

Introduction

Welcome to the, first issue of Dental Summary Review a brand new publication brought to you by Oral-B Laboratories.

As dental professionals we are constantly bombarded by so much information that one might reasonably ask – why another publication? The reason is two-fold. Firstly, as the name suggests, Dental Summary Review aims to provide a digest of some of the most interesting and stimulating research that has recently been published. As you will see from the list on page 20, a plethora of current issues of journals have been scanned – so you don't have to. Dental Summary Review provides a guide to subjects that you may wish to pursue further in addition to your own research opportunities.

However, there is a second function to this new venture, that of continuing professional education. Although this process has many different applications across Europe the purpose behind it is universal, to ensure that dental professionals are kept as fully up-to-date as possible for their entire practising lives. Dental Summary Review is published in five language versions throughout Europe to ensure maximum opportunity to utilise this resource. The need for Professional Development has been generated from dental professionals themselves and from the public, our patients, who have every right to know that their trust and confidence is well placed in the dental professionals who treat them.

In this, and subsequent issues of Dental Summary Review you will see that each summary is followed by a question and four possible answers, only one of which is correct in the context of the paper summarised. By completing the multiple-choice answer form on the back cover and mailing it using the postage-paid card, each reader can earn points, credits or hours, which ever is appropriate in their country, towards the accumulating goal of proof of continuing education. You should note your answers on the pages themselves and retain them to check the answers, which will be also be sent to you.

With its heritage of being innovative and supportive to dental professionals, Oral-B is proud to bring you Dental Summary Review. We trust that you and your colleagues across Europe find this resource a standard of current knowledge and a focus of future excellence in continuing dental education.



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1 Smoking impairs oral healing

It is now widely accepted that cigarette smoking is a strong risk marker for periodontal disease. The prevalence and severity of periodontal disease in smokers is greater than in non-smokers and in particular tobacco smoking is associated with an increased rate of periodontal bone loss. Additionally, evidence suggests that smokers heal less well following periodontal surgery and this study aimed to evaluate the treatment outcome of periodontal furcation defects following flap debridement surgery in smokers and non-smokers. Thorough clinical periodontal recordings were taken of plaque and bleeding scores, pocket depth and vertical and horizontal attachment level immediately before surgery and again six months later. The results showed that the surgery produced clinically and statistically significant vertical and horizontal attachment gain in the furcation defects. However, for both measures, smokers exhibited less favourable healing outcomes, for example showing just 0.6mm horizontal gain after six months compared with 1.3mm for non-smokers. Similarly, only 3.4% of smokers had complete closure of Class I furcation defects post-surgery, compared with 27.6% of non-smokers.

Trombelli L, Cho K-S, Kim C-K et al. Impaired healing response of periodontal furcation defects following flap debridement surgery in smokers. *J Clin Periodontol* 2003 30: 81-87.

Q. Smokers:

- A Generally heal better than non-smokers
- B Are at less risk from periodontal disease due to bacteria being burnt
- C Heal less well after periodontal surgery
- D Almost never have periodontal pockets

2 Can you spot the signs of apical periodontitis?

Apical periodontitis frequently develops without any subjective symptoms for the patient until it causes acute pain, often requiring emergency attendance with its associated trauma, inconvenience and testing of the dentist-patient relationship. With greater numbers of patients retaining more teeth for longer, especially heavily conserved and root treated teeth, any aid towards identifying risk factors would be welcome. Generally, oral radiography plays an important role in diagnosing the condition and this paper details techniques for identifying risk factors and investigating their interrelation. The study included full mouth surveys of 613 randomly selected adults (20-60 years of age) in Denmark. It was found that smoking, non-attendance at the dentist, ≥ 2 secondary carious lesions, ≥ 3 inadequate coronal restorations and the presence of root filling(s) were statistically associated with apical periodontitis. A separate analysis of individuals with no previous root fillings showed that those who had regular dental visits as well as those who had all their teeth (third molars excluded) were less likely to have apical periodontitis, whereas patients who had ≥ 3 inadequate coronal restorations were more likely to experience the condition.

Kikevang L-L, Wenzel A. Risk indicators for apical periodontitis. *Community Dent Oral Epidemiol* 2003 31: 59-67.

Q. The most telling risk factors for apical periodontitis include:

- A Poor gingival condition
- B Low socio-economic status of the patient
- C Smoking and non-attendance at the dentist
- D Less than 2 secondary carious lesions

3 Smoking harms the gums and distorts the figures

With the increasing evidence of causal links between smoking and periodontitis, the goal of this study was to determine how the changes in smoking prevalence during the 20th century impacted on advanced periodontal disease incidence in the USA. Analysing epidemiological evidence, the authors estimated that the incidence of advanced periodontitis decreased by 31% between the years 1955 and 2000. The changes in smoking habits, and consequently the changes in periodontitis incidence, depended strongly on education and gender, so that between 1966 and 1998 they estimated a 43% decrease in the condition among college-educated individuals compared with only an 8% decrease with less than a high-school education. During the period 1955 to 1999 the calculated decrease among males was 41% versus a lower 14% decrease among females. In terms of the impact that such an analysis may have in the future, the study speculates that by the year 2020, the incidence of periodontitis may have decreased by 43% from its historic level in 1955. Further, the authors argue that this represents an epidemic of periodontitis fuelled by and hidden by smoking which has distorted our understanding of the disease. The socioeconomic polarisation of the incidence may have important implications for the provision of care, possibly requiring periodontal analysis to be on the basis of 'never-smokes' and past and current smokers.

Hujoel P P, Bergström J, del Aguila M A et al. A hidden periodontitis epidemic during the 20th century? *Community Dent Oral Epidemiol* 2003 31: 1–6

Q: It is possible that smoking:

- A Has distorted our perception of the true incidence of periodontitis
- B Will increase substantially, requiring increases in periodontal treatments
- C Is beneficial to the periodontium by killing bacteria
- D Is more prevalent in educated males

4 Sheepish research leads the way

The applicability of results from animal studies to the human situation is often questioned, and rightly. However, recent research on periodontal conditions in sheep may have some interesting implications for the future study of the condition in humans. Sheep suffer a naturally occurring form of periodontal disease called 'broken mouth', which can cause the premature spontaneous exfoliation of teeth, in turn contributing to malnutrition, weight loss and systemic health problems. Taking eight periodontally healthy and eight periodontally diseased ewes, the researchers collected subgingival plaque and sera for evidence of human periodontally-associated pathogens. On analysis, clinical, microbiological and serological characteristics of sheep periodontitis were found to have important similarities to the human equivalent. It may well be that an 'ovine' broken mouth model warrants further investigation as a potential model for periodontal studies, especially as differences between the diseased and healthy animals suggested that periodontitis may have systemic effects on sheep. In the current climate of speculation and contradictory evidence about the links between periodontal disease and systemic disease in humans, including cardiac conditions, low-birth weight babies, diabetes and others, additional leads for further investigation are of great potential significance. Quite apart from which, this study was carried out in New Zealand, a country heavily economically reliant on sheep farming. Any measures that improve the health of sheep will be warmly welcomed from both a humanitarian and commercial viewpoint.

