

# Dental Review™

Making Education Easy

Issue 40 – 2014

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**Welcome** to the 40th edition of *Dental Review* and a belated Happy New Year. We cover an interesting sleep medicine paper that looked closely at oral devices plus some disturbing evidence on squamous cell carcinoma.

As always, I look forward to your comments and feedback.

Kind regards,

**Nick Chandler**  
Associate Professor

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## Dental implants in the medically compromised patient

**Authors:** Diz P et al.

**Summary:** This extensive paper (147 references) investigates medical contraindications to implant placement. Various authors caution against implants for those with uncontrolled diabetes, bleeding disorders, problems of immunity, endocarditis risk, osteoradionecrosis risk and other factors. The current authors review the literature, using 12 disease categories. They conclude that there are few absolute contraindications, although some conditions may increase complications and the risk of treatment failure.

**Comment:** The relative lack of prospective studies leaves the level of risks unclear. The degree of control of the disease may be more important than the disorder itself. Many patients with systemic health problems may get great quality of life benefits from being supplied with implants, and these could outweigh the risks.

**Reference:** *Journal of Dentistry* 2013;41(3):195-206

[Abstract](#)

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### The impact of fractured endodontic instruments on treatment outcome

**Authors:** McGuigan MB et al.

**Summary:** Rotary NiTi endodontic files may break without warning, requiring a decision on whether to leave, try to remove or bypass the fractured piece. The authors performed a MEDLINE search, finding that retained fragments of files did not affect prognosis if apical periodontitis was absent and the work was carried out to the highest technical standard. If disease was present, they found healing significantly reduced.

**Comment:** The stage of treatment (level of disinfection) is clearly critical. Long-term outcome studies would be useful, but the nature of this problem rules out randomised prospective trials. The authors found 189 publications from 1977 to 2011 and included 171 in their review.

**Reference:** *British Dental Journal* 2013;214(6):285-289

[Abstract](#)

### The role of occlusal loading in the pathogenesis of non-carious cervical lesions

**Authors:** Antonelli JR et al.

**Summary:** This study involved subjects with canine guidance on one side of the mouth and group function on the other. Non-carious cervical lesions (NCCL) and occlusion were recorded clinically and with articulated study casts for 20 subjects. Examinations included the use of 8 µm shimstock. On the group function sides, almost 23% of teeth that contacted during excursions had NCCLs. On the canine-guided side, this figure dropped to just over 2%.

**Comment:** NCCLs are most common on premolar teeth. The authors admit their data is very limited, but it supports occlusion as the major factor in the formation of these lesions. However, the aetiology is complicated and multifactorial. Flexing of teeth generates tensile forces causing breakdown of enamel prisms and loss of enamel, while exposure of dentine is less frequent. The mean age of the patients in the study was 52 years.

**Reference:** *American Journal of Dentistry* 2013;26(2):86-92

[Abstract](#)

### Efficacy of an oral appliance for the treatment of obstructive sleep apnea

**Authors:** Giannasi LC et al.

**Summary:** Sixty-three patients with obstructive sleep apnoea (OSA) or primary snoring were fitted with a mandibular repositioner appliance. The technician made each acrylic device to 65–75% maximum protrusion and to separate the incisor edges by 3–4 mm. Snoring decreased and other measures also validated the device for the safe treatment of OSA.

**Comment:** There are over 100 oral devices sold to help with this problem, with these authors stating that only 15 have been rigorously tested. The one in this study (PM Positioner) is FDA approved. This is a good paper to read if you are interested in sleep medicine, to learn how sleep is measured and to see how treatment success is determined.

**Reference:** *International Journal of Prosthodontics* 2013;26(4):334-339

[Abstract](#)

### The bonding of glass ionomer cements to caries-affected primary tooth dentin

**Authors:** Alves FBT et al.

**Summary:** Occlusal cavities were cut in 36 extracted primary molars and pH-cycling used in half of them to simulate caries-affected dentine (CAD). They were restored with three glass ionomer materials and subjected to microtensile tests and immersion in silver nitrate. The presence of CAD did not adversely affect the bonding to dentine.

**Comment:** Glass ionomers were first marketed in the early 1970s and while continually being improved it seems amazing that there are still aspects of their performance to study. Because primary tooth dentine with caries is difficult to collect (due to its dimensions and proximity to the pulp) the simulation model was used to standardise the tests. In the experiment, a resin-modified GIC with nanoparticles performed the best. This paper is especially important as in atraumatic restorative treatment (ART), hand instruments may be the only ones used and CAD may be left.

