

Oral Health Research Review

Making Education Easy

Issue 13 – 2012

In this issue:

- > *Multivitamin therapy for RAS*
- > *Oral S. mutans acquisition in infants*
- > *Surface alterations from laser*
- > *Tobacco cessation interventions among dental hygienists*
- > *Complications of lip and tongue piercings*
- > *Long-term aspirin and CAL*
- > *Psychology of patient compliance*
- > *Severe periodontal destruction with advanced anaemia*
- > *Tongue cleaning and oral mutans streptococci*
- > *Interproximal cervical lesions due to incorrect flossing*



Oral Health Research Review is also made available to Dental Hygienists through the kind support of the New Zealand Dental Hygienists' Association

Abbreviations used in this issue

CAL = clinical attachment loss

RAS = recurrent aphthous stomatitis

Welcome to issue 13 of Oral Health Research Review.

This winter edition includes a study that identified several factors associated with acquisition of oral *Streptococcus mutans* in infants, while another showed reduced oral mutans streptococci counts in children who had added tongue brushing and tongue scraping to their regular oral hygiene regimen. The edition also includes two case reports that highlight important clinical points. One draws our attention to the need to be vigilant for medical conditions manifesting as unexplained periodontal abnormalities (in this case severe periodontal destruction due to severe anaemia), while the other reminds us it is important to ensure our patients carry out their oral hygiene regimens with correct techniques.

We hope you find the selection interesting, and as always your comments and feedback are welcome.

Kind regards,

Jonathan Leichter D.M.D

jonathanleichter@researchreview.co.nz

Multivitamin therapy for recurrent aphthous stomatitis

Authors: Lalla RV et al

Summary: These researchers enrolled 160 patients with a history of ≥ 3 episodes of idiopathic minor RAS in the previous year. Their trial involved 77 patients taking placebo while the other 83 took a multivitamin that contained the US reference daily intake of essential vitamins. The groups had similar red cell folate and vitamin B₁₂ levels at the start. There was no significant difference in their new episodes of RAS over the year of the trial.

Comment (JL): RAS is a common disease leading to significant morbidity and diminished quality of life. While genetics, stress, allergies and autoimmunity have been implicated, the aetiology is still not well understood. However, several studies have found vitamin deficiencies in patients with RAS. This paper investigated the use of a prophylactic daily multivitamin supplement in patients with RAS. Participant allocation was done using a computer-based pseudorandom number generator and the study investigators were unaware of the participants' assignment. The 58 intervention participants took a once daily generic multivitamin supplement containing the recommended daily intake of essential vitamins. The 56 placebo participants took a lactose powder capsule. A study diary was kept and the participants were seen at baseline, 6 months and 1 year when their diaries were collected, medical histories updated and an oral examination carried out. Unfortunately, the number, mean duration and associated pain of new RAS episodes did not differ significantly between the two groups. Although limitations such as the reliance on self-reported data from the participants to determine the presence and duration of RAS episodes and the inherent difficulty in measuring compliance with pill-taking existed, the authors did not expect that these would change the outcome. While they suggested that patients with refractory RAS be tested for vitamin B₁₂ and folate deficiencies, they do not recommend the use of daily multivitamin supplements as a prophylactic strategy for these patients.

Comment (RP): There have been vast amounts of studies done over many years suggesting various causes and treatments for RAS. Vitamin deficiencies have been implicated as one of the possible causes. This study examined the viability of providing patients with low-dose vitamin supplements to prevent RAS recurrence. The study found that there was no noticeable difference in either the frequency or severity of RAS episodes when patients took low-dose vitamins over the duration of 1 year. It should be noted that other studies have found that high doses of specific vitamins (vitamin B₁₂ and folate) have had the opposite effect on RAS episodes. The conclusion from this research suggests that there is not enough evidence to warrant recommending vitamin replacement therapy as a treatment modality for patients with RAS. The aetiology of RAS still remains unclear and treatment is largely palliative.

Reference: *J Am Dent Assoc* 2012;143(4):370-6

<http://jada.ada.org/content/143/4/370.abstract>

DID YOU KNOW? ...the greatest airborne infection threat in dentistry comes from aerosols?¹

PROTECT YOUR STAFF AND PATIENTS FROM THE THREAT OF AEROSOLISED BACTERIA.