Duncan W J, Perrson G R, Sims et al. Ovine periodontitis as a potential model for periodontal studies. *J Clin Periodontol* 2003 30: 63–72.

Q. Periodontal disease in sheep:

- A Has important similarities with human periodontal disease
- B Has no systemic effects on the welfare of the animals
- C Shows that plaque bacteria grow less strongly with a diet of grass
- D Can be passed on to humans

5 Lasers match ultrasonic scaling for effectiveness

The use of lasers in dentistry has increased considerably in recent years for both hard and soft tissue applications. In periodontics, lasers have been expected to serve as alternative or adjunctive treatment to mechanical therapy due to perceived advantages such as vaporisation, haemostasis and sterilisation effects. Researchers in Japan aimed to compare the effectiveness of Nd:YAG and CO₂ laser treatment to that of ultrasonic scaling on periodontal pockets. Forty-one sites with pockets of >5mm depth in 18 patients were randomly assigned to one of three treatments; Nd:YAG laser only, CO₂ laser only, or ultrasonic scaling only. Clinical measurements, including bacterial counts from subgingival plaque and gingival crevicular fluid (GCF) analysis, were recorded at baseline and at 1,4 and 12 weeks post-operatively. Decreased inflammation and pocket depth were observed in all groups after treatment and microbiological analysis showed significant decreases of *P.gingivalis* in the Nd:YAG and ultrasonic groups at all post-treatment stages. The amount of GCF also significantly decreased in these two groups by 12 weeks, although it had showed a slight increase in the CO₂ group after 1 week. Despite these variations, no significant differences were observed between the three groups, the authors suggesting that the Nd:YAG laser in particular is as effective in these situations as ultrasonic scaling.

Miyazaki A, Yamaguchi T, Nishikata J et al. Effects of Nd:YAG and CO₂ laser treatment and ultrasonic scaling on periodontal pockets of chronic periodontitis patients. *J Periodontol* 2003 **64**: 175–180.

Q: Which of the following uses/statements is not true

- A** Lasers used in periodontal treatment can be as effective as ultrasonic scalers
- B** Ultrasonic scaling and laser treatment all reduced inflammation
- C** Use of Nd:YAG lasers increases the counts of micro-organisms
- D** Lasers are regarded as having beneficial haemostasis and sterilisation effects

6 Sports diets and dental erosion

A questionnaire on oral health habits, diet and dental health was sent out to 32 sports clubs to try and discover the consumption of acid food and drinks, the extent of dental erosion and if there was a relationship between them. Dental erosion, defined as being the loss of dental hard tissue by a chemical process not involving bacteria, has become a considerable problem in recent years. Although having a multifactorial aetiology dental erosion is thought to have a substantial dietary component, and this could be especially true of athletes because of their frequent intake of sports drinks and carbonated mineral water. The results of the survey revealed that 25% of respondents reported having dental erosion pointed out by their dentists, the highest percentage being among martial arts participants at 37%. No specific associations could be identified between dental erosion and the imbibing of sports drinks or soft drinks but statistically significant correlations were found between age group (older age groups being more adversely affected), frequency of drinking juices and tooth sensitivity. Conducted in Melbourne, Australia, the study concluded that there was a significant need for preventive programmes and dietary counselling for young athletes to help control and reduce the effects of acidic food and drinks.

Sirimaharaj V, Messer L B, Morgan M V. Acidic diet and dental erosion among athletes. *Austral Dent J* 2002 **47**: 228–236.

Q. Athletes may be at greater risk of dental erosion because:

- A** They have poor oral hygiene
- B** Exercise inhibits the flow of protective saliva
- C** Of their frequent intake of acidic drinks
- D** Bacteria thrive at higher body temperatures

7 Measuring bad breath to test periodontal disease

Volatile sulphur compounds (VSCs) are recognised as major components of oral malodour, being created by breakdown products from bacteria in periodontal pockets and on the dorsum of the tongue. There appears to be a strong correlation between oral malodour and periodontal disease and it has been shown that VSC levels increase with the number and depth of periodontal pockets. It has been suggested that being able to measure the levels of VSCs may provide a monitoring tool to assess the success or otherwise of periodontal treatment or indeed to assess the risk of periodontal diseases in individuals. This study therefore set out to establish to what extent the level of VSCs were stable in an individual over a period of time, which might allow a characteristic pattern to emerge. Using dental students who rinsed with standardised mouth rinses of cysteine, a substance known to stimulate creation of VSCs, the researchers then measured the gases exhaled by use of the Halimeter[®] and gas chromatography. Unfortunately, the intra-individual variations in VSC production were so large that no characteristic patterns were discernible. Convenient as it might have seemed, measuring oral malodour in this way would not be sufficiently exact for the accurate prediction of periodontal disease status.

Young A, Jonski G, Rølla G. Variation in oral volatile sulphur compound formation
Acta Odontol Scand 2002 60: 321–324.

Q: Which of the following statements is true?

- A** Bacteria found in periodontal pockets are known to cause oral malodour
- B** Individuals with periodontal disease are free of harmful bacteria
- C** Volatile sulphur compounds make breath smell pleasant
- D** The use of Cysteine mouth rinses helps to prevent oral malodour

8 Too much tea for infants?

Although tea contains fluoride, which can be of obvious benefit to oral health, for infants as well as other ages, some 'iced tea' products with acidic pH values and added sugars could prove harmful. This is the conclusion of work from Germany, where such products have recently gained notice as being used for infants in bottles and feeders. Concerns have been raised that over-consumption of such beverages might lead to fluorosis in the very-mild or mild categories, and/or caries as a result of the sugars contained in them. Taking 44 iced tea samples, the researchers analysed them for pH values and fluoride concentration. Of the samples, 10 were available as granular powder, the others as ready-to-drink liquids all with variable types and amounts of sugars and all with either lemon juice or citric acid as an additive. The pH ranged from 4.04 to 2.63 and the fluoride concentrations from <0.6ppm in 14 products, 0.6–1.1ppm in 16 products, 1.6–2.0ppm in two products and >2ppm in the remaining two products. Clearly, most of the iced teas contained considerable fluoride concentrations that, if consumed in large amounts, could risk overdosing and fluorosis in conjunction with amounts from other sources. Additionally the sugar content risks caries initiation and the acid nature of the drinks could cause dental erosion. Practitioners in areas where such drinks are popular should be aware of these risks when taking dietary histories, especially of infants and young children.

Behrendt A, Oberste V, Wetzel W E. Fluoride concentration and pH of iced tea products.
Caries Res 2002 36: 405–410.

