

Dental & Oral Health Research Review™

RESEARCH REVIEW
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Issue 2 - 2016

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Abbreviations used in this issue

ASD = autistic spectrum disorder
BMI = body-mass index
CV = cardiovascular
FMD = full-mouth disinfection
GP = general practitioner
OHRQoL = oral health-related quality of life
OIDP = oral impacts on daily performance
QoL = quality of life
SDA = shortened dental arches
SRP = scaling and root planing

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Dental & Oral Health Research Review

Welcome to the second combined issue of Dental and Oral Health Research Review.

This publication reviews papers from each field, with Colleen Murray providing commentary for Dental Health and Jonathan Leichter for Oral Health.

A paper published in *The Journal of the American Dental Association* has highlighted the benefits of measuring bodyweight in children when they attend dental visits, to identify those who could benefit from additional general and oral health interventions. Meanwhile, researchers from Australia identified large proportions of patients with periodontitis who had undiagnosed prediabetes/diabetes mellitus and other CV disease risk factors. Another paper from Australia reports on the rulings of legal cases associated with inadequate record keeping by dental practitioners. It suggests that newer technologies such as digital intraoral and extraoral photography, as well as audiorecording of patient interactions, could help to overcome problems that can arise with handwritten or typed dental records.

Research Review is ten!! The first ever issues of Research Review were delivered to inboxes in February 2006. Fast forward ten years and we now publish 48 regular reviews to which there are over 160,000 subscriptions. We're grateful to each and every one of you for your support and are looking forward to even bigger and better things over the coming years. We hope you find the papers in this issue useful in your practice and we welcome your comments and feedback.

Kind regards

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Impact of shortened dental arches on oral health-related quality of life (OHRQoL)

Authors: Antunes JL et al.

Summary: These researchers assessed the prevalence of adults with shortened dental arches (SDA) in Brazil and effects of the SDA on oral health-related quality of life (OHRQoL). Data were obtained from the 2010 National Survey of Oral Health conducted in Brazil, which involved individuals aged 5, 12, 15–19, 35–44 and 65–74 years. All participants were interviewed at home and subjected to oral examinations. This analysis included data from the 35–44-year age group (n=9779). OHRQoL was assessed by the modified version of the oral impacts on daily performance (OIDP) index. The assessment of SDA used two alternative definitions: having 3–5 natural occlusal units (OUs) in posterior teeth or having 4 OUs in posterior teeth. Both definitions included having intact anterior region and no dental prosthesis. A total of 9.9% of subjects had SDA according to the first definition as compared with 3.8% using the second definition. Under the first definition of SDA, the SDA cohort had a higher prevalence of OIDP (unadjusted count ratio [CR] 1.22; 95% CI, 1.09 to 1.36) and greater OIDP severity (unadjusted CR 1.43; 95% CI, 1.19 to 1.72) than those with more natural teeth. These between-group differences were not statistically significant after adjusting for sociodemographic and dental covariates: OIDP prevalence (CR 1.04; 95% CI, 0.92 to 1.17) and severity (CR 1.09; 95% CI, 0.91 to 1.30). Similar results were obtained in analyses using the second definition of SDA.

Comment (CM): For many dentists, replacement of missing teeth is viewed as best practice, with this traditional approach followed without questioning why, and indeed if, they should be replaced. This study, which had 9779 adult participants, compared individuals who had shortened dental arches (SDA) with those who did not. Differences in OHRQoL were assessed using a modified version of the OIDP index. The main findings were that Brazilian adults with SDA had no statistically significant differences in the prevalence and severity of OIDP compared with those who had more natural teeth. This suggests that patients presenting with SDA may not need treatment – a factor that should be kept in mind when treatment planning for our patients. As other dental conditions, such as periodontal disease and untreated caries, do impact on a patient's OHRQoL, money might be better spent on addressing these diseases.

Reference: *J Oral Rehabil.* 2016;43(3):190-7

[Abstract](#)

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Ophthalmologic complications after administration of local anesthesia in dentistry: a systematic review

Authors: Alamanos C et al.

Summary: This systematic review of the published literature identified 89 reports of patients experiencing ocular adverse events after administration of dental local anaesthesia. The majority of the complications manifested as double vision. Eight percent of the complications caused permanent functional damage, either as vision deficit or anisocoria. Complete permanent blindness was not reported.