Pre-procedural rinsing for 30 seconds with LISTERINE® Antiseptic mouthwash reduces the number of aerosolized bacteria by up to 94%²

LISTERINE

PRE-PROCEDURAL RINSE SUPPORT PROGRAM:

Protect your patients and your own health with Johnson & Johnson. To know more about J&J PPR support program and the special promotion on PPR please call Oraltec on 09 478 2229.

CLICK HERE to read more clinical information on the benefits of Pre-procedural Rinse.

¹ Harrel S, Molinari J. *J Am Dental Assoc*. 2004; 139: 429-37. ² Fine DH, et al. *J Am Dental Assoc*. 1993; 124(5): 56-8. Medicines have benefits and some may have risks. Always read the label and use only as directed. Listerine® Antiseptic Mouthwash contains: Benzoic acid 0.12% w/v, Cineole (Eucalyptol) 0.0922% w/v, Ethanol 27.0% w/v, Thymol 0.064% w/v. Johnson & Johnson (New Zealand) Ltd, Auckland. TAPS PP9948 2033/11

Effect of mode of delivery and feeding practices on acquisition of oral *Streptococcus mutans* in infants

Authors: Thakur R et al

Summary: These researchers followed 60 mother-infant pairs, stratified by mode of delivery (i.e. caesarean versus vaginal), for 1 year after birth. They found that potential influences of initial acquisition of *S. mutans* in the infants' oral cavities included prolonged bottle feeding, socioeconomic status and maternal tasting of the infants' food.

Comment (JL): The authors of this paper investigated a potential correlation between the mode of delivery and other associating factors with colonisation of oral *S. mutans* in infants. Sixty mother-infant pairs, divided into either the caesarean section group or the vaginal group, were followed at 3-month intervals for 1 year. At each visit, saliva or plaque samples were collected, and the feeding practice, pacifier use, nocturnal bottle feeding, frequency of sugar intake and oral hygiene practices used for the infant were recorded. Other data obtained were maternal age, mother's education, sex of the child, siblings, time of tooth eruption and father's profession. The results showed no association between *S. mutans* acquisition and gender, mother's education, time of tooth eruption, the presence of siblings or the child's mode of delivery. Tasting of food by the mother, exposure to sugar >3 times a day, socioeconomic status of the family, prolonged bottle feeding and oral hygiene practice were significantly associated with early colonisation. Breastfeeding appeared to play a preventive role. As we are often asked for advice by expectant and new mothers, practical and easy advice, such as not tasting food and limiting sugar exposure, could be simple suggestions.

Comment (RP): This study did not find a positive correlation between caesarean deliveries and the acquisition of *S. mutans*. It did highlight several factors that do have a bearing on *S. mutans* acquisition, with education and socioeconomic status having the greatest implications. While the oral health provider will have little or no effect on the socioeconomic status of a patient, education is an area that can and should be addressed. Thorough oral health education, focusing on feeding techniques for babies, is especially important for new mothers. Accessibility to this information for new mothers is crucial, as it may be difficult for them to attend a clinical setting.

Reference: *Int J Paediatr Dent* 2012;22(3):197–202

<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-263X.2011.01176.x/abstract>

Potential surface alteration effects of laser-assisted periodontal surgery on existing dental restorations

Authors: Kilinc E et al

Summary: Using fabricated samples from eight material groups, these researchers identified the following effects of laser irradiation using the manufacturers' recommended settings for gingivectomy: i) detrimental effects on all metallic materials and tooth structures with Nd:YAG laser; ii) detrimental alterations on composite, ceramic and tooth surfaces, and slight alterations on amalgam, gold and palladium-silver, with CO₂ laser; and iii) alterations on amalgam, titanium, gold and palladium-silver with the 810nm diode laser, but only the latter two surfaces were barely traceable.

Comment (JL): Although the use of lasers for a range of periodontal surgeries has many advantages such as less scar formation, postoperative swelling and pain, it has also been shown to affect the surrounding tissues, causing crater-like defects on enamel and cementum. This may be a problem in aesthetic areas and may cause restoration or implant surface deformities that promote bacterial adhesions. This *in vitro* study used both scanning electron microscopy and digital photography to evaluate surface alterations after 30-second use of CO₂, Nd:YAG and 810nm diode lasers on a range of dental materials and extracted tooth slices. The results showed that the Nd:YAG lasers caused significant damage to amalgam, palladium-silver and titanium, and the authors caution against their use in patients with titanium implants, amalgam fillings or restorations with palladium-silver collars. The Nd:YAG laser was also the most damaging on gold and tooth surfaces. Both composite restorations and ceramic surfaces were detrimentally affected by CO₂ laser. The authors recommend caution in laser-assisted periodontal surgeries and suggest further clinical studies to validate their findings.