Q: Fluoride in tea products affects infants' oral health by:

- A** Possibly causing overdoses leading to fluorosis
- B** Negating the beneficial effect of calcium in milk
- C** Reducing the need for other fluoride supplements
- D** Their use being encouraged in night time bottles and feeders

9 Power toothbrush gains better access

Power toothbrushes have become far more widespread in use in recent years with improved efficacy and better patient compliance. This study aimed to compare the efficacy and safety of two such toothbrushes with different characteristics. Using a single-blind, randomised, crossover method, the intention was to test the ability of the two brushes to remove plaque during a two-minute brushing period. One brush (the Excel) is rechargeable with an oscillating/rotating/pulsating action, the other (Actibrush) is battery operated with an oscillating/rotating action. The 74 subjects in the trial firstly abstained from oral hygiene for 24 hours to establish baseline plaque levels before following a standardised sequence of alternate toothbrush use over two, two-week periods. Both toothbrushes were safe and both significantly reduced plaque levels but the Excel was significantly more effective for the whole mouth and for approximal sites. Plaque reductions for the Excel being 46.5%, 55.2% and 42.9% for whole mouth, marginal and approximal sites, compared with 41.5%, 52.5% and 36.8% respectively for the Actibrush. The results, which are in line with those of previous comparison studies, point to the effectiveness of the oscillating/rotating action with the added advantage of the pulsating motion enabling the operator to better clean the difficult to reach areas that are frequently associated with caries and periodontal disease.

Cronin MJ, Dembling WZ, King DW et al. A clinical study of plaque removal with an advanced rechargeable power toothbrush and a battery-operated device. *Am J Dent* 2002 15: 365-368.

Q: Power toothbrushes:

- A Are all the same
- B Remove plaque most effectively when used without toothpaste
- C Seem to be most efficacious when incorporating a combined oscillating/rotating/pulsating action
- D Should be used only after a period of 24 hours with no oral hygiene

10 Oral hygiene works

To maximise health, many dental associations and authorities recommend various oral health regimens which usually include frequent brushing and other appropriate plaque removal measures and regular dental visits. However, the efficacy of such recommendations are rarely tested over a long period of time. Taking as an aim the discovery of whether adherence to American Dental Association (ADA) guidelines lead to retention of more teeth, researchers in Boston tapped into data from a longitudinal study which began in 1961. Records of tooth brushing habits, floss use, annual dental prophylaxis and combinations of such behaviours, were associated with clinical examinations of current tooth retention. The 736 male participants, whose initial ages had ranged from 26 years upwards, showed that use of multiple oral hygiene behaviours was indeed associated with greater tooth retention, cross-sectionally and longitudinally. Initial age, number of teeth, education of the participant and smoking habits were significantly associated with tooth loss over time, as found in other studies. Nevertheless, the authors concluded that consistently practising preventive measures over the long term confers greater benefit than doing so only over the short term.

Kressin NR, Boehmer U, Nunn ME et al. Increased preventive practices lead to greater tooth retention. *J Dent Res* 2003 82: 223-227.

Q. Tooth retention over a long time period:

- A Is more likely if the patient is a regular smoker
- B Is less likely following a lifetime of regular dental visits
- C Seems to be improved if oral hygiene guidelines are adhered to in the long term
- D Is best in educated young men regardless of flossing habits

11 Fresh chewing sticks for good hygiene

Chewing sticks are used for oral hygiene purposes in many countries around the world, indeed recent research into their use has focussed on whether or not they may have anti-microbial properties as well as their physical actions in mechanical plaque removal. However, it is apparently quite common to see chewing sticks displayed for sale, which are covered in post-harvest fungal infection, a situation that has not been previously investigated. Concentrating on chewing sticks from three plant types; *Azadirachia indica*, *Garcinia kola* and *Glyphea brevis*, researchers in Nigeria observed the fungal growth following four different treatment methods. Using sticks cut freshly from each of the plants, the following storage conditions were applied after drying at 45°C for two hours before being left at room temperature (30°C) for four weeks: left exposed and unsealed (normal practice); sealed in clear polythene; disinfected using sodium hypochlorite for 10 minutes; similarly disinfected and then sealed in polythene bags. The samples were observed at 2,3 and 4 weeks of storage. There were significant differences in fungal colonisation dependent on plant type (*A.Indica* being most susceptible) and storage period but preparative methods and storage conditions did not have any significant impact. Overall, the recommendation for good trading standards practice as well as optimum hygiene is to surface disinfect the chewing sticks, seal them and discard them no later than two weeks after harvesting.

Etebu E, Tasie AA, Daniel-Kalio LA. Post-harvest fungal quality of selected chewing sticks. *Oral Diseases* 2002 9: 95-98.

Q: Chewing sticks:

- A Can be cut from any tree
- B Are most effective when matured, ideally for six weeks or more
- C Should be discarded two weeks after being harvested
- D Contain natural levels of hypochlorite for organic disinfection

12 Smear campaign removal leads to success

The effect of a smear layer on microleakage around restorations and on resulting bond strengths of dental materials has been widely studied. However, its effect on the subsequent development of secondary caries is less well documented. Created during instrumentation, the smear layer consists of a mixture of denatured collagen and mineral and the objective of this study was to investigate its potential role in the development or inhibition of root caries adjacent to resin-modified, glass ionomer (RMGI) restorations. Following cavity preparation on 54 extracted, caries free permanent molars, four different surface treatments were used prior to restoration: none; polyacrylic acid; phosphoric acid; Scotchbond Multi-Purpose adhesive as a control. Specimens were aged for two weeks in synthetic saliva, thermocycled, and subjected to an artificial caries challenge. The resulting lesions, studied using polarised light microscopy and microradiography showed significantly less demineralisation with phosphoric acid. Dentine fluoride profiles supported these findings, leading to the conclusion that removal of the smear layer with phosphoric acid prior to restoration with RMGI leads to significantly enhanced resistance to secondary root caries formation adjacent to such restorations.

Al-Helal AS, Armstrong S R, Xie XJ et al. Effect of smear layer on root demineralization adjacent to resin-modified glass ionomer. *J Dent Res* 2003 82: 146-150.

Q: Removal of the smear layer using phosphoric acid, prior to restoration with resin-modified glass ionomer materials:

- A Significantly weakens bond strength
- B Reduces the fluoride content of the eventual restoration
- C Is most effective in reducing secondary caries
- D Conflicts with the chemistry of the ionomers causing discolouration

13 Microleakage not adversely affected by caries dyes

Microleakage between tooth structure and restorations is considered an important factor associated with the development of secondary caries and pulp injury. The advent of acid etching and adhesive bonding systems in restorative dentistry has provided the potential to decrease microleakage but various impairments still exist such as the presence of eugenol, saliva, oil and blood contaminants. A further potential interference may come from the dyes used to stain caries for its more effective elimination. The purpose of this investigation therefore was to test just that possibility. To do so, 60 cubic class V cavities were prepared in a standardised procedure on the buccal and lingual surfaces of 30 extracted third molars, with the coronal margins located in enamel and the gingival margins in cementum. The cavities were subjected to caries dyes before being restored with a bonding system and either a composite resin or compomer restoration. Control cavities received no dyes. After storage, thermocycling and immersion in methylene blue detecting dye the teeth were sectioned and examined for leakage. There were no significant differences between the control teeth and those subjected to caries dyes, leading to the conclusion that such diagnostic aids used during cavity preparation do not adversely affect restoration sealing, thereby not increasing microleakage.

