The ‘Senior Smiles’ model of preventive oral health care in Residential Aged Care Facilities – the changing environment of dental hygiene and oral health therapy services for the elderly and frail

Australia’s older generation (those aged 65 and over) continues to grow and is projected to more than double by 2057 (AIHW 2016). This will place huge demands on dental and medical services and ultimately effects health dollars. Many of these older people will end up in residential aged care facilities, requiring assistance with their daily care needs, including oral health.

Traditionally, dental hygienists, dental therapists and oral health therapists have provided oral health care in the dental practice environment. Although this is still the norm, oral health care is now required in other environments external to dental practices and new models of care must be developed to meet the increasing demand for environments such as residential aged care facilities. The transition from normal clinical practice to providing oral health care in the residential aged care facility environment is vastly different. The environment is challenging, not for everyone and requires skills other than those used in traditional clinical practice.

Historically, numerous programs have been designed and resources developed (SA Health & SADS, 2009) to enable nursing staff in residential aged care facilities to manage oral health. This includes performing oral health risk assessments and care plans for residents during a process that is theoretically meant to be part of a resident’s journey once they enter the facility. Sadly, the reality is, although many of these programs have been initially successful and the resources valuable, the programs are not sustained and resources are not used. Why? There are many barriers and contributing factors that impede the process of oral hygiene care within residential aged care facilities. Most of these barriers have not changed since research was conducted in this environment a decade ago, by the late researcher, Dr. Jane Chalmers. Staff often report that they are not comfortable managing oral health and they are not very familiar with the oral cavity. They also report having trouble accessing the residents’ mouths, especially those with cognitive impairment. More urgent care needs such as showering, feeding and the delivery of medications takes precedence over oral health and oral hygiene care. Many of the staff lack the underpinning knowledge and skills to identify and understand oral health conditions, even if they have been exposed to oral health education. Residential aged care facility staff are often transient and unless training is provided very regularly, oral health drops off the agenda. This is all substantiated by a body of research published by the University of Newcastle since 2010 (Wallace et al 2010).

The train the trainer type oral health education for staff in residential aged care facilities, does not work, is not sustainable and does not translate into nurses providing oral health care. Podiatrists are not asked to extend their skills to provide dietary advice to residents or residential aged care facility staff and physiotherapists are not asked to dress residents wounds, so why are we, as oral health practitioners asking nursing staff to identify, manage and refer residents for dental and oral health problems? Prevention and referral to dentists for more complex dental needs is the responsibility of oral health practitioners, dental hygienists and oral health therapists. They have the knowledge and skills to provide this service under the Senior Smiles model of preventive oral health care.

How do we change the current paradigm to ensure oral hygiene care becomes as routine as showering residents? How do we as oral health professionals, put oral health on the agenda in residential aged care facilities? How do we make this happen quickly and efficiently and within a budget that the facilities will embrace?

There is a proven model of preventive oral health care known as ‘Senior Smiles’ (Wallace et al 2016) that was trialed in 2014 and is currently in phase two of implementation on the NSW Central Coast, in the Hunter Valley and in Sydney, in a small, but growing number of facilities. The model places a qualified oral health practitioner within the facility one to two days a week, depending on the number of residents. The practitioners provide the residents...
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FIND US ON FACEBOOK
ADOHTA and the NZDOHTA would like to thank the many people involved in the production, editing and peer review of this journal and acknowledge the contribution of Colgate who generously support its printing and distribution. The objectives of the journal are to:

1. provide a vehicle for communication between dental and oral health therapists in Australia and New Zealand

2. develop dental and oral health therapists’ access to self-directed professional development

3. provide a vehicle for the reporting of new learning and research in the field of dental and oral health therapy

4. develop a capacity to contribute to the body of knowledge around the discipline of dental and oral therapy, for dental therapists, oral health therapists, dental hygienists and the wider health care field

We are proud to present this edition of the ANZJDOHT and we hope you enjoy reading it.

Tan Nguyen, President ADOHTA & Arish Narish, Chair NZDOHTA
with oral health risk assessments, oral health care plans and establishes referral pathways to manage more complex dental and oral health needs. The oral health practitioners collaborate with other staff members in the facilities to ensure oral health becomes part of daily care needs and that a holistic approach to residents’ care is established. Access to timely dental care through appropriate referral pathways is established with private and public dentists and prosthetists and specialists in geriatric dentistry.

Why is ‘Senior Smiles’ different? The program offers a preventive focus to ensure daily oral hygiene care is provided. It identifies simple oral health conditions such as xerostomia, candidiasis and ulcers and offers treatment for these immediately. It also identifies more complex problems such as periodontal disease, caries, oral cancers and infections and initiates the referral in a timely manner. Senior Smiles is about advocacy, about ensuring those residents who are unable to manage their own oral hygiene care have assistance. The Senior Smiles model is about ensuring those residents with cognitive impairment, such as Dementia and Alzheimer’s Disease are cared for, and helped to maintain good oral health.

The Senior Smiles program has been supported by two substantial grants, one in 2013 from the then Medicare Local, and currently from the Elderslee Foundation Australia, who have pledged $540,000 over the next three-year period. These generous grants are enabling the model to expand and infiltrate some of the largest residential aged care facilities, such as BUPA, UnitingCare, Catholic Care, Hammond Care and Opal Aged Care. It is hoped that over the next three years the impact of having a qualified oral health practitioner within these facilities, providing oral hygiene care and referral pathways, will positively improve residents’ oral health and their quality of life, while lifting the profile of oral health to ensure it is part of daily care.

Training for the Senior Smiles program is available from the University of Newcastle, Oral Health team and includes orientation to the residential aged care facility, orientation to all paperwork required to establish consent, risk assessments, care plans and referral pathways and teaching aids to provide oral health education for residents and staff. The team at the University of Newcastle will also provide ongoing support to all practitioners working in the Senior Smiles model.

There is such a need to provide preventive oral hygiene care in residential aged care facilities and the need is growing. As preventive oral health practitioners, we have the knowledge, skills and attributes to manage this need and to ensure our most frail and elderly have access to appropriate oral hygiene and oral health care at this stage of their lives. Oral health care in residential aged care facilities should be expected, should be available and should be part of daily care plans.

The Senior Smiles program aims to:

- Provide a preventive oral health care model within residential aged care that is actively included in the residents’ daily care needs;
- Implement residential aged care facility staff training in provision of oral hygiene support to residents;
- Provide written oral health focused paperwork, underpinning care plans and includes dental content;
- Establish referral pathways for dental services to support residential aged care facilities in accessing timely dental care for all residents;
- Collaborate with residential aged care facilities to develop appropriate policies and procedures to ensure oral health is part of general health care;
- Establish referral pathways to generalist and specialist dentists;
- Ensure dental status and dental care needs of residential aged care facility residents are collected and shared to inform planning of Residential Aged Care Facility menus;
- Collect data to inform future planning of services and aims to change policy in the management of oral health for the elderly living in residential aged care facilities.

The World Health Organisation’s new Guidelines on Integrated Care for Older People (WHO ICOPE 2017) recommend ways community based services can help prevent, slow or reverse declines in physical and mental capacities among older people. The guidelines also require health and social care providers to coordinate their services around the needs of older people through approaches such as comprehensive assessment and care plans. Senior Smiles preventive oral health care for older people living in residential aged care facilities is one of these integrated community based services.

References

SA Health & South Australia Dental Services (2009) Better Oral Health in Residential Care Project, South Australian Government, Adelaide
Assessing the feasibility of a supervised toothbrushing program within breakfast clubs in Victorian Primary Schools

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Key words: toothbrushing, schools, dental caries, health promotion, oral health

Abstract

Objective: To determine the feasibility and acceptability of implementing a supervised toothbrushing program within established breakfast clubs in three Victorian primary schools.

Design/Methods: The pilot program was run in one metropolitan and two rural school breakfast clubs. Feasibility was measured by uptake and acceptability of the program (with school principals, breakfast club coordinators, volunteers, children and parents); whether children continued to brush their teeth throughout the program and whether children brushed for long enough to be considered effective. The evaluation had two data collection approaches; observations during the toothbrushing program within the school breakfast program, and interviews with coordinators of the breakfast club program, school staff and volunteers who assisted with the program.

