

Dental Review™

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Issue 21 - 2010

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Welcome to this issue of Dental Review.

One of the papers revisits a research area explored by the late Professor Ewen Kirk almost 50 years ago, and another uses a time-honoured material, plaster, in yet another dental application. Our shortcomings as operators are featured in papers on visual defects and finger sensitivity.

Happy reading and best wishes,

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Shade matching performance of normal and color vision-deficient dental professionals with standard daylight and tungsten illuminants

Authors: Gokce HS et al

Summary: This experiment involved normal and red-green colour vision-deficient dentists with at least two years' experience matching sets of porcelain discs in standard artificial daylight and under a tungsten filament lamp. The colour vision-deficient group were notably unsuccessful at the task in artificial daylight. The A4 and C4 shades were the most correctly matched shades for the two types of lighting.

Comment: Previous experiments with subjects with normal eyesight show shade matching success of 70% with normal vision and reproducibility of selection from 35 to 67%. Red-green colour vision deficiency has an incidence from 3–10% and so this study highlights the importance to dentists and technicians of this potential problem. 'Standard daylight' is rarely available so using tungsten illumination should be considered by affected dental staff and technicians.

Reference: *J Prosthet Dent.* 2010;103(3):139-47.

<http://www.prosdent.org/article/S0022-3913%2810%2960020-0/abstract>



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Considerations for the selection of a luting cement

Authors: Rickman LJ et al

Summary: This paper presents a comprehensive review on the cementation of all types of indirect restorations. It clarifies much of the mystery involved in the topic and considers all aspects including types of restoration, handling, strength and even retrievability.

Comment: A 9-page 'update' item on this subject shows just how far we have come since the days of zinc phosphate cement and enamel etching. The mysteries of 2- and 3-step bonding methods and many other aspects of the subject are well explained.

Reference: *Dent Update*. 2010;37(4):247-64.

The reality of identifying early oral cancer in the general dental practice

Authors: McGurk M et al

Summary: Detected early, oral cancer has a good prognosis but this paper tells us that in the UK, half the patients are at an advanced stage when seen with the disease. The National Health Service now recommends neck palpation and tongue palpation as part of each consultation, but despite this the proportion of oral cancers detected early has not changed in 50 years. An estimated 5–15% of the population have an oral lesion at any one time, but very few are malignant. Only 40% of patients with these cancers present to the dentist.

Comment: Early lesions are asymptomatic and there is no correlation between onset of symptoms and size of tumour at diagnosis. A primary care physician may see one head and neck cancer per 63,000 visits. This paper suggests that targeting high risk groups (increasing age, excess alcohol and smoking, males, sun exposure etc.) may be more effective.

Reference: *Br Dent J*. 2010;208(8):347-51.

<http://www.nature.com/bdj/journal/v208/n8/abs/sj.bdj.2010.345.html>

Diminutive digits discern delicate details: fingertip size and the sex difference in tactile spatial acuity

Authors: Peters RM et al

Summary: In the experiment finger surface areas were measured after digital scanning and the 100 subjects (50 male and 50 female undergraduates) were asked to feel surfaces with progressively smaller grooves. The surfaces felt smooth when the grooves were too narrow for the individual's sense of touch; a mean of 1.59 mm for the males and 1.41 mm for the females. What mattered was finger area and not gender.

Comment: Beat that for the title of an academic paper! Women are reported to have a more sensitive touch than men, but it seems it is not because of gender; they just tend to have smaller fingers. If you ever thought you were all fingers and thumbs setting up a matrix band, perhaps your excuse should be that you grew up with fingers just a bit too large for the job.

Reference: *J Neurosci*. 2009;29(50):15756-61.

<http://www.jneurosci.org/cgi/content/short/29/50/15756>

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Independent commentary by Associate Professor Nick Chandler of the Department of Oral Rehabilitation, University of Otago

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Parameters influencing increase in pulp chamber temperature with light-curing devices: curing lights and pulpal flow rates

Authors: Park S-H et al

Summary: LED lights are replacing halogen types, and this study examined in the laboratory how curing lights could increase pulpal temperature. It involved an extracted premolar fitted with temperature sensors and cooled by a flow of water through its two roots. Four curing lights were used at different power densities. The conclusion was that devices with high power density (>1200mW/cm²) should be activated for less than 15 seconds.

Comment: Unfortunately, the threshold for pulp necrosis in human teeth is not fully understood, being based largely on experiments on five monkeys carried out over 40 years ago with a soldering iron as the heat source. There is nothing in the literature to suggest it, but perhaps some teeth are found to be non vital many months after being heated by curing lights? The recommendations in this paper are made for teeth without cavity preparation. As hard tissues are cut away during many operative procedures, the potential for thermal damage may be even greater.

Reference: *Oper Dent.* 2010;35(3):353-61.