Piva E, Meinhardt L, Demarco F E et al. Dyes for caries detection: influence on composite and compomer microleakage. *Clin Oral Invest* 2002 6: 244–248.

Q: Dyes used for caries detection:

- A Cause bonding failure between tooth and restoration
- B Inhibit bacterial growth and reduce secondary caries
- C Substantially strengthen the bond between compomers and dentine
- D Do not increase microleakage

14 Caries removing gel preferred by patients

Carisolv is a relatively new chemomechanical method for caries removal involving the application of a gel followed by removal of cariously affected dentine with hand instruments specially designed for quick, easy and painless operation. The gel is thought to work by the proteolytic effect of sodium hypochloride dissolving the diseased dentine by degradation of collagen. In this study, Carisolv was compared with conventional drilling technique by selecting 45 adult patients with two contralateral primary coronal mesio- or disto-occlusal carious lesions, similar in extent. One operator treated both lesions in one visit, one with Carisolv, the other with conventional powered handpieces. Following the restorative procedure, patients were asked their opinion of the two processes while the operator recorded any need for drilling in addition to Carisolv, time required for each lesion, need for anaesthesia and any gingival reaction to the Carisolv gel. Patients found Carisolv treatment more pleasant (82%) and preferable (88%) to drilling although operators reported significantly longer times needed for the process. Additional drilling was needed in 10% of Carisolv treated teeth and anaesthesia was required in 8%. No gingival reactions were recorded. The Carisolv technique may well have a place in caries removal but the advantages and disadvantages need to be carefully weighed for each potential case.

Kakaboura A, Masouras C, Staikou O et al. A comparative clinical study on the Carisolv caries removal method. *Quintessence Int* 2003 34: 269–271.

Q. Removal of carious dentine by gel and hand instruments:

- A Works by using really hard instrument tips
- B Is much quicker than drilling
- C Often requires drilling to complete the preparation
- D Is preferred by patients compared with drilling

15 Cutting cavities under pressure

While there is research into the range of cutting forces used to prepare teeth, perhaps surprisingly there is none which has studied the forces actually imposed while cutting teeth with high-speed handpieces. Large forces may cause damage to the structure of the teeth and possibly compromise the vitality of the pulpal tissues. The purpose of this paper was to record the forces imposed while cutting teeth with tungsten carbide burs in such handpieces. Thirty-one dentists each cut eight conventional class II MO and DO cavity preparations in intact, extracted third molars using two air turbines with different torque-speed characteristics. Two different types of flat fissure bur were also used, cross-cut and plain either wet or dry. The teeth were mounted in a custom-made transducer, which displayed the forces applied. Although there were no significant differences between the burs or the wet or dry cutting conditions, there was a significant difference between the two handpieces with the higher torque version producing a greater force. The authors speculate that each operator adjusts the force applied during tooth cutting on the basis of audible feedback to find a point of compromise between increasing force and decreasing cutting speed.

Elias K, Amis AA, Setchell DJ. The magnitude of cutting forces at high speed
J Prosthet Dent 2003 89: 286–291.

Q: The force used to cut cavities:

- A** Is directly affected by the torque of the handpiece used
- B** Is unlikely to cause any damage to tooth tissue even if excessive
- C** Depends on the type of bur used
- D** May causes injury to the operator's hearing

16 Effect of surface roughness of implant abutments

Perhaps surprisingly, the surface roughness of implant abutments exposed to the oral cavity had no relation to the inflammatory response in a short-term, human study. The conclusion was reached after a trial involving replacing the abutments of nine patients with test equivalents of five different surface roughnesses for a period of four weeks. Testing the hypothesis that a rougher surface would lead to greater plaque accumulation and consequent inflammation, clinical evaluation of the patients included health of the surrounding mucosa, plaque levels, marginal bleeding and a biopsy. There was a statistically significant difference between patients regarding the amount of accumulated plaque on the abutment surfaces and inflammatory cells, but no difference between the surface modifications in relation to plaque accumulation or number of inflammatory cells. While previous studies have found periodontal pathogens to be related more to patient dental status than surface roughness, others have reported greater bacterial levels on roughened surfaces after a period of three months. While the shorter period of this study may be a factor, the authors consider that four weeks should provide sufficient time for adverse cell reactions to be detectable but not long enough to establish clinical inflammation.

Wennerberg A, Sennerby L, Kultje C et al. Some soft tissue characteristics at implant abutments with different surface topography. A study in humans. J Clin Perio 2003 30: 88–94.

Q: The surface roughness of implant abutments exposed to the oral cavity:

- A** Seems not to be related to inflammatory response in the short term
- B** Creates periodontal lesions in the long term
- C** Feels rough to the patient's tongue
- D** Adversely affects the aesthetics of the restorations

17 Anxiety over implant insertion

Pain is a complex experience affected by such factors as stress, anxiety and perceptions and is often thought of in association with dental care. The purpose of this study was to examine the inter-relationship between anxiety and acute pain perception in the situation of oral surgery implant insertion, in short to determine whether anxious patients experienced a more painful event. Sixty patients who were scheduled for implants were evaluated on three consecutive occasions; immediately pre-operatively, immediately post-operatively and at four weeks post-operatively. Patients were requested to complete a questionnaire concerning their anxiety on each occasion and to indicate their subjective evaluations of pain using a visual analogue scale. Anxiety and pain evaluation were highest before the implant insertion, with a significant decrease immediately after the surgery, with the best predictor of a patient's pain evaluation being their level of anxiety at that time. The lower the anxiety, the lower the subjective experience of pain. This has implications for patient evaluation of the dentist and dental team, patient care, compliance and indeed potential success of a procedure. The patient's emotions can be as crucial a factor in the eventual treatment outcome as the technical competence of the practitioner.

Eli I, Schwartz-Arad, Baht R et al. Effect of anxiety on the experience of pain in implant insertion. Clin Oral Implant Res 2003 14: 115-118.

Q: Patient anxiety associated with implant surgery:

- A** Is most extreme when the pain is at its highest
- B** Directly affects their perception of the pain they experience
- C** Is made better with the use of sedatives
- D** Is highest four weeks after the surgical procedure

18 Occlusal loading important in implant bone stress

The rise in the popularity of implants has encouraged their use in many and diverse clinical situations but the direct contact of implant to bone needs to be carefully managed in terms of occlusal forces. Using a combination of computer modelling and chewing data from human subjects, this study aimed to compare the biomedical stress distribution in bone supporting an implant and that of a natural tooth under occlusal function. Adults with complete dentitions and free of temporomandibular joint problems were categorised into either 'choppers' or 'grinders' according to their eating patterns and had their chewing movements recorded with an electronic jaw-tracking device. Resulting data were then applied to the three-dimensional computer models of both normal tooth and implant. The implant model showed stress concentration in the supporting bone around the neck of the implant, especially buccally, while the tooth model revealed smooth stress distribution throughout the bone with less concentration around the neck of the tooth. Of the two chewing modes, the grinding type caused higher tensile stress at the neck of the implant. Occlusal considerations and patient chewing function are important factors to consider when deciding on implant treatment and in helping determine short and long term loading.