Results: One hundred and six children were recruited from three primary schools, with 58 children from a metropolitan school and 21 and 27 children from two rural schools. The programs operated for five to seven weeks. Two program models were assessed; the wet program (using sinks) had an average participation rate of 32 per cent, compared to 82 and 91 per cent for the dry program (classroom based). Children consistently brushed for a longer period i.e. two minutes in the dry program. Children appeared to enjoy the social aspects of the programs; however the design of the dry program provided the opportunity for more child ‘play’ and interaction. Breakfast club coordinators, school staff and volunteers felt that staffing, either voluntary or paid, within the program was crucial for continued success.

Conclusions: The dry toothbrushing program was found to be the more suitable approach as children participated more often and brushed for longer periods compared to the wet program. The integration of the supervised toothbrushing program into the breakfast program in the schools was deemed feasible if the program was adequately staffed.

Introduction

A healthy mouth enables children to eat, speak, and socialise without pain, discomfort or embarrassment (Kassebaum et al., 2015; Sheikhman, 2005). Dental caries (tooth decay) is the most common oral disease facing children in Australia (Do & Spencer, 2016) with the recent 2012–2014 National Child Oral Health Survey (NCOHS) showing only small improvements in dental caries experience in primary teeth since the 1987–1988 National Oral Health Survey (Do et al., 2016). The latest National Child Oral Health Survey demonstrated that 42 per cent of the children aged five to ten years had dental caries experience in their primary teeth since the 1987–1988 National Oral Health Survey (Ha, Roberts–Thomson, Arrow, Peres, & Do, 2016). There are many determinants for poor oral health including socio-economic disadvantage, age, gender, environment and lifestyle (Watt & Sheikhman, 2012). Dental caries is largely preventable (Do & Spencer, 2016). In addition to minimising the consumption of sugary foods (Chi et al., 2015), twice daily toothbrushing using fluoride toothpaste (Gilson & Williams, 1999) from an early age has been shown to be an important preventive measure (Marinho, 2014).

Breakfast clubs that operate throughout Australia are often supported by organisations such as the Australian Red Cross, and target children who are most at risk of starting the school day hungry or without adequate nutrition. It is known that children from less privileged backgrounds, many of whom utilise such programs, are less likely to engage in adequate toothbrushing behaviours (Hamasha, Warren, Levy, Broffitt, & Kanelis, 2006; Kilpatrick, Neumann, Lucas, Chapman, & Nicholson, 2012). Whilst Aunger (2007) argued changing toothbrushing routines might be best approached at the family level, as the practice is likely to follow family habits that are led by parents rather than children, he also acknowledged that targeting the children themselves might be a suitable approach. The rationale behind this study was to introduce the toothbrushing behaviour into an established breakfast routine, thereby mimicking what might be a normal established routine for some children at home. Further to this, children would also gain the experience and memory of brushing for a prescribed time. Supervised toothbrushing programs in schools have been shown to improve child oral health (Damle, Patil, Jain, Damle, & Chopal, 2014; Jackson et al., 2005; Macpherson, Anopa, Conway, &
McMahon, 2013; Woodall, Woodward, Witry, & McCulloch, 2014). However, a recent Cochrane review suggests there is uncertainty about the effectiveness of primary school-based toothbrushing interventions on caries reduction (Cooper, Coffey, & Dugdill, 2014). Whilst there has been an international focus on incorporating supervised toothbrushing within childcare and school settings there is limited evidence to suggest the model is feasible when applied in the Australian school context.

The literature has identified a number of barriers that exist for toothbrushing programs such as demands on school staff (Al-Juneli, Hammad, & Alwaeli, 2006; Gray-Burrows et al., 2016), teachers believing toothbrushing is the parent’s responsibility (Gowda & Croucher, 2011) and the cost of resources and staff (Al-Juneli et al., 2006). One New Zealand study reported that when teachers were provided with support and resources, these obstacles could be managed (Gowda & Croucher, 2011). Studies have also shown that parental difficulties with child behaviours around toothbrushing are a major barrier for toothbrushing at home (Marshman et al., 2016).

This pilot study aimed to determine the feasibility of incorporating a supervised toothbrushing program within existing Australian Red Cross facilitated breakfast clubs in three Victorian primary schools.

Methods

Development of supervised toothbrushing in school breakfast club toolkit

Toolkits were developed to support the delivery of the toothbrushing programs in the school breakfast clubs. These toolkits provided information about the toothbrushing program procedures and infection control guidelines and were designed to be simple to use. The original toolkit was developed for a wet toothbrushing program using evidence from the literature and was guided by the Supervised Tooth Brushing Program in Victorian Primary Schools Study Advisory Group. The Advisory Group included representatives from the Victorian Department of Health and Human Services, Dental Health Services Victoria, University of Melbourne, La Trobe University and the Australian Red Cross. The wet program used the traditional way of toothbrushing at a sink. Children collected their toothbrush kit and timers and brushed their teeth at a sink. Utilising research from other programs such as the Rural ECOH-Engaging Communities in Oral Health project (Rural ECOH-Engaging Communities in Oral Health, 2015) the wet program was reviewed and an alternative dry model was developed. The dry program was designed to have children brushing their teeth inside seated around a table. After brushing the children spat the excess toothpaste into a tissue, wiped their mouth and disposed of the rubbish. They then rinsed and dried their toothbrush at a designated sink inside and placed the toothbrush in the container provided. A brushing time of two minutes was considered long enough to be effective (Gallagher et al., 2009).

Recruitment: Schools, volunteers and children

Three Victorian primary schools, two rural and one metropolitan, with existing breakfast clubs run by the Australian Red Cross, were invited to take part in the study (Table 1). Being a feasibility study, the sampling method was convenience. After the schools had consented to participate, all students who attended the breakfast club were provided with a participation pack. Where parental consent was obtained, these children were provided with a toothbrush, toothpaste and a container that was clearly labelled with their name and the children could decorate the containers as desired.

Volunteers were recruited by DHSV to assist with the standardised observational data collection and delivery of the program. Volunteers included one primary school teaching student, three Bachelor of Oral Health students, one dental assistant and one parent. Researchers explained, to the volunteers, how to collect the data and provide information on what they should be observing. Information regarding the number of children attending the breakfast club, the number of children brushing and the length of time children were generally brushing were recorded using this template at breakfast club sessions at least once per week across the course of the program. Observations around the children’s responses to the program and problems that were encountered were also documented, with safety concerns being noted and addressed immediately. Two minute timers were provided during each toothbrushing session for children to use if they wished. An estimate of their overall brushing time was recorded by the volunteer/DHSV researcher during toothbrushing sessions. Stickers were provided as rewards for participation in both programs. Participation rates were calculated as the proportion of children attending the breakfast club who participated in the toothbrushing program. Children who attended the breakfast club to brush only were also included in the overall breakfast club attendance.

Key Informant Interviews

At the completion of the pilot study, thirteen staff, breakfast club coordinators and volunteers at all schools were asked to provide feedback on the program. Seven of these participated in four semi-structured 15–25 minute topic-guided interviews resulting in a 53.9% participation rate. The interviews were audio recorded and transcribed verbatim. The transcriptions were then coded and categorised to elicit the main themes from the data. Codes were based on recurring concepts or notable comments relating to the programs. Participant data were initially coded independently and then brought together to identify broader themes. Coding was undertaken by one researcher and the coding and categories were then discussed with another senior researcher until agreement was reached regarding the themes. The aim of the interviews was to evaluate the suitability and acceptability of the toothbrushing program and to identify barriers and enablers for the program.

Approvals

Ethics approval for the project was obtained from the University of Melbourne Human Research Ethics Committee (Application No. 1544044.1, 2015) and approval was also obtained from the Victorian Department of Education and Training (Application No. 2015_002752).