Comment (RP): Lasers have been proven to be invaluable tools in dentistry, particularly in the area of periodontal management, and they have become increasingly commonplace in dental practices. As with any technology, thorough research is required on behalf of the user to ensure optimal results are achieved and limit any negative side effects. As shown in this study, each type of laser interacts differently with the various dental materials commonly used in dentistry. The effects were more pronounced in this study, being an *in vitro* study, and it was noted that further *in vivo* studies would be beneficial. Clinicians need to be aware of the limitations of each type of laser. Of particular note was the recommendation not to use Nd:YAG lasers around full metal or metal ceramic restorations with metal collars in gold or base metal, as this can cause serious defects.

Reference: *Quintessence Int* 2012;43(5):387–95

<http://tinyurl.com/QuintInt-43-387>

Privacy Policy: Research Review will record your email details on a secure database and will not release them to anyone without your prior approval. Research Review and you have the right to inspect, update or delete your details at any time.

Disclaimer: This publication is not intended as a replacement for regular medical education but to assist in the process. The reviews are a summarised interpretation of the published study and reflect the opinion of the writer rather than those of the research group or scientific journal. It is suggested readers review the full trial data before forming a final conclusion on its merits.

Research Review publications are intended for New Zealand health professionals.

Tobacco cessation interventions by Swedish dental hygienists

Authors: Johannsen A et al

Summary: Responses to a questionnaire on tobacco smoking cessation that was sent to 400 Swedish dental hygienists (response rate 57%) showed that while most respondents felt that smoking cessation was important for patients with periodontitis or dental implants and most conducted some smoking cessation interventions, some barriers were identified. Smoking cessation interventions were associated with appropriate training courses in a bivariate analysis (odds ratio 3.25 [95% CI 1.80, 5.85]) and competence and experience in a logistic multivariate analysis (2.4 [1.16, 4.85] and 2.1 [1.06, 4.28], respectively).

Comment (JL): Cigarette smoking is implicated in a range of health problems (e.g. coronary heart disease, stroke, chronic lung disease, cancer), and is a significant risk factor for periodontal disease and peri-implantitis. It is also associated with impaired healing after scaling, root planing and periodontal surgery. Four hundred randomly selected Swedish hygienists were sent a questionnaire in order to investigate their perceptions of the importance of smoking cessation and the interventions they used. Tobacco habits were routinely recorded by 94% of the 229 respondents, and a range of interventions were routinely used, such as providing information on the benefits of quitting and/or the deleterious effects of tobacco, giving brief advice or information on the quit-smoking line, and recommending nicotine replacement therapy. Only 33% of hygienists referred patients to an external cessation expert, and a smoking cessation programme was utilised by only 6% of the hygienists. Lack of time, insufficient competence and lack of experience were the main barriers reported, although all the hygienists considered that encouraging smoking cessation is important. Considering that our NZ hygienists graduate from the BOH programme with the potential to become smoking cessation counsellors, it would be interesting to know how we compare with our Swedish counterparts.

Comment (RP): As shown in the research, and by that of others, any effort on behalf of the dental hygienist with respect to assisting a patient towards tobacco cessation can be beneficial, whether it's 1 minute or 10 minutes of the appointment time. The dental hygienist may be the health professional a patient sees most often, and the constant reinforcement of smoking cessation can have lasting implications. The time that a patient is in the chair should be optimised, and this requires the hygienist to be prepared with current health strategies to assist patients in tobacco cessation.

Reference: *Swed Dent J* 2012;36(1):45–52

<http://www.ncbi.nlm.nih.gov/pubmed/22611904>

CLICK HERE

to read previous issues of
Oral Health Review

Dental and periodontal complications of lip and tongue piercing: prevalence and influencing factors

Authors: Plessas A & Pepelassi E

Summary: These researchers assessed complications in 110 individuals with 110 lip and 51 tongue piercings. They found that attachment loss and probing depth were significantly affected by wear time/habits, with no difference between tongue and lip piercings, although tongue piercings had a greater overall impact on dental defects than lip piercings. Gingival recession was significantly affected by wear times/habits, and was significantly associated with ornament height closure and stem length of tongue ornaments. No significant association was seen between periodontal biotype and gingival recession, attachment loss or probing depth.

