITH* and H.E. REED (Oral Biology Unit, School of Dentistry, The University of Liverpool, UK). Calcium estimation in acutely isolated mouse submandibular acinar cells.

In mice submandibular acinar cells, thygipagin may be shown to mobilize practically all the Ca\(^{2+}\) contained in intracellular pools. Furthermore, it may be shown that slowly leaking the intracellular pools using thygipagin does not cause a massive, cytotoxic, increase in cytoplasmic Ca\(^{2+}\) concentration because Ca\(^{2+}\) is rapidly cleared from the cell via the plasma membrane. Using microelectrophoresis techniques to measure [Ca\(^{2+}\)] in single cells we have observed that the absence of extracellular Ca\(^{2+}\), application of a sub-maximal [Ca\(^{2+}\)] (500nM) during the rising phase of the response to thygipagin caused a decrease in the amplitude of the rise in [Ca\(^{2+}\)], without any significant alteration of the time course of the response. As thygipagin alone is capable of mobilizing all releasable Ca\(^{2+}\), this increase in amplitude is likely the result of an inhibitory process (mediated by protein kinase C) blocked by the presence of extracellular Ca\(^{2+}\). In conclusion, these results indicate that high concentration of extracellular Ca\(^{2+}\) will not impair the ability of thygipagin to mobilize Ca\(^{2+}\) from intracellular stores.

We conclude that thygipagin may be able to inhibit Ca\(^{2+}\) extraction and thus may be used to increase in [Ca\(^{2+}\)], following release of Ca\(^{2+}\) from intracellular stores.
Several systems exist for the classification of skeletal muscle fibre types, including those based upon physiological properties and the expression of myosin heavy chain proteins. It has been suggested that fibres can be classified on the basis of their ultrastructural characteristics, especially the Z- and M-line widths and the mitochondrial density. The aim of this study was to assess whether the same ultrasound-derived relative difference could be used for fibre classification. The extensor digitorum longus (EDL), soleus and superficial tibialis muscles were removed at their physiological resting length from 6 female, 84 day old Wistar rats. Following fixation in phosphate buffered formaldehyde, the muscles were dissected out, stained and viewed. In control sections, the EDL had a latency of 40 ± 0.8 ms and a duration of 37 ± 3.0 ms (means ± SEM). Five minutes later, immediately after a 1 min conditioning period during which the subject had undergone vigorous exercise of a lower arm while its blood supply was blocked, the reflex duration was reduced to 43 ± 2.3 ms. This was due almost entirely to an effect at the beginning of the reflex as evidenced by a significant increase in its latency (by 13 ms; P < 0.005, Student's paired t-test). By contrast, in similar experiments when noxious cutaneous stimulating stimuli (submersion being a 45°C water) were used, reflex latencies (P < 0.05; n = 10) occurred at both ends of the reflex with starting 10 ± 3.2 ms later and finishing 14 ± 5.1 ms earlier than in controls. This indicates that noxious stimulation of remote deep somatic, but not cutaneous, structures can selectively delay the early part of an inhibitory reflex.

It is concluded that on the basis of the combined assessment of Z-line width and mitochondrial density, three major fibre types (type I, IIA and IIB) could be identified from the muscle studied.

Expression of the nuclear phosphoprotein Fox A is very low in the brain stem and spinal cord of normal animals. After nociceptive stimulation of the periphery, it is rapidly expressed in the appropriate spinal cord segments and can be detected using immunocytochemical techniques. The aim of this study was to map the expression of the trigeminal sensory complex involved in nociceptive processing, by examining the distribution of Fox A in the trigeminal system after tooth pulp stimulation. The adult female rats were prepared under isoflurane anaesthesia, using bilateral supraorbital, infraorbital, and incisive incisions. The mandibular incisors were exposed, and 0.7% nitric acid was applied to a large area of the incisal edge. The incisors were separated from the underlying bone with high-speed, air-cooled, diamond burrs. Rats were killed by intravenous injection of 100 mg/kg of thiopental. The heads were removed and immersed in 10% neutral buffered formalin. After 24 h, the heads were dehydrated and embedded in paraffin. Serial sections were cut at 4 μm, mounted on coated slides, and stained with hematoxylin and eosin. The expression of Fox A was mainly localised to the trigeminal nuclei in the brainstem and spinal cord. To confirm the expression of Fox A in the trigeminal nuclei, immunohistochemistry was performed using a polyclonal anti-Fox A antibody. Immunoreactivity was detected in the nucleus of the trigeminal trigeminal motor nucleus, the principal sensory nucleus and the spinal trigeminal nucleus. It was concluded that Fox A has a significant role in the nociceptive processing of the trigeminal system.


Cytokeratins are a large multigene family of proteins which constitute the major cytokeratin component in epithelial cells. In man there are about 40 genes which express more than 20 different keratin polypeptides grouped into two subfamilies of type I and type II keratins which are differentially expressed as specific pairs of a type I and type II polypeptide. In the mitotically active areas of oral epithelium, the major cytokeratin in the oral keratinized stratified squamous epithelial layer is expression of either K10/K6 or keratinized epidermis (skin, gingiva, hard palate) or K17/K14 in keratinized oral epithelium. In overlying and subjacent layers of the oral keratinized epithelium, the K3/K13 pair is expressed. The K13 expression is altered. An understanding of the mechanism of keratinization in 13 expression will provide important information for the understanding of the molecular disorder of keratin disease. The oral keratinization is involved in the mechanism of oral dental plaque, dental plaque and oral cavity cancer cells, the pattern of K13 expression is altered. An understanding of the mechanism of keratinization in oral mucosa has been cloned K13 gene by using a polymerase chain reaction (PCR) and the concentration range 10-1000 μM IL-1β significantly inhibited (p<0.01) IL-1β as a cell-inhibited collagen gel contraction was dependent on the presence of serum.

C. Irwin*, C. Rice†, M. Smyth* and S. Schoff (Queen's University, Belfast, Dundee Dental Hospital): The effects of IL-1β on fibroblast-induced collagen gel contraction is considered to closely reflect wound contraction in vivo and so may be used as a model system for investigating the effects of the inflammatory cytokine IL-1β (IL-1) on contraction of the collagen gel. The cells were isolated from the gingival fibroblasts in periodontal disease and characterized in vitro. The concentration range 10-1000 μM IL-1β significantly inhibited (p<0.01) IL-1β as a cell-inhibited collagen gel contraction was dependent on the presence of serum. The effects of IL-1β on collagen gel contraction, and the mechanisms through which these effects are mediated, are dependent on the presence or absence of serum components in the culture medium.


A multicomponent evaluation of the oxidative consumption of salivary biomolecules by a commercially available oral rinse was performed and the reaction products of chloroform, CO, and NO have been investigated using high resolution 1H NMR spectroscopy. Unstimulated human saliva samples were obtained from twenty patients. Immediately after collection all samples were centrifuged, supernatant removed, and the aliquots of each sample to be examined. Each sample was mixed with 300 μl of 0.5 N HCl. The mixture was incubated at 37°C for a 30 min period prior to 1H NMR analysis. Aqueous solutions containing 100 mL 10 mol dm−3 nitrous acid, L-lysine or L-methionine were prepared in 4.00 x 10-3 mol dm−3 phosphate buffer (pH 7.0). Aliquots of each solution were incubated with the oral rinse at 37°C for 30 min. The samples were dried and analyzed using high-resolution 1H NMR spectroscopy (Bruker AVANCE 200). The results demonstrated that CO, present in the preparations affected the oxidative decarboxylation of salivary proteins (to acetic and CO2). Experiments conducted on chloroform model systems confirmed the oxidative decarboxylation of the oral rinse by using the amino acids cysteine and methionine (precursors to volatile sulphur compounds responsible for oral malodour) were oxidatively consumed.

High resolution 1H NMR spectroscopy is a technique of much utility concerning multicomponent evaluation of the masticatory actions of a chloroform-containing oral rinse.
A.J. McGHEE*, P.A. ROBINSON, W.J. HUME
(Division of Dental Surgery, Leeds Dental Institute, Leeds, UK)
PCNA immunoreactivity in multinucleated cells of giant cell tumors of the oral cavity and peri-angial giant cell tumors.

Multinucleated cells (MNCs) in giant cell tumors (GCTs) are thought to originate from local fibroblasts (Odent et al, J Oral Pathol Med 23: 287-4, 1994), whereas MNCs in peri-angial giant cell granulomas (PGCG) probably form by fusion of differentiated mononuclear cells derived from bone marrow (Bensimon et al, Oral Surg Oral Med Oral Pathol 79: 4; 1995). GCTs and PGCGs have different patterns of nuclear immunoreactivity to proliferating cell nuclear antigen (PCNA), a marker of deoxyribonucleic acid (DNA) synthesis and repair. To test this hypothesis, we investigated archival, formalin-fixed and paraffin-embedded specimens from GCTs, and compared with PCNA immunoreactivity.

Consideration was given to the complexities of PCNA immunohistochemistry (Morrison et al, Histopathology 22: 543-5, 1993) with evaluation of different anti-PCNA antibodies available at the time. Immunohistochemical analysis of formalin-fixed and paraffin-embedded tissue was done by immunohistochemical methods. PCNA immunoreactivity was observed after autolysis and the results described were consistent for anti-PCNA antibody dilutions between 1:10 and 1:600 (v/w). PCNA immunoreactivity was observed in nearly all nuclei of each GCT MNC. However, within a single MNC, nuclei could be either PCNA-negative (NA) or PCNA-positive (P). Numerous MNCs were NA, whereas intensely PCNA-positive nuclei were PCNA-positive. The patterns of PCNA immunoreactivity described support 1. (1) GFAP-immunoreactivity by fusion of recently Schwannian peripheral mononuclear cells; or 2. Neuronal cell nuclei without oligodendroglial division.

G.BOWES*, V.SIVARAJASINGAM*, M.BRISOLLA, P.BRICE & G.GODDEN
(Department of Dental Surgery & Periodontology, University of Dundee, UK)
Effect of significant wear on saliva production in cigarette smokers.

The aim of this study was to examine the effect of different doses of cigarette smoke on saliva production and on the expression of anterior and posterior teeth.

The results indicated that there was no significant difference in saliva production between smokers and non-smokers. However, smokers had a significantly lower expression of anterior teeth than non-smokers.

The study also showed that there was a significant difference in saliva production between smokers and non-smokers. Smokers had a significantly lower expression of anterior teeth than non-smokers.

However, smokers had a significantly lower expression of anterior teeth than non-smokers.

---

A.WIGHT, V.SIVARAJASINGAM*, P.BRICE, J.WOFFE & G.GODDEN
(Department of Dental Surgery & Periodontology, University of Dundee, UK)
Cytological quantification of buccal mucosal cell effect of alcohol.

The aim of this study was to determine the effect of alcohol consumption and smoking on nuclear and cytoplasmic areas of buccal mucosal cells. Two groups of smokers were compared: Group A (n=10) who smoked >20 cigarettes per day; and Group B (n=10) who smoked <20 cigarettes per day.

The results indicated that there was no significant difference in nuclear or cytoplasmic areas between the two groups. However, there was a significant difference in the ratio of nuclear to cytoplasmic areas, with Group A having a significantly higher ratio than Group B.

Additionally, there was a significant difference in the ratio of nuclear to cytoplasmic areas between smokers and non-smokers, with smokers having a significantly higher ratio than non-smokers.

The study also showed that there was a significant difference in the ratio of nuclear to cytoplasmic areas between smokers and non-smokers, with smokers having a significantly higher ratio than non-smokers.

---

J. WOFFE, E.KENNARD, M.GREENG, A. GODEEN
(Department of Dental Surgery & Periodontology, University of Dundee, UK)
Effect of significant wear on saliva production in cigarette smokers.

The aim of this study was to examine the effect of different doses of cigarette smoke on saliva production and on the expression of anterior and posterior teeth.

The results indicated that there was no significant difference in saliva production between smokers and non-smokers. However, smokers had a significantly lower expression of anterior teeth than non-smokers.

The study also showed that there was a significant difference in saliva production between smokers and non-smokers. Smokers had a significantly lower expression of anterior teeth than non-smokers.

However, smokers had a significantly lower expression of anterior teeth than non-smokers.

---

T.Y. YANG*, P.B. ROBINSON and R.D. RAINING (King's College and Department of Clinical Sciences, London, UK): Assessment of PVD TiN coatings for dental instruments.

The aim of this study was to compare the cutting efficiency of stainless steel (SS) cutting instruments with those coated with titania nitride (TiN).

TiN-coated SS instruments were compared with uncoated SS instruments. The TiN coating was found to be more efficient in cutting soft tissues than uncoated SS instruments.

The TiN coating was found to be more efficient in cutting soft tissues than uncoated SS instruments.

---

W.A. WADW, J.R. HEATH and D.C. WATTS
(University of Manchester, UK): Physical characterization of the kinesin-1 heavy chain.

The kinesin-1 heavy chain (KHC) is a member of the kinesin superfamily of molecular motors that move along microtubules, and is involved in a variety of cellular processes. This study aimed to characterize the KHC at the molecular level.

The KHC was purified from cells using a specific antibody against the KHC. The purified KHC was then analyzed using various techniques, including mass spectrometry and circular dichroism.

The results showed that the KHC had a molecular mass of approximately 580 kDa, and was composed of two distinct domains: a globular head domain and a helical tail domain.

The head domain contained several conserved motifs that are characteristic of kinesin family proteins. The tail domain contained a series of repeats that are involved in binding to microtubules.

---

J. VERSEAPP and C. MARTIN (School of Biological Sciences, University of Manchester, UK): Adhesion of Candida to acrylic and silicome of different surface topographies.

Silicone adhesion in higher numbers to roughened surface material (acrylic) than to smooth (Vesalius L203, 2.5:19). The number of adherent cells was significantly higher (p<0.05) by physical vapor deposition (PVD). Silane was processed on a sheet of acrylic, 2.4g silicone was processed on a vacuum mixed dental stone. Acrylic was roughened significantly using a roughness of 2.5g with 0.01 1.5 and 1.0 mm were used as soft acid. Smooth acrylic had significantly lower adhesion (silicone samples were too thin to be used).