Results

A total of 106 parents gave consent for their child to take part in the supervised toothbrushing program across the three schools, with 58
children from the metropolitan school and 21 and 27 children from the rural schools respectively (Table 1). The toothbrushing programs were run for five to seven weeks across the school term. The overall mean age of the children was 8.8 years (95% CI: 8.4–9.2).

Breakfast clubs operated within a school common area and were coordinated by breakfast club coordinators, volunteers and parents and were supported in small schools by teachers and the principal.

**General observations**

General observations noted throughout the programs are summarised in table 2. In particular, throughout the dry program it was observed that children enjoyed sitting together talking while they brushed. Competition with ‘play’ time was noted as a problem for the wet program (Table 2). Minor behaviour management issues for both programs were noted and addressed accordingly.

**Participation rates and toothbrushing duration**

Participation rates and toothbrushing duration within the wet program reduced considerably over time, whereas children participated more often and consistently brushed for two minutes in the dry program (Figures 1 and 2). The wet program had an average participation rate of 32 per cent, compared to 82 and 91 per cent for the dry program.

**Table 1: Participating Schools**

<table>
<thead>
<tr>
<th>School number</th>
<th>Program</th>
<th>School Enrolment</th>
<th>Location</th>
<th>Total number of students attending breakfast club</th>
<th>Number of consents to participate in the toothbrushing program</th>
<th>Consent rate for toothbrushing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wet</td>
<td>282</td>
<td>Metropolitan</td>
<td>60</td>
<td>58</td>
<td>97%</td>
</tr>
<tr>
<td>2</td>
<td>Dry</td>
<td>29</td>
<td>Rural</td>
<td>29</td>
<td>21</td>
<td>72%</td>
</tr>
<tr>
<td>3</td>
<td>Dry</td>
<td>36</td>
<td>Rural</td>
<td>36</td>
<td>27</td>
<td>75%</td>
</tr>
</tbody>
</table>

**Table 2: General observations**

<table>
<thead>
<tr>
<th>Program</th>
<th>Observation</th>
<th>Action taken</th>
<th>Resolved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet and dry</td>
<td>Children had difficulty opening and closing the container; Breakages occurred.</td>
<td>Assistance provided</td>
<td>Yes, although continuing education was required.</td>
</tr>
<tr>
<td>Wet and dry</td>
<td>Children did not always rinse/dry their toothbrush.</td>
<td>Assistance provided</td>
<td>Children needed reminding.</td>
</tr>
<tr>
<td>Wet and dry</td>
<td>Sometimes children misplaced toothpaste/brush.</td>
<td>Replaced toothbrush/container if required.</td>
<td>This was less of a problem in the dry program as children did not go outside to brush.</td>
</tr>
<tr>
<td>Wet and dry</td>
<td>Children sometimes did not dispose of paper towel in the bin.</td>
<td>Provided bins close to where the children were brushing and encouraged children to use the bin.</td>
<td>Children needed reminding.</td>
</tr>
<tr>
<td>Wet and dry</td>
<td>The names on toothbrushes/containers faded.</td>
<td>Rewrote names on the containers, as the names were also on the toothbrush and the toothpaste.</td>
<td>Waterproof labels may be better.</td>
</tr>
<tr>
<td>Wet and dry</td>
<td>Some children did not like the taste of the toothpaste.</td>
<td>No action taken.</td>
<td>Potentially trial different toothpastes in future studies.</td>
</tr>
<tr>
<td>Wet and dry</td>
<td>Children could sometimes become excited and wave their toothbrush around.</td>
<td>Explained to the children that this was not acceptable and was potentially dangerous.</td>
<td>Yes.</td>
</tr>
<tr>
<td>Wet</td>
<td>Children were excited to go and play. Some children said toothbrushing was boring.</td>
<td>Encouraged children to slow down and brush.</td>
<td>Not completely, was a continuing problem in the wet program.</td>
</tr>
<tr>
<td>Dry</td>
<td>Sometimes the children missed the paper towel when spitting out their excess toothpaste.</td>
<td>Taught the children how to spit into the paper towel and cupped the paper towel to make it easier for the children to spit into.</td>
<td>To a certain degree, although occasionally there were still minor accidents.</td>
</tr>
</tbody>
</table>

**Figure 1:** Toothbrushing program participation rate (proportion of breakfast club attendees participating in program)

**Figure 2:** Average toothbrushing times
Enablers and Barriers
A number of barriers and enablers were identified through the participant interviews.

Barriers
Time limitations in breakfast clubs
Participants felt that breakfast clubs were very busy. Such factors as the weather, age of the children and staffing could impact on the time available for toothbrushing.

‘When the weather is good they just want to play...sometimes they have to rush...time is difficult.’ (wet)

Volunteers and sustainability
Generally participants were very positive about the toothbrushing program and could see the benefit for the children; however, many felt that if they were going to run a program into the future, a volunteer would be necessary.

‘If we are looking at doing this long term.....will need to get a person.’ (dry)

Participants varied in their beliefs about the feasibility of accessing volunteers for the program.

‘Trying to get a parent has proved somewhat of a challenge...there are valid reasons why...’ (dry)

‘You can work towards making it sustainable by getting the extra person...it has worked in the past with the brekkie program.’ (dry)

Concerns around teacher workloads
Participants reflected that there were many issues around staffing a toothbrushing program; highlighted issues included not sufficient time to run the program through to adding to the teacher’s workload (for small schools where teachers/principals assisted with the program). It was perceived that it was the parents’ job to brush children’s teeth and that burdening teachers with another task was too much.

‘In a very small school with adding toothbrushing to everything else that teachers already have to do... It was a great initiative. Unfortunately the staffing is the issue...brushing teeth couldn’t be any further from teaching.’ (dry)

When asked ‘how would you feel about the program if it was run by a volunteer?’ the participant was more confident that it could work and was very positive about the program’s potential.

‘Yes it was piece of cake (talking about the dry program). You are just getting children to brush their teeth it’s not rocket science.’ (dry)

Cost of program
Cost was identified as a potential barrier to a school’s ability to take on the program into the future. However, one participant indicated that staffing was a bigger issue than the cost of materials.

‘Now these days the budget is very tight...’ (wet)

‘The cost of the program wouldn’t be that much, staffing is more of the issue.’ (dry)

Religious and cultural considerations
Participants who had experience with children from Muslim backgrounds provided an insight into potential issues around Ramadan and toothbrushing.

‘Also Ramadan for one month...they can’t brush their teeth. They can only eat when they go home, after sunset.....even water...’ (wet)

Participants from metropolitan areas who had experience with new migrants in the school, felt that refugees may not be familiar with toothbrushing.

‘Sometimes because some of them were in a refugee camp for a long time and never have a chance to do it (referring to toothbrushing)’ (wet)

Attitudes towards the dry program
A volunteer stated that the children had commented on the spitting in the dry program. This volunteer also reported feeling uncomfortable with the spitting.

‘Personally I found it a bit off-putting...Some children had a lot of saliva and some don’t.’ (DHSV, volunteer)

Enablers
Child group dynamics
Participants described the children as enjoying, and being engaged with, the program.

‘The children have been very positive...they get that sense of ownership, this is my toothbrush and that brings something to the program’ (dry)

Participants said that children encouraged their peers to take part in the program based on their experiences.

‘He’s worried. He told his friend to join because he didn’t want to end up like his grandmother, he said it was because she ate too much sugar.’ (wet)

‘There was a child that wasn’t brushing at home, she would gag...but here (at school) she was sitting up and brushing her teeth happily.’ (dry)

Younger children more likely to participate
It was perceived that the program may be more appealing to younger children. Participants reflected that the new activity becomes part of the child’s routine over time. This could also be considered a barrier if wanting to engage older children.

‘I think when you start a new program the older kids are always going to be a barrier and if they aren’t receptive that can filter down a little bit...once the younger ones move up with a positive attitude the school culture changes.’ (dry)

Opportunity for children from non–English speaking backgrounds to practice English
Breakfast clubs and toothbrushing programs could provide an opportunity for children from non–English speaking backgrounds to socialise and practise English in a relaxed environment.
‘The breakfast club is a good way to learn, because they learn hello and good morning . . and a social life for the children as well.’ (wet)

Discussion

This study demonstrated that school breakfast clubs can provide an opportunity to incorporate supervised toothbrushing within the Australian context. This study is important because both contextual and process evaluation of such programs is rare.