Ishigaki S, Nakano T, Yamada S et al. Biomedical stress in bone surrounding an implant under simulated chewing. Clin Oral Implant Res 2003 14: 97-102.

Q. Occlusal forces:

- A** Have no significant effect on implant placement
- B** Can cause high stress in bone supporting implants
- C** Should be measured using computer models
- D** Determine whether patients eat a balanced diet

19 Trays can make or break an impression

Rigid custom trays produce significantly more accurate impressions for implant usage than polycarbonate stock trays. This was the main finding of an in vitro project that aimed to compare the accuracy of the two tray types to make implant fixture-level impressions. In total, 27 impressions were made of two pairs of Brånemark 3.75mm diameter implants mounted in an aluminium typodont using an open tray technique. Three polyether impressions were made with each of three different trays: stock impression, close-fit custom and spaced custom. The casts produced were assessed by attaching a reference framework with alternative single screws and measuring any vertical fit discrepancy with the aid of a travelling microscope. Results showed that of the three tray types, the stock trays had a discrepancy of $23\pm 20\mu\text{m}$, significantly greater than the spaced custom trays at $12\pm 10\mu\text{m}$ or close fit customs at $11\pm 10\mu\text{m}$. The lack of consistency of the impressions recorded in the stock trays also mean that their reliability was suspect. In situations which require the necessary accuracy of implant fixtures every positive aid is needed to ensure that error is avoided since prosthesis misfit is likely to increase the incidence of mechanical component loosening or fracture.

Burns J, Palmer R, Howe L et al. Accuracy of open tray impressions: an in vitro comparison of stock versus custom trays. *J Prosthet Dent* 2003 89: 250–255.

Q: Which of the following types of impression tray provided the most accurate impressions:

- A** Stock trays
- B** Rigid custom trays
- C** Nickel-copper trays with plastic handles
- D** Flexible custom trays

20 Mandibular position as well as body posture affect snoring

Obstructive sleep apnoea (OSA), or snoring, is a respiratory-related complication characterised by repetitive partial or complete obstruction of the upper airway during sleep. Quite apart from the disturbance to the sleep patterns of the sufferer, and others, the resultant daytime sleepiness can interfere with normal activities. One successful treatment method that has been well documented, and often applied by dentists, is that of an oral appliance which keeps the mandible in a forward position. However, since a considerable factor in OSA is nasal resistance, this study set out to measure changes in nasal patency induced by forward positioning of the mandible and by alterations in body posture. Nasal resistance was measured while each of the 15 individuals recruited to the project held their mandible in intercuspal, middle and maximum forward positions. Similar recordings were taken with them in four body positions; sitting erect, at 30° and 60° dorsally reclined and supine. The patency of the nasal passages were significantly greater in the middle and maximally forward mandibular positions than intercusally. In terms of body posture, the nasal patency showed a progressive decrease from sitting erect to a supine position. Such results indicate that mandibular position and body posture should both be considered in the history taking and subsequent treatment of patients suffering from sleep apnoea.

Hiyama S, Ono T, Ishiwata Y et al. Effects of mandibular position and body posture on nasal patency in normal awake subjects. *Angle Ortho* 2002 72: 547–553.

Q: Improvements in patients with obstructive sleep apnoea can be obtained by:

- A** Reducing nasal patency and increasing upper airway resistance
- B** Altering body posture alone
- C** A combination of altering body posture and mandibular position
- D** Advising the patient to sleep in the sitting position

21 Root resorption may be genetically programmed

The possibility that there may be a genetic predisposition to external apical root resorption (EARR) has been studied in 35 families. EARR is an undesirable sequela of orthodontic treatment in some patients, resulting in permanent loss of tooth structure from the root apex, although clinical manifestation is highly variable. Families having at least two siblings who had received full-banded comprehensive treatment were invited to join the study, resulting in 118 subjects consisting of 73 siblings and 45 parents being tested for the interleukin gene under scrutiny. To collect a sample for DNA analysis, the inside of the mouth was scraped with a sterile nylon brush. Root measurement was carried out pre- and post- treatment to determine apex resorption. Highly significant evidence of linkage between the suspected gene and the clinical manifestations of EARR was obtained, showing that persons homozygous for the gene were at 5.6 fold increased risk of resorption greater than 2mm. The findings are consistent with genetic factors providing a predisposition to this condition and add important knowledge to the understanding of factors causing this unfortunate outcome of professionally applied tooth movement.

Al-Qawasmi R, Hartsfield JK, Everett ET et al. Genetic predisposition to external apical root resorption. Am J Ortho Dentofacial Orthop 2003 123: 242-252

Q: A genetic predisposition to apex resorption:

- A** Is unproven
- B** Seems highly likely
- C** Results from grandparents having undergone orthodontic treatment
- D** Can be detected from the DNA of parents with untreated malocclusions

22 Measurements from panoramic radiographs require caution

Panoramic radiographs are often used to evaluate the status and relationships of various dental and skeletal structures and sometimes measurements are required from orthopantomograms (OPGs) for diagnostic and treatment planning purposes. However, such images suffer from a variable degree of distortion. This research project sought to test the effects of varying tooth angulations and spatial position of the object on the linear distortion in such images, using a test model with metal rods to simulate maxillary teeth from the first permanent molar to the lateral incisor. Calculations were made of the distortions created by different 'tooth' positions by measuring the magnification change of the width and length of the rods on the processed radiographs. Results showed significant errors occurred when the rods were inclined bucco-palatally or when they exceeded 5 degrees from the true perpendicular. The work emphasises the caution that must be used when taking measurements from panoramic radiographs and applying them to clinical decision making. To minimise errors in this type of radiography it is particularly important to position the patient in the apparatus precisely according to the manufacturer's specification.

Yeo DKL, Freer TJ, Brockhurst PJ. Distortions in panoramic radiographs. Aust Orthod J 2002 18: 92-98.

Q. Measurements taken from OPG radiographs:

- A** Represent exact dimensions of the tissues they show
- B** Are more accurate if manufacturer's instructions are ignored
- C** Should be adjusted by 5 degrees to obtain the best results
- D** Must be treated with great caution

23 Agreeing to agree on orthodontic treatment need

The decision to seek orthodontic treatment is usually based on a variety of factors and while often patient motivated, it can also be professionally initiated and influenced by general dental practitioners, paedodontists and orthodontists. This study in the USA aimed to test the perceptions of orthodontic treatment need of members of these three groups using 137 dental casts. The models represented the full range of severity of malocclusions based on the dental health component of the Index of Orthodontic Treatment Need and the dentists were asked to rate their opinion of the need from 1, none/minimal through to 7, great. Additionally, each participant was asked to nominate a cut-off point that, in general, represented the point at which he or she deemed treatment to be indicated. Overall, the level of agreement was very strong, both within and between the groups, indicating that the different training pathways had not affected basic perception. However, the orthodontists and paedodontists had lower cut-off points for treatment being indicated than GDPs, perhaps showing that they would refer patients at an earlier stage. Interestingly, the results contrast with evidence from the UK, which suggests that treatment decisions of GDPs are variable and this may reflect differences in health service environments.