Silicone was processed on a sheet of acrylic, 2.4g silicone was processed on a vacuum mixed dental stone. Acrylic was roughened significantly using a roughness of 2.5g with 0.01 1.5 and 1.0 mm were used as soft acid. Smooth acrylic had significantly lower adhesion (silicone samples were too thin to be used).

Silicone was used in facial prostheses and was normally processed on dental stone. The roughness of the surface increased the adhesion of silicone to different silicome of different surface topographies.
Room-temperature vulcanizing (RTV) denture soft lining materials have been associated with high water absorption. A previous investigation demonstrated that the high absorption of an experimental RTV silicone material was significantly reduced by a modification of the curing cycle. The aim of the present study was to modify the filter content of the experimental material in order to produce a material with low water absorption. Three new formulations were prepared, each containing different combinations of ingredients. The materials were tested for 24 hours and then stored at room temperature. Water absorption, solubility and volume change of the formulations were determined using standard experimental techniques. All formulations demonstrated greatly reduced water uptake at 3 months. One formulation was found to be better than the others in terms of its physical characteristics and water absorption of 1.82%, solubility of 0.75%, and volume change of 1.13% at equilibrium. Modification of the filter content of an experimental RTV silicone soft lining material has produced a material with low water absorption characteristics.
479

This in vivo study investigated the effect of mouthwashers on the surface hardness of specimens of resin composite and glass ionomer cement. Specimens were prepared and divided into two groups, one group receiving mouthwashers and the other control. Specimens were immersed in the respective mouthwashers for 24 hours, then subjected to hardness testing to evaluate the effect of the mouthwashers. The results showed that the use of certain mouthwashes might be found to reduce the surface hardness of resin composite and glass ionomer cement.

480

A three-dimensional finite element (FE) model was developed to predict the evolution of the temperature distribution in a sound and restored premolar subject to thermal shock. A finite element model incorporating elements representing enamel, dentine and a Class I amalgam restoration was constructed. The FE method program AMAVIS was used to predict the thermal response of a sound premolar tooth during transient heat conduction corresponding to high (65°C) and low (2°C) temperature cycles. The results showed that a maximum temperature of 56.2°C was reached at the buccal tip of the crown after 3.6s in both the sound and restored tooth. The thermal gradient in the restoration was much lower than in the corresponding region of the tooth. The effect of the restoration on the isotherms was less apparent. The model will be used to investigate thermally induced stresses at the interface between the restoration and tooth.

481

There are several plausible models for the pattern of tooth loss in adult dental patients. The aim of this study was to explore the relationship between the number of missing teeth and the subsequent experience of tooth extractions is adults to determine whether previous tooth loss is a reliable indicator of future experience of extractions.

The subjects were 720 Scottish adults who were dentate in 1978. All were dentally examined as part of the Adult Dental Health Survey in 1978 and gave permission for their NHS dental treatment to be used for research purposes. Of these, 407 had had at least one tooth extracted at follow up. Subjects who had fewer than 20 teeth in 1978 (n=201) experienced an average of 2.7 extractions in the next 10 years compared with an average of 1.1 extractions among those with 20 or more teeth (n=499) (Mann-Whitney U Test, p<0.001).

The findings indicate that previous tooth loss appears to be an indicator of future dental extractions.

Supported by the Scottish Office Home and Health Department.

483

The aim was to investigate the relationship between cigarette smoking and function involvement of molar teeth. A consecutive group of 50 smokers (>10 cigarettes/day for >10 years) and 50 non-smokers (≥18 years old) were recruited for a periodontal examination of age and gender matched with never smokers. The smokers consumed an average of 18.0 (SD 6.7) cigarettes per day and had smoked for 20.7 (SD 6.5) years.

Radiographic examination of all molars was performed by an investigator who was blind to the smoking status. Differences between the radiographic assessment of function involvement at the two examinations were subsequently resolved by discussion between two investigators. The investigators had the same mean of molar teeth 6.7 (SD 2.6) as the never smokers, 7.3 (SD 2.3), t=1.2, P=0.22. A higher proportion of function involvement (21%) in smokers than in the never smokers (13%), χ 2 test, P=0.005. The odds ratio for a smoker having one molar with radiographic evidence of function involvement was 4.6 (c.1.2 -10.6). Smokers had more moles with function involvement 1.6 (c 1.7) compared with never smokers, 0.94 (SD 1.4), t=3.1, P=0.003.

485

The prevalence of tooth sensitivity (Cervical Desensitising Sensitivity [CDS]) in adult populations indicates that 8-35% of subjects reported CDS depending on the population studied and the methodology used. Few studies, however, have reported on the prevalence of CDS in periodontal patients. The aim of the study was to determine the prevalence, severity and distribution of CDS in patients referred for specialist periodontal diagnosis. 51 patients (27M:24F, Mean Age 48.5 years [SD 11.43] who gave their informed written consent were clinically evaluated for CDS using comprehensive periodontal examination and subjective evaluation. Other clinical variables (e.g., plaque and recession scores) were also recorded at this visit. Regression analysis and correlation coefficients were used to determine the relationship between the clinical variables. The relationship between tissue type and sensitivity was found to be significant between 72.5% to 98% of patients, with no significant gender difference. Results for the distribution of tooth types showed that molar teeth were mainly affected, followed by lower canines and premolars. No correlations were noted between gingival, plaque, response to tactile and-stimulation. Pain response from tactile and thermal stimulation showed no significant difference between tooth surfaces. Cold stimulation was perceived to be the dominant pain-producing stimuli at all sites and was more prevalent in patients with inflammatory periodontal conditions.

486

Antioxidant vitamin status may influence the responses of the periodontal tissues to plaque and its products and, through their role as free radical scavengers, may have a part to play in the treatment and prevention of periodontal disease. This study aimed to ascertain whether a relationship existed between dietary intakes of antioxidant vitamins (vitamin C and vitamin E) and the severity of inflammation of the periodontal tissues. A cross-sectional study was conducted in a rural community in the upper right quadrant of their mouth for 21 days. Gingival health (Plaque score, modified gingival index (MGI) (Lobene et al. Clin Prev Dent 8 3-6, 1986) and gingival crural index (GCI) flow) were assessed at baseline and at 7 day intervals thereafter. Dietary intakes of antioxidant vitamins were quantified using a food frequency and amount questionnaire (O'Brien and Nelson, Proc Nutr Soc 32 63A, 1983). Relationships were investigated using Pearson's correlation analysis. No associations were found between dietary antioxidant intakes of any of the vitamins and GCI or MGI scores. These data do not show a relationship between dietary intake of antioxidant vitamins and gingival inflammation. The relationship between blood and GCF antioxidant concentrations and development of experimental gingivitis needs to be examined.
The potential importance of free radical damage in the pathogenesis of periodontal disease lies to anecdotal reports of the use of free radical scavenger treatments (e.g. vitamin C). The aim of this study was to determine whether total antioxidant status (saliva and serum) is altered in chronic adult periodontal disease.

Antioxidant capacity was determined using an enhanced chemiluminescence method (Whitehead TP, Thorpe G & Maxwell S, Anal Biochem Acta 366: 265-277, 1997). The method was calibrated with a better protein substrate and results expressed as a standard.

It was found that the total antioxidant status was significantly lower in periodontics (0.17±0.05 unit/ml) compared with controls (0.31±0.12 unit/ml). These results indicate that chronic periodontitis may be associated with reduced salivary antioxidant capacity, possibly due to excess free radical release from disease sites. Further studies are in progress to investigate whether similar changes can be detected in gingival crevicular fluid.

Gingival overgrowth is frequently associated with cyclosporin A (CsA) therapy. This study aimed to investigate the effects of CsA and the inflammatory mediator TGFp, on growth and protein production by gingival fibroblasts from patients with nephro-arteritis (Cic) induced solely by cyclosporin A, and fibroblasts derived from normal subjects (N) in aged and sex matched controls. Cultures were maintained in a media containing 3% (w/v) FCS, 37°C. Human gingival fibroblasts were cultured in medium, two samples were tested in each culture model. All the culture models were significantly stimulated by the combination of CsA and TGFp, but to a markedly lesser degree than TGFp alone, which caused a two-fold increase in protein production.

It is concluded that the solubilized mediator TGFp may have a role as a co-factor in the pathogenesis of gingival overgrowth.

This work was supported by the Sir Iain Chalmers Trust.

Human Type I collagen sponges were manufactured following the method outlined by Chung and Miller (Science 183: 1200-1217, 1974) and impregnated with Tetracycline, Clindamycin, Metronidazole, Ibuprofen 25 and Ibuprofen 50. Extraction of shape by immersion and incubation in MEM at 37°C for 24 hours was carried out. Extract solutions were added at triplicate concentrations (60, 100, 160) to 96 well microtitre plates containing HGF (1000, 500, 1000, 1000, 1000, 1000, nM) and maintained at 37°C for 72 hrs. Proliferation and/or cytotoxicity was assessed by counting (a) cell density by crystal violet (b) DNA (c) protein synthesis, estimated by the incorporation of H-proline into non-delaysable macromolecules (d) collagen production, assessed by a specific enzyme degradation assay. Results indicated that HGF had no significant effect on the proliferative capacity or biosynthetic activity of either population of gingival fibroblasts.

This study suggests that HGF-DHT is of diagnostic importance in the pathogenesis of cyclosporin-induced gingival overgrowth, and its effects appear to be mediated through functional parameters other than cellular proliferation or matrix biosynthesis.

The aim of this study was to assess the effects of the culture supernates of Porphyromonas gingivalis (PGN) tissue Web on the collagenolytic and cell-substrate interactions of human gingival fibroblasts (HGF). HGF were exposed to supernatant from PGN conditioned TGFp reduced activity indicated that it was not a result of cell death. Most doses of TGFp, and TGFp containing supernatant for 18 hours. The supernatant was added to the supernatant and the supernatant was washed and washed with the supernatant. Reduction in both 37°C and 10°C supernatant were observed. Inhibition of these cells was abolished by the supernatant. Reductions in both 37°C and 10°C supernatant were observed. Inhibition of these cells was abolished by the supernatant.
The aim of the present study was to compare the effects of 25% metronidazole on subgingival neutral proteolytic enzyme activity of subjects with adult periodontitis. A split-mouth study was utilized with two parallel sites in front of the mandibular right and left first molar teeth in each subject. Treatment either by mechanical therapy as described by Rawlinson & Walsh (Dent J. 128, 161-166, 1999) or by two sublingual applications of 25% metronidazole 7 days apart, was randomly applied to the contralateral sites. Subgingival neutral proteolytic enzyme activity was monitored at baseline, one week, one month and three months using the renazol/blast blue collagen–powder assay (Walsh TF et al., Dent Res J 72, 719, 1993). The results showed that there was no difference between the treatments with regard to changes in the neutral proteolytic enzyme activity when assessed using the CA-squared test.

It was concluded that the sublingual application of 25% metronidazole gel was equally effective as mechanical treatment at reducing the level of pocket inflammation as assessed by the level of neutral proteolytic enzyme in the crevicular fluid.

---

**500** R P ALLAKER*, C R JARROLD, K A YOUNG, J H HARDIE* and M R HALEH* (Department of Periodontology, London Hospital Medical College) (Evaluation of topical minocycline in the treatment of elderly patients with periodontitis).

The efficacy of a 2% w/v minocycline gel (Dentocycline™) was evaluated in a split-mouth study of 22 older adults (mean age 70 years; age range 37-92 years) with chronic periodontitis. At baseline, patients received conventional scaling and root planning. Test and placebo gels were administered at contralateral disease sites at baseline, and at weeks 2 and 4. Clinical measurements and microbiological parameters were assessed at baseline and weeks 2, 4, 6 and 12. Reductions in gingival bleeding and plaque scores occurred with both test and placebo gels. Reduction in pocket depth was more pronounced at test sites in comparison to control sites. Levels of Porphyromonas gingivalis and Prevotella intermedia were reduced until week 6 at test sites only. Actinobacillus actinomycetemcomitans was not isolated from any sites sampled.

This study has shown that administration of a 2% minocycline gel, in addition to scaling and root planning, may be useful adjunct in the treatment of older adults with periodontitis.
503  A.L. COOKSON*, A. Wray, A.E. Jacob, P.S. Handley, (School of Biological Sciences, University of Manchester, UK): Characterisation and Speciation of Prevotella intermedia and Prevotella nigrescens.

The black pigmented obligate anaerobe Prevotella intermedia and Prevotella nigrescens have been implicated in periodontal disease and endodontic infections respectively. Despite being genetically related, both species share phenotypes that make separation difficult to perform without DNA probes. Two methods not requiring DNA probes to speciate P. intermedia and P. nigrescens have been published (Multilocus enzyme electrophoresis, Shah and Burhin, Int. J. Syst. Bacteriol. 42, 254-256, 1992 and phenotype-specific molecular methods Devine et al. FEMS Microbiol. Lett. 120, 259-264, 1994), but these methods cannot easily be used in all laboratories. The aim of this study was to find an alternative method to speciate both organisms. Potential properties investigated were the presence of surface structures, the production of proteases and surface protein profiles. Further surface structures were observed on all strains examined and strains of both species produced proteases. However, clear species discrimination of 14 P. intermedia strains and 19 P. nigrescens strains was possible by SDS-PAGE analysis of SDS cell surface extracts. P. intermedia was characterised by the presence of a 31kDa protein, while P. nigrescens was characterised by a doublet of proteins of approximately 28 and 35kDa. Protein profiles from other black pigmented anaerobes (Porphyromonas gingivalis, Prevotella denticola, Prevotella loewii and Prevotella melaninogenica) were clearly distinct from the P. intermedia and the P. nigrescens profiles. The use of protein profiles from P. intermedia and P. nigrescens therefore offers a rapid and convenient way of unambiguously distinguishing these from other black pigmented oral anaerobes.

505  H Wardle†, J. Bennett†, P. Hull†, L. Joseph†, D. Denning†, and D. Drucker† (Hope Hospital, Salford, University of Sheffield, University of Manchester): GLC characterisation of spirochaetes.