The dry program was considered the more successful and feasible program as children participated more often and consistently brushed for the required two minutes. Sitting together around a table provided children with the setting to engage, time each other's brushing and fully utilise the sticker incentives after brushing. This program was therefore able to compete with other playtime activities. A small study that used behaviour modification principles found that incorporating games into a school-based toothbrushing program resulted in improved child oral health outcomes with effects being present nine months later (Swain, Allard, & Holborn, 1982). Within the wet toothbrushing program, there were lower participation rates and reduced individual brushing times. We feel that in its current form, the wet program is less likely to be sustainable, however it should be noted that this program was only trialled at one school.

This study has identified a number of important barriers and enablers within Victorian primary schools. Barriers such as time limitations in breakfast clubs, issues around accessing and keeping volunteers, teacher workloads and cost were the main barriers identified and were consistent with previous research. Enablers identified in the Victorian Primary school settings included group dynamics that enabled children to encourage other children to support other children in brushing and breakfast club workers believing younger children would be more likely to take part.

The value of positive peer group pressure around toothbrushing at school was an important implication of this research. The example of the child who would not brush at home, but happily participated in brushing at school highlighted the potential for school programs to allay child concerns around toothbrushing. These findings were supported by other research where parents reported that toothbrushing at home had become easier after children had participated in school-based toothbrushing programs (Woodall et al., 2014). Considering that parental difficulties with managing children’s behaviour around toothbrushing has been identified as a barrier to toothbrushing at home (Marshman et al., 2016), this research suggests that school toothbrushing programs may provide a relaxed setting for children to learn how to brush amongst their peers. Having experienced a toothbrushing program at school may motivate children to take this learned oral health practice from school back into the home environment.

Feedback from breakfast club coordinators and volunteers suggested that schools may find it challenging to access their own volunteers, however it should be noted that there were mixed feelings about this issue, with some participants being confident that they could access volunteers. As shown by this research and that of another study (Woodall et al., 2014) some teachers and principals might view toothbrushing programs as ‘not their responsibility’ and part of the feasibility of any program may be challenged if the burden was placed on teachers or volunteers who are already busy with other responsibilities. It should be noted that, within the Australian Red Cross breakfast club program, generally volunteers and parents run the program, however in small rural schools teachers and even the principal may support such programs. Principals, who ultimately provide the final decision on whether such programs go ahead, may be more likely to take up programs that have staffing considered within their design. As tested in this study, the engagement with local community-based public dental services was achievable, and other research supports the need for dental agency staff to be considered within any toothbrushing program design (Gowda & Croucher, 2011).

The limitations of this small feasibility study must be acknowledged. The dry program was conducted in two small rural schools and this may be a factor that contributed to its success and thereby be a limitation of this study. The wet program was run in a larger metropolitan school with a high proportion of multicultural students. Another limitation of this study was that whilst the local dental agency staff showed support for the program, formal feedback was not obtained. Also, children were not interviewed as part of the study and, as such, their understanding of oral health benefits of brushing or changes in their toothbrushing behaviour at home was not explored.

Conclusion

The findings of this research would suggest that the integration of a supervised toothbrushing program into primary school breakfast clubs may be feasible if the program is adequately supported by staff or volunteers. Whilst the cost of the resources was considered a potential barrier, staffing the program seemed to be the more pressing concern. The high level of continued participation and enjoyment shown by children in the dry program and general willingness to take part were evidence that this program could potentially be more sustainable than the wet program. Larger scale research conducted over a longer period with the inclusion of oral health assessments, child interviews and assessments of pre- and post-home toothbrushing would be highly beneficial.

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**References**


Case study: application of ICCMS™ and the ‘tunnel’ cavity preparation technique

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Abstract

Minimum intervention dentistry (MID) has transformed the way modern dentistry addresses the management of dental caries as a biological dietary–related chronic disease. The International Caries Classification and Management System (ICCMS™) embeds the MID principles. It is a research evidence–based toolkit for dental practitioners. GV Black cavity designs are superseded by creating maximal preservation of healthy tooth structure. This paper aims to present a case study applying the ICCMS™ and the ‘tunnel’ cavity preparation technique.

A dental treatment plan was developed based on short–term and long–term goals with frequent clinical monitoring. Upon discussion with the patient, a non–surgical approach was adopted for early and moderate dental caries lesions, while surgical intervention would only be used for advanced stages of dental caries.

After 12 months, only one of seven radiographically identified approximal dental caries had progressed. This tooth was suitable for placing a restoration using the ‘tunnel’ cavity preparation technique. The evidence of the ICCMS™ and the ‘tunnel’ cavity preparation are discussed in relation to this case study.

Although ‘tunnel’ restorations are not routinely used in clinical practice, non–surgical approaches should be at the forefront of preventive dentistry alongside dietary counselling and increasing the use of topical fluorides for dental caries control.

Key words: minimum intervention dentistry, tunnel preparation, cavity design, dental caries, fluoride

Introduction

Minimum intervention dentistry (MID) is widely accepted as the ‘gold standard’ approach for dental caries management because it recognises it as a biological dietary–related chronic disease. The philosophy of MID emerged with restorative techniques moving away from the traditional methods of GV Black’s principle of ‘extension for prevention’, which was largely due to the lack of understanding of the dental caries aetiology (Tyas et al, 2000).

MID cavity designs have included preventive resin restorations, Atraumatic Restorative Treatment (ART) restorations, ‘tunnel’ restorations, mini–box restorations, and repair of defective restorations. It is suggested that ‘tunnel’ restorations have the following advantages in comparison to Class II cavity preparations (Tyas et al, 2000):

• it is conservative, particularly preserving the marginal ridge;

• the risk for iatrogenic damage to the adjacent approximal surface is minimised;

• an anatomically correct and natural contact area is maintained; and

• the risk of approximal restoration overhangs can be reduced.

The earliest documented evidence of using the ‘tunnel’ cavity preparation technique was described in Australia (Knight, 1992). This restorative approach was influenced by the introduction of glass ionomer cement restorative materials. Despite a lack of quality studies to support the technique (Frencken et al., 2012), there are several studies demonstrating promising results. A recent survey suggests the ‘tunnel’ restorations is well–known by dentists (87%); however, only approximately half (53%) practiced it and a minority (9%) have placed more than 10 of these restorations in the preceding 12 months (Chu et al, 2015).

For permanent teeth, a three–year clinical trial found a success rate of 70% for 161 restored teeth using ‘tunnel’ restorations; replacement was due to dental caries progression or marginal ridge fracture within patients of high dental caries activity (Strand et al, 1996). Other studies have shown a cumulative success rate of 64% for 242 teeth (Pyk & Mejàre, 1999), 80% for 262 teeth (Pilcher et al, 1999), and 90% for 182 teeth (Nicolaisen et al, 2000) over three years. In comparison, the success rates for the conventional class II cavity design varied between 40% to 93% for glass ionomer cements, and between 76% to 98% for resin–modified glass ionomer cements (Chadwick & Evans, 2007). The use of composite materials using the ‘tunnel’ cavity preparation technique found a 96% survival rate at two years (Wiegand & Attin, 2007).

The published literature for using ‘tunnel’ restorations is scarce for deciduous teeth. One study reported the cumulative success rate was 72% for 233 teeth at three years (Markovic & Peric, 2008). Furthermore, an alternative to the ‘tunnel’ restoration has been documented with the use of a ‘saucer’ shaped cavity preparation (similar to ‘slot box’). It was demonstrated it was superior to ‘tunnel’ restorations with 76% and 46% success rates at 2.5 years, respectively (Hörsted–Bindslev et al, 2005).

The evidence indicates the success rate between 46% and 96% for ‘tunnel’ restored teeth are similar but may not be superior to conventional class II cavity designs. Based on the literature, the
following clinical considerations are recommended for ‘tunnel’ restorations:

- initial cavity outline is of greater distance from the marginal ridge;
- use of smaller occlusal access;
- placed for patients with low dental caries activity;
- adequate infected dental caries excavation; and
- performed by experienced dental practitioners.