Comment (CM): We all administer local anaesthetic (LA) routinely and, almost without exception, our patients experience no serious adverse reactions. However, when a patient's vision is affected, this could be severe. Adverse phenomena specifically affecting vision have a prevalence rate of 1 in 1000, and include permanent or transient loss of sight, diplopia, blurred vision, loss of accommodation, ophthalmoplegia, pupil dilation and strabismus. Although 92% of the complications in the 104 studies included in this review were transient, 8% had permanent complications. Although reassuring patients about the transient nature of most ophthalmological complications after LA administration is appropriate, it is vital that clinicians correctly assess any adverse effects. Failure to do so could result in permanent damage to vision. With safety in mind, always aspirate in two planes, know your anatomic landmarks, inject slowly, and refer to a specialist should a vision deficit last for more than a few seconds.

Reference: *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2016;121(3):e39-50

Abstract

Influence of preoperative pain intensity on postoperative pain after root canal treatment: A prospective clinical study

Authors: Alf A et al.

Summary: These researchers sought to determine the intensity of postoperative pain after endodontic treatment according to levels of preoperative pain. The investigation recruited 270 patients with pulpal pathology who were scheduled for routine endodontic treatment. Conventional endodontic treatment was carried out in a single visit. Chemomechanical root canal preparation was performed using ProTaper instruments and canals were obturated with a warm gutta-percha obturation technique. The mean level of pain after root canal treatment was 2.58 on a 10-cm visual analogue scale. Variables associated with a higher preoperative pain intensity (female gender, mandibular and molar teeth) were also associated with higher postoperative pain ($p>0.05$).

Comment (CM): Postendodontic pain is linked to periapical inflammation and occurs most often during the first 24–48 h after obturation. Preoperative (prior to local anaesthetic administration) and postoperative (after 4, 8, 16, 24, 48 and 72 h) pain was recorded in 270 adult patients undergoing single-visit endodontic treatment. The teeth were also recorded as either vital or necrotic prior to treatment. A visual analogue scale was used for all pain recording. Ibuprofen was recommended for pain control if needed. The results showed that preoperative pain is strongly associated with postoperative pain. The incidence of postoperative pain is higher in women, and the level of postoperative pain is significantly higher in posterior and mandibular teeth. Vital and necrotic teeth showed no difference. As pain control is a key aspect of endodontics, knowing which patients are more likely to experience post-treatment pain enables us to inform these patients of what to expect and to prescribe the necessary analgesics.

Reference: *J Dent.* 2016;45:39-42

Abstract

Inadequate record keeping by dental practitioners

Author: Brown LF

Summary/Comment (CM): Published rulings of formal complaints and notifications brought before disciplinary hearings in Victoria, Australia between January 2000 and January 2014 were analysed with regards to orders made in respect to record keeping. Most of the complaints made about dental practitioners referred to treatment and consent issues. The quality of dental work accounted for 40% of complaints, issues of informed consent just over 5% and only 1.6% were related to record keeping and falsifying documents. However, despite the fact that poor record keeping was not the key reason for the complaint, in 48% of these cases the dental practitioner had engaged in unprofessional conduct in this regard. Accurate, comprehensive and contemporaneously written dental records are an essential part of health care and, besides all their other uses, are the cornerstone of a sound defence against claims of negligence. Are we any better than our Australian colleagues in this regard?

Reference: *Aust Dent J.* 2015;60(4):497-502

Abstract

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Predictive factors on the efficacy and risk/intensity of tooth sensitivity of dental bleaching: A multi regression and logistic analysis

Authors: Rezende M et al.

Summary: This retrospective analysis of data from 11 clinical trials of dental bleaching explored what factors help to predict the whitening outcome and risk and intensity of bleaching-induced tooth sensitivity. The researchers observed a significant relationship between baseline colour and age in relation to colour change estimates ($p<0.001$). Every increase from the baseline colour by one shade guide unit (SGU) resulted in an increase of approximate 0.66 in the final colour change in shade guide units (Δ SGU) and 2.48 for the colour change in the CIEL*a*b* system (ΔE). Every increase of one year in the participant's age reduced the whitening degree by 0.07 for the final Δ SGU and 0.69 for the ΔE . The bleaching technique (at-home vs in-office protocol) was a significant predictor of Δ SGU ($p<0.001$) but not of ΔE . Baseline colour and bleaching technique were significant predictors of tooth sensitivity ($p<0.001$). The risk of tooth sensitivity was higher for in-office protocols (62.9%) than for at-home bleaching (51%).

Comment (CM): More than 80% of general dentists in the UK perform dental bleaching. Many patient-related variables affect bleaching – age, gender, baseline tooth colour, as well as the variables that predispose bleaching-induced sensitivity. Patient data from 426 participants in 11 randomised clinical trials were collected and retrospectively analysed with regards to colour evaluation and tooth sensitivity. Both baseline colour and bleaching technique were found to be significant predictors of tooth sensitivity. Sensitivity was found to be 120% more likely from in-office bleaching than at-home bleaching, and every one shade guide unit increase in baseline colour reduced the odds of sensitivity by 17%. Age was negatively correlated to whitening effect, but not related to the risk or intensity of sensitivity, and women had a better whitening response than men. Darker teeth showed reduced risk and intensity. It is advisable that clinicians set appropriate expectations to avoid patients being disappointed or frustrated by the results.

