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Dental Review™

Making Education Easy

Issue 29 – 2011

In this issue:

Welcome.

Contrasting articles in this issue include a new glass ionomer and an old favourite, linings under amalgam. Evidence also that some focused training might speed up our examining. Magnets and musical microbes too!

Best Wishes,

Nick Chandler
Associate Professor
Department of Oral Rehabilitation, University of Otago
nickchandler@researchreview.co.nz

Frequency of persistent tooth pain after root canal therapy: a systematic review and meta-analysis

Authors: Nixdorf DR et al

Summary: The first paper about pain after endodontic treatment was published in 1921. These authors searched electronic databases for articles published from 1949 to July 2009. After applying exclusion criteria to the 770 articles found, 26 were included in their analysis. These involved 5,777 teeth, of which 2,996 were followed up. The frequency of all-cause, persistent pain was 5.3%. When higher quality studies only were included this became over 7%.

Comment: A great deal of research on the outcomes of root canal treatment is concerned with changes visible on radiographs. But does the tooth hurt afterwards and can the patient use it? There are many possible reasons for pain 6 months later, and this paper is one of the first to look at how widespread this problem is. There is probably a group of patients at high risk of suffering pain after treatment, and we are left to wonder about the pain condition of patients whose teeth were extracted, because of the 48% lost to follow-up.

Reference: Journal of Endodontics 2010;36(2):224-230

http://tinyurl.com/persistent-tooth-pain

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

Research Review publications are intended for New Zealand health professionals

The evaluation of resin infiltration for masking labial enamel white spot lesions

Authors: Kim S et al

Summary: Twenty teeth with a developmental defect of enamel (DDE) and 18 with post-orthodontic decalcification were treated by resin infiltration. The teeth were eroded by a 15% hydrochloric acid gel, dried with ethanol and then a low-viscosity resin was applied for 3 minutes and light cured. Standardised photographs were taken and colour change measured with image analysis software. The teeth were scored as being completely masked, partially masked or unchanged. Among the DDE teeth one-quarter were completely masked. The orthodontic cases were more successful.

Comment: White spot lesions may be treated in four ways; by remineralisation by fluoride or CPP-ACP, by bleaching, by microabrasion or by restoration. Overall, the experiment found significant colour differences after the infiltration treatment, and in the DDE teeth the improvement was greater after one week than immediately after treatment. Also, no harm or adverse effects were reported.

Reference: International Journal of Paediatric Dentistry 2011;21(4):241-248

http://onlinelibrary.wiley.com/doi/10.1111/j.1365-263X.2011.01126.x/abstract

For more information, please go to http://www.medsafe.govt.nz

Developing consumer-centered, nonprescription drug labeling. A study in acetominophen

Authors: King JP et al

Summary: In the USA acetaminophen (paracetamol) overdose results in 30,000 hospitalisations of patients with acute liver failure each year. Up to two-thirds of cases are accidental, suggesting poor understanding of labelling or problems with recommended dosage, despite ingredients being listed on packaging since 1999. The researchers studied patients in two clinics and at an adult basic education centre, seeking feedback on plain-language text instructions and labelling icons. Under half routinely read product label information; they did not know the drug was in the common medication Tylenol. A statement about liver damage was desirable, together with an icon and warning for maximum dose.

Comment: Twenty-five billion doses of paracetamol were sold in the USA in 2008. People can inadvertently exceed the maximum daily dose by simultaneously taking both over-the-counter and prescription medications containing paracetamol. The groups involved in this study were expected to have a higher prevalence of limited literacy, and had limited knowledge of the concept of an 'active' ingredient. Most were surprised that this drug could cause liver disease, but the majority, including those who could not read well, understood the concept of liver damage.

Reference: American Journal of Preventive Medicine 2011;40(6):593-598

http://tinyurl.com/drug-labelling

Development of a self-adjusting magnetic attachment for implant overdentures

Authors: Maeda Y et al

Summary: Magnets have been used to aid the retention of overdentures supported by natural teeth and implants. The viscoelasticity of the supporting mucosa allows denture base movements which tend to separate the magnet from its keeper. This in vitro experiment investigated a self-adjusting magnetic attachment (SMAT), which permitted 0.4 mm vertical movements and 8° rotation. An implant was placed in an acrylic mandible with artificial mucosa. A testing machine measured retentive forces with three magnet types and a ball attachment.

Comment: With no compensation from the periodontal ligament supplied by implant overdentures, retention of magnetic attachments is a problem. Answers to some of these were provided by the SMAT. It remained retentive and reduced lateral stress on the implant compared to the other magnets and the ball retainer.

Reference: International Journal of Prosthodontics 2011;24(3):241-243

http://ijp.quintessenz.de/index.php?doc=abstract&abstractID=21477

Evaluation of the microbial flora found in woodwind and brass instruments and their potential to transmit diseases

Authors: Glass RT et al

Summary: Studies confirm a relationship between breathing difficulties and playing wind instruments, but no association has been made regarding contaminated instruments. A high school band participated in this study, providing seven previously played brass and six woodwind instruments. They had been used in the previous week or not played for at least a month. One hundred and seventeen sites including reeds and mouthpieces were swabbed. Due to the large number of organisms discovered (442 isolates), only a few were investigated further. Methicin resistance was noted, and 19 yeasts isolated. While the reeds and mouthpieces were most heavily contaminated, there were sufficient organisms in other instrument parts to recommend sterilisation of the whole instruments, and especially before transfer to a new user.