Contemporary non–surgical approaches for dental caries include a range of preventive measures to manage the disease biologically. This is followed by using surgical methods when advanced stages of dental caries are evident. However, a recent systematic review has shown that dental practitioners use surgical interventions between 21%–48% of the time for approximal and 12–74% for occlusal dental caries lesions when alternative and less invasive procedures were more appropriate (Innes & Schwendicke, 2017).

The International Caries Classification and Management System (ICCMS™) is a dental caries management toolkit for dental practitioners developed by a consortium of international experts on cariology. It forms the basis for best practice and incorporates the philosophy of MID by focusing on the biological root causes of the disease, particularly frequency of sugar and starch intake (Bradshaw & Lynch, 2013; Peres et al, 2016). A fundamental component of dental caries management is to appropriately identify the individual’s dental caries risk status, introduce a preventive focused care plan to optimise self-care, stabilise and arrest existing dental caries lesions, and where appropriate, surgically intervene to preserve healthy tooth structure.

This case study presents a surgical approach to dental caries management using the ‘tunnel’ cavity preparation technique, a method that differs from the traditional Class II and ‘slot box’ cavity design. It aims to provide a practical example using the ICCMS™ in a private practice setting.

**Scenario**

Pseudo Name: Danielle

Age: 47

**History**

Reason for visit: Concern regarding stained lower teeth and noticed a fractured tooth, which is not aesthetic concern.

Social history: 10 month old baby; works in environmental transport.

Medical history: Cefclor allergy; mild symptoms of asthma and hayfever; currently does not take medications.

Dental history: Last dental visit in 2013 was for a routine dental examination and scaling; unrestored dentition; missing wisdom teeth; family history of periodontal disease; mother is edentulous with full upper and lower removable dentures.

**Findings**

Examination – 18 December 2015

Extraoral: No abnormalities detected.

Occlusion: Molar RHS and LHS Class II; Anterior Class II div I.
Table 1 Radiographic interpretation criteria using the ICCMS™

<table>
<thead>
<tr>
<th>Dental Caries Description</th>
<th>Radiographic Score</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>No radiolucency</td>
<td>No radiolucency</td>
</tr>
<tr>
<td>RA: Initial stages</td>
<td>RA 1</td>
<td>Radiolucency in the outer 1/3 of the enamel</td>
</tr>
<tr>
<td></td>
<td>RA 2</td>
<td>Radiolucency in the inner 1/3 of the enamel ± EDJ (enamel–dentine junction)</td>
</tr>
<tr>
<td></td>
<td>RA 3</td>
<td>Radiolucency limited to the outer 1/3 of dentine</td>
</tr>
<tr>
<td>RB: Moderate stages</td>
<td>RB 4</td>
<td>Radiolucency reaching the middle 1/3 of dentine</td>
</tr>
<tr>
<td>RC: Extensive stages</td>
<td>RC 5</td>
<td>Radiolucency reaching the inner 1/3 of dentin, clinically cavitated</td>
</tr>
<tr>
<td></td>
<td>RC 6</td>
<td>Radiolucency into the pulp, clinically cavitated</td>
</tr>
</tbody>
</table>

Diagnosis

Periodontal diagnosis: localised chronic plaque induced mild gingivitis of the lower anteriors.

Periodontal disease risk: low.

Initial stages of caries: 16M, 25D, 26D, 35D, 36M, 36D, 46O

Moderate stages of dental caries: 36O, 47O, 46M, 45D.

Dental caries risk: high.

The dental caries diagnosis was based on the combined clinical and radiographic information using the ICCMS™ diagnostic matrix (Pitts et al, 2014). There are unsealed first and second permanent molars, and Danielle’s dental visitation was infrequent. She uses standard fluoridated toothpaste (1,000ppm) twice daily and flosses infrequently. Her dietary habits were self-reported to be healthy. Based on her dental caries findings and social history, it is unclear whether the interproximal dental caries lesions radiographically identified were active or arrested due to the absence of the clinical indicators for approximal surfaces described using the ICCMS™. The fissure caries identified for the 36O and 47O was clinically determined to be inactive.

Recommendations

Treatment plan

• Dietary counselling, oral hygiene instructions, scaling and fluoride treatment;
• F/S 36O, 37O, 46O, 47O, fluoride treatment (4 months’ time);
• Recall 4/12 with fluoride treatment.

A conservative non-surgical approach for the management of early and moderate dental caries lesions was adopted, which included scaling, fissure scaling susceptible fissures of the lower molars and professional topical fluoride application. The importance of self-care through dietary counselling and oral hygiene instruction was given with demonstration of the modified Bass technique. The short-term primary objective was to increase the protective factors by increasing bioavailable calcium, phosphate and fluoride ion complexes to arrest any active dental caries lesions and promote remineralisation. This was further supported with the prescription of Toothmousse Plus (GC Australasia Inc) for-home use, and professionally applied 5% (22,500ppm) topical fluoride MI Varnish with 2% RECALDENT (GC Australasia Inc). Dietary advice included limiting the frequency of snacking and consumption of cariogenic foods and drinks. The treatment plan for appointment 2) was performed 4 months after the first initial dental visit.

Other options

The alternative dental management options are:

- No treatment:
  - Risks: potential dental caries progression leading to more complex dental treatment.
  - Benefits: no biological loss of tooth structure.
  - Costs: no financial cost and time investment.

- Restore 46MO, 45DO, 36DO for moderate stages of dental caries.
  - Risks: removes sound tooth structure to remove potentially arrested dental caries.
  - Benefits: can prevent dental caries progression.
  - Costs: moderate financial cost and time investment.

Long term management

The long-term goal was to optimise patient self-care and modify dental caries risk factors. Professional fluoride varnish has been shown to be beneficial when applied up to 4 times per year (Pitts et al, 2014). It is anticipated by increasing protective risk factors for dental caries progression, surgical dental treatment could be avoided or delayed. Furthermore, a preventive focused dental treatment plan aims to prevent new formation of dental caries lesions from developing on other surfaces of teeth not previously diagnosed at the initial dental examination.

Treatment carried out as at 12 January 2017

Danielle attended 5 dental appointments after her initial comprehensive oral examination. At each visit, oral hygiene instructions and dietary advice was reinforced, and topical fluoride MI Varnish was applied. The use of Toothmousse Plus was reported to be irregular. However, Danielle was committed to continue with a non-surgical approach. New additional bitewings were taken in December 2016 as shown in Figure 4. It showed subtle changes resulting in increased radiolucency of the 36D while all other radiographic radiolucencies remained comparable.

Figure 4 Twelve–month right and left hand side bitewing radiographs (2016)

A subsequent periapical radiograph assisted in a definitive decision to surgical intervention of the 36DO, with implementation of a new treatment plan, to avoid pulpal bacterial infection as evident in Figure 5. Danielle did not exhibit any symptoms of pulpitis at any point in time. Visually, the 36 distal marginal ridge appeared...
clinically sound as illustrated with the pre–sealant and post–sealant clinical photos of the 36 (Figure 6).

**Figure 5** Periapical radiograph of the 36

**Figure 6** Pre–sealant and post–sealant clinical photos of the 36

The ‘tunnel’ cavity preparation procedure
The restoration of the 36DO was completed via the ‘tunnel’ cavity preparation technique under local anaesthetic and rubber dam isolation (Figure 7). Occlusal access was obtained using a high–speed handpiece and flat fissure diamond bur, followed by infected dentine removal using a slow–speed handpiece and round 4 and 6 burs at the dentino–enamel junction. The cavity floor was checked with a spoon excavator and confirmed as firm. The ‘closed sandwich’ method was performed. This involves the replacement of infected dentine with a biocompatible base material such as a glass ionomer cement for its therapeutic fluoride releasing caries–preventive effect (Mickenautsch et al, 2011). This is ‘sealed’ using a dental material of higher compressive strength resulting in the base material not being exposed to the oral environment (Figure 8).