Comment (JL): Body piercing has evolved from a cultural practice to a fashion statement, with intraoral and perioral sites such as the tongue, lips and cheeks often selected for piercing. Unfortunately, a significant percentage of pierced individuals are not aware of the oral health complications of a piercing. The extensive list of risks and complications is therefore not taken into consideration prior to having the procedure done. This cross-sectional study assessed the complications of intra- and perioral piercing in a group of 110 subjects with a mean age of 21.25 years and a total of 161 pierced sites. Only one of the piercings was done by a medical doctor and less than one-third of the subjects regularly cleaned the piercing ornament. Common problems found in this study included inflammation, abnormal toothwear and/or tooth chipping/cracking, and gingival recession. It is our responsibility to inform our patients, in particular the younger patients, about the consequences of oral piercings, advise their removal or, if this is not going to happen, educate them on proper ornament care and the importance of regular professional oral monitoring. Frequent recall to ensure early detection of dental and/or periodontal complications is essential, and the location, wear time, habits and long tongue piercing stem length should be documented.

Comment (RP): While previous research has focused on the effect of intraoral piercings on the oral environment, this study takes a closer look at the factors that contribute to the wear on the teeth and the gingiva. The type of piercing and the duration of wear were found to have significant bearing on the amount of wear. It would seem in the best interests of patients that clinicians become familiar with various piercings and the potential detrimental effects on the gingiva and teeth. This information needs to be available to those who are considering oral piercings or who already have one. The demographic for piercings tends to be adolescents and young adults. As it was noted in this study that the piercings were predominantly done in a tattoo/piercing studio, perhaps this is where the oral health message needs to be focused, as adolescents/young adults can slip through the 'cracks' in the dental system in NZ.

Reference: *Aust Dent J* 2012;57(1):71-8

<http://tinyurl.com/ADJ-57-71>

Find healthcare jobs
in your area



Association between long-term aspirin use and periodontal attachment level in humans

Authors: Faizuddin M et al

Summary: This cross-sectional investigation found that compared with controls (aspirin nonrecipients; n=146), recipients of aspirin 75mg or 150mg for >6 months (n=162) had significantly less CAL (2.01 vs. 2.38mm; p<0.001). A negative correlation was apparent between CAL and duration of aspirin therapy, but no difference was seen between the two doses.

Comment (JL): Aspirin inhibits prostaglandin synthesis and modifies the action of cyclo-oxygenase, resulting in the formation of lipotoxins, which inhibit neutrophil chemotaxis, superoxide generation and the secretion of proinflammatory cytokines. As periodontitis is an inflammatory disease, pharmaceutical modulation of host responsive pathways may be an adjunctive or alternative strategy for treatment. This cross-sectional study compared 162 patients on aspirin therapy for cardiovascular disease with 146 patients not on aspirin. All patients were over 40 years of age with at least 20 teeth present. Current and former smokers were excluded. Parameters recorded were oral hygiene status, bleeding on probing and CAL. There was no significant difference in oral hygiene status between the study and control groups. The percentage of bleeding sites was significantly higher in the study group. This can be attributed to the antithrombotic effect of aspirin. The mean CAL was significantly higher in the control group. While this result is similar to that reported in other studies, it should still be interpreted with caution as the parameters were recorded at one point in time, and further large sample prospective cohort studies are needed to confirm the findings.

Comment (RP): It has long since been established that nonsteroidal anti-inflammatory drugs can have a significant impact on gingival inflammation and periodontal bone loss. Aspirin is effective in its ability to inhibit prostanoid synthesis, prostaglandin-E2 being the product implicated in periodontal destruction. While this study found a significant correlation between low dose aspirin use and a reduction in the risk of periodontal attachment loss, the study was limited by a small sample size from a select group of patients with parameters recorded at one point in time. As noted by the authors, a cohort study with follow-up would have been preferable. Low-dose aspirin irreversibly affects the platelets, making it valuable in treating coronary heart disease, and it appears to have a role to play in reducing CAL. High doses can have detrimental effects, such as gastrointestinal bleeding disorders. It is a treatment modality that needs further research to be able to be used safely and effectively.

