

# Dental Review™

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Issue 10 - 2008

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## Welcome to the latest edition of Dental Review.

We also explore some effects of diabetes, characteristics of treating patients with attention deficit hyperactivity disorder and the impact of sugar-free gums.

I appreciate the comments that come through after every edition and we're happy to consider requests for some specific topics if we haven't covered them for a while.

I hope you enjoy this edition.

Kind regards,

**Nick Chandler**

*Associate Professor*

**Department of Oral Rehabilitation, University of Otago**

[nickchandler@researchreview.co.nz](mailto:nickchandler@researchreview.co.nz)

## An in vitro comparison of tooth whitening techniques on natural tooth colour

**Authors:** Patel A et al

**Summary:** Tooth whitening is very popular with patients but there is little evidence of what to prescribe or recommend for maximum effect. One hundred extracted mandibular incisors of matched size and with no restorations were placed in five matched groups. The treatments involved carbamide peroxide (CP) at different concentrations and hydrogen peroxide. Some of the agents were activated with a diode laser, a halogen light or a plasma arc curing light. Colour changes were analysed with a colorimeter. The materials in combination with the halogen light gave the most tooth whitening. Tooth surface temperature rise was greatest with the laser. All the lightening effects were lost over time with single treatments. Overall, the effect of 10% CP in a nightguard technique seemed the best.

**Comment:** The application of 10% CP for 60 minutes as used in many home-applied techniques was effective. This method is known to result in lower levels of tooth sensitivity, to be cost-effective and to give a sustained outcome. It was similar in this experiment to 'power whitening' with a halogen light.

**Reference:** *American Journal of Dentistry* 2008;21:71-73.

<http://dx.doi.org/10.1038/sj.bdj.2008.291>



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## A systematic review of the survival and complication rates of resin-bonded bridges after an observation period of at least 5 years

**Authors:** Pjetursson BE et al

**Summary:** The aim was to determine the 5-year survival of resin-bonded bridges (RBB), and the author's systematic review examined 93 articles of which 17 met strict inclusion criteria. Meta-analysis revealed an estimated survival figure of 87.7%. Debonding occurred in over 19% of cases; there was a tendency for posterior designs to debond more than anterior types, but the data did not reach statistical significance. Materials fracture arose in 13 of 451 RBBs, and caries occurred in 1.5% of abutments.

**Comment:** The authors recommend that technical complications should be studied for over 10 years to determine outcomes more fully. Debondings are frequent and were a feature of all 17 studies, so while the procedure may appear conservative and quick there may be hidden costs for dentist and patient at a later date.

**Reference:** *Clinical Oral Implants Research* 2008;19:131-141

<http://dx.doi.org/10.1111/j.1365-2842.2007.01824.x>

## Magnification in dental practice and education: experiences and attitudes of a dental school faculty

**Authors:** Meraner M et al

**Summary:** This paper presents the results of a survey among teaching staff at a North American dental school which had a 66% return rate. It found that all the periodontists and endodontists who completed the survey used magnification, and 56% of general/restorative dentists used it. The teachers were not in full agreement about the value of magnification in dental education, with one quarter of users unlikely to use it for teaching, even though they may use it in private practice. Sixty one per cent of magnification users talked about the benefits to their students.

**Comment:** There appears to be no research on how well a dentist needs to see in order to perform to an acceptable level. Many performance standards for dentistry are ill-defined, so measurement of outcomes is a problem. But the use of magnification is increasing in the dental community, and it is interesting that uptake is so discipline-specific. The authors raise a raft of questions in their conclusions. Can we perform at a higher level with magnification? Will patients benefit? Does failing vision with age severely affect our abilities? Will students become competent operators more quickly with enhanced vision?