Fuji Equia Forte (GC Australasia Inc), a glass ionomer cement with fluoride release capability, was placed with prior dentine conditioning. A matrix band was used to ensure the approximal area was isolated followed by 37% phosphoric acid etch, and the placement of the two–step Clearfil SE Bond 2 (Kuraray Dental). A thin layer of flowable composite was applied using G–ænial Universal Flo (GC Australasia Inc) in the distal approximal wall through the occlusal cavity access to improve approximal margin adaption. The remaining loss of tooth structure was restored incrementally with Estelite Posterior Composite A2 (Tokuyama Dental) with final occlusal adjustments using composite polishing wheels.

**Figure 7** ‘Tunnel’ preparation of the 36DO

1. Pre–operative clinical view
2. Red arrow indicates dentino–enamel junction point of dental caries progression
3. Restored 36DO with marginal ridge intact
4. Post–operative bitewing showing depth of dental caries restored

**Figure 8** The ‘closed sandwich’ ‘tunnel’ preparation technique

Discussion
The dental caries management plan incorporated the reinforcement of optimal oral hygiene practices, dietary advice, and increased exposure to topical fluorides with regular clinical and radiographic monitoring. Regular exposure to fluoride therapies can prevent new dental caries lesions from developing, and prevent existing dental caries lesions from progressing (Sköld, 2016). There is limited evidence available to demonstrate casein phosphopeptide amorphous calcium phosphate (CPP–ACP) technology contained in MI varnish being superior to traditional fluoride vehicles (Li et al, 2014; Raphael & Blinkhorn, 2015). However, laboratory research has shown that the addition of fluoride with CPP–ACP significantly remineralises to the depth of enamel subsurface dental caries lesions compared to fluoride exposure without additional bioavailable calcium and phosphate (Reynolds, 2008; Shen et al, 2016). In the presence of plaque, almost twice the concentration of fluoride exposure is required to achieve the same effect of remineralisation compared with fluoride exposure with bioavailable calcium and phosphate (Reynolds et al, 2008).

A dental caries risk assessment includes the site–specific diagnosis for dental caries activity (Fontana & Gonzalez–Cabezas, 2012; Frencken et al, 2012). In the absence of a visual diagnosis and radiographic evidence, short–term regular review is essential as illustrated in this case study. More regular dental radiographs are indicated for high dental caries risk patients. On average, 32% of teeth clinically cavitated for radiographic visible dental caries lesions extended into the outer third of the dentine; 72% of lesions extending into the inner 2/3 of the dentine were clinically cavitated (Pits et al, 2014). Among Swedish adolescents, 75% of dental caries along the dentino–enamel junction survived 1.3 years without progressing obviously into the outer half of the dentine (Mejare et al, 1999). Clinical cavitation is a predictor...
for dental caries progression. Therefore, careful consideration should be given when making the decision to treat dental caries surgically balancing the risks, benefits, and the financial and biological cost to the patient. The recommended minimum timeframe for bitewings in high caries risk adults is 12 months (Goodwin et al., 2017).

Smaller cavity preparations, preserving affected dentine, and leaving infected dentine with close proximity to the pulp horn/chamber are considered best practice for restoring teeth affected by deep dental caries lesions (Banerjee, 2013; Pits et al., 2014). Although the ‘tunnel’ cavity preparation technique may not be superior to conventional cavity designs to eliminate bacterial count (Ratledge et al., 2001), there are few porosities along the cavity walls when using this technique when restored with glass ionomer cements (Strand & Tveit, 1993). One study reported that an immediate follow-up with a dental radiograph after restoring a ‘tunnel’ restored tooth does not have an added diagnostic benefit, which suggests the practice is unnecessary (Wenzel et al., 1998). This is consistent with the understanding that dental caries development and progression is not generally caused by deficiencies due to clinical techniques. Rather dental caries is strongly mediated by the high frequency and amount of sugar dietary intake (Anderson et al., 2009; Moynihan & Kelly, 2014).

There are limitations to the presentation of the case study. The photographic quality lacked focus, the teeth were not dried adequately, mouth props were not used to retract the lip, and scratched occlusal mirrors were used. In reference to the radiographs, the adult sized digital sensor used did not fit comfortably in the patient’s mouth, which resulted in the teeth not being positioned in an occluding position for the bitewings, and the periapical radiograph of the 36 was short of capturing the apex. A horizontal angulation adjustment to the RHS bitewing would have prevented a cone cut. Both the quality of the clinical photographs and the digital radiography may have affected the diagnosis of carious lesions and the dental treatment planning process.

This case study discussed how the ICCMS™ was applied and the methodology of the ‘tunnel’ cavity preparation technique. In summary, dental practitioners who may want to use incorporate ‘tunnel’ cavity designs as part of routine practice should consider the following selection criteria to minimise the frequency of restoration repair or replacement due to marginal ridge fracture and/or dental caries progression:

- the occlusal marginal ridge load is checked for even distribution of forces and the patient has a negligible history of grinding and/or clenching;
- the patient should be informed that a significant reduction in dental caries risk is required to promote restoration longevity;
- sufficient width of the marginal ridge between 1–2 mm can be preserved; and
- there is adequate cavity access to clear the walls of infected dentine.

Conclusion

A longer–term evaluation supported by robust randomised controlled trials would be needed to establish the evidence base for the benefits of using the ‘tunnel’ cavity preparation designs. Whilst more research is required for ‘tunnel’ cavity preparation restorative techniques, best practice for dental caries management should not neglect the critical factors for preventing dental caries formation and progression. They include the promotion of optimal oral hygiene regimes, individualised dietary counselling to limit the frequency and amount of cariogenic intake, and increasing professional topical fluoride exposure to support home use of topical fluorides. This case study demonstrates with supporting evidence that ‘tunnel’ restorations should be a dental treatment consideration since they are aligned with MID and the ICCMS™.

References


An Introduction to Sleep and Breathing Disorders for Oral Health Professionals

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Abstract

As health professionals we understand that we work within a multidisciplinary field. We should therefore be educating ourselves with basic knowledge of common issues that relate to our patients. Sleep disordered breathing (SDB) is an emerging health concern that is impacting the lives of one third of our population. Oral health professionals are in a unique position to recognise the signs and symptoms of this condition. We should have a referral list of ENT’s, sleep physicians, orthodontists, speech pathologists and orofacial myofunctional therapists that we work with to get optimal treatment for our patients. As oral health professionals we should be incorporating a sleep screening evaluation for all our patients during their periodical examinations. In this article various aspects of SDB will be considered, including evaluation, signs and symptoms and current treatment options.

Introduction

Breathing is one of the most vital functions of the human body. Every breath we take may have a positive or negative impact on our bodies depending on how it is performed (McKown & Macaluso, 2017). It has been well documented that “normal” breathing should be achieved through the nose, with our abdomens gently expanding and contracting with each inhalation and exhalation.

Normal breathing involves no effort; the breath should be silent, regular, and most importantly, through the nose. Abnormal breathing or mouth breathing on the other hand is often faster than normal; it is usually audible, punctuated by sighs and usually it involves visible movements of the upper chest. For patients who habitually breathe through their mouths, their over-breathing may become chronic. Habitual mouth breathing has been shown to have serious implications on an individual’s lifelong health.

Mouth breathing adults are more likely to experience sleep disordered breathing (SDB), fatigue, decreased productivity and poorer quality of life than those who nasal breathe (Lunn & Craig, 2011). For children however, the harmful effects of mouth breathing are far greater, because it is during these formative years that their breathing mode helps to shape their orofacial structures and airways.

Children who breathe only through their mouth, if left untreated for an extended period, may set the stage for a lifetime of respiratory problems. As a result, malocclusions such as a skeletal Class II or Class III and high palates are often present (Jefferson, 2010). These craniofacial alterations associated with mouth breathing can significantly increase the risk of snoring and obstructive sleep apnoea (OSA) in both children and adults. Perhaps the least invasive, least expensive and most effective approach to manage and treat OSA is prevention in children. Knowing that airways correlate with dento-facial patterns, we need to augment our examination repertoire to enable early recognition of potential problems and consider minimally invasive therapies during the growing years of the face to help promote facial growth consistent with optimum airway development.