Isolation and identification of oral spirochaetes is of great importance for determining the pathogenic potential of spirochaetal diseases. The aim of this study was to isolate and to characterise spirochaetes using GLC. A collection of spirochaetes was obtained from the culture of subgingival plaque samples using modified New Oral Microbiological media. The presence of spirochaetes was confirmed by an electron microscopy technique. Spirochaetae denticola ATCC 35405 and T. vulcanis ATCC 35580, T. pallidum ATCC 33708 and T. saxonii ATCC 33534, were cultivated in the appropriate media. All the isolates were grown in broth. Non-volatile end-products were extracted from the broth using ether and chloroform extraction for volatile and non-volatile fatty acids respectively. Peaks that were observed were compared to those produced by sterile broth. Known standards were used to identify the peaks produced. Clinical isolates seemed to fall into two groups that were similar to fractions of T. denticola. Prominent peaks of volatile fatty acids corresponded to acetate and propionate acids and of non-volatile acids to lactic acid.

These preliminary results suggest that GLC is a very useful aid in the characterisation of clinical isolates of oral spirochaetes.

508  S Fatteh*, M. Abd†, D. Drucker†, L. Wardle†, and L. Joseph† (Turner Dental School, Manchester and Hope Hospital, Salford): Fusobacterium phosphatidylglycerol profiles analysed by FAB-MS.

The major phospholipid of Fusobacterium is known to be phosphatidylglycerol with smaller amounts of other polar lipids such as phosphatidylethanolamine. However, few studies have been examined and only lipid families have been sought. The aim of this study was to analyse individual polar lipid analogues, within each family present, using fast atom bombardment mass spectrometry (FAB-MS). Analysis was performed using an M/MS mass spectrometer. Samples were dissolved in a matrix of m-nitrobenzyl alcohol and analyzed by negative ion FAB MS using xenon. Major lipid peaks observed in the low mass region of mass/charge, m/z, 211, 225, 227, 241, 235, 255, 279 and 281 were consistent with presence of (16:0) 18:2, 16:0 18:2, 16:0 18:3, 16:0 18:4, and (16:0) 18:0. In the high mass region, major peaks observed were of m/z 618, 634, 644, 660, 662, 672, 688, 693 and 719 which were consistent with the presence of PE(17:1), PE(25:0), PE(25:0), PE(29:0), PE(31:2), PE(31:3), and PE(31:4). These lipid peaks were used to confirm the presence of LPS (PS) and F-Glycolipids. We conclude that FAB-MS can provide data on individual analogues of PE and PG from Fusobacterium not readily obtained by other means. Furthermore the phospholipid content is diagnostic for Fusobacterium.
The Random Amplification of Polyomaviral DNA (RAPD) technique has been used to differentiate closely related species of different bacterial genera and to determine the source of the same species. The potential for using RAPD to differentiate and characterize Treponema species was investigated. Nucleic acid was extracted from four different Treponema species (ATCC) and 10 clinical isolates. P. gingivalis and F. nucleatum were used as different controls. Both F. nucleatum and P. gingivalis were differentiated by their unique RAPD patterns. F. nucleatum showed a unique RAPD pattern when compared with other Porphyromonas species, whereas P. gingivalis could be differentiated only from other Porphyromonas species by RAPD. This study demonstrates that the RAPD technique may be of use in differentiating closely related species and in identifying new species that do not follow the existing RAPD patterns.

In conclusion, DNA probe tests for unidentifiable bacteria were successfully constructed. However, the presence of the target bacteria in clinical specimens was not detected.

In conclusion, DNA probe tests for unidentifiable bacteria were successfully constructed. However, the presence of the target bacteria in clinical specimens was not detected.

In conclusion, DNA probe tests for unidentifiable bacteria were successfully constructed. However, the presence of the target bacteria in clinical specimens was not detected.

In conclusion, DNA probe tests for unidentifiable bacteria were successfully constructed. However, the presence of the target bacteria in clinical specimens was not detected.
Selective decontamination is the inactivation of microorganisms known to be opportunistic pathogens in medically compromised individuals. The aim of this study was to determine the efficacy of selective decontamination (SD) of oral Gram-negative bacteria (GNB), known to cause serious systemic infections in children suffering from leukaemia and Non-Hodgkin lymphomas. Weekly oral washings were taken using 10 ml saline syringe free water for 30 sec in 12 leukaemic children (11 males, 1 female, mean age 10 years, range 4-16 years) during antimicrobial therapy. The washings were inoculated onto blood agar and McConkey agar and the frequency of GNB carriage was calculated and this was compared to the follicle episodes. The frequency of GNB carriage was compared to a group of age and sex matched healthy children. The SD regimen was 2% w/v Tobramycin, 2% w/v amphotericin and 2% w/v Colistin given as oral tablet. The children were also given Tobramycin for 20 - 80 mg i.m. per day) and Polymyxin (0.6 - 12 million units per day) systematically during intermittent periods. Only one faecal episode was suffered by the 12 leukaemic / lymphoma children, associated with oral GNB carriage; oral frequency of GNB carriage during SD was 2% in the control group, oral frequency of GNB carriage was 7%. SD appears to reduce oral GNB carriage associated with faecal episodes in leukaemic and lymphoma children.

The aim of the study was to assess the incidence of bacteremia following orthodontic banding. Guidelines on the prevention of endocarditis published in the United Kingdom do not consider the adjustment of orthodontic appliances to be of significance. There is considerable uncertainty among orthodontists about the need for antibiotic prophylaxis when fitting and removing orthodontic bands.

Thirty orthodontic patients with good oral health were included in this study. An orthodontic band was placed on a first molar tooth of each subject. Various blood samples were taken in the following way: immediately prior to the banding procedure and 3, 6, 12, 24 hours after the banding procedure. The blood samples revealed a comparatively low incidence of bacteremia (10%) following orthodontic banding.

The isolation of non-C. albicans species, resistant strains and multiple isolates from oral infections is increasingly reported. We therefore compared the recovery from two differential chromogenic media, modified Papageorgiou (PL, DiCor) and CHROMagar Candida (CHROMagar Co., Paris) with Sabourauds dextrose agar (SDA). A total of 41 patients attending either an IVF clinic (N = 19) or an oral medicine clinic, with clinical evidence of oral candidiasis, were recruited. Samples were taken using an oral rinse technique (10 ml at 37°C for 60s). 10% of sera and usually diluted sera were grown on the SDA, the blood culture bottles, and colour, with reference to the manufacturer's guide, were recorded and classified. Ten isolates per plate and those with colour or morphology variation were identified using the UAG test (Perry J L, C Clin Microbiol 28:2442-2425, 1987) or API 20C AUX 50% of patients harbouring yeast with multiple isolates being recovered from 1. There was no difference in the counts from the SDA or CHROMagar (p > 0.05) but a lower count was found with the PL medium, < 0.05. Non-C. albicans species were detected with an equal frequency on both differential media. The correlation between presumptive identification by colour only of C. albicans as the CHROMagar and the formal identification was excellent. In parallel cultures from clinical samples there was no difference in the total counts obtained on the SAB and CHROMagar. CHROMagar facilitated the reliable presumptive identification of C. albicans and aided the recognition of mixed cultures.

526 J M SHAGAMI*, D B DRUCKER and A J DUXBURY (Turner Dental School University of Manchester) Non-suppressive and non-suppressive orthodontic banding: effect of negative air ion (HAI) stress on Candida albicans.

The aim of this study was to evaluate the incidence of occult blood in a hospital orthodontic practice. The incidence of occult blood in the healthy population and the possibility of occult bleeding and multiple molecular bonding procedures was assessed. The detection of blood utilised the Kastle Meyer Test (McColl et al., Brit Dent J 1994, 176: 66-67). Cotton wool swabs were taken from the area of the tooth to be bonded and examined for occult blood with and without heat trays after the completion of each procedure and following standard disinfection regime. The swabs were placed in 9.95 ml PBS and vortexed for 30s and manually suctioned for 10s and then assessed for the presence of blood using the Kastle Meyer Test. Blood was found on all the surfaces tested, prior to disinfection. After disinfection the bracket table, lamp, bandpiece motor and band-containing tray all had occult blood present.

Orthodontic procedures such as bonding and debonding are associated with persistent blood contamination and could therefore be a source of cross infection. Simple disinfection procedures are not sufficient to remove all of occult blood.
888

THE PROOF OF THE PURCHASE ORDER

527

The purpose of this study was to determine the effect of sucrose on the colonization and growth of probiotic bacteria. Using pooled human saliva as a inoculum, biofilms were grown on the surface of tooth enamel from different species. The results showed that sucrose had a significant effect on the growth of probiotic bacteria in the biofilms. This finding suggests that sucrose may be a potential inhibitor of oral biofilm formation.

528

Currently there are gaps in the understanding of the relationship between host immunity, the virulence of Candida and the oral flora. The aim of the study was to investigate mucosal and serum responses to bladderspore and hyphal cell wall antigens of different Candida species. Separated antigens were added with pooled human whole saliva (pH), pure human whole saliva and immunoperoxidase serum (IgG) raised against bladderspore and hyphal forms of C. albicans. Western blotting was performed using these sera to detect specific Candida antigens. The results showed that the sera contained antibodies specific for Candida antigens, indicating that these antigens are present in the oral flora. The findings suggest that the oral flora may play a role in the immune response to Candida antigens.

529

Oral immunization with polyclonal co-glucone monoclonal antibodies against antigen efficiently induces both local and systemic immune responses. In the present study, we determined whether oral immunization with biopolymers might lead to a common mucosal response including salivary secretions. Female Balb/c mice were orally immunized with biopolymers containing antibodies at 0 and 4 weeks. Antibody responses were assessed by ELISA in saliva, gut washings, vaginal washings and serum, and antibody production cells were assessed by IFSP (immunofluorescence-staining) test. Of the antibodies detected in vaginal washings, saliva and gut washings which were significantly greater than those detected with soluble antigen for (p<0.05).

The results suggest that immunization with biopolymers induces common mucosal and systemic immune responses efficiently and may be effective against infections affecting a number of different mucosal surfaces.

530

Nitric oxide (NO) is a potential pro-inflammatory mediator produced by various cell populations (e.g., macrophages and endothelial cells) when exposed to endotoxins or pro-inflammatory cytokines. The possibility that the locally produced surface-associated material (SAM) of oral bacteria could induce NO synthesis has been studied. The murine macrophage cell line J774 was cultured in 96 well plates in the presence of various concentrations of SAM (or SAM plus interferon-g) from Actinobacillus actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Campylobacter rectus or Staphylococcus aureus. The effect of endotoxin and lipopolysaccharide from enteric bacteria was also tested. The production of NO was measured by nitrate-nitrite and aminoguanidine inhibition.Both the SAM's and 'endothelial NO synthase' inhibitors prevented the NO synthesis observed in the presence of the SAM's of A. actinomycetemcomitans, P. gingivalis, P. intermedia, C. rectus and S. aureus.

531

Fibroblasts are an important source of IL-6 in many chronic inflammatory conditions. Therefore, we report here our findings that interferon-activated human gingival fibroblasts.

532

Thrombin is a coagulation factor for a number of inflammatory cell populations that are involved in the activation of the neutrophil. However, it is unclear what role prethrombin chemotaxis is triggered by the proteinase cleavage and activation of the neutrophil. We have found, using flow cytometry, that antibodies against this receptor bound to platelets but not neutrophils (Humphries, L. L. J. Immunol. 1993). The aim of this study was to investigate the mechanism of thrombin-induced neutrophil chemotaxis in vivo. Using a well-identified human neutrophil and freshly isolated neutrophils, we compared human thrombin, a recombinant prethrombin proteinase inactive form of thrombin, and S. mutans-induced thrombin. The results showed that thrombin-induced neutrophil chemotaxis was not blocked by the antibody blocking thrombin inhibitor.

533

The aim of the study was to investigate the role of the bl-lymphocyte in the immune response at this site.

534

A specific image analysis system has recently replaced the MF5 microdensitometer and Vids V analyzer which were previously used for the assessment of nucleic acid content of Francisella stained smears and measuring nucleic (NA) and cytoplasmic (CA) species of Pseudomonas stained smears, respectively. The system performs both DNA and NA and CA measurements. We have previously reported that 2.5% of the total NA signal was obtained from different individuals irrespective of their positions and size. Interestingly comparison of the pattern obtained for the GCF samples and the peripheral blood lymphocytes DNA indicated some differences.

It is concluded that this approach is useful in the analysis of JHV sera in GCF samples and therefore in the study of the role of the bl-lymphocyte in the immune response at this site.
J Dent Res 74 (3) 1995

C FROST, G P COPE and I L C CHAPPELE (School of Dentistry & Wolphon Applied Technology Laboratory, The University of Birmingham, UK): A new delivery system for acrylate monomer for analgesia of smoking habit.

Studies have demonstrated that self-report of smoking habit is inaccurate and that objective tests for nicotine and its metabolites are more useful in assessing active and passive smoke exposure. We report a new chain-side assay (CSA) for salivary cotinine, modified from the method of Cope et al. in its Smoking-Exz. 3 (163-167, 1994) which expresses cotinine concentrations as μg/mL nicotine equivalents (μg/mL n). This study aimed to calibrate the CSA against a standard radioimmunoassay (RIA), to measure within and between assayer coefficients of variation (CV) and to relate salivary cotinine levels to nicotine intake to smokers and nonsmokers. A salve sample from a smoker was aliquoted and assayed 8 times under uniform conditions. A second saliva sample from a non-smoker was loaded with 0.5 μg/mL cotinine and diluted with phosphate buffer saline to form 1.575 μg/mL cotinine standards, which were assayed 9 times on separate days. Stimulated saliva was collected (5 min) from age-matched smokers (n=24) and non-smokers (n=18) by drawing a rubber band and related to smoking habit. The within batch CV was 15% and between CVs were 15.7% (1.757 μg/mL) and 13.8% (0.5 μg/mL). The correlation (r) between the CSA and RIA was 0.6 ± 0.005. On a day-by-day basis, there was a significant difference between salivary cotinine concentration and number of cigarettes smoked daily (R, r=0.5 ± 0.01; CSA, r=0.5 ± 0.03). By using a threshold of 0.5 μg/mL n, the CSA correctly identified smokers with 22% sensitivity and 96% specificity. It is concluded that the salivary cotinine assay has potential value as a crude test of smoking habit.

J G McMPD绵, P A RAGANNS and P L LAMERT (Dental School, Queen's University, Belfast UK): Thermographic imaging subclinical inflammatory changes following surgical removal of impacted lower wisdom tooth.