<http://www.jodentonline.org/doi/abs/10.2341/09-234-L?journalCode=odnt>

Efficacy of sweet solutions for analgesia in infants between 1 and 12 months of age: a systematic review

Authors: Harrison D et al

Summary: In newborns there is an established literature showing that glucose and other sweet solutions work as analgesics during painful procedures and they are widely recommended. This paper is a meta-analysis of 14 trials on infants up to 12 months old being immunised. A reduced incidence and duration of crying was found when sucrose or glucose was given.

Comment: The final sentence of the conclusion states that healthcare professionals responsible for administering immunisations should consider using sucrose or glucose during painful procedures. The paper also indicates that for multiple immunisations the total dose of sweet solution should be given prior to and throughout the procedure to ensure sustained effects of sweet tasting analgesia. Sugar before shots; is this something that people concerned with teeth need to worry about?

Reference: *Arch Dis Child.* 2010;95(6):406-13.

<http://adc.bmj.com/content/95/6/406.full>

Dens evaginatus and dens invaginatus in all maxillary incisors: report of a case

Authors: Vardhan TH et al

Summary: This paper describes the two conditions, reporting that only two cases of concomitance of dens invaginatus and dens evaginatus have been described. The case report is of a 25-year-old male who attended with problems from his posterior teeth (paramolars were present) and the anterior tooth anomalies were discovered during examination.

Comment: The treatment of the patient is not described, but the dens evaginatus/talon cusp problem can compromise aesthetics, create occlusal interference and caries may arise in the developmental grooves. The invaginatus state may lead to endodontic problems if simple preventive measures such as fissure seals are not applied. These are four very interesting teeth that need some help.

Reference: *Quintessence Int.* 2010;41(2):105-7.

<http://tinyurl.com/248vmls>

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Ability of two radiographic methods to identify the closeness between the mandibular third molar root and the inferior alveolar canal: a pilot study

Authors: Kositbowornchai S et al

Summary: Removing impacted third molars can damage the inferior alveolar nerve, and the oral surgeon's most widely used radiograph is a panoramic type (PR). In this experiment using dry human mandibles, a PR and a 20-degree negative angle periapical radiograph were compared with two periapical radiographs (one with the vertical tube shift) by two untrained dental students. They were asked to score the impacted teeth as 'in contact' or 'separate' from the canal. The readings were compared with a cone beam CT image as the gold standard. Both sets of experimental films were effective at determining the closeness of the tooth to the canal.

Comment: Surgeons report that dependence on a panoramic film alone is not reliable for assessing some unerupted mandibular third molars. While CT has the greatest accuracy, there are availability and cost implications. This work suggests that with a panoramic film often already to hand, adequate information is available with just one further exposure. With another experiment with a trained assessor group and more 'subjects' the optimum vertical angle for the periapical film might be calculated.

Reference: Dentomaxillofac Radiol. 2010;39:79-84. http://tinyurl.com/26984z5

In vitro bond strengths of amalgam added to existing amalgams

Authors: Roggenkamp CL et al

Summary: Can freshly mixed amalgam be added to an existing restoration as a repair and be expected to join? A jig was made so that amalgam increments could be condensed into moulds with standardised condensation forces. Specimens were shear-bond tested at 15 minutes, one hour, one week, two months and after seven years. The joints were nearly the original strength, provided that sufficient condensation time and pressure were used.

Comment: If amalgam restorations can be added to or repaired then time and money can be saved. Readers of this paper may note that the late Professor Kirk of Dunedin is extensively cited in this paper, having published a 'preliminary report' on this topic in 1962. Perhaps it is a little obvious, but the current authors through their rigorous standardisation show us how effective these repairs/additions can be, irrespective of the age of the original material present.

Reference: Oper Dent. 2010;35(3):314-23. http://www.jopdentonline.org/doi/abs/10.2341/09-180-L

Application of calcium sulfate in surgical-orthodontic treatment of impacted teeth: a new procedure to control hemostasis

Authors: Scarano A et al

Summary: Impacted canines and premolars may be uncovered surgically so that orthodontic brackets can be bonded to them. Bond failure can be due to blood or saliva contamination. The authors report 43 patients with 66 impacted teeth. For 33 teeth the bleeding was controlled with gauze. For the others the space between exposed tooth and bone was filled with calcium sulphate hemihydrate (plaster of Paris) and the outer layer hardened and strengthened with potassium sulphate solution. Haemostasis was effective and none of the brackets separated from the teeth in this group in traction tests.

Comment: I wanted to know more about the nature of the traction tests but this was not revealed in the paper. All the material was removed after bracket placement but it is totally resorbable and biocompatible. It also provided good contrast and visibility around the surgical site, especially when impactions were high.

Reference: J Oral Maxillofac Surg. 2010;68(5):964-8. http://www.joms.org/article/S0278-2391%2809%2902167-3/abstract



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