**Reference:** *Pediatric Dentistry* 2013;35(4):320-324

[Abstract](#)

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### Influence of the thickness of silicone registration material as a means for occlusal contact examination – an explorative study with different tooth clenching intensities

**Authors:** Obara R et al.

**Summary:** Twenty-four subjects underwent electromyography of their masseter muscle while they maintained intercuspal position with a silicone material between their teeth. They then worked with different thicknesses of silicone materials and visual feedback of their muscle activity. The work suggested that occlusal contacts may be different at low tooth clenching with potential effects on teeth and periodontium.

**Comment:** There are many ways of trying to record tooth contact, with the ideal occlusion usually defined as even, simultaneous and bilateral contacts in the intercuspal position. But the criteria for tooth contact are not widely accepted in general practice. The experiment suggests a detection accuracy of 5 µm may be needed to evaluate a number of occlusal contact points. I am reminded that the diameter of a red blood cell is about 8 µm! Support here, however, for the use of silicone registration materials for 'bite' recordings.

**Reference:** *Journal of Oral Rehabilitation* 2013;40(11):834-843

[Abstract](#)

### Bisphosphonate-related osteonecrosis of the jaws and its relevance to children – a review

**Authors:** Christou J et al.

**Summary:** This review investigates the use of bisphosphonates in children, where their main use is to reduce bone pain and fracture in osteogenesis imperfecta. This is associated with dentinogenesis imperfecta and has an incidence of about 1 in 20,000 live births. While bisphosphonate-related osteonecrosis (BRONJ) was first reported in adults in 2003, the authors state that there have been no reports in children.

**Comment:** Paediatric use is probably not the first thing to come to mind when the word bisphosphonates is mentioned. The relatively sparse studies suffer from a lack of long-term follow-up and very few patients. As doses are cumulative and the duration of treatment often protracted, problems might be identified in the future. There are many reviews of these drugs available for readers to study, and the background given at the start of this paper can be recommended as good general reading on the subject.

**Reference:** *International Journal of Paediatric Dentistry* 2013;23(5):330-337

[Abstract](#)

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**Research Review publications are intended for New Zealand health professionals.**

### Carcinoma of the tongue in patients younger than 30 years: comparison with patients older than 60 years

**Authors:** Hilly O et al.

**Summary:** This study investigated squamous cell carcinoma of the tongue in young patients. It identified 113 patients, going on to consider 16 under 30 years old and 62 over 60 who had been treated in one centre by glossectomy and neck dissection with curative intent. The disease was more advanced when it presented in the younger patients. There were also higher rates of regional metastases and more distant lesions. Recurrent disease was worse, with 100% fatality within 16 months compared to a 50% 3-year disease-free survival in the older group.

**Comment:** Excessive alcohol intake was rare in both groups in this study, while previous research has found smoking for 21 years may be necessary to increase the risk of oral cancer. The incidence of squamous cell carcinoma is rising in young patients, with several reports finding an increased incidence in young white women.

**Reference:** *Oral Oncology* 2013;49(10):987-990

[Abstract](#)

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## Anatomy of sodium hypochlorite accidents involving facial ecchymosis – a review

**Authors:** Zhu W-c et al.

**Summary:** Sodium hypochlorite is the most common endodontic irrigant, and accidents from its apical extrusion are fortunately uncommon. Most are published as case reports. These authors analyse the distribution of soft tissue damage from those reports, suggesting a new mechanism for the accident via extrusion of solution into the facial vein via non-collapsible venous sinusoids within cancellous bone.

**Comment:** An accident first described in the literature in 1974, this fascinating study of a fortunately rare event is based on revisiting the grim series of 23 photographs from the 50 cases in the literature. Very interesting endodontics, physics and anatomy. Good advice on prevention too.

**Reference:** *Journal of Dentistry* 2013;41(11):935-948

[Abstract](#)

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# Sleep Medicine Research Review™

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## Randomized clinical evaluation of the effect of chlorhexidine on postoperative sensitivity of posterior composite resin restorations

**Authors:** Hajizadeh H et al.

**Summary:** Thirty patients with similar carious lesions on both sides of their jaws received either a posterior composite filling following use of an etch and rinse adhesive or one with a 60-second dentine application of 2% chlorhexidine (CHX) solution after etching. Postoperative sensitivity (POS) was assessed at 1 day, 1 week, 1 month and 6 month recalls. The CHX group suffered significantly less POS one day later. There was no difference after the extended time intervals.