Surgical removal of an impacted lower wisdom tooth will inevitably produce as inflammatory response causing unpleasant symptoms for the patient. To date clinical parameters have usually been employed to quantify inflammatory response, and such analyses appear to show an infective/inflammatory process. Subjective Thermographic imaging offers a non-invasive means of quantifying such an inflammatory response accurately and objectively.

The purpose of this prospective study was to measure thermographically the inflammatory response found at operated sites prior to surgery, 20 minutes after surgery on the third and fifth post-operative days.

In this pilot study 10 patients were recruited between 20-50 years, who required the removal of an impacted lower wisdom tooth under local anaesthesia. Pre-operative assessment of the tooth in all cases indicated the necessity for removal of bone using a dental drill. Patients recruited were only permitted to use paracetamol for post-operative analgesia. The results at each of the measurement times indicated temperature changes from occult of 2.2°C immediately postoperatively, 2.0°C on the third day post operatively and 1.3°C and the fifth day after the operation.

The baseline results will be used to study the inflammatory responses to different inflammatory agents.

J D ROČÉ, C L WU, J SPÉRIGH, S FORGER, C SCULLY, N TAKKHER: (University of Manchester, Manchester Dental Institute, London): Loss of heterozygosity (LOH) on chromosome 3p in oral preneoplastic lesions and squamous cell carcinomas.

Loss of heterozygosity (LOH) indicative of presence of tumour suppressor genes on chromosome 3p is commonly observed in carcinomas of various tissues. We have examined LOH on chromosome 3p in 27 oral preneoplastic lesions (OPL) and 28 preneoplastic lesions (PCL) (c) in all cases indicated the necessity for removal of bone using a dental drill. Patients recruited were only permitted to use paracetamol for post-operative analgesia. The results at each of the measurement times indicated temperature changes from occult of 2.2°C immediately postoperatively, 2.0°C on the third day post operatively and 1.3°C and the fifth day after the operation.

These data suggest a role for at least three tumour suppressor genes on chromosome 3p in oral SCC. Furthermore, the high frequency of LOH in oral PCLs suggests that genetic alterations of chromosome 3p are an early event in oral carcinogenesis.


We earlier reported that point mutations in the H-ras oncogene of oral squamous cell carcinomas are ubiquitous in British cases (Abu-Obeid et al. Oral Oncol. 24 (1992) 29-44) but are uncommon in chewing tobacco-related oral carcinomas in India (Saravanakumar et al. Br J Cancer 1991; 63:573-8). We now report on the prevalence of 11 ras mutations (codon 12) in a refined sample of oral squamous cell carcinomas (SCC) and 28 preneoplastic lesions (PCL) (c) (PCL) and 28 preneoplastic lesions (PCL) (c) in all cases indicated the necessity for removal of bone using a dental drill. Patients recruited were only permitted to use paracetamol for post-operative analgesia. The results at each of the measurement times indicated temperature changes from occult of 2.2°C immediately postoperatively, 2.0°C on the third day post operatively and 1.3°C and the fifth day after the operation.

These data suggest a role for at least three tumour suppressor genes on chromosome 3p in oral SCC. Furthermore, the high frequency of LOH in oral PCLs suggests that genetic alterations of chromosome 3p are an early event in oral carcinogenesis.

K RAY, H K EMPSON, J J M btbs and J C HABWABSE (School of Dentistry, University of Birmingham, UK): p53 expression in oral lichen planus.

While over expression of p53 is often interpreted as indicating the presence of abnormal product, due to mutation of the p53 gene, overexpression of normal p53 may be associated with local repair mechanisms. The aim of this study was to examine expression of p53 in oral lichen planus and simple keratosis. Paraffin sections of lichen planus (n=13) and simple keratoses (n=14) were retrieved from the histopathological evidence of dysplasia were stained for p53 using a sensitive Birken-Streptavidin (immunoperoxidase) and DAB (Bioscope) and antialkaline phosphatase (IRC51-12; Biogenex). Biogenex was performed with and without microsce pre-treatment. Positive cells were counted in 3 highpower fields (x400) and percentage of positively stained cells was determined as the percentage of positively stained cells in the epidermis and dermis, respectively. Morphological examination showed integration of the epithelium after both forms of pre-treatment, probably due to osmotic shock. These results, that p53 expression is capable of collecting the presence of large molecular weight, molecules into the oral mucosa, which may be important in the pathogenesis of mucosal disease.

Ethanol has been implicated in the etiology of oral cancer, through its local action as a solvent on the lipid permeability barrier of oral mucosa, enhancing penetration of carcinogenic to epithelium. Previous studies on exposed tissue have been limited in that short-term exposure can increase the permeability to trysinized water (Trigila and Del J Dent Res 74 (3) 1995). We have shown that ethanol can increase the permeability to FITC-albumin and H2O-excess, Sudan red-stained specimens of human ventral tongue mucosa were obtained at autopsy from 16 individuals, aged 31-87 years, snap frozen and stored at 7°C until use. The Tongue was chyleed for 15 h and then incubated at 37°C for 15 h at a concentration of 1 μM ethanol. This was followed by 4°C for 1 h at 15 h, then exposed to FITC-albumin for 18 hours, using a continuous flow perfusion chamber. The tongue mucosa examined for ethanol penetration experiments, and the depth of albumin penetration measured using computer-assisted image analysis. The albumin permeability was further examined by exposure to ethanol with ethanol, for 15 minutes (653 ± 0.3 μm) or for 1 hour (74.2 ± 9.5 μm), compared with the PBS pre-treated tissue (17.1 ± 11.6 μm). Morphologically, the surface layers of the epithelium were seen to lift off after treatment with ethanol, and the extent of this effect was time-dependent. Further tongue samples were exposed to H2O-excess after pre-treatment for 1 hour with PBS or 15% ethanol. Permeability co-efficients (Kp) were determined, but no significant difference was found (7.81 ± 2.60 and 7.11 ± 3.41) of 10-5 cm/min, respectively). Morphological examination showed disintegration of the epithelium after both forms of pre-treatment, probably due to osmotic shock. These results, that ethanol is capable of collecting the presence of large molecular weight, molecules into the oral mucosa, which may be important in the pathogenesis of mucosal disease.
Lichen planus is a chronic inflammatory skin disease characterized by a massive infiltration of lymphocytes, particularly T-cells. It typically affects middle-aged adults, but can occur at any age. Lichen planus is associated with a sterile papular eruption that is often accompanied by inflammation and pain. The disease is often misdiagnosed as herpes zoster or chemodermatitis.

In investigations into fibroblast behaviour, we are carrying out more frequently in collagen matrices. This allows the cells to grow in three dimensions which is more analogous to the in vivo state. In our earlier investigations we employed 30% gel for radiolabelling experiments which required large stocks of cells. Our current collagen matrix system is one in which known numbers of fibroblasts were mixed in a collagen matrix and allowed to grow in the wells of a 96 well microtitre plate. This enabled large numbers of different cell samples to be investigated simultaneously and under identical conditions. It also allowed those observations to be carried out running from zero hour to several days. We have used this method for radiolabelling fibroblasts with 3H-thymidine and 35S-methionine as a measure of DNA and protein synthesis respectively. We have also investigated the effect of drugs on fibroblast behaviour (e.g. cyclosporin) using this technique.

We have developed a mini-collagen gel system that enables rapid investigation of different fibroblast samples. The gel system has a number of advantages over the collagen matrix system. It allows the incorporation of radiolabel into the collagen matrix itself, it is easy to test the effects of drugs on fibroblast behaviour, and it is less expensive and more convenient to use. The mini-collagen gel system has been used to investigate the effects of drugs on fibroblast behaviour, and it has been shown to be a useful tool for the rapid investigation of different fibroblast samples.

The results of the study show that TGF-β signal transduction may be mediated through peroxisome proliferator-activated receptors. In addition, the data indicate that TGF-β-induced control of cell proliferation is not altered and ECM (extracellular matrix) is not regulated at the cellular surface.

This work was supported by an MRC project grant G1223775.

**References**

1. J. L. P., F. FARTHING, G. W. IRVING, and S. M. THORNHILL (The University of Manchester and The London Hospital Medical College, UK): Comparison of IL-6 production by oral and skin keratinocytes.

Keratinocytes (KC) play an important role in immune and inflammatory processes by producing pro-inflammatory cytokines such as IL-6. IL-6 is an important mediator of the host response to injury and infection and has pleiotropic effects on wound healing as well as immune and inflammatory processes. We compared IL-6 production by human keratinocytes (SK) in cultures, and studied the effects of cytokine stimulation on IL-6 production, using an IL-6 specific standard antibody. We also examined the IL-6 specific cDNA in SK cells and SK cells were transfected with a cytokine reporter cell line. The two assays produced comparable results.

There was no constitutive IL-6 production by SK or OK. However, stimulation with TNF-α or IFN-γ induced strong IL-6 production by SK but not OK. This difference was observed in SK and SK cells transfected with cytokine reporter cell line. The stimulation of SK occurred after 48 hr and 48-72 hr for SK using 100-1000 U/ml TNF-α or IFN-γ, respectively. Detection limits were 10 ng/ml for SK and 100 ng/ml for OK. The stimulation of SK occurred after 48 hr and did not peak until sometime later than 72 hr for SK. In contrast, IL-6 production in SK cells was always greater than that in SK cells and SK cells transfected with cytokine reporter cell line. The stimulation of SK was greater than that in SK cells and SK cells transfected with cytokine reporter cell line. The stimulation of SK was greater than that in SK cells transfected with cytokine reporter cell line.

To further investigate the role of IL-6 in SK cells, we transfected SK cells with a cytokine reporter cell line. The transfection efficiency was determined by counting the number of SK cells that expressed the cytokine reporter cell line. The transfection efficiency was determined by counting the number of SK cells that expressed the cytokine reporter cell line. The transfection efficiency was determined by counting the number of SK cells that expressed the cytokine reporter cell line.

**References**

1. J. L. P., F. FARTHING, and S. M. THORNHILL (The University of Manchester and The London Hospital Medical College, UK): Comparison of IL-6 production by oral and skin keratinocytes.

Interleukin-6 (IL-6) is a pro-inflammatory cytokine that plays a critical role in the immune response. IL-6 is produced by a variety of cell types, including keratinocytes, and is involved in the regulation of numerous immune and inflammatory processes. We investigated the role of IL-6 in the regulation of immune and inflammatory processes by keratinocytes, focusing on the expression and function of IL-6 in keratinocytes.

In our experiments, we found that IL-6 expression in keratinocytes was induced by a variety of stimuli, including TNF-α, IFN-γ, and lipopolysaccharide (LPS). The expression of IL-6 was regulated at the transcriptional level, with increased expression seen at 24-48 hours after stimulation. We also observed that IL-6 production by keratinocytes was inhibited by the addition of anti-IL-6 antibodies, suggesting that IL-6 production is regulated by a feedback mechanism.

To further investigate the role of IL-6 in keratinocytes, we performed a series of experiments using keratinocytes that were transfected with a dominant-negative form of IL-6. These experiments showed that the expression of IL-6 was decreased in the transfectants, and that the production of IL-6 was reduced in response to stimuli.

These results suggest that IL-6 plays a critical role in the regulation of immune and inflammatory processes by keratinocytes. The expression and function of IL-6 in keratinocytes is regulated by a feedback mechanism, and the expression of IL-6 can be inhibited by the addition of anti-IL-6 antibodies. Future studies will be needed to further elucidate the role of IL-6 in the regulation of immune and inflammatory processes by keratinocytes.
TGFα and EGF are structurally related molecules that regulate cell growth and differentiation via EGFR receptors (EGFR). Our recent studies have demonstrated differential expression of TGFα and EGF by different types of odontogenic cyst lining (Li T-J, Brown M & Matthews JB, Fowkes Arch Dent 423: 137-144, 1993). The aim of this study was to investigate the pattern of expression of TGFα and EGF in the three major types of odontogenic cyst lined keratocysts (OKC), molar (OKC) and unicystic ameloblastoma (UCO). The simplest and most direct method of measuring mRNA expression is in situ hybridisation (ISH). In this study, we used the Northern blotting method to compare the expression of TGFα and EGF in the three types of odontogenic cysts. The results show that TGFα is expressed at different levels in the different types of odontogenic cysts. This suggests that TGFα may have a role in the development and differentiation of odontogenic cysts.

The differential display polymorphism chain reaction (DD-PCR) technique is a very useful method which enables the rapid identification of expression differences between cell populations. In short, all, a large number of cDNA clones produced from a specific tissue by retrotranscription, and then amplified by DD-PCR with specific primers. The amplified fragments that have undergone a different treatment, it is possible to discern different mRNA molecules in the same sample. Here, we used DD-PCR to detect those expression differences directly from RNA isolated from human bone cells. Although this approach has provided us with molecular markers, differential expression of TGFα and EGF, we did not observe any increase in TGFα and EGF expression in any of the cell types we tested. We conclude, therefore, that TGFα and EGF have a role in the development and differentiation of odontogenic cysts.
Hypertension investigation of Caucasian prior to general anaesthesia for dental surgery is merely of clinical advantage, however, there is little data of the possible value of such screening in groups of children liable to haemorrhage in such outcomes of reduced haemoglobin in a group of children attending a dental clinic unit in central London. The study group comprised 1000 children requiring urgent or elective dental surgery at the Eastman Dental Institute, London, for dental care under general anaesthesia from 1987 to 1992. The background of the children comprised Caucasians (76%), African-Caribbeans (16.8%), Indian/Pakistani (0.2%), Maltese (0.5%), Asian (0.4%), Arab (4.4%) and South America (0.2%). Haemoglobin levels were estimated in all children and appropriate haematological investigations undertaken in children at risk of haemorrhagic shock.

Three children had haemoglobin levels 10.4g/dl or less. In addition, seven had sickle cell trait and ten had possible thalassaemia trait but there was no correlation between haemoglobinopathy and low levels of haemoglobin. The planned general anaesthesia was undertaken in 22 of the 31 children with low levels of haemoglobin. Only 6 children ultimately did not undergo general anaesthesia, all failing to return to clinic.

It is concluded that pre-anaesthetic haematological assessments of children requiring minor dental surgery is adequately of any clinical value.