Reference: J Dent. 2016;45:1-6

[Abstract](#)

Autoextraction of twelve permanent teeth in a child with autistic spectrum disorder

Author: Williams AC

Summary: These authors reported the case of a 12-year-old boy with ASD who presented with two teeth missing; he was a new patient at the practice. He subsequently self-extracted another ten teeth. The authors commented that it is important for dental teams to be able to recognise autoextraction and to manage it in a multidisciplinary setting that includes professionals from education, healthcare and social services.

Comment (JL): Although self-injury is not unusual in people with ASD, autoextraction is not the first self-injury activity that springs to mind. However, recognition of this unusual behaviour by the dental team is important. This case report described a 12-year-old child with ASD in whom teeth 32 and 42 were presumed to be congenitally missing. As 2–10% of the population have missing teeth, no concerns were raised until, 1 year later, teeth 22 and 63 were missing. It was reported that the child had removed them himself. Teeth 21, 11 and 12 suffered the same fate 2 months later, with teeth 31, 33, 34, 41 and 43 joining them 9 days later – a total of 12 teeth, all removed within short timeframes (10–15 minutes) when the child was unsupervised. It is thought that self-injury causes release of opioids, producing a euphoric effect that reinforces the behaviour. The take home messages when treating children with ASD: do not always presume that a tooth is congenitally missing and keep an eye on recently erupted permanent teeth, as root formation is incomplete and autoextraction can be rapid.

Reference: Int J Paediatr Dent. 2016;26(2):157-9

[Abstract](#)



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Weighing in on pediatric obesity: weight screening at the dental visit

Authors: Ziegler J & Hughes CV

Summary: This paper discussed bodyweight screening in paediatric patients at dental offices as a means of promoting healthy behaviours to improve bodyweight and oral health status, thereby reducing both systemic and oral health risks. The authors noted that bodyweight screening can be performed quickly and BMI can be easily calculated. They recommended routine screening in paediatric patients, with prompt education and referral to a dietician and a GP for those who are underweight or overweight/obese to help reduce disease risk.

Comment (JL): Oral healthcare professionals are in a prime position to be part of an interprofessional effort to intervene in the paediatric obesity problem as they may have frequent and regular contact with children and adolescents. Obesity is a growing problem. Overweight/obese children have a greater risk of becoming overweight adults, increasing their long-term risk of developing chronic diseases. The dental visit provides the ideal setting to measure bodyweight and height and calculate BMI (at the first visit and at each 6-month recall), and incorporate nutrition and oral health education. Needless to say, one must maintain empathy, privacy and nonjudgemental behaviour. Where weight status is not in the normal range, referral to a registered dietitian nutritionist or the child's GP can be actioned. For all patients, advice to limit snacking and minimise the intake of sugary drinks will reduce both caries risk and improve their overall health.

Reference: J Am Dent Assoc. 2016;147(2):146-50

[Abstract](#)

Independent commentary by Colleen Murray.



Colleen Murray graduated from the University of Pretoria with a BChD in 1984, followed by an Honours degree in Oral Radiology and Diagnostics in 1987. After a combination of private practice and university teaching, she emigrated to New Zealand in 1992, took a break from dentistry and obtained her BEd degree. She has been in Dunedin since 2003 when the pull back to dentistry resulted in a BDS and return to private practice. This was followed by a change to the academic setting and a PGDipClinDent in Paediatric Dentistry. [For full bio CLICK HERE](#).

Independent commentary by Jonathan Leichter DMD, Cert Perio (Harvard).



Dr Leichter is currently Senior Lecturer in the Department of Oral Sciences at the University of Otago. Dr Leichter joined the faculty after 20 years in fulltime private practice in New York and Boston, 18 of which were spent in specialist practice limited to periodontology and implant dentistry. Trained at Tufts University and obtaining his specialist training at Harvard University, he has been actively involved in clinical dental implant practice since 1984. Since 2002, he has supervised and mentored postgraduate students in periodontology, endodontics and prosthodontics.

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Scaling and root planing per quadrant versus one-stage full-mouth disinfection: assessment of the impact of chronic periodontitis treatment on quality of life

Authors: Santuchi CC et al.