Reference: *Aust Dent J* 2012;57(1):45-50

<http://onlinelibrary.wiley.com/doi/10.1111/j.1834-7819.2011.01650.x/full>

The psychology of patient compliance

Authors: Umaki TM et al

Summary: This focussed literature review of current research into psychological factors associated with compliance with periodontal maintenance therapy found: i) more stressful life events among noncompliant patients; ii) a possible relationship between initial patient response to periodontal treatment and emotional intelligence; and iii) associations between both high neuroticism and low conscientiousness and noncompliance. The authors recommended sound working knowledge of both the 'big five' personality factors (i.e. neuroticism, extraversion, openness to experience, agreeableness and conscientiousness) and the 'Health Belief Model and Theory of Planned Behavior'.

Comment (JL): Studies have shown that although successful long-term periodontal therapy requires a periodontal maintenance programme, as few as 16% of patients return for their appointments after completion of active therapy. Time constraints, prolonged treatment plans and the perceived unimportance of maintenance therapy have been listed as contributing factors. This literature review assessed 14 studies on periodontal compliance and 10 studies from psychology literature. The authors found a long list of psychological variables linked to noncompliance, and suggest that appropriate periodontal maintenance programmes could be developed based on the understanding of the patient's personality traits, clinical history and health beliefs. While the idea of assessing compliance probabilities and avoiding noncompliance certainly sounds good, I query its practicality and accuracy, and doubt that it is a concept that would be readily embraced by the busy hygienist or periodontist.

Comment (RP): Dentistry is often limited to just the oral environment. As this paper reinforces, the whole patient needs to be treated in order to achieve long-term successful outcomes. The principle of holistic treatment should be the basis of every treatment plan. While the concepts in this paper are logical, the application of the theory would be difficult in the average dental practice. The level of patient assessments the authors are suggesting in this paper would require further training than is currently given to dental health professionals in NZ. Not only would the clinician need to be trained in psychological assessment, but a high level of social intuition and perception would be needed in order to correctly interpret and apply these findings.

Reference: *J Periodontol* 2012;83(4):395-400

<http://www.joponline.org/doi/abs/10.1902/jop.2011.110344>

Subscribing to Research Review

To subscribe or download previous editions of Research Review publications go to
www.researchreview.co.nz

Severe periodontal destruction in a patient with advanced anemia

Authors: Hatipoglu H et al

Summary: These authors reported the case of a 23-year-old woman who had presented with tooth mobility. X-rays revealed generalised severe alveolar bone loss. A medical consultation, which was recommended based on clinical findings and medical history, revealed severe anaemia. Her periodontal treatment was modified, and her periodontal and systemic statuses remained stable during 1 year of follow-up.

Comment (JL): Systemic disorders such as diabetes, haematological, immunological and mucocutaneous disorders have been linked to changes in the periodontium, with colour changes, spontaneous bleeding, increased periodontal destruction, gingival overgrowth and ulcerations noted as the leading periodontal findings. This case report described the findings and treatment of a 23-year-old patient who presented with tooth mobility and insignificant medical and dental histories. On examination, her mucosa and gingival were pale, there was bleeding and suppuration on probing, and probing depths of up to 10mm were found. Her oral hygiene was fair and almost no visual plaque and calculus were noted. A medical consultation and evaluation revealed severe anaemia with iron and vitamin B₁₂ deficiencies. This case report reminds us of the importance of keeping possible systemic disorders in mind when treating patients with unexplained destructive periodontal diseases and referring them for medical assessment if any doubts exist. We may be the first health professionals to note an abnormality, thus enabling timely and essential medical interventions to be initiated.

Comment (RP): This isolated case study could possibly show a correlation between anaemia and periodontal disease, but further definitive research is needed to have clinical bearing on treatment modalities for patients with anaemia. Without previous historical records, it is not possible to attribute the periodontal destruction solely to anaemia. As mentioned in this case study, anaemia of chronic disease and iron-deficiency anaemia are among the leading causes of anaemia, although the treatments can be quite different. This is of particular importance as the symptoms may be first noticed in the periodontium before a medical diagnosis has been made. Assessments need to be made in conjunction with a patient's doctor, as it is crucial to distinguish between the different types of anaemia.

Reference: *Eur J Dent* 2012;6(1):95–100

http://www.eurjdent.com/images/Volume_6/6-95-100.pdf

The comparative evaluation of the effects of tongue cleaning on salivary levels of mutans streptococci in children

Authors: Rupesh S et al

Summary: Children aged 9–12 years with ≥4 restored, decayed and/or missing teeth performed supervised tongue scraping (n=15) or tongue brushing (n=15) along with toothbrushing, or toothbrushing only (n=15), twice daily for 21 days in this study. Tongue scraping and tongue brushing were associated with similar, significant reductions in salivary mutans streptococci counts at 10 days and 21 days with similar efficacy.