We are grateful to the staff of the Marylebone Centre, Liverpool for their help and support.

The conclusion is that sufficient subgroups of BMS are present in a UK and USA population and this work warrants a dental unit.

Stress is one of the many trigger factors reported by patients as triggering attacks of migraine. Whether auras and migraines are linked directly or stress acts via increasing nociceptive parafuncional activity is unclear. One way of potentially reducing stress is by the use of relaxation tape therapy. A tape especially designed to relax the muscles of the head and neck has been produced by ourselves recently. This open study reports on the patients documented reactions and the groups comprised 30 patients who were asked to take a 30 minute recording and to play it back to themselves each day whereas in Type 3 BMS the burning in the tinnitus. The significance of subtypes is that the precipitating factors involved in BMS are different between subtypes and the prototype is an irritable diastemal subtypes. The BMS group comprised 150 patients and the UK group comprised 130. All patients were properly questioned and their existing history taken Type 1, 2 and 3 BMS. Despite wide differences in disease states the UK (20%) and USA (20%) patient groups virtually identical results for the presence of subtypes were recorded. There were Type 1 (54% UK vs 27% USA), Type 2 (55% UK vs 56% USA) and Type 3 (11% UK vs 17% USA).

The conclusion is that sufficient subgroups of BMS are present in a UK and USA population and this work warrants a dental unit.

566

M LONG*, W LLOYD, D BOWSHER AND P J LAMEY (School of Clinical Dentistry, The Queen's University of Belfast, Pain Relief Foundation, Liverpool, UK): Relaxation tape therapy and its impact on migraine.

Stress is one of the many trigger factors reported by patients as triggering attacks of migraine. Whether auras and migraines are linked directly or stress acts via increasing nociceptive parafuncional activity is unclear. One way of potentially reducing stress is by the use of relaxation tape therapy. A tape especially designed to relax the muscles of the head and neck has been produced by ourselves recently. This open study reports on the patients documented reactions and the groups comprised 30 patients who were asked to take a 30 minute recording and to play it back to themselves each day whereas in Type 3 BMS the burning in the tinnitus. The significance of subtypes is that the precipitating factors involved in BMS are different between subtypes and the prototype is an irritable diastemal subtypes. The BMS group comprised 150 patients and the UK group comprised 130. All patients were properly questioned and their existing history taken Type 1, 2 and 3 BMS. Despite wide differences in disease states the UK (20%) and USA (20%) patient groups virtually identical results for the presence of subtypes were recorded. There were Type 1 (54% UK vs 27% USA), Type 2 (55% UK vs 56% USA) and Type 3 (11% UK vs 17% USA).

The conclusion is that sufficient subgroups of BMS are present in a UK and USA population and this work warrants a dental unit.

566

M LONG*, W LLOYD, D BOWSHER AND P J LAMEY (School of Clinical Dentistry, The Queen's University of Belfast, Pain Relief Foundation, Liverpool, UK): Relaxation tape therapy and its impact on migraine.

Stress is one of the many trigger factors reported by patients as triggering attacks of migraine. Whether auras and migraines are linked directly or stress acts via increasing nociceptive parafuncional activity is unclear. One way of potentially reducing stress is by the use of relaxation tape therapy. A tape especially designed to relax the muscles of the head and neck has been produced by ourselves recently. This open study reports on the patients documented reactions and the groups comprised 30 patients who were asked to take a 30 minute recording and to play it back to themselves each day whereas in Type 3 BMS the burning in the tinnitus. The significance of subtypes is that the precipitating factors involved in BMS are different between subtypes and the prototype is an irritable diastemal subtypes. The BMS group comprised 150 patients and the UK group comprised 130. All patients were properly questioned and their existing history taken Type 1, 2 and 3 BMS. Despite wide differences in disease states the UK (20%) and USA (20%) patient groups virtually identical results for the presence of subtypes were recorded. There were Type 1 (54% UK vs 27% USA), Type 2 (55% UK vs 56% USA) and Type 3 (11% UK vs 17% USA).

The conclusion is that sufficient subgroups of BMS are present in a UK and USA population and this work warrants a dental unit.

Migraine is a common condition with a number of recognised precipitating factors. Recently nocturnal parafunctional activity has been added to this list and may be of particular importance since 70% of migrainers have their attacks on waking suggesting a nocturnal trigger. Temporomandibular dysfunction syndrome (TMD) is similarly multifactorial but parafunction has long been established as a significant trigger factor. Mandibular rest can be determined and the actual major role for nocturnal grinding of the teeth is unknown. The hypothesis that uncorrected mandibrators and 24 patients with TMDMS were compared with an equal number of age and sex matched controls with no known history of parafunction, migraine or TMDMS. Only one patient had a history of acute TMDMS (control subjects). There is a significant difference (p < 0.0001) between control subjects and migrainers and TMDMS patients in relation to the presence of mandibular rest.

This study lends support to the hypothesis that mandibular rest are related to parafunctional activity andargs for the promotion of mandibular rest in migrainers may be important implications for management.
567

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

The aim of this study was to investigate whether a relationship exists between parafunctional habits and anxiety and depression in migraineurs. Sensory patients who were diagnosed as suffering from migraine in accordance with criteria defined by the International Headache Society (Cephalgia 1988; 6: 1-69) were assessed for a parafunctional activity by clinical examination and also assessed for anxiety and depression using HAD scales. They were drawn from those referred to a facial pain clinic in Belfast. Fifty-nine patients between the ages of 18 and 67 attended for the study. Twenty-six were female and 33 male. The mean age of the group was 43 years. Sixty-five patients were assessed as having parafunctional activity of whom 13 had anxiety scores of 8 and over suggesting possible or frank anxiety while 11 had anxiety scores of 8 and over suggesting possible or frank anxiety. This association was compared with those without parafunctional activity tests yielded similar results. All our patients experienced a significant difference p<0.01 (X2 test) was observed between a group of patients with a parafunctional activity and a group without. These findings (Journal of Dental Research; 1994; 73 (4); 806) have shown a highly significant relationship between parafunctional activity and symptomology in MIG patients. This study supports a similar relationship between anxiety and parafunctional activity in migraineurs.

It is concluded that anxiety and parafunctional activity may play a role in the aetiology of migraine headaches.

568

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

Nocturnal parafunctional activity is an important precipitating factor in some patients with migraine. Acrylic appliance therapy is highly effective in migraine patients and the worst outcome appears to be a reduction in 40-60% of cases, although it is clear that many patients are rendered asymptomatic. In an attempt to predict the likelihood of a successful response to appliance therapy, the authors have developed a migraine severity index. This study was developed. The MSI quantifies clinical features of the patients migraine attack including duration, severity and accompanying clinical features. One hundred and thirty patients were treated with nocturnal acrylic appliance therapy for one year and outcome assessed using the MSI.

While the overall success rate of treatment was high - 70% of migraines were asymptomatic - some patients or groups of patients appear to benefit from other outcome indices (the MSI).

569

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

Migraine is recognized as being capable of being triggered in susceptible individuals by a number of factors such as cheese, chocolate, red wine, overindulgence and citrus fruits. Nocturnal parafunctional activity may also be a trigger attack in susceptible individuals and acrylic appliance therapy can be very successful in rendering some migraines asymptomatic. This study was designed to investigate parafunctional activities and their effect on the triggering of migraine attacks by inhibiting acrylic appliance therapy from successfully treated patients. Ten patients were studied and all provided informed consent to participate. All were migraine sufferers and were treated nightly with a variety of dental devices which were prepared and provided for patients. A total of eight patients were followed over a period of at least three months and were receiving no medication. Daily staff were collected on walking for two days while wearing the appliance, daily with an attack and for two days following return to wearing the appliance. Needleman A was measured by radioactivity with symptoms at rest. The number of patients who had no symptoms was greatly decreased prior to an attack and return to baseline following re-institution of splint therapy.

This study may involve detailed parafunctional activity analysis before and during a migraine attack and enable to be made of its role in disease.

570

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

Thermographicaurinal camera,'. Handpiece working rotation speeds of 8, 12 and 16 thousand per minute were used. The images were recorded at 90 intervals for a period of 20s and stored for later analysis. Results: The baseline temperature for all groups was approximately 52°C. The mean maximum temperatures recorded on the root face during the abutment sequence were 73.5(10.9), 67.5(15.3) and 76.8(13.1)°C for the rotation speeds of 8, 12 and 16 thousand per minute respectively. These relate to a maximum deviation from baseline of approximately 60, 45 and 52°C. The most rapid temperature rise was recorded in the fastest rotation group. Conclusion: Very high temperature rises are produced at the root surface during thermomechanical obturation of root canals.

1 Thermovision 900, Agena, Danderyd, Sweden.
2 Guta-Condensor, Mellieri, Balingwe, Switzerland.

571

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

Pulpal blood flow has been estimated using various techniques including laser Doppler, oximetry, Ms 131 clearance and transillumination. None of these have gained clinical acceptance and conventional thermal and electrical nerve pulp tests remain the diagnostic tools of choice in assessing pulpal vitality. The aim of this study was to assess the usefulness of the Angenhe thermoas 900 system for detecting pulp vitality using a root-filled upper incisor tooth and the contralateral tooth sound and responding positively to thermal and electrical pulp tests. The tooth was occluded with a rubber dam and imaged prior to testing. The non vital tooth was cooled with a stream of water at 2°C for 30 seconds, dried with wax and imaged until the temperature fell to baseline temperature. The results of this study demonstrated that the thermoas 900 system can be used to predict pulp vitality and that the technique is sufficiently sensitive to detect the earliest changes of pulp vitality.

The results suggest that if thermal tomography may be useful as a predictor of tooth vitality based on blood supply rather than nerve supply.

572

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

Thermographicaurinal camera.' Handpiece working rotation speeds of 8, 12 and 16 thousand per minute were used. The images were recorded at 90 intervals for a period of 20s and stored for later analysis. Results: The baseline temperature for all groups was approximately 52°C. The mean maximum temperatures recorded on the root face during the abutment sequence were 73.5(10.9), 67.5(15.3) and 76.8(13.1)°C for the rotation speeds of 8, 12 and 16 thousand per minute respectively. These relate to a maximum deviation from baseline of approximately 60, 45 and 52°C. The most rapid temperature rise was recorded in the fastest rotation group. Conclusion: Very high temperature rises are produced at the root surface during thermomechanical obturation of root canals.

1 Thermovision 900, Agena, Danderyd, Sweden.
2 Guta-Condensor, Mellieri, Balingwe, Switzerland.

573

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

A series of in vitro studies were carried out to investigate the use and application of a radiographs contrast medium in endodontic radiography. The use of a radiograph contrast medium in endodontic radiology may be a valuable aid in the diagnosis and evaluation of root canal systems and that this method would complement rather than replace plain radiography.

574

J DENT RES 74 (3) 1995
Divisional Abstracts: The British Society for Dental Research
893

The temperature changes on the root surface of human premolar teeth during thermomechanical root canal obturation were measured, in vitro, using an infrared thermal imaging camera. Thirty human premolar teeth were prepared to a size 10 master apical file using stepback technique. Each tooth had a gutta percha (GP) point fitted to the working length and this was condensed with a handpiece. The teeth were then divided into three equal groups and each canal was obturated with GP using a thermomechanical technique. Handpiece working rotation speeds of 8, 12 and 16 thousand per minute were used. The images were recorded at 30 intervals for a period of 20s and stored for later analysis. Results: The baseline temperature for all groups was approximately 24°C. The mean maximum temperatures recorded on the root face during the abutment sequence were 73.5(10.9), 67.5(15.3) and 76.8(13.1)°C for the rotation speeds of 8, 12 and 16 thousand per minute respectively. These relate to a maximum deviation from baseline of approximately 60, 45 and 52°C. The most rapid temperature rise was recorded in the fastest rotation group. Conclusion: Very high temperature rises are produced at the root surface during thermomechanical obturation of root canals.

1 Thermovision 900, Agena, Danderyd, Sweden.
2 Guta-Condensor, Mellieri, Balingwe, Switzerland.
894

Methods

Four methods were used: 1) a new method using the Perfotoformer Profilometer (Feinpruf-Perthen GmbH, Göttingen, Germany). The teeth were then loaded in an axial direction and the surface re-profiled. Comparisons of profiles taken before and after loading were undertaken and differences noted. The results indicate that changes in the lateral profiles of enamel teeth that are subjected to axial loading, which could be considered to represent vertical barreling.

It is concluded that the concept of vertical barreling could be considered valid and may influence the development of non-cavicular cervical notch lesions and that surface profilometry offers a potential method to quantify this effect.

F MCDONALD, K BRADY, TR FILL PORD and M YUBANIPADAJ (Departments of Orthodontics and Orthodontic and Conservative Dental Surgery, UMD, London): Mesial groove indices as a substrate for osteoblasts.

In this report, we have examined cultured osteoblasts in the presence of Mesial Tricuspid Aggregate (MTA). Firstly we examined the material, MTA as set in moist conditions, secondly we examined the behaviour of MG-63 cells with respect to time and with respect to the MTA material. For the analysis of the material we used the X-ray microanalysis (SEM-EDAX) and mercury intrusion methods. To examine the reactions of the osteoblast-like cells MG-63 cells were grown to confluence in Hank's F12/DMEM media which contained 10% fetal calf serum, 50 nM ascorbate, 50 nM putrescine and 100 nM amphotericin. Prior to incorporating the cover slips into the media, the MTA had been conditioned in Hank's solution for 7 days. The cells were then loaded in an axial direction and the surface re-profiled. The cells were returned to the incubator together with the MTA and stopped at 12 hours, 24 hours, 48 hours and 72 hours. Examination demonstrated that the osteoblasts expressed discrete crystallites and the latter appeared as an amorphous structure with no apparent crystal growth but score a granular type appearance. The mass value of calcium in the prisms was 87% calcium and 2.47% silica, the remainder being comprised of oxygen. The cells appeared to lay down processes over the granular substrate while they were completely absent from the amorphous substrate.

In conclusion therefore, it appears that mesial tricuspid aggregate offers a reasonable substrate for osteoblast growth.

N RUBBA*, D WOOD, B MILLAR, L GABRIELSON (King's College Dental School & Brunei University, London): Comparison of Dynamic Contact Angle and traditional measurements of advancing contact angles.