Berk NW, Dukich Bush H, Cavalier J et al. Perception of orthodontic treatment need: opinion comparisons of orthodontists, pediatric dentists, and general practitioners. *J Orthod* 2003 29: 287–291.

Q: Perceptions of the need for orthodontic treatment:

- A Vary widely between general dental practitioners and orthodontists
- B Should be based solely on the wishes of the patient's parent or guardian
- C Can only be assessed using models for comparison
- D Are remarkably consistent between general dental practitioners, paedodontists and orthodontists

24 Xylitol reduces *S. Mutans* in young children

Encouraging the use of chewing gum in young children may not be everyone's idea of good oral health practice. However, a study in preschool children in Florida has shown that regular use of xylitol containing gum can reduce the counts of streptococcus mutans bacteria, implicated in the caries process. Eighty-five children between the ages of 3 and 5 years were divided into a gum and control group. The experimental group chewed, at school and under direct supervision, a gum sweetened with 100% xylitol, for five minutes three times each school day for three weeks. Baseline examination consisted of recording caries status and a strip method of measuring *S. Mutans* levels, which were repeated at the conclusion of the experimental period. Results showed that while 75% of children in the control group showed no change in measured bacterial levels, in the xylitol group only 42% remained the same, with 48% showing a significant decrease in levels. While the results are short term, the alteration in *S. Mutans* levels is in keeping with other studies and points towards a possible targeted use of xylitol even for young children who have a high caries status or caries risk. Despite commonly expressed concerns about the possible digestive effects of xylitol, no adverse effects were reported in this study.

Autio J T. Effect of xylitol chewing gum on salivary streptococcus mutans in preschool children
J Dent Child 2002 69: 81–86.

Q: The use of xylitol containing chewing gum by young children:

- A Reduces caries risk because of salivary stimulation
- B Increases the counts of protective and beneficial bacteria
- C Prevent caries by getting impacted in fissures
- D Leads to reductions in the oral levels of *Streptococcus mutans*

25 Pocket money and child influence increases cariogenic snacks

Adults' efforts to limit their children's intake of sweet snacks and drinks are being undermined by earlier and earlier influences in the child's life and by access to money, allowing the child to out-manoeuvre preventive influences. So concludes a study in inner-city families with primary school children in Manchester, UK. In interviews, 7–8-year-old children were asked about their sweet eating habits, pocket money and their perceived levels of autonomy within the home. The parents were then asked to complete a questionnaire that mirrored the children's questions. There was a moderate but significant correlation between the opinion of the children and parents on the extent of their influence. When analysed by age of parents, the children of older parents aged over 36 years seemed to get less of his or her own way. In addition, the researchers also noted that the situation was compounded by the change in working patterns of families, where both parents are out at work and can over-compensate the children as a result. The study also highlights the possibly negative role of older adults, especially grandparents, when considering the long term approach to oral health education.

Roberts BP, Blinkhorn AS, Duxbury JT. The power of children over adults when obtaining sweet snacks. *Int J Paed Dent* 2003 13: 76–84.

Q: Which of the following statements is true:

- A Children are increasingly likely to obtain potentially cariogenic snacks
- B Older parents are less likely to care for their children's oral health
- C Grandparents positively reinforce healthy diets for young children
- D Children with most pocket money spend it on toothbrushes

26 Caries bacteria in mothers and children

Dental caries is an infectious and transmissible disease with two groups of microorganisms most strongly associated with it, the mutans streptococci and the lactobacillus species. Previous studies demonstrated that infants acquire mutans streptococci from their mothers, but only after eruption of the deciduous teeth. However, more recent work has indicated that these organisms can colonise the mouths of pre-erupted infants as well, finding the furrows of the tongue a useful ecological niche. Since early colonisation is a major risk factor for future caries experience, early detection and greater knowledge of the acquisition and transmission are of key importance. The transmission from mother to child, termed vertical transmission, has been determined by DNA testing of bacterial species and is dependent on factors such as the quantity of bacteria in the maternal mouth and the frequency of inoculation. It has been shown that suppressing maternal reservoirs can prevent infection of the child. Horizontal transmission, from other family members and peers has also been demonstrated, and this occurs particularly in the day care, pre-school or nursery setting. This may prove to be an area of prevention to target, given the social trend towards greater provision of this type of child-care. Indeed, given the need to identify high-risk individuals for caries and provide specific interventions, the identification of such reservoirs of potential infection may be an important future strategy.

Berkowitz RJ. Acquisition and transmission of Mutans Streptococci. *CDA J* 2003 31: 135–137.

Q. Caries causing bacteria:

- A Can be passed from mother to child
- B Find a natural resistance in children, passed down from the mother
- C Never colonise prior to tooth eruption
- D Should be neutralised by regular DNA testing

27 Fluoride – yes, but how much?

The steep reductions in caries in countries in which fluoride containing toothpastes are widely used are well documented. Having discovered this, the aim has been to increase the levels of fluoride in dentifrices to give maximum benefit. However, the potential negative effect of fluoride intake is that too great a quantity can cause fluorosis. Thus a balance has to be struck between these potentially conflicting extremes. Because of the cost and time involved in setting up clinical trials to test the effects of fluoride toothpaste usage, especially in children and notwithstanding any ethical issues, a systematic review of the literature was undertaken. The aim was to review previously published randomised controlled trials comparing low fluoride toothpastes (600ppm or less) with those containing 1,000ppm or more in both children and adults. Seven such trials were available and the data were analysed by the meta-analysis method. Statistically significant results emerged showing that decayed and filled surface increments were greater in the low fluoride groups than in the 1,000ppm plus cohorts. Unfortunately the data were not sufficient to precisely define a cut-off point for the level of fluoride. Thus, the authors concluded that whilst a level of 250ppm was not as effective as 1,000ppm, to detect the differences between 500ppm and 1,000ppm further trials will indeed be required.

Ammari AB, Bloch-Zupan A, Ashley PF. Systematic review of studies comparing the anti-caries efficacy of children's toothpaste containing 600ppm of fluoride or less with high fluoride toothpaste of 1,000ppm or above. *Caries Res* 2003 37: 85–92.

Q: Which one of the following statements is true?