Summary: Patients with chronic periodontitis were randomised to SRP (scaling and root planing) per quadrant (n=45) or one-stage FMD (full-mouth disinfection; n=45) in this trial. There were no significant differences between the SRP and FMD groups for OHQoL (Oral Health and Quality of Life) and OIDP (Oral Impacts on Daily Performance) scores at 30 days or 180 days after treatment, or for periodontal clinical parameters assessed (probing depth, clinical attachment level, plaque index and gingival index) at 180 days.

Comment (JL): The aim of this clinical trial was to compare the effects of SRP per quadrant and one-stage FMD on periodontal parameters and oral health-related QoL. Ninety patients with chronic periodontitis were randomly allocated to two treatment groups – weekly 30-minute long SRP per quadrant versus FMD divided into two 60-minute FMD sessions over 2 consecutive days. Seventy-eight participants finished the study. The authors had assumed that FMD patients would present better oral health-related QoL, as this option costs less and is more efficient regarding treatment and time management, with less travelling or work absences. However, no statistically significant differences were found with the OIDP (which focuses on daily activities such as eating, speaking, working, physical activities and smiling) and the OHQoL (which evaluates function, pain or discomfort, and psychological, social and behavioural impacts). Both were assessed at 30 and 180 days after treatment. Both treatment protocols resulted in clinical improvement. As neither treatment protocol appears better, the choice will still depend on operators' and patients' preferences.

Reference: J Periodontol. 2016;87(2):114-23

[Abstract](#)

Diabetic and cardiovascular risk in patients diagnosed with periodontitis

Authors: Zhang DH et al.

Summary: Patients with periodontitis at an Australian dental hospital underwent casual blood glucose level, total cholesterol level, HbA_{1c} level, BP, bodyweight and height measurements to assess their diabetes mellitus and CV disease risks in this pilot study; 42 of the 159 individuals approached to participate were enrolled. Undiagnosed prediabetes (HbA_{1c} level $\geq 5.7\%$) was identified in 24 participants (57.1%) and undiagnosed diabetes (HbA_{1c} level $\geq 6.5\%$) in three participants (7.15%). There were also 14 participants (33.3%) with hypertension (BP $\geq 140/90\text{mm Hg}$), 17 (40.5%) with hypercholesterolaemia, 12 (28.6%) who were smokers and 24 (57.1%) with a BMI $> 25 \text{ kg/m}^2$. GP referrals were made for 24 participants (57.1%) due to elevated disease markers.

Comment (JL): Periodontitis has been strongly linked with both diabetes and CV disease. It has been estimated that, in Australia, up to half of type 2 diabetes cases remaining undiagnosed. A two-way relationship exists between periodontitis and diabetes, with the prevalence, severity and extent of periodontitis positively correlated with control of diabetes and vice versa. The inflammatory nature of periodontitis plays a deleterious role in damaging the circulatory system by impairing blood vessel endothelium function, promoting atheroma formation and increasing the risk of thrombotic and embolic events. Forty-two participants with moderate-to-severe periodontitis, and an average age of 51.3 years, were included in this study. It was found that 24 were prediabetic, three were diabetic, 14 were hypertensive, 17 had hypercholesterolaemia and 24 had a BMI score that categorised them as overweight or obese. Oral healthcare professionals are in a good position to aid in the early diagnosis of diabetes and CV disease risk in periodontal patients. This could contribute to early detection improving outcomes and reducing complications. Wouldn't it be great to make even more of a difference in our patients' lives?

Reference: Aust Dent J. 2015;60(4):455-62

[Abstract](#)



Dental & Oral Health Therapists
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Characteristics of mesiodens and its related complications

Authors: Nam OH et al.

Summary: The effect of mesiodens on adjacent permanent anterior teeth according to mesiodens characteristics was evaluated in 107 children with a total of 153 mesiodens in this research. Clinical complications were evident in 67% of the children. The morphological type was conical in 96.1% and the direction of eruption was inverted in 56.2%. The palatal side of the adjacent permanent maxillary central incisors was where 80.4% of the mesiodens were located.

Comment (JL): One hundred and seven children over 5 years of age who were diagnosed with mesiodens participated in this study. The aim was to determine the eruption disturbance and/or displacement of the adjacent maxillary central incisors. Children with genetic syndromes were excluded. CBCT was used to evaluate the number, morphology, eruption path and stage of root development of the adjacent teeth. Findings were that the rate of complications increased if the mesiodens was close to the eruption path of the adjacent central incisor or on its labial side. It is essential that the normal eruption times are always kept in mind and radiographic investigations carried out where primary maxillary incisors are over-retained or we see displaced or delayed eruption of permanent maxillary incisors. Timely detection and intervention will help to avoid further problems such as root resorption, cystic degeneration or eruption of the mesiodens into the nasal cavity.

Reference: Pediatr Dent. 2015;37(7):e105-9

[Abstract](#)



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