Comment: Readers who were at the School of Dentistry in 1994 might recall clinical tutor Dr David Fyfe. A keen bassoonist, he manufactured his own reeds from cane he sourced from Europe. His music teacher had taught him to store them in good quality Scotch whisky between playing sessions. Investigating this further, David made scanning electron micrographs of his used reeds. The tubular structures were full of bacteria, with the images closely resembling infected dentinal tubules. This new study confirms his (sadly unpublished) findings; more whisky is required! Probably the only way to sterilise an entire instrument would be to use ethylene oxide gas, usually only available in major hospitals.

Reference: General Dentistry March/April 2011;100-107

http://tinyurl.com/microbial-flora

Underreporting of bloodborne exposures in a dental school clinic

Authors: Cuny E et al

Summary: Studies indicate that underreporting of bloodborne exposures (BBE) is prevalent in health care settings. This may be due to low risk perception, the time and paperwork involved and dissatisfaction with what happens next. A survey was given to three classes at a dental school in the USA with over 140 students in each year. They were asked to report the BBEs they had each year, in order to determine how many were reported as they gained clinical experience. Reporting ranged from 20% to 40% and was 43% in the final year. After an education campaign this figure rose to 79%.

Comment: In the surveys some said the protocol to follow after exposure was cumbersome, and some assumed there was little or no risk. They did not want time away from the clinics, and despite knowledge of HIV risk from needlesticks they felt the risk was so low that reporting was not necessary. The education comprised mass e-mail reminders, discussions at mandatory class meetings and annual clinic orientation sessions.

Reference: Journal of Dental Education 2011;75(4):544-548

http://www.jdentaled.org/content/75/4/544.abstract

Evidence summary: which dental liners under amalgam restorations are more effective in reducing postoperative sensitivity?

Author: Nasser M

Summary: The title of this paper was a question needing an answer, provided by a Primary Care Dentistry Research Forum involved in online voting. A search of the literature uncovered only one general review on the subject, which was described as being only partially relevant. There is, however, quite a lot of data comparing different liners and bases against each other, so some good references are provided to follow up.

Comment: Yet another question involving the everyday activities of most dentists, and once again very little conclusive research evidence on what is best. Letters appeared in the following issues of the journal, some of them belonging to the 'I've been doing this for decades and it works for me' genre. The answer will require a well-conducted randomised controlled trial.

Reference: British Dental Journal 2011;210:533-537

http://www.nature.com/bdj/journal/v210/n11/full/sj.bdj.2011.461.html

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A clinical study evaluating success of 2 commercially available preveneered primary molar stainless steel crowns

Authors: Leith R et al

Summary: Introduced in the mid 1990s, these crowns are designed to provide the durability of a conventional stainless steel crown and the aesthetics of composites. Different bonding systems are used, and in this experiment one of the crowns featured perforations to give mechanical retention. Forty-eight crowns were placed in 18 children with a mean age of 5 years, using a split-mouth experiment design. Two examiners blindly evaluated the results, and parent satisfaction was recorded for up to 12 months. Overall the clinical and radiographic success was high and parent satisfaction excellent.

Comment: Patients and parents must be warned about potential veneer failure, but in the study crowns with facing loss were still thought to be satisfactory by parents and no repairs were requested. The use of facings restricts crimping to fit the contour of the tooth. Interestingly, one of the outcomes assessed was crown retention, but I cannot find the luting cement used mentioned in the article.

Reference: Pediatric Dentistry 2011;33(4):300-306

http://tinyurl.com/preveneered-crowns

The influence of a short training program on the clinical examination of dental restorations

Authors: McAndrew R et al

Summary: Sixteen dentists were involved in a study in which eight underwent a short training programme about restoration replacement decision making before examining 66 restorations in nine patients. Their results were compared with those of two clinicians who had applied US Public Health Service criteria (gold standard). The trained group recommended fewer replacement restorations, took less time for their examinations and had greater agreement with the gold standard.

Comment: Studies report that about half of all restorations placed are replacements and note the considerable variation among clinicians regarding treatment need. Calibration is a feature of epidemiological surveys but unusual in dental practice. The time saving indicates that providing written descriptions of what comprised restoration failure led to clearer thought processes. The test subjects in this study might not be representative of the general public. All were female with low 'active' caries experience, half the restorations were resin-based, and none were in anterior teeth.

Reference: Operative Dentistry 2011;36(2):143-152

http://www.jopdentonline.org/doi/abs/10.2341/10-202-C

Fluoride release from a new glass-ionomer cement

Authors: Neelakantan P et al

Summary: Fluoride release gives glass ionomers their antibacterial and cariostatic properties; the longer the release, the better. The authors researched a new nano-ionomer material (Ketac N 100) together with a conventional GIC, a resin-modified GIC, a compomer and a fluoride-releasing composite. A resin composite acted as control. Fluoride release from standardised specimens was followed for up to 28 days. Apart from compomer and composite, all materials showed an initial 'burst effect'. The conventional GIC had the highest release over the first 3 days, the nano-ionomer the best over the remaining period.

Comment: GICs have been around since 1972. The initial fluoride release is due to an acid-base reaction; the nano-sized filler in the new material may have enhanced fluoride release because its filler has an increased surface area to volume. The paper does not reveal how small the nano filler particles are. The next question will be how well it recharges with fluoride.

Reference: Operative Dentistry 2011:36(1):80-85

http://www.jopdentonline.org/doi/abs/10.2341/10-219-LR