- A** Toothpaste with under 250ppm fluoride always causes fluorosis
- B** Meta-analysis helps prevent caries
- C** Fluoride toothpaste is yet to be proved effective for caries reduction
- D** Toothpaste with 1,000ppm fluoride or above is more effective at preventing caries

28 Caries makes teeth appear sooner

Many factors have an impact on the timing of the emergence of the permanent dentition including genetics and the especially the time of loss of the deciduous molars in the case of the premolars. The purpose of this study was to evaluate the effect of caries experience in primary molars either decayed or restored versus those extracted, on the timing of the eruption of the successive premolars. The authors examined 4,468 Flemish children in Belgium, all of whom were born in 1989. Examinations took place annually for a period of six years (1996–2001) during which time the authors built a database of caries experience in the primary molars as well as presence of the erupting premolars. Analysis showed that the emergence of the premolars in both the maxilla and the mandible was accelerated by 2–8 months when its predecessor had been decayed or restored but had not been extracted. Premature loss of maxillary primary molars resulted in significant acceleration of the emergence of the premolars but this was not observed in the mandible, which may be a feature of the different composition of bone between the two jaws, with more cancellous and cortical bone in the mandible. As for the effect of caries, it may be that in the teeth so affected degenerative processes in the pulp cause an increased rate of deciduous root resorption, an effect that might be useful to consider in the prediction of an individual's dental development.

Leroy R, Bogaerts LR, Lesaffre et al. Impact of caries experience in the deciduous molars on the emergence of the successors. *Euro J Oral Sci* 2003 111: 106–110.

Q: Which of the following statements is not true:

- A** Premolars whose deciduous molar predecessors have experienced caries emerge earlier
- B** Premature loss of maxillary primary molars results in acceleration of the emergence of the premolars
- C** Caries in primary molars is automatically transferred to the following premolars
- D** The composition of bone between the maxilla and the mandible is different

29 Are you sitting comfortably?

Basic operating posture is considered an important occupational health issue for oral health care team members. Ideally, the physical posture of the operator for working is such that all muscles should be in a relaxed, well balanced and neutral position. Despite the importance given to this ideal, to date the range of the neutral operator position has not been well defined and there has been no way in which the various elements can be assessed. Researchers in Kansas City have therefore developed what they call a Posture Assessment Instrument (PAI) for use in evaluating operator performance in oral care situations. A panel of experts first defined the basic parameters for acceptable, compromised and harmful postures, looking specifically at levelness of body, trunk position, head tilt, shoulder and wrist orientation. During the second phase of the work, four assessors tested the instrument in various surroundings for its reliability. Overall, the experts were encouraged with the applicability of the PAI, concluding that it will be useful in both evaluating operator performance as well as helping to pinpoint poor posture leading to musculoskeletal disorders.

Branson B G, Williams K B, Bray et al. Validity and reliability of a dental operator posture assessment instrument (PAI). *J Dent Hygiene* 2003 **76**: 255–261.

Q. In dental care, good operator posture:

- A** Relies only on being the ideal body weight
- B** Should be established by achieving the correct sitting position
- C** Is of no importance as long as the operator plays sports
- D** Can only be achieved using seating fixed to the surgery floor

30 Scaling as a possible cause of hearing loss

Noise exposure is the most common occupational disease in the USA, made more troublesome by the fact that many people are unaware of any hearing impairment until they have lost 28% of their hearing ability. Dental hygienists continually use low-speed handpieces, sonic and piezoelectric scalers and ultrasonic cleaners and scalers in the course of their work, with ultrasonic devices posing the highest threat to hearing. Such scalers can produce 68–75 decibels, which although not in the range defined as causing damage, may cause hearing impairment with constant use. Selecting by questionnaire 20 dental hygienists who had high ultrasonic usage and a matched group of 20 with low usage, and matching the groups for age, each individual was given an audiometric hearing test in each ear. Results revealed that right and left ears were not statistically different in their hearing thresholds, although right or left-handedness was not sought on the initial questionnaire and it is speculated that a larger sample may show a difference, as the significance in this study was borderline. There was, however, a significant difference between the groups at the frequency of 3000Hz, with hearing loss in the high ultrasonic use cohort. Although hearing was not affected at the other frequencies tested: 500, 1000, 200, 4000, 6000 and 8000Hz, the authors suggest that further studies are needed to assess the risk factors in relation to dental hygienist occupational exposure.

Wilson J D, Darby M L, Tolle et al. Effects of occupational ultrasonic noise exposure on hearing of dental hygienists: a pilot study. *J Dent Hygiene* 2002 **76**: 262–269.

Q. Use of an ultrasonic scaler by dental hygienists can lead to:

- A** Deafness in the 'working side' ear
- B** No relevant changes in hearing
- C** Permanent deafness if used at a frequency above 8000Hz
- D** Hearing loss at the frequency of 3000Hz

31 Illegal dentures reveal their legacy

It seems unlikely that the debate about whether or not ‘denturists’ or indeed dental technicians should be permitted to make and fit removable dentures instead of ‘qualified’ dentists will ever be truly settled by evidence one way or the other. However, a Finnish study set out to evaluate the clinical quality of such dentures fabricated by each of the three groups. In Finland, dentists are the only ones allowed to provide all forms of dentures, while denturists may supply full dentures only to those already edentulous. The 242 elderly participants had their mouths, 231 maxillary and 177 mandibular dentures assessed by a dentist ‘blinded’ as to which group the maker belonged. Complete dentures which had been illegally supplied by laboratory technicians has significantly poorer retention and fitted less well in the areas of the tuberosity and alveolar areas than those provided by either dentists or denturists. Of the partial maxillary dentures, a rather alarming 53% of those provided by dentists had some unacceptable characteristics compared with 80% of those illegally supplied by either of the other groups. Overall the authors concluded that illegal provision of dentures seemed to be related to decreased clinical quality.

Tuominen R. Clinical quality of removable dentures provided by dentists, denturists and laboratory technicians. *J Oral Rehab* 2003 30: 347–352.

Q: Which of the following statements is true?

- A** In Finland dentists can only provide partial dentures
- B** Elderly patients in Scandinavia can only receive full dentures from technicians
- C** The clinical quality of illegally provided dentures is comparatively poor
- D** Denturists in Finland design partial dentures for dentists to fit

32 Does the intra-oral camera lie?

The use of the intra-oral camera has markedly improved communication between dentist and patient in recent years but these investigators set out to establish whether or not the equipment could also be used to detect occlusal caries. With the reduction in caries prevalence associated with increased fluoride use, occlusal caries has become more difficult to diagnose accurately, especially when using an unaided clinical examination, which is the mostly widely used. Eighty extracted premolars and molars were set up to simulate clinical conditions and were examined by six examiners using three techniques; visual, intra-oral camera and watching a video recording made using the camera. The teeth were then sectioned for histological validation. Compared to unaided visual assessment, the use of the camera significantly increased the number of occlusal caries lesions detected. Use of the video technique also increased the detection rate but only with a similar rise in ‘false positive’ scores at enamel and dentine and caries into dentine stages. However, the authors argue that in today’s climate of minimal invasive treatment this may not be as disadvantageous as it may at first seem.

Forgie AH, Pine CM, Pitts NB. The assessment of an intra-oral video camera as an aid to occlusal caries detection. *Int Dent J* 2003 53: 3–6.