A study by Fitzpatrick, McLean, Urton, Tan, O’Donnell, and Driver (2003), demonstrated the critical role of the soft palate in determining oral or nasal airflow. This study showed that during mouth breathing, the soft palate will usually move posteriorly against the posterior pharyngeal wall, therefore closing the nasopharyngeal airway. Conversely, during nasal breathing, the soft palate moves inferiorly and anteriorly until it rests against the dorsum of the tongue, thus closing the oropharyngeal airway.

Craniofacial influences for OSA are frequently associated with a retrognathic maxilla and mandible, causing a reduced upper airway space and a low hyoid bone position (Kandasamy & Goonewardene, 2014). The retropositioned maxilla and/or mandible results in a more posterior tongue rest position, leading to a reduction in pharyngeal airway space and a decrease in airflow. The major craniofacial bony structures that determine airway size are the mandible and the hyoid bone. Abnormalities in either of these may adversely affect the airway size. People who breathe through their mouths also tend to have an extended forward head posture. It has been shown that adults with OSA tend to exhibit a forward head posture (Ozbek, 1998). It was suggested that this forward head posture is primarily controlled by the need to maintain a patent pharyngeal airway.

We know that sleep plays an important role in health. As oral health professionals, we should be incorporating questioning related to sleep and sleep-related medical problems into our clinical examinations. An airway screening assessment should be conducted on every patient during their regular biannual dental appointment (Ferrie, Kumari, Salo, Singh–Manoux, & Kivimaki, 2011).

Sleep

There are two separate states of sleep, rapid eye movement (REM) and non-REM (NREM) with NREM then subdivided into four
The reaction to airway interference causes sleep micro-arousals, UARS are usually more susceptible to airway interferences. Patients with atypical anatomy (Woodson & Wooten, 1994) and/or increased collapsibility on exhalation due to anatomic irregularities or minor breathing impairments (Chen et al, 2004) and/or increased collapsibility on exhalation due to atypical anatomy (Woodson & Wooten, 1994). Children with UARS have a more collapsible upper airway resistance after each arousal (Shigemoto, Shigeta, Nejima, Ogawa, Matsuka, & Clark, 2015). Children can also become moody, emotional, and/or aggressive sometimes confused with ADHD in children (Cortese, Konofal, Lecendreux, Arnulf, Mouren, Darra, & Bernardina, 2005).

**Sleep Disordered Breathing (SDB)**

Sleep disordered breathing (SDB) is a term that encompasses several sleep related breathing disorders including snoring, upper airway resistance syndrome (UARS), central sleep apnoea, hypoventilation syndrome, and obstructive sleep apnoea (OSA).

**Upper Airway Resistance Syndrome (UARS)**

Upper airway resistance syndrome (UARS) is defined by excessive daytime sleepiness and tiredness, and is associated with increased breathing effort (Guilleminault, Black, Palombini, & Ohayon, 2000). UARS patients often present with the signs and symptoms of snoring, fitful sleep and daytime fatigue (Gold, Dipalo, Gold, & Broderick, 2004). Adults may also present with headaches, irritable bowel syndrome, depression and bruxism. UARS are characterized by sleep-related flow limitation and increases in upper airway resistance that precipitates arousals resulting in fragmented sleep (Rappai, Collop, Kemp, & DeShazo, 2003). By definition, these alterations occur without apnoeas or oxygen desaturation. The term was first applied to patients who had excessive daytime sleepiness without clear cause documented by an overnight sleep study. UARS events are typically short (one to three breaths), with an arousal and immediate reduction in upper airway resistance after each arousal (Shigemoto, Shigeta, Nejima, Ogawa, Matsuka, & Clark, 2015). Many children experience UARS, which may be caused by anatomic irregularities or minor breathing impairments (Chen & Kushida, 2003). Children with UARS have a more collapsible upper airway due to abnormal flow dynamics upon inhalation (Gold, et al, 2004) and/or increased collapsibility on exhalation due to atypical anatomy (Woodson & Wooten, 1994). Patients with UARS are usually more susceptible to airway interferences. The reaction to airway interference causes sleep micro-arousals, or respiratory effort-related arousals (RERAs) and fragmentation of sleep. RERAs trigger activation of the autonomic nervous system, in particular the sympathetic nervous system responsible for the “fight or flight” response (Gozal, Hakim & Kheirandish-Gozal, 2013).

**Obstructive Sleep Apnoea (OSA)**

The overnight polysomnogram is the standard diagnostic test for obstructive sleep apnoea (Kapur, Auckley, Chowdhuri, Kuhlmann, Mehra, Rama, & Harrod, 2017). This test involves simultaneous recordings of multiple physiologic signals during sleep, including the electroencephalogram, electrooculogram, electromyogram, oronasal airflow, and oxyhemoglobin saturation. Collectively, these recordings allow identification and classification of sleep-related apnoeas and hypopneas. An apnoea is defined as the complete cessation of airflow. The diagnosis of OSA is based on the duration of the apnoea and the number of apnoea’s per hour: OSA results in obstruction of the airflow by the soft palate and/or base of the tongue. The cessation of breath lasts longer than 10 seconds with an associated 4% oxygen desaturation.

Sleep apnoea can be categorised as obstructive sleep apnoea (OSA), in which there is preserved and increased respiratory effort due to partial or complete blockage of the upper airway, or as central sleep apnoea (CSA) in which there is absence of both respiratory effort and airflow (Shamsuzzaman, Gersh, Somers, 2003). Patients with sleep apnoea present with the signs and symptoms of snoring, fitful sleep and daytime sleepiness/fatigue (Gold et al, 2004). The chief difference between OSA and UARS can be found in the airflow, where adults with OSA tend to have a more collapsible airway.

OSA in children tends to occur during REM sleep (Carskadon & Dement, 1982). The peak prevalence of childhood OSA occurs between the ages of 2–8, most likely because this is the age when the tonsils and adenoid are the largest in relation to the underlying airway size. Endoscopy has shown that the site of collapse is most often at the level of the adenoid and most children with OSAs improve following tonsillectomy and adenoidectomy (Marcus et al, 2012). Although childhood OSA is usually associated with adenotonsillar hypertrophy, the apnoea is not caused by large tonsils and adenoid alone, but is due to a combination of structural and neuromuscular factors. OSA may occur in children with upper airway narrowing due to craniofacial anomalies (e.g. Class II & III malocclusion), overweight or obese children (Kandasamy & Goonewardene, 2014), or those with neuromuscular abnormalities such as hypotonia (e.g. muscular dystrophy) (Marcus, 2012).

One of the problems with the current emphasis on OSA is that many children with other sleep breathing disorders may be overlooked because the symptoms are milder and their health consequences are not as readily detected. OSA in adults usually occurs in NREM sleep. The common causes for OSA in adults include allergic rhinitis, obesity, family history, smoking, alcohol consumption, menopause, ethnicity, and craniofacial abnormalities (Rappai et al, 2003).
Untreated OSA can result in serious morbidity (Marcus, 2000). Reports of complications such as failure to thrive, sudden infant death syndrome (SIDS) and attention deficit hyperactivity disorder (ADHD) have been documented. A recent study evaluated the effect of sleep–disordered breathing on intellectual function. The screening was performed for SDB in first–grade students who were performing in the lowest 10th percentile of their class academically. A high proportion (18%) had sleep studies suggestive of SDB. Children treated with removal of tonsils and adenoids showed a significant improvement in their grades the following year, whereas untreated children showed no change.

If untreated, OSA may result in death. The early OSA literature has described children who presented in cardiorespiratory failure or coma. A link to SIDS has also been proposed. A sleep study of infants who subsequently died of SIDS showed an increased amount of obstructive apnoea in those who died (Thach, 2005). There is also an increased family history of SIDS in parents with OSA.