**Reference:** *Journal of Dental Education* 2008;72:698-706

<http://www.jdentaled.org/cgi/content/abstract/72/6/698>

## The failure rate of NHS funded molar endodontic treatment delivered in general dental practice

**Authors:** Tickle M

**Summary:** This study investigated the outcome of root canal treatments performed on mandibular first molar teeth in 12 general dental practices over a 5 year period. Radiographic quality of fillings was assessed and teeth with crowns compared with those with intracoronal restorations. Extractions, retreatments and endodontic surgery were classified as failure. Of 174 teeth, 16 failures were reported. The failure rate differed little between optimally and sub-optimally root filled teeth. Most of the failures occurred in two years. Nearly 39% of the teeth were crowned, and none of these teeth failed.

**Comment:** The authors concluded that the quality of the root filling had little influence on outcomes. The danger here is that there is more to endodontic success than the two-dimensional appearances seen on radiographs. Once again the importance of appropriately restoring root canal treated teeth is emphasized.

**Reference:** *British Dental Journal* 2008;204(5): E8

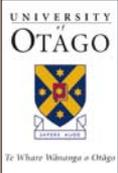
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*Independent commentary by Associate Professor Nick Chandler of the Department of Oral Rehabilitation, University of Otago*




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### Oral characteristics of children with attention-deficit hyperactivity disorder

**Authors:** Bimstein E et al

**Summary:** This study was to compare the oral and demographic characteristics of a sample of children with ADHD and receiving medication (25) with a group of children without ADHD (127). The demographic characteristics (eg age, gender, ethnicity, income) were not significantly different. The children with ADHD had a higher prevalence of toothache, bruxism, bleeding gums and oral trauma ( $P < 0.05$ ).

**Comment:** The study was retrospective and did not involve calibration of the multiple examiners. The data was gathered from among dental charts randomly selected from three paediatric clinics, with information from parents at the first visit also used. The prevalence of ADHD was 8.6% with a male to female ratio of 2:1. Patients with ADHD may have difficulties with communication, overactivity and staying focused, which can make dental examination and treatment challenging.

**Reference:** *Special Care Dentist* 2008;28:107-110

<http://dx.doi.org/10.1111/j.1754-4505.2008.00021.x>

### Removal time of fiber posts versus titanium posts

**Authors:** Frazer RQ et al

**Summary:** This experiment used 40 extracted root filled teeth divided into three groups and fitted with fibre posts (resin cement) and titanium posts (glass ionomer or resin cement). The metal posts were removed by preparing a trough around them and applying ultrasound. The fibre posts were cored out internally using a pair of burs, and the removal times recorded included taking a radiograph to ensure complete removal of fibre materials from these teeth. It took the longest to remove the titanium posts cemented with resin; there was no difference between the other post-cement combinations.

**Comment:** A 2004 survey of Australasian endodontists revealed that 95% used ultrasound in the removal of posts, but there is little consensus on the best method for removing the variety of posts currently available. A huge number of factors are involved in the ease or difficulty of removal of posts, and there is agreement in the literature that some mechanical removal devices are dangerous. This study confirms other work showing that fibre posts can be removed more quickly than metal posts, and that glass ionomer is not ideal for luting titanium posts.

**Reference:** *American Journal of Dentistry* 2008;21:175-178

<http://www.ncbi.nlm.nih.gov/sites/entrez>

### Existence of an electrically insulating layer in amalgam-containing galvanic couples

**Authors:** Sutow EJ et al

**Summary:** Avoiding placing amalgam restorations next to those of noble metals has been taught in order to avoid the anticipated galvanic corrosion of amalgam. Galvanic couples can also occur between amalgam restorations. This study determined if corrosion products would create an electrically insulating layer in the presence of these couples. Corrosion potentials were measured with a microreference electrode and a voltmeter in a sample of 158 subjects. Subjects had dental records with the age of the restorations known, or gave their best estimate of age of their dental work; all restorations were at least 6 months old. The amalgam/noble metal couples had consistent and mostly large corrosion potential differences, but amalgam/amalgam and noble metal/noble metal also had an insulating layer. The layer is probably non-metallic corrosion products, biofilms and possibly calculus.