During the use of elastomeric impression materials the Adhering Contact Angle (ACA) is important during the taking of an impression and pouring of a die and the effect of the fit of a finished restoration. Traditionally, ACAs have been measured by recording the angle formed by a droplet of liquid, which is placed on a sample substrate, so that it rolls-off the substrate. Ensuring that the ACA rather than static contact angle is recorded is an inherent problem. Alternatively a Wettability head procedure may be used; such as the Dynamic Contact Angle analysis system (Palintest) which produces the Stokes angle in a period of time. A pilot study into the differences in values for the ACA obtained between water and impression materials using method 1 and method 2 was carried out on a selection of 12 addition curing systems from each of 3 manufacturers, IntraJet: 32°-35° for method 1 and 80°-114° for method 2. Close agreement (<5% difference) was found at phase 2. However, a comparison of the rank order (Spearman's Rounding Coefficient of the results from the two methods show significant (P<0.05) similarity between the rank orders of the ACAs.

In conclusion, the two methods may offer similar trends for better direct assessment of ACAs. Difficulties associated with the recording of ACAs would support the use of a dynamic method.

G BURKE, JR MAIN and DC WATTS (Restorative Dentistry, University of Manchester, UK): Effect of contamination of etched porcelain surfaces by operating gloves.

Gloves are worn by a high proportion of dental health care workers while treating patients. It is the purpose of this study to investigate whether contamination of etched porcelain surfaces by operating gloves may result in a reduction of the shear bond strength of the porcelain to a ceramic composite luting material. Fifty specimens (7 mm thick x 1.5 mm) were constructed in duplicate porcelain. These were placed in copper rings (11.5 mm diameter) using dental stone and divided at random into 5 groups of 10 specimens. The porcelain surface of each specimen was etched with hydrofluoric acid. Samples of glove contamination were used (10, 5, 2, 1, 0) as follows: 1) Bioglass (50 µm; 0.5 cm diameter) coated with a light dusting of dusting powder; 2) Silicone (50 µm; 0.5 cm diameter) spray; 3) Petroleum jelly (50 µm; 0.5 cm diameter) spray; 4) Water (50 µm; 0.5 cm diameter) spray. Mean shear bond strengths (Mpa) of 22.3, 21.3, 16.4, and 22.3 were recorded for Groups 1,2,3 and 4 respectively, and 21.6 for the control group. Statistical analysis of the results by one-way ANOVA showed no significant difference between the groups. While the tests may support a diminution of shear bond strength between multiple contamination using material contaminants with some glove specimens is, it is concluded that there is no significant difference in shear bond strength between specimens the surfaces of which have been contaminated by gloves and those which were not.

J Dent Res 74 (3) 1995 852

GEARY LE, CUNNINGHAM JL, KINBONES MJ (School of Clinical Dentistry, Queen's University of Belfast, UK): A subjective assessment of the shade of dental laboratory-fused samples of dehydrae coloured ceramic.

The aim of this investigation was to compare the observed shade of laboratory-fused, dehydrae coloured ceramic discs, with their expected colours as defined by the manufacturers. Eight shades from each of four different manufacturer's products were selected for testing. The fired ceramic samples (n=20), which were seven mm in diameter and 3 mm thick, were placed in a rectangular glass beaker containing a shade panel. The samples were viewed by four different observers. Each observer was asked to select a shade from the panel which compared with each sample. No single shade was selected as the most appropriate shade by all four observers. Each observer then selected a shade which was closest to the sample. The samples were then re-tested for all four observers in a different condition. No single shade was selected as the most appropriate shade by all four observers. The results did not match the manufacturers designated shades of the samples as shown from the one-way ANOVA. The results were subsequently judged as the most appropriate shade by all four observers. The results did not match the manufacturers designated shades of the samples as shown from the one-way ANOVA. The results were subsequently judged as the most appropriate shade by all four observers. The results did not match the manufacturers designated shades of the samples as shown from the one-way ANOVA. The results were subsequently judged as the most appropriate shade by all four observers. The results did not match the manufacturers designated shades of the samples as shown from the one-way ANOVA. The results were subsequently judged as the most appropriate shade by all four observers.
This investigation aimed to monitor the clinical performance of porcelain veneers (PV) fitted to unprepared teeth in BEDT between November 1984 and February 1992. 272 PV were fitted for 104 teeth were followed-up for a minimum of 9 months. The veneers were constructed using platinum foil techniques, the bonding surfaces were prepared by grit blasting with 50μm Al₂O₃, a layer of silane coupling agent (Figura) was applied to the prepared surface and the PV were consumed using micro-filled composite resin. At each review the veneers were classified as clinically satisfactory, presenting with a repairable problem or failed. Survival analysis showed that the probability of survival for these restorations was 87% after 1 year decreasing to 68%, 58%, 48%, 47% after 2, 3, 4, 5, 6 7 years respectively. The major cause of failure was the fracture of the veneer at 0.5-0.6mm, followed by debonding 21%. The highest percentage of failures was seen in the group of PV cemented over existing restorations. The study showed a higher failure rate than the previously published work (Oman S M and Biller B H, Br Dent J 175: 317-321, 1993).

It is concluded that PV fitted to unprepared teeth show a high probability of failure especially if the mental surface area is reduced by the presence of restorations.

Twelve systemic antimicrobials are included in the Dental Practitioner’s Formulary (DPF). Little information is available concerning the usage of these agents by general dental practitioners (GDPs). A postal questionnaire with pre-coded and self-categorised response format was used to determine prescribing of these antibiotics (‘often’, ‘occasionally’ or ‘never’) was sent to 500 randomly selected GDPs in the UK, stratified by geographical area. Replies were received from 279 practitioners (response rate 56%). Each of the antimicrobials was prescribed on occasions. Whilst four agents (tetracyclines, amoxicillin, co-amoxiclav and penicillin V) were used ‘often’ by some GDPs, six drugs (ampicillin, cephalaxin, doxycycline, clindamycin, enrofloxacin) were ‘never’ prescribed by 57.03%-93% of GDPs. A quarter of GDPs felt that the number of patients presenting with acute infections had either increased or remained stable. GDPs consider that a dental practitioner’s knowledge of antibiotics was adequate. While the majority of GDPs showed a low rate of the small range of drugs employed by the majority of GDPs, 27% felt that the antimicrobial prescribing potential of the majority of GDPs resulted in a small range of the agents available in the DPF. It would appear that such restricted prescribing is associated with low incidence of clinical failure.

It is generally accepted that the ideal labial preparation for porcelain bonded to metal crowns consists of a shoulder 0.8-1.5mm with a shoulder angle of 90°-110°. Such a preparation will provide for adequate material thickness, correct depth for porcelain and minimal unsupported metal structure. Recent studies have indicated that when preliminary clinical cut preparing or conventional etched crowns from a labial to incisal to prepare the labial shoulder and to over-fold. This may have implications for esthetic longevity and proximal health if compromised by the clinical situation. A laboratory report of four different porcelain blocker preparations have been tested in the current study. The study design, the working day of twenty five each type prepared for the group of experienced clinicians to receive porcelain bonded to metal crowns were placed in the mid-basal plane using a co-ordinate measuring instrument and 100 readings were taken on four samples of each porcelain blocker preparation. The data were used to determine the accuracy of the lapping used in the accuracy of the porcelinas.

The data suggest that the shorter data in proportions of both axial and cervical margin are not be expected in the in vivo situation or at the four preparation type within the accepted shell margin of and shell shoulder width.

Quantification of the morphology of tooth surfaces to a high precision was carried out by a coordinate measuring machine with a semiconductor laser sensor. (Bedford, J et al, J Dent Res 72:742, Adv 445, 1993). Observations were made of the influence of the scanning speed, the incident light intensity, the laser light intensity and the laser probe sensitivity threshold level on the accuracy of measured co-ordinates of surface points. Two reference surfaces were used - one flat, the other with a 3.5 mm corrugation. Each of the two surfaces was scanned twice, ten times, at different probe speeds (4, 10 and 50 points/second), at two incisal angles (0° and 45° to the surface normal) and at five threshold levels. There was a marked drop in accuracy on the corrugated surface at speeds above 15 points/second but no change on the smooth surface. The sensitivity threshold did not influence the measurements significantly. The optimum value of the probe incident angle was found when the bisector of the incident and reflected beam was set parallel to the vector surface normal.

This pilot study has provided initial data on the optimal scanning speed, incident angle and sensitivity threshold necessary for accurate quantification of tooth morphology.

Glass formulations used for the manufacture of glass-ionomer cements (GICs) also have the potential for use as castable glass-ceramics for the production of crowns and inlays. These high fluoride glasses offer the advantage of low liquidus temperatures with bulk nucleation of fluorapatite and multiple through-chilling phase inversion systems to provide a casting ceramic system in that they can be cast using conventional dental technology equipment, are easily bonded using GICs and are capable of releasing fluoride ions which are known to stimulate apatite deposition to render the interface of the ceramic properties. A range of glasses with 1.5Al₂O₃-0.5Y₂O₃-1.5CaO-2MgO-XCaO, formulated, using thermal analysis techniques (DSIC with SiO₂ and XRD full characterization of the glasses used were undertaken. Their suitability for dental applications was assessed by producing crowns and inlays with crystalline (Glassy Bioglass 53S 3 Li) and air pressure/vacuum (HexXeno CL377, Dentex ®) casting machines. Thermal analysis and X-ray powder diffraction were carried out and crystallization was used to 1000°C for six hours. The results showed that the current glass formulations were too viscous in the melt state for air pressure/vacuum casting. However, the results of casting using these glasses are encouraging, with the fabrication of model crowns and inlays with a good. Further adjustment of the investment composition reduced tolerances to < 0.100μm, while initial problems with carbon contamination from the glassine line were eliminated using a platinum crucible. It was concluded that glass-ceramics based on ionomer glasses have the potential for use as crown and inlay ceramics.
591

Master casts for the construction of partial dentures are duplicated in investment using media commonly based on agar. Lately duplicating media based on polyvinyl siloxane have become increasingly popular. The object of the study was to compare the surface of a phosphated investment poured in metacrylate molds and cores at 23°C temperature to a phosphated investment poured in agar molds.

Casts were examined using scanning electron microscopy and profilometry. (V values) of surface roughness were derived from the computer held images. Biaxial hardness was measured using a universal testing machine 52.01. Specimens from the surface roughness range 0.7 to 2.29 (22.9) than investment poured in PVS molds (1.93.15). Hardness values were determined for agar and PVS poured in agar molds, as set. EDS:34.3.8 (6) than in agar 15.8.4 (6). 1.4.1.1.2.2 (29). 1.2.9 (180). 2.9.7 (90). 1.2.9.6. (45) respectively.

The surface of investment poured in PVS media is harder and smoother than the same investment poured in agar.

Gordon Hill, Desmond Shader, Lehman, Hurs, UK. "Grateful acknowledgment to the manufacturers. We gratefully acknowledge financial support from 3M.

593

The aim of this investigation was to use silicone spectrophotometry to study ion movement in dental materials as they hydrate. Sixty minutes after setting the temperature of the specimens was changed at regular intervals. Electrical impedance measurements were made by sandwiching each disc between two copper electrodes. The frequency range was from 10 Hz to 100 Hz. Impedance measurements were measured under the same conditions with interdigitating electrodes placed on one surface of each disc. Each time the water in which the discs were immersed was changed, the current and voltage for each disc was recorded and the data was transmitted to and stored on a microcomputer.

These measurements showed that the glass ionomer exhibited the greatest release of ions, composite had the lowest and the hybrid ion release values were in between those from the other materials. Results of the impedance measurements using interdigitating electrodes were comparable. However, measurements of electrical impedance using platinum foil electrodes were more successful.

Typical DC resistance values for materials are shown in table 1. A model of ion movement is illustrated in fig. 2.

Glass ionomer = 0.16 MΩ. Hybrid = 1.55 MΩ. Composite = 6.90 MΩ.

We conclude that electrical impedance measurements are a useful technique to study ion movement in dental materials and release of ions in the water in which the specimens are hydrated.

595

DC WATTS and AJ CASE (University of Manchester Dental School, UK)

Fracture-toughness and creep-resistance of resin-modified restorative resins.

This study aims at in vitro stress evaluation of two resin/onion "hybrid" (Dyract® plus, 3M), including a Composite system (Veneerlux, Kerr) with a metal-ceramic restoration system. Three products were from the same manufacturer. Fracture-toughness (KIC) was determined using an apparatus (BS 5547, 1977) employing specimens 25x25x6.5 mm. Specimens (m) were prepared by the manufacturer and cut to size 25x25x6.5 mm. Specimens were loaded to failure at a constant displacement rate of 5 mm/min. The load at failure was recorded digitally. Stress was transmitted to the specimen through the indenter. The load at failure was determined by a computer and the value of the product of the load and the specimen width was calculated. The fracture toughness was calculated. The results show that the composite had the highest fracture toughness and the metal-ceramic restoration system had the lowest.

597

B R DAVIES, S M DUNNE and J MILLAR (King's College Dental School, London): A survey of the effectiveness of light-curving units and testing devices.

This study is aimed at a) survey output from 49 light-curing units in clinical use; b) examine the effect of depth on composite of cure rates assessed by a range of light intensity; c) assess the relationship between radiometer readings and depth of cure in a human tooth and a holoteeth model. The survey included monitoring the output of light curing units using a Lanthum phosphate radiometer. The results were then compared with clinical outcomes and the findings were then compared with those of previous studies.

The results showed that the values of light output were within the range 2.0 and 7.0. However, light of very low output (0.7) was found to be inadequate for curing a deep cavity. The results showed that the maximum depth of cure was 0.2 to 1.0 mm. The results showed that the depth of cure was significantly influenced by the light intensity. The results showed that the depth of cure was significantly influenced by the light intensity. The results showed that the depth of cure was significantly influenced by the light intensity.

The results showed that the depth of cure was significantly influenced by the light intensity. The results showed that the depth of cure was significantly influenced by the light intensity. The results showed that the depth of cure was significantly influenced by the light intensity. The results showed that the depth of cure was significantly influenced by the light intensity.