Comment (JL): The tongue is generally neglected during daily toothbrushing, although its large surface area and papillary nature favour the accumulation of oral bacteria. Three parallel groups of 15 children each were compared in this single-blind, stratified comparative study. The children, aged 9–12 years, were allocated into tongue scraping, tongue brushing or toothbrushing only groups. Cleaning was done twice daily, and stimulated whole saliva samples were collected prior to the study, at 10 days and again at 21 days. The results showed significant reductions in salivary mutans streptococci counts in the tongue scraping and tongue brushing groups. The control group did not show any statistically significant changes. Although tongue cleaning and scraping have been done since ancient times, particularly in India, this habit appears to have fallen out of favour and is not routinely included in the oral hygiene instructions that we give to our patients. This study shows it to be a simple and effective adjunct oral hygiene measure that we should consider incorporating into oral hygiene instructions.

Comment (RP): Tongue brushing and tongue scraping has been proven to reduce the overall microbial load of the oral cavity. This study showed a specific reduction in mutans streptococci with twice daily tongue brushing or tongue scraping. Being a relatively easy technique to implement, it seems a sensible recommendation for all patients. It would be interesting to see how this reduction in salivary mutans streptococci correlates to the DMF index and streptococcal plaque counts.

Reference: *Int J Dent Hyg* 2012;10(2):107–12

<http://onlinelibrary.wiley.com/doi/10.1111/j.1601-5037.2011.00522.x/abstract>

Interproximal cervical lesions caused by incorrect flossing technique

Authors: Salas ML et al

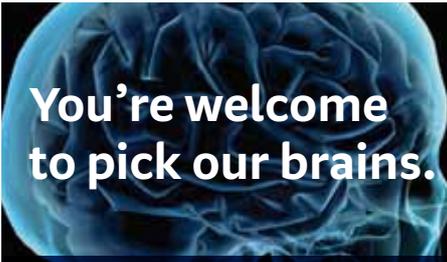
Summary: These authors reported a case of a 58-year-old asymptomatic man who presented with unusual notch-like interproximal cervical lesions. A clinical examination and x-ray findings suggested that his lesions were the result of incorrect flossing technique. He received oral hygiene technique re-education.

Comment (JL): Although effective oral hygiene measures play a crucial role in the prevention of dental caries and periodontal disease through the removal and control of dental biofilm formation, it is important that our patients are instructed in the use of the correct techniques. This case report describes the damage that a 58-year-old man caused by using an incorrect flossing technique. Unusual linear notch-like lesions on the distal of his maxillary and mandibular molars were noted in both the clinical and radiographical examinations. They involved the distal cemento-enamel junction and extended onto the distolingual and distobuccal surfaces, and were approximately 2mm deep. A long-standing aggressive and incorrect use of dental floss was the cause. Highly motivated patients may misunderstand or misapply their brushing and/or flossing techniques, with gingival recession and cervical abrasion commonly seen and extensively discussed in the literature. Although less common, flossing abrasion lesions have been described, and must not be overlooked when examining our patients. We should not presume that patients instinctively know how to use dental cleaning aids, and instruction in their proper use is imperative.

Comment (RP): This study reinforces the importance of thorough assessments and review of homecare regimens. Ideally this patient's detrimental flossing technique should have been picked up many years prior, either during orthodontic treatment or upon diagnosis of chronic periodontal disease. The patient in this instance showed motivation and commitment in maintaining his own oral health, but he appears to have been let down by the clinicians treating him through the years. As oral health providers, taking the time to involve patients in correct and effective homecare regimens is possibly the most valuable tool we can give them.

Reference: *Int J Dent Hyg* 2012;10(2):83–5

<http://tinyurl.com/IJDH-10-83>



You're welcome to pick our brains.

Ask us about financial solutions today.

0800 273 916 > bnz.co.nz/medical **bnz**

Oral Health Research Review

Independent commentary by Jonathan Leichter DMD, Cert Perio (Harvard). For full bio [CLICK HERE](#).

Independent commentary by Rachel Perrott – DipDentHyg

After graduating from the University of Otago, Rachel worked in private practice setting up hygiene clinics in two West Auckland practices. Shifting to part-time hygiene work, she is presently raising a family while studying early childhood development. She plans to further her study into the area of health promotion.