**Comment:** Corrosion products introduce a large electrical resistance to reduce galvanic currents. There is little clinical evidence of problems arising from the necessary task of developing contact points when restoring dentitions, despite the large differences in the corrosion potentials of the alloys that we use.

**Reference:** *Dental Materials* 2008;24:874-879

<http://www.ncbi.nlm.nih.gov/pubmed/18093640>

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## Fluid dynamics of gingiva in diabetic and systemically healthy periodontitis patients

**Authors:** Sakallioglu EE et al

**Summary:** Many reports have studied the relationship between diabetes and periodontitis. Diabetes modifies periodontal disease expression by inducing a hyperinflammatory host response to the bacterial challenge. Forty three non-smokers were in the study group, and among them were 15 with Type 2 diabetes diagnosed at least 2 years previously and controlled by diet and oral hypoglycaemic drugs. Gingival crevicular fluid volume and gingival tissue osmotic pressure were measured. The results indicate that diabetes has an additive effect on the fluid dynamics of the periodontium in the presence of periodontal disease.

**Comment:** The metabolic control process of diabetes may enhance fluid retention. This is the first study to investigate the effects of diabetes on the fluid dynamics of periodontal tissues in the presence of periodontitis.

**Reference:** *Archives of Oral Biology* 2008;53:646-651

<http://www.ncbi.nlm.nih.gov/pubmed/18281015>

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## Direct pulp capping with mineral trioxide aggregate. An observational study

**Authors:** Bogen G et al

**Summary:** Forty patients with a diagnosis no more severe than reversible pulpitis underwent direct pulp capping with a layer of mineral trioxide aggregate (MTA) 1.5 to 3 mm thick. Sodium hypochlorite was used to achieve haemostasis before capping. The teeth received an interim restoration of unbonded composite, and at a second visit tooth vitality and set of the MTA were confirmed and the teeth permanently restored. Forty nine of the 53 teeth were followed-up for up to 9 years with almost 98% having favourable outcomes on the basis of radiographic appearance, subjective symptoms and cold testing. The patients in this study were aged from 7 to 45 years and the 15 teeth in young patients with open apices went on to complete their root formation.

**Comment:** All the pulp caps were placed by the same operator, who continued caries excavation even after exposures had occurred. Fifty one of the teeth were molars, and the teeth had as many as four exposures. The wounds were as large as 2.5 mm. This practice-based research supports other work this year which indicates that calcium hydroxide should no longer be considered as the gold standard material for pulp-capping.

**Reference:** *Journal of the American Dental Association* 2008;139:305-315

<http://www.ncbi.nlm.nih.gov/pubmed/18310735>

## Remineralization of enamel subsurface lesions in situ by the use of three commercially available sugar-free gums

**Authors:** Manton DJ et al

**Summary:** Several beneficial effects of chewing sugar-free gum have been reported. Caries reduction is probably due to alterations in salivation, but claims of further efficacy with additives to manufactured gums have been made. This trial of three gums included one with casein phosphopeptide-amorphous calcium phosphate nanocomplexes (CPP-ACP). Adult subjects wore removable palatal appliances fitted with enamel pieces with subsurface demineralized lesions. They chewed the gums over 14-day periods, and changes to the enamel were assessed by microradiography. The CPP-ACP containing gum replaced 75% and 107% more minerals than the other two gums.

**Comment:** The appliances were removed for all eating, drinking and oral hygiene procedures so that differences were due only to gum chewing. The results support existing evidence that CPP-ACP significantly increases mineralization when added to chewing gums by increasing the availability of calcium and phosphate ions.

**Reference:** *International Journal of Paediatric Dentistry* 2008;18:284-290

<http://dx.doi.org/10.1111/j.1365-263X.2008.00920.x>

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