Q. An intra-oral camera may be beneficially used to:

- A** Detect early occlusal caries better than direct vision alone
- B** Connect to a microscope allowing vision of the underlying dentine
- C** Film early caries for comparison at a later date
- D** Significantly reduce occlusal caries

33 Oral contraception may not stop pain

The use of oral contraceptives appears to increase the risk of dry socket and postoperative pain after extraction, according to recent research in Spain. Dry socket among women, compared with men, began to show a marked increase in the 1960s, when oral contraceptives came into widespread use. This has been attributed to the pharmacological activity of the drug, since it increases fibrinolysis, and since dry socket has been linked with fibrinolytic activity. Taking a sample of 267 women, aged 17–45 years, undergoing removal of third molars, medical history revealed that 87 were users of oral contraceptives. All extractions were performed by the same surgeon under local anaesthetic and patients were then monitored for postoperative pain, trismus and dry socket 24 hours and five days later. The dentist providing the follow-up was 'blinded' as to whether or not the patient was taking oral contraceptives. Results showed that mean trismus values were similar in the two groups but that postoperative pain was significantly more frequent among women on oral contraceptives. This was true on day 1 when 30% taking contraceptives used analgesics compared with 11% who did not, through to day 5 when the figures were 14% and 5% respectively. Similarly, dry socket occurred more frequently in the contraceptive group at 11% versus 4%, which was also significant. Careful history taking and vigilant follow-up care are needed to identify and treat such women.

Garcia AG, Grana PM, Sampedro FG et al. Does oral contraceptive use affect the incidence of complications after extraction of a mandibular third molar? *Brit Dent J* 2003 **194**: 453–455.

Q: Women taking oral contraceptives:

- A** Are more at risk from dry socket and postoperative pain after extraction
- B** Should not be given local anaesthetic for tooth extraction
- C** Need to stop taking oral contraceptives for five days after extraction
- D** Suffer worse trismus than non-users following third molar surgery

34 Stone models need cross-infection control too

Using disinfectant solutions mixed in water to produce cross-infection protected stone casts adversely affects the surface roughness, according to on-going research in Minnesota, USA. Concern about the possible spread of infection through contaminated impressions has prompted safety measures as the materials used can be heavily contaminated with micro-organisms from saliva and blood in the mouth, and are difficult to sterilise without compromising accuracy. One suggested method has been the incorporation of disinfectant solutions in the water used to cast stone models in the laboratory. However, this has led to adverse effects on the hardness of the gypsum, causing surface roughness. To counter this, researchers also added small amounts of gum Arabic and calcium hydroxide to the mixing water. This reduced the amount of water required and concomitantly yielded a harder stone surface without compromising other surface properties. As an essential part of the dental team, laboratory staff require protection from cross-infection and seemingly this method of stone model disinfection provides both safety and uncompromised hardness, roughness and surface detail of the models so cast.

Abdelaziz KM, Combe EC, Hodges JS. The effects of disinfectants on the properties of dental gypsum, part 2, surface properties. *J Prosthodont* 2002 **11**: 234–240.

Q. Disinfecting stone models in the dental laboratory:

- A** Is unnecessary as the stone kills the bacteria anyway
- B** Is necessary to prevent the micro-organisms distorting the surface features
- C** Can cause surface roughness leading to potential inaccuracies
- D** Aids the surface detail by reducing contamination from blood and saliva

35 Surface antibacterial properties of fissure sealants

Fissure sealants form a physical barrier between the oral environment and deep fissures, which can contribute to caries prevention. Antibacterial properties would clearly be advantageous and this microbiologically based research aimed at evaluating such characteristics of four commercially available materials by two standard tests, direct contact and agar diffusion. For the first, samples of the materials were polymerised in the sidewalls of microbiological wells before freshly grown strains of *Streptococcus* mutants were placed on their surfaces and left for 1 hour at 37°C, following which fresh media was added and the wells incubated and watched for 16 hours. Similarly prepared samples were aged in saline for 14 and 30 days before being identically tested. In the agar diffusion test, the bacterial 'halo' around the materials was measured for 48 hours. All the materials showed antibacterial properties but two materials demonstrated prominently such benefits, which lasted most strongly with Dyract Seal, a compomer-based sealant, for 14 days, fading after 30 days. The antimicrobial characteristics of fissure sealants are obviously important and although this in vitro research does not establish clinical effectiveness it provides background data to indicate bacteriocidal potential.

Matalon S, Sluzky H, Mazor Y, et al. Surface antibacterial properties of fissure sealants. *Pediatr Dent* 2003 25: 43-48.

Q: Which statement is not true?

- A** Fissure sealants need bacteria to help stick them to tooth surfaces
- B** The surfaces of fissure sealants are antibacterial
- C** *Streptococcus* mutants strains are implicated in dental caries
- D** Sealants help to prevent caries by blocking deep pits and fissures

In accordance with the General Dental Council's Guidance on providing verifiable CPD for dentists:

- The aim of Dental Summary Review is to provide summaries to update dentists on reports of recent research in the dental literature across a range of topics, and to test dentists' understanding of the reports.
- The anticipated outcomes are that dentists will be better informed about recent scientific, clinical and management research and advances and that they may apply their learning to their practise.

List of recent issues of journals scanned for summaries for Dental Summary Review

Acta Odontologica Scandinavica
Advances in Dental Research
American Journal of Dentistry
American Journal of Orthodontics and Dentofacial Orthopedics
Angle Orthodontist
Archives of Oral Biology
Australian Dental Journal
Australian Orthodontic Journal
British Dental Journal
British Journal of Oral and Maxillofacial Surgery
British Journal of Orthodontics
British Medical Journal
Caries Research
CDA Journal
Cleft Palate–Craniofacial Journal
Clinical Implant Dentistry
Clinical Oral Implant Research
Clinical Oral Investigations
Community Dental Health
Community Dentistry and Oral Epidemiology
Dental Health
Dental Materials
Dental Traumatology
Endodontics & Dental Traumatology.
Endodontic Practice
European Journal of Oral Science
European Journal of Orthodontics
European Journal of Prosthodontics and Restorative Dentistry
Evidence Based Dentistry
Functional Orthodontist
General Dentistry
Gerodontology
Implant Denstistry
International Dental Journal
International Journal of Computerized Dentistry
International Journal of Oral and Maxillofacial Surgery
International Journal of Orthodontics
International Journal of Paediatric Dentistry
International Journal of Prosthodontics
Journal of the American Dental Association
Journal of the California Dental Association
Journal of Clinical Periodontology
Journal of Dental Education
Journal of Dental Hygiene
Journal of Dental Research
Journal of Dentistry for Children
Journal of Disability and Oral Health
Journal of Endodontics
Journal of Esthetic and Restorative Dentistry
Journal of Medical and Dental Sciences
Journal of Oral and Maxillofacial Surgery
Journal of Oral Rehabilitation
Journal of Orofacial Pain
Journal of Orthodontics
Journal of Periodontology
Journal of Prosthetic Dentistry
Journal of Prosthetic Dentistry
Journal of Prosthodontics
Journal of Public Health Dentistry
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Oral Diseases
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Oral Radiology and Endodontics
Pediatric Dentistry
Periodontal Abstracts
Periodontology 2000
Quintessence International
Special Care in Dentistry
Swedish Dental Journal