1 Icardov Vivestent, UK, Clarke Dental, UK, Elfa Inc, Canada; 2 Demetron Research Corp, USA.

592

KANCHANAVASTA W., PEARSON GI & ANSTICE HM (Eastman Dental Institute, London): The temperature rise in ion-leachable cements during setting reaction.

It is a well established fact that composite resin undergoes an exothermic setting reaction. The resinsmodified GICs is therefore likely to lead to an increase in temperature during the setting reaction. This effect is more pronounced in those cements containing a large amount of water and a small amount of polyacid. The results of this study showed that the temperature rise during the setting reaction of a high- and a low-polyacid cement was measured at 27°C and 37°C, respectively.

The samples were maintained at either 27°C or 37°C, being light-cut if required for 20s. The temperature rise which occurred during setting was measured using a thermocouple connected to a digital thermometer. Two more samples were used under the same conditions. The samples were then placed under a stereomicroscope for physical changes and b) measured with a trichrometric colour analyzer for reflectance colour-characteristics. The results showed that the composite resin had a higher temperature rise than the conventional GIC, which is in agreement with previous studies.

The results showed that the composite resin had a higher temperature rise than the conventional GIC, which is in agreement with previous studies.

594

B W BEXTENSHAW and DC WATTS (University of Manchester, UK):

High Temperature degradation of resin-modified cements: morphological implications.

Homes houses show that the temperature on the ground floor can reach 120°C, presenting major problems of identification of five victims. Toold-coloured anterior fillings are the most common teeth studied, giving rise to the conclusion that they are made of heat-resistant material and are not for use in the mouth.

The results showed that the composite resin had a higher temperature rise than the conventional GIC, which is in agreement with previous studies.

596

BM GRIFFITHS H, and TF WATSON (Eastman Dental Hospital and UMDs, Guy's Hospital, London, UK): Conical microscopic investigation of the healing ability of five bonding agents.

The interdiffusion zone between bonding agent and dentin may be permeable to pulsed fluid movement. Interfacial porosity when using five bonding agents (DBA) was investigated by observing microphotographs of fluorescent labelled saline from the pulp cavity. The DBAs ranged from high to low ability to remove the smear layer. In the case of the high ability, 80% of the smear layer was removed.

The results showed that the composite resin had a higher temperature rise than the conventional GIC, which is in agreement with previous studies.

The results showed that the composite resin had a higher temperature rise than the conventional GIC, which is in agreement with previous studies.

U Lichón, ESPR, Cl. l, Estaires, Kent, UK: Open-field, Rev. B 2, experiments and with U.
There is some confusion in the literature over the importance of the different variables of orthodontic sliding friction. The finite element method (FEM) was used to build an idealised three-dimensional model of a bracket/archwire system to study these variables. Followin recomposed finite element procedure, a three-dimensional model was built and a friction analysis was performed under a variety of loading conditions. Results from these analyses indicate the expected areas of high frictional force. This data was then used to refine mesh design and loading conditions for the detailed three-dimensional model. Results showed that in an idealised model system, increasing the sliding force, will increase the frictional force. More surprisingly, the distribution of this applied force was the dominant factor in determining the level of friction. Result from the two frictional analysis indicated that a flatter, evenly distributed friction force will produce the lowest friction.

It is concluded that finite element analysis is a valuable method for studying friction in an idealised orthodontic bracket/archwire system. Indeed, if friction is ignored when using the F.E.M., then results will be subject to secondary effects that show test friction and the distribution of this force are important factors in sliding friction.

1 Using Mysys / Luma version 11 software.

---

**600**

**JEDYNAKIEWICZ NM, MARTIN N, FLETCHER JM**

*Department of Clinical Dental Science, The University of Liverpool*

A clinical evaluation of a new iono-matrix composite

Dyrcat \( I \) direct restorative is a light-activated composite material containing ceramoid side-chains on the polymerizable molecule. The setting reaction takes place in two stages. The first stage is a light-activated polymerisation reaction. The second stage is an acid-base reaction between the ceramoid groups and metal ions released from the glass filler. This study examines the clinical performance of Dyrcat \( I \) within a period of three years. Twenty-nine samples, coated against a control material (Fuji II LC) for the restoration of cervical class V lesions. Sixty matched pairs of restorations were placed in human subjects and evaluated according to modified Ryge criteria. The evaluation was performed single-blind by two examiners. The parameters used for evaluation are: surface finish, surface contour, colour match, gingival index, secondary caries and marginal integrity. Baseline observations were recorded and the restorations were evaluated at one year. There was no statistical difference between the test and control materials for any parameter except surface finish. The surface finish of Dyrcat was scored grade 1 in all test restorations. All control restorations were scored grade 2. At one year, all restorations placed with Dyrcat were clinically acceptable and showed a superior surface finish to the control material.

1 De Troy Dentalply, Konstanz, Germany. *GC Int. Tokyo, Japan*

---

**603**

**A. ROBINSON*, JF McCABE**

*Department of Restorative Dentistry, University of Newcastle upon Tyne, Dental School*

Effect of surface treatments on cement to gold bonding.

The effect of 4 surface treatments on shear bond strength of 6 cements (4 resin, 1 glass ionomer and zinc phosphate) on gold alloy were evaluated. Adhesives were applied to the alloy using the gelatin capsule method (Barberant WW, et al. J Dent Res, 1991, 70:48-53) and debonded after 24 hours at 37°C RHE 100% at a cross head speed of 1mm / minute. The treatments were: (i) air blast, (ii) acid etch, (iii) tooth powder + water and (iv) control. Test groups of 50 were used and the results were subjected to Weibull analysis from which a probability of failure at 6MPa was computed, as follows:

- **Powder + Water**
  - 0.756
- **Water**
  - 0.301
- **Air blast**
  - 0.005
- **Control**
  - 0.003

The probability of failure is significantly reduced by the use of heat treatment and use of powder.

---

**604**

**SOO ST, LEUNG T**

*Prosthetics Dept., Eastman Dental Institute, U. of London; The Hidden-clasp System vs. Conventional Clasping - A Comparison of Retention Forces*

Partial dentures rely on clasps for direct retention, but their poor appearance has often been a barrier to patient acceptance. Many so-called aesthetic clasping systems have been proposed in an attempt to improve the esthetics of the clasp mechanism. A new clasp system, the Goodfellow clasp was developed. The Goodfellow clasp is a single design that can be adapted to any of the bars systems, using a modified natural tooth edging. The clasps are manufactured by a single moulded sticker technique and the teeth are bonded to the clasp. The study compared the behaviour of the clasp systems, CerCAD Student K&B and ChromaSpect/3 in the presence of mechanical retention. Sixty 8mm diameter cylinders and alloy bars, 30°*4.0mm, had 0.6mm diameter retention holes cast on to the bonding surface at regular intervals. These specimens were stored in 70% RH at 37°C and the bars were cleaned in distilled water immediately prior to bonding of the retainer, 4mm deep on the cylinders and 2mm deep on the bars. Polymersignment was initiated by heat and pressure or light as appropriate for the retainer. The specimens were removed and the clasps were then separated from the bars using an angle grinding wheel. The bond strengths were tested at 1 week, 6 weeks and 12 weeks using a universal testing machine (UTM). Three point bond testing of the bar specimens was carried out in an Instron 4505 UTM. The nature of the bond was examined at each stage of the experiment. In addition, to test the bond strength initially were 23.5MPa, 25.5MPa, and 9.6MPa and following thermocycling 30MPa, 27.5MPa, 10.5MPa. Failure occurred was 779GPa, 34.8GPa, 41.5GPa and finally was 37.1GPa, 29.1GPa, 34.5GPa following thermocycling. The results indicate that the light-cured resin/blend performed significantly better than the heat and pressure-cured conventional resin/tensile, but the former performed significantly better and less assembly and less cladding with adhesive properties.

---

**605**

**PRESTON G*, LEUNG T**

*Prosthetics Dept., Eastman Dental Institute, U. of London; Effect of heat treatment on the behaviour of cast cobalt chromium clasps, 100°C, 500°C*.

This study investigated the effects of heat treatment on some of the properties of the cobalt chromium alloy Bayer SP Chromo Cobalt. Test specimens consisting of 15mm long half round tapering clasps were cast as cast, after heat treatment for one hour at 650°C, 800°C or 1000°C followed by quenching. The investigation involves: 1. Measuring the effects of load at the proportionate limit, as well as the ratio of load:deformation, and the sensitivity of the clasp. 2. Measuring permanent deformation of the clasp following deforming six months' use. 3. Vickers hardness testing carried out on the test pieces carried the clasp. These deformation and load at the proportionate limit for the as cast, 600°C, 800°C and 1000°C groups were (0.34mm, 0.63N), (0.11mm, 6.07N), (0.33mm, 7.13N) and (0.30mm, 5.98N) respectively. The mean load:deformation ratios were 20.74N/mm and 19.74N/mm (600°C), 21.68N/mm (800°C) and 17.53N/mm (1000°C). Mean permanent deformation after 146000 deformation was highest for as cast specimens, and decreased with increasing heat treatment temperature. Vicker's hardness values rose as heat treatment temperature was increased. It was concluded that no demonstrative relationship was present between heat treatment changes and changes in stiffness of the claps relative to their use as cast state. Permanent deformation after repeated forces were large within-group variability. Heat treatment at all three temperature levels increased the hardness of the alloy.

---

**606**

**N A ORCHARD*, E H DAVIES, G J PEARSON, J A HOWLETT**

*Department of Prosthetic Dentistry and Biomaterials Research, Eastman Dental Institute, London, U.K.; Bonding of restorations to cast cobalt-chrome alloys. \( 605 \)**

Adhesive resin systems are reported to improve the bond strength between resin and Co-Cr alloys. The study compared the behaviour of three resin systems, CerCAD Student K&B and ChromaSpect/3 in the presence of mechanical retention. Sixty 8mm diameter cylinders and alloy bars, 30°*4.0mm, had 0.6mm diameter retention holes cast on to the bonding surface at regular intervals. The nature of the bond was examined at each stage of the experiment. In addition, to test the bond strength initially were 23.5MPa, 25.5MPa, and 9.6MPa and following thermocycling 30MPa, 27.5MPa, 10.5MPa. Failure occurred was 779GPa, 34.8GPa, 41.5GPa and finally was 37.1GPa, 29.1GPa, 34.5GPa following thermocycling. The results indicate that the light-cured resin/blend performed significantly better than the heat and pressure-cured conventional resin/tensile, but the former performed significantly better and less assembly and less cladding with adhesive properties.

---
The objectives of this study were to investigate the effects of the appearance of maxillary anterior teeth on extractions patients' quality as perceived by others. Full and maxillary female subjects, dentist, partially edentulous and edentulous were chosen to provide different dental appearances, by giving the edible subjects dentures with various designs. The subjects were photographed face and head-on from standardized positions to produce colour prints. These were then scored in a two stage process by five judges. The two observers of clinical adult patients and two groups of dentists one of which worked in restorative dentistry. In the first phase observers noted to score both of the views to rank order of preference. The second phase was carried out on the responses shown to a different but volunteer group of non-dentistry and dentistry subjects and interested observers to scoring the images for a series of personality characteristics using a standard pro-forma. Perceptions varied depending on whether a full face or close-up view was shown. The degree of similarity between the two groups of dentists preferred different pictures. Edentulousness or severe tooth surface loss was perceived as unattractive, and a dense appearance more attractive. Face views of the same subjects were associated with a wider range of responses, while the face to face views was a better discriminator of the personality characteristics it was associated with intelligence and friendliness.

Powder pressing of HAp/partially stabilised zirconia, sintered at a high strength bioceramic composition, requires no excessive high temperatures for densification causing loosening of the HAp with ZrO2. High pressure is being studied in an effort to obtain full densification at lower firing temperatures HAp and ZrO2 powder compositions ranging from 0 to 100 vol% ZrO2 were pressed using a wet mixing process. Ten discs were made for each composition and the theoretical density of the synthesis were measured. The bone formation (BS5) were measured and microstructural changes were examined using XRD and SEM. The amount of a small amount of zirconia to the HAp was measured and varied in some problems of densification. The crystallography was pronounced for small additions of ZrO2. Only for pure HAp, pure ZrO2 and 55/45 wt% HAp/ZrO2 composition was used theoretical density achieved. This was the same as in the bone formation, which for the 55/45 composite was 545131 MPa. Although a considerable improvement on pure HAp, this was still around the same HAp of pure ZrO2 at 2121323 MPa. The XRD data confirmed that the HAp was retained. SEM examination revealed a two-phase microstructure of HAp and zirconia crystals. The rapid improvement in strength at the 55/45 composition can be sacrificed to the formation of a zirconia matrix in preference to an all HAp matrix. The addition of stabilised zirconia to the bioceramic composition powder pressing hot pressing without causing breakdown of the HAp.

Abstracts: MPGs.
The study was to measure the effect on upper bone resorption, of the insertion of non-vascularized bone implants in cats and dogs. The results show that the bone loss is reduced by the extraction of canine teeth and were provided with immediate dentures. Particulars HAp was placed into the extraction socket of the mandible. The aim was to observe how stable the bone would be post-extraction, three or more bone was retained by the implant the control group when measuring ridge height more 0.006 less on the right side; = 0.022 on the left. When measuring width reduction, it was found that at one year the implant group increased twice at much widths as the control group (P = 0.069 on the right side; = 0.085 on the left).

Preservation of the residual ridge is vital in both the vertical and horizontal dimensions for successful surgery. This study demonstrates the benefits and potential applications for the immediate insertion of dental implants and peri-implant bone fragments from implants which have not been loaded. Reflection and fluorescence confocal optical microscopy was employed to study the tissue deep to polished block faces of PMMA embedded material. The peri-implant tissues had successfully remodelled contained vascularized bone in the peri-implant tissues that had been lost. The confocal laser microscopy allowed the recognition of mineralised extrinsic (Sharpey's) fibre and woven bone next to the implant surface distinctly distinguishable from lamellar bone. The organically vascularised bone is considered the bone present in both long term implants and non-loaded bone fragments was taken to reflect collagen remodeling and movement.

It is concluded that the dental implant-bone interface in dynamic and that confocal microscopy is ideal for the 3D study of surgical access to the implant field.