**Comment:** POS is now thought to be more related to sealing of cut dentinal tubules than shrinkage of material or cuspal deflection. CHX may work as a matrix metalloproteinase inhibitor, so as well as having antibacterial effects in the cavity it could help the bond strength. The 1-day effect here could be because of fewer bacteria in the well-sealed cavity. Older readers may remember reducing residual organisms before restoring teeth by carrying out 'cavity toilet' with Tubulicid (benzalkonium chloride).

**Reference:** *Quintessence International* 2013;44(10):793-798

[Abstract](#)

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

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ALSO AVAILABLE

# Oral Health Research Review

Another useful summary from Research Review takes a closer look at general oral health. This quarterly publication is ideal for those working as hygienists or dental therapists or for anyone with a keen interest in evidence-based oral health management. Expert commentary supplied by Dr Jonathan Leichter, DMD, Cert Perio (Harvard), University of Otago.

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Making Education Easy

Issue 14 - 2012

**In this issue:**

- > Ocular hazards of LLDs
- > Sex differences in pain
- > Dental erosion in the 21<sup>st</sup> century
- > Child dental neglect in the UK
- > Oral health inequalities in Australian children
- > Avoidance/believing dental visits in Australia
- > Identifying physical child abuse in Brazil
- > Delayed incisor eruption associated with supernumerary teeth
- > Dental fear transference from parents to children
- > Impacted canines

**Welcome to issue 14 of Oral Health Research Review.**

Dentists dental neglect in the UK has been put under the spotlight in one of the papers selected for this issue. Claret from, Australian researchers have, to review dental neglect, they report that appear at early as 2 years of age and general practitioners of hearing cases of conductive deafness in the adult population. We also feature an important paper from Brazil that reported disturbingly low rates to dental professionals of hearing cases of conductive deafness in the appropriate children. We would like to thank our readers for their comments and feedback, and hope that you continue to share your thoughts with us.

Kind regards,  
**Jonathan Leichter DMD**  
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**Evaluation of ocular hazards from 4 types of curing lights**

Authors: Labati P et al

**Summary:** These researchers assessed extracted human maxillary teeth mounted in a denture in four types of light curing units (LCUs) to assess ocular hazards and calculated weighted blue light and ultraviolet (UV) radiation that a dental practitioner's eye would receive. None of the LCUs tested were found to be associated with UV-mediated ocular damage. The higher powered lamps exhibited potential to cause the light-mediated ocular damage after cumulative viewing of only 6 seconds at 30cm from the tooth during an 8-hour working.

**Comment (AJ):** LCUs are in daily use in the dental setting, and their potential to cause ocular damage needs to be considered in terms of risk management and operator protection. Blue light, absorbed by the retina, can directly irritate the eye and degenerate, while UV radiation causes corneal injury and cataractogenesis. Both types of light are emitted by LCUs. The authors of this paper evaluated four LCUs – one low and high-powered LCUs and quartz halogen. They found that curing a 2mm-thick layer of a laboratory-grade restorative material from both ipsilateral and labial directions. A laboratory-grade light detector was used to measure radiation at corneal equivalent to the eye of the operator. The results showed that the maximum permissible cumulative exposure time would not be exceeded by the 8-hour working day. However, the maximum permissible cumulative exposure time would not be exceeded by the 8-hour working day. The authors advised that practitioners should nonetheless be advised – wearing protective glasses and covering one's eyes. Remember, too, that laser eye surgery and the use of photorefractive keratotomy result in a greater susceptibility to retinal damage.

**Comment (DB):** Light curing machines have become more refined and the light they produce more intense, as manufacturers strive to create equipment that can keep up with the ever-evolving needs of light sensitive materials within the dental industry. This study looked to assess the risk of ocular damage from four types of LCUs, measuring both blue light and UV-mediated ocular damage at 30cm. UV radiation was not measured. Ocular damage was not found to be a significant risk, relative risk being from high-powered units around the potential to cause ocular damage at short distances. The authors advised that practitioners should nonetheless be advised – wearing protective glasses and covering one's eyes. Remember, too, that laser eye surgery and the use of photorefractive keratotomy result in a greater susceptibility to retinal damage.

**Reference:** *J Can Dent Assoc* 2011;77:1318  
<http://www.jcda.com/doi/10.1017/S1700564611000000>