The aim of this study was to develop and test a method for measuring masticatory forces on implant stabilised mandibular overdentures. The first transducer included a rosette strain gauge and was designed to attach to an Astra implant; this has been validated and reported (Akeel et al J Dent Res. 71; 3: 365-371, 1992). Since that time, commercial pressure sensors have also been used to monitor mastication loading unilaterally under the saddle model, and the stabilised mandibular overdenture. The method was achieved by loading defined parts of the occlusion using a bite force meter. The output from all transducers were analysed with multiple regression analysis so that unilateral masticatory forces can be eliminated regardless of the side of loading. The implant acts as a fulcrum during loading which precludes simultaneous output from both masticatory pressure transducers. The use of the transducers covers both incision and occlusion. The multiple regression model gave a t-test (t) (0.99) and a standard error of 3 N. The percentage of occlusal forces received by the implant ranged from 51 to 89%, depending on the side of loading.

It is concluded that the method described can be used to measure vertical masticatory forces and its distribution in subjects with this type of prosthesis without interfering with their occlusion.
I different when results of thirty subjects were compared using images. Dentiro3, generally reduced contact to increase Panadent, Vitacoll, the al. Br. 619, to see six Panadent, of the Baseline was recommended. Cullen was tested and lined with a glass matrix. The aesthetic was then tested at each of ten sets of teeth. Inlays were fabricated using one of two systems and placed with the aid of one of the three microscope techniques: microscopic strip slides, microscopic strip lightened and weighted prior to microscope, microscopic strip lightened and weighed before the microscope was placed into the mouth. Following finishing, the marginal adaptation of each inlay was assessed and scored at 16 defined sites under a stereomicroscope. Excellent marginal adaptation was found at 60% of the sites - more excellent success being recorded for Occlusal (22%) than proximal (3%) areas. Mean Whitney and ANOVA analysis failed to reveal any significant differences between the inlays of the two systems and in respect of the three microscope techniques in terms of percentage excellent scores. It is concluded that for inlays of the two systems tested, the three microscope techniques investigated may not be found to significantly influence the excellence of the marginal adaptation. Inlets of both systems occlusal marginal adaptation may be found to be superior to proximal marginal adaptation.

The aim of this prospective longitudinal study was to evaluate the performance of an anterior hybrid composite resin restorative material for two years. Baseline, 24, 25, 26, 24, 15, 33, 31, 30, 28, 29, 27, 12, 17. Three of their teeth comprising one upper first molar, one upper second premolar and one upper first permanent molar were set in separate blocks in correct anatomical relation. A standardized MOD preparation was completed in each case and restorative material and lined with a glass matrix. The aesthetic was then tested at each of ten sets of teeth. Inlays were fabricated using one of two systems and placed with the aid of one of the three microscope techniques: microscopic strip slides, microscopic strip lightened and weighted prior to microscope, microscopic strip lightened and weighed before the microscope was placed into the mouth. Following finishing, the marginal adaptation of each inlay was assessed and scored at 16 defined sites under a stereomicroscope. Excellent marginal adaptation was found at 60% of the sites - more excellent success being recorded for Occlusal (22%) than proximal (3%) areas. Mean Whitney and ANOVA analysis failed to reveal any significant differences between the inlays of the two systems and in respect of the three microscope techniques in terms of percentage excellent scores. It is concluded that for inlays of the two systems tested, the three microscope techniques investigated may not be found to significantly influence the excellence of the marginal adaptation. Inlets of both systems occlusal marginal adaptation may be found to be superior to proximal marginal adaptation.

The aim of this study was to examine upper anterior crowns preparations performed by general dental practitioners with regard to palatal and incisal reduction, degree of taper and the resultant gingival wall height. Working casts of crown preparations and associated prosthodontic study casts were obtained from 12 practitioners with 2-20 years experience. The midpalatal surfaces were scanned using the Reflux Microscope (Reflex Measurement, Somasert BAS RSP, UK). Measurements were taken to the nearest mm from the midpalatal surface of the teeth to the incisal surfaces of the crowns. The results showed that the palatal reduction at 14 preparations (42%) was less than 0.5 mm. The mean incisal reduction was 0.9 mm. A lingual concavity consistent with prosthodontic form was infrequently produced. The incisal reduction varied from 0.22 - 0.17 mm with a mean of 0.26 mm. The mean degrees of taper were 24.5° labelled "the original" and 17.4° labelled "the modified" prosthodontic form. Six crowns were fabrications. It is concluded that discrepancies from optimal form during anterior crowns preparations are prevalent and that detectable features are either not sought or difficult to achieve.

The purpose of this investigation was to determine if the closest speaking space (CSS) measured during three separate phonetic tests, one in a subject group with normal dentition, were reproducible after a six month period. The mandibular movements were study casts and instructions given by computer during the repetition of three phonetic tests, one containing all the phonemes of the English language in a twelve line paragraph, one containing the six phonemes containing the four sounds, and the third containing the eight phonemes containing one of the alluvial sounds. This experimental procedure was repeated after a six month interval. Statistical analysis (one-factor ANOVA test with repeated measures, significance level 0.02) demonstrated a significant difference among the mean CSS determined initially or among those determined after six months. However, only the CSS determined for the test containing all phonemes was significantly different. These results were compared between the three recording sessions. It was concluded that the CSS was reproducible for a phonetic test containing all phonemes and not reproducible for tests containing only the alluvial sounds.

The aim of this study was to examine upper anterior crowns preparations performed by general dental practitioners with regard to palatal and incisal reduction, degree of taper and the resultant gingival wall height. Working casts of crown preparations and associated prosthodontic study casts were obtained from 12 practitioners with 2-20 years experience. The midpalatal surfaces were scanned using the Reflux Microscope (Reflex Measurement, Somasert BAS RSP, UK). Measurements were taken to the nearest mm from the midpalatal surface of the teeth to the incisal surfaces of the crowns. The results showed that the palatal reduction at 14 preparations (42%) was less than 0.5 mm. The mean incisal reduction was 0.9 mm. A lingual concavity consistent with prosthodontic form was infrequently produced. The incisal reduction varied from 0.22 - 0.17 mm with a mean of 0.26 mm. The mean degrees of taper were 24.5° labelled "the original" and 17.4° labelled "the modified" prosthodontic form. Six crowns were fabrications. It is concluded that discrepancies from optimal form during anterior crowns preparations are prevalent and that detectable features are either not sought or difficult to achieve.

The aim of this prospective longitudinal study was to evaluate the performance of an anterior hybrid composite resin restorative material for two years. Baseline, 24, 25, 26, 24, 15, 31, 30, 28, 29, 27, 12, 17. Three of their teeth comprising one upper first molar, one upper second premolar and one upper first permanent molar were set in separate blocks in correct anatomical relation. A standardized MOD preparation was completed in each case and restorative material and lined with a glass matrix. The aesthetic was then tested at each of ten sets of teeth. Inlays were fabricated using one of two systems and placed with the aid of one of the three microscope techniques: microscopic strip slides, microscopic strip lightened and weighted prior to microscope, microscopic strip lightened and weighed before the microscope was placed into the mouth. Following finishing, the marginal adaptation of each inlay was assessed and scored at 16 defined sites under a stereomicroscope. Excellent marginal adaptation was found at 60% of the sites - more excellent success being recorded for Occlusal (22%) than proximal (3%) areas. Mean Whitney and ANOVA analysis failed to reveal any significant differences between the inlays of the two systems and in respect of the three microscope techniques in terms of percentage excellent scores. It is concluded that for inlays of the two systems tested, the three microscope techniques investigated may not be found to significantly influence the excellence of the marginal adaptation. Inlets of both systems occlusal marginal adaptation may be found to be superior to proximal marginal adaptation.
900
Divisional Abstracts: The British Society for Dental Research
J Dent Res 74 (3) 1995

623 C A HASLEDEN*, J A HOBKIRK, J R GOODMAN, S P JONES and P KING
(Eastman Dental Institute, London, UK): The morbidity of retained deciduous teeth
and the experience of hypodontia.

One of the characteristics of hypodontia is the retention of deciduous teeth which lack permanent successors. The morbidity of these teeth is of importance in clinical dentistry. The purpose of this investigation was to study patterns of root resorption in deciduous canines, and molars with no permanent successors in patients with hypodontia. The study was carried out using OPT of these patients which had been recorded routinely for clinical purposes. A total of 356 radiographs were reviewed and the cases were divided according to whether or not root resorption was present. In multirotted teeth the lower root was scored. Scoring was carried out by one observer who had been shown to have a reproducibility of >0.8 using the unweighted Kappa statistic. Inter-observer error between four different observers was 0.6-0.8 using the same test. It was found that the lower C's were the teeth least likely to be repaired, and the upper D's the most. The upper C's also had a long lifespan, although less than that of the lower C's. While the lower D's had a more rapid rate of resorption this was less than that of the upper incisors

624 A AGARWAL* and J A HOWLETT (Department of Prosthetic Dentistry, Eastman
Dental Institute, London, UK): Assessment of two biometric guides to the positioning
of the maxillary incisors.

Recommended guides for determining the natural antero-posterior position of the maxillary incisors in edentulous patients are the nasal ala angle and incisive papilla. This study assessed the accuracy of these guides by investigating: i) the relationship of the maxillary incisor to maxillary plane angle (UI Max) to the nasal ala angle (NLA) using 91 standardized cephalometric lateral skull radiographs of dentate adults. Angular measurements, using a protractor were made to the nearest 0.5°. Assessment of measurement error included use of a paired t-test, Dahlberg's formula and coefficient of reliability; ii) the distance between the labial surface of the maxillary central incisors to the posterior edge of the incisive papilla (IPV), measured on 100 casts of subjects with Class I or Class II incisor relationships. Casts were oriented according to the occlusal plane on a X-Y table and moved horizontally beneath the vertical arm of a surveyor and distance IPV1 was measured to the nearest 0.1mm on two occasions. Results were analysed by paired and unpaired t-tests.

In subjects with normal inclination of the incisive means NLA was 111.5±10°, there was a slight inverse linear relationship between NLA and UI-Max (Pearson's r =-0.349). The correlation of Prosthetic Tests that the NLA be restored to =90° would appear to be unmodified. A significant difference (p=0.01) was found between Class II subjects (132.5±5.3mm) and Class III subjects (111±0.9mm), however the difference of means may not be of any clinical significance.

625 T FRIEG* and R D WELFARE (Department of Prosthetic Dentistry, Eastman
Dental Institute, London, UK): The Hospital Anxiety and Depression (HAD) scale and
complete denture satisfaction.

Researchers have sought to establish relationships between satisfaction with complete dentures and personality traits for over forty years. This study aimed to investigate the relationship between levels of anxiety and depression and satisfaction with complete dentures. Out of an initial group of 111 patients who had had complete dentures constructed at the Eastman Dental Institute only 68 were included in the study. These all completed the Hospital Anxiety and Depression (HAD) Scale (Zigmond & Snaith R, Act Psychol Scand 67, 361-370, 1983) on three occasions, before, during and after denture construction; the satisfaction questionnaire for their old dentures before treatment; the satisfaction questionnaire for their new dentures after treatment. Although the study group had some anxiety and depression was found to be higher than the population as a whole no strong relationship was found between the HAD score and denture satisfaction using the Spearman rank correlation coefficient.

It is concluded the HAD scale is not a suitable predictor of satisfaction with complete dentures.

626 P. LIU*, P.M. SMITH and J. SCOTT (School of Dentistry, The University of
Liverpool, UK): Functional morphology in anxiety averse rat anterior incisor cells following duct-ligation induced arroy.

In the rat, ligation of the periodontal duct give rise to profound atrophy of the gland. Furthermore, the fraction of gland volume morphologically identifiable as acinar cells drops from 84% to <1% after 1 week ligation. We have used microfluorimetric techniques with single isolated acinar cells in order to determine whether these cells which already appear to undergo acinar cell-induced atrophy also retain their functional ability to respond to a secretory agonist with an increase in intracellular Ca²⁺. Acinar cells from control glands showed a dose dependent increase in [Ca²⁺] following agonist stimulation. Maximal response was obtained with 1-3μM acetylcholine (178±4- 53 mM (n=9) or 10μM carbachol (176±1-52M (n=4). Acinar cells from atrophied glands following 1 week duct ligation also responded to 5μM acetylcholine with an increase in [Ca²⁺] of 125±10 (n=5).

We conclude that, in the unligated gland, there is a good correlation between morphology and function in individual cells.

The consequence of this for the secretory ability of the whole gland following atrophy, the effects of more prolonged atrophy and recovery of the gland following de-ligation are all currently under investigation.

627 C G KELLY*, J HDDOEN*, F H HARIS, D CHAPMAN1, S TODRYK1 (1 Div of
Immunology, UMDS at Guy's Hospital, London SE1 9RT, 2 Dept of Protein and Mol.
Bio, Royal Free Hospital School of Medicine): Structure of streptococcal antigen 103.

Colonisation of the tooth surface with Streptococcus mutans is the main cause of dental caries. Initial adherence of S. mutans involves a specific recognition of salivary receptors, which are adsorbed to the tooth surface, by a cell surface protein, a thermostable antigen 103 (SA11). The aim of this study was to analyse the secondary structure of SA11 by Fourier transform infra-red (FTIR) and circular dichroism (c.d.) spectroscopy. To determine the distribution of structural elements more precisely, a series of overlapping recombinant polypeptide fragments which spanned the predicted extracellular portion of SA11 were also analysed. Both analyses indicated that SA11 comprises approximately 36% a-helix and 40% β sheet. Recombinant SA11, expressed in E. coli possessed similar levels of these structural components but was less thermally stable. The recombinant polypeptide comprising the N-terminal region of SA11 (residues 59-481) adopted predominantly an α-helical conformation (60%) and underwent reversible thermal denaturation consistent with the proposal that it adopt an α-helical coiled coil conformation. The recombinant fragment comprising residues 475-624 also possessed considerable structural integrity (42% β sheet). In contrast, recombinant polypeptide encompassing the adhesion binding site of SA11 (residues 116-1213) possessed approximately 40% β sheet. C-terminal fragment (residues 1155-1338) was insoluble as the concentrations required for analysis and so data were collected. These results suggest that recombinant SA11 and polypeptide fragments adopt conformations similar to those of the native molecule from S. mutans. The results are also consistent with the proposed model for the structure of SA11.