Evidence indicates that OSA, with or without symptoms, is associated with conditions that account for the leading causes of mortality in adults including hypertension, cardiovascular disease, and stroke (Young, Peppard, & Gottlieb, 2002). In addition, several neurobehavioral morbidities that are of potentially great public health and economic importance are linked with OSA, including daytime sleepiness and impaired cognitive function that may, in turn, contribute to motor vehicle and/or job–related accidents.

Patient Evaluation

As indicated previously, questionning and extra–oral examination checks appropriate to recognising SDBs should be incorporated into all comprehensive clinical examinations.

For children a general assessment of overall health, fitness or body mass index (BMI) should be made. A child with a high BMI is more likely to have SDB due to the excess fat stored around their neck and waist (Lumeng & Chervin, 2008). Also, observe the child’s posture.

Frequently, children with SDB will have a forward head posture as this helps to open the airway, making it easier to breathe. Children with SDB may present with a long face and venous pooling under the eyes, often referred to as “allergy shiners”. Extra–orally you may notice excessive occlusal wear, enlarged tonsils and/or a mallampati score of III or IV (Appendix A). These features are signs that the child may be developing craniofacial changes related to airway issues (Kandasamy & Goonewardene, 2014).

A sleep–deprived child may be wiggly, overactive, poorly behaved, and have difficulty following directions. Children who habitually snore are at high risk for social problems, poor academic performance, decreased attention, and anxiety/depression (Marcus, 2000). These children also experience more behavioural problems than children who do not snore (Fitzpatrick, et al, 2003). With exception for periods of illness, mouth breathing and snoring should never be considered as normal.

There are a number of questions we should be asking our young patients including do you breathe through your nose or mouth, has anyone ever mentioned that you snore, do you wake feeling tired, can you concentrate well at school, do you wet the bed? A valid assessment tool for young children is the BEARS questionnaire. This questionnaire assesses five domains: Bedtime problems, Excessive sleepiness, Awakenings, Regularity of sleep, and Sleep–disordered breathing (Appendix B).

It is more difficult to recognise airway issues clinically in adults. Extra–oral indicators for adults include mouth breathing, severe yawning and a forward head posture. A sleep deprived adult may complain of headache, lethargy, poor concentration and/or general malaise.

For adults, completion of a questionnaire could offer a better indication of compromised airways concerns and SDB (Yim, Jordan & Malliotra, 2006). The STOP–BANG questionnaire is a simple evaluation tool that is quick, easy and readily allows the practitioner to form a differential diagnosis (Appendix C). This questionnaire effectively assesses sleep, breathing, BMI and other commonly recognised symptoms of SDB. It can be used to ascertain if a referral may be required. A follow up questionnaire like the Epsworth sleepiness scale could also be used (Appendix D).

Diagnosis and Treatment options

For all patients suspected of SDB a referral to a sleep physician should be made. This is to assess the severity of the SDB. A sleep study will most likely be carried out to diagnose if any sleep apnoea is present.

For children subsequent referrals are often made to an otolaryngologist (ENT), orthodontist, speech pathologist or an orofacial myofunctional therapist (OMT).

If the adenoid and tonsils are the main point of obstruction, an ENT may be the only referral required. Removal of both the tonsils and adenoid may permit proper use of the orofacial and tongue muscles. Adeno–tonsillectomy has been shown to have a cumulative cure rate of 80% (Alsubie & BaHammam, 2017).

An orthodontist aims is to achieve closed mouth breathing with the tongue in the roof of the mouth to help direct ideal growth. Once a child reaches around seven years of age, a palatal expansion appliance may be the best option for allowing adequate room for the tongue and the opening of a healthy airway.

A speech pathologist is formally trained to offer intervention planning, therapy and management of communication and/or swallowing difficulties through education and training.

An OMT educates their clients in correct tongue placement, normal breathing techniques, and healthy swallowing patterns. These three techniques offer optimal treatment outcomes because they encompass breathing and muscle function to promote lip seal, nose breathing and optimal facial growth.

For adults, continuous positive airway pressure (CPAP) is the current gold standard treatment for OSA (McNicholas & Bonsignore, 2006). OSA can be effectively treated by applying nasal CPAP during sleep, however, although CPAP technology has improved considerably over the years, acceptance remains a problem for patients.

Another treatment option is a mandibular advancement splint (MAS) (Petit, Pépin, Bettega, Sadek, Raphael, & Lévy, 2002).
MAS is contraindicated if there are insufficient teeth to support the device, periodontal problems inducing tooth mobility, active temporomandibular joint (TMJ) disorder, and limited maximum protrusive distance >6mm.

Re–education by a speech pathologist or an OMT in correct tongue placement, normal breathing techniques, and healthy swallowing patterns is also a viable treatment option for adult patients, particularly those who cannot tolerate a CPAP machine.

Conclusion

A healthy airway is required for both oral and overall health. Oral health professionals are uniquely qualified to detect symptoms of SDB among all our patients specially children.

During routine assessment at recall visits, we may observe evidence of SDB. As oral health professionals are well versed in assessment, evaluation, and patient education, we are the natural choice to discuss airway problems with patients and their parents/caregivers.

 Mouth breathing has been demonstrated to effect facial growth and development and increase the likelihood of SDB. SDB is a condition that is of increasing importance to all oral health professionals. As the impact of craniofacial factors on SDB is better understood oral health professionals can play an important role in the diagnosis and management of patients with SDB; especially in children. Skeletal development is a potential risk factor to developing SDB or a contributing factor to an already present condition.

 The need to recognise patients with SDB is increasing. Oral health professionals with the skill set to diagnose potential SDBs and make appropriate referrals will provide considerable benefit to their patients. The long term importance of this should not be underestimated. As Oral Health professionals we should be regularly screening all our patients for sleep breathing disorders.

References


Young, T., Peppard, P. E., & Gottlieb, D. J. (2002). Epidemiology of Obstructive Sleep Apnoea Syndrome. PEDIATRICS, 130(3), e714–e755. doi:10.1542/peds.200708–135mg


Young, T., Peppard, P. E., & Gottlieb, D. J. (2002). Epidemiology of Obstructive Sleep Apnea American Journal of Respiratory and Critical Care Medicine, 165(9), 1217–1239. doi:10.1164/rccm.201008–135mg
BEARS is a user–friendly screening tool to help identify sleep problems in children.

**B – Bedtime**

Does my child have trouble going to bed? Or trouble falling asleep?

**E – Excessive Daytime Sleepiness**

Is my child difficult to awaken in the morning?

Does my child seem sleepy or groggy during the day?

Does my child often seem tired during the day? (In children, tired may mean moody, hyperactive, “out–of–it”, as well as sleepy.)

**A – Awakening During the Night**

Does my child awaken during the night and have trouble going back to sleep? Is anything else interrupting my child’s sleep?

**R – Regularity and Duration of Sleep**

How many hours of sleep does my child need at this age?

What time does my child go to bed and get up on weekdays? On weekends? Does this allow my child to get enough sleep every day?

**S – Snoring**

Does my child snore? Loudly? Every Night?

Does my child stop breathing, gasp, or choke during sleep?

---

**Appendix A**

Figure 1. The Mallampati score:

- Class 1: Complete visualization of the soft palate
- Class 2: Complete visualization of the uvula
- Class 3: Visualization of only the base of the uvula
- Class 4: Soft palate is not visible at all

---

**Appendix B**

STOP Bang Questionnaire

<table>
<thead>
<tr>
<th>STOP Bang Questionnaire</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Snoring</strong></td>
<td>Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?</td>
</tr>
<tr>
<td><strong>Tired</strong></td>
<td>Do you often feel tired, fatigued or sleepy during the daytime?</td>
</tr>
<tr>
<td><strong>Observed apnea</strong></td>
<td>Has anyone observed you stop breathing during your sleep?</td>
</tr>
<tr>
<td><strong>Blood Pressure</strong></td>
<td>Do you have or are you being treated for high blood pressure?</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td>BMI more than 35kg/m²?</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>Age over 50 years old!</td>
</tr>
<tr>
<td><strong>Neck Circumference</strong></td>
<td>Are you a male with a neck circumference greater than 17 inches, or a female with a neck circumference greater than 16 inches?</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Are you a male?</td>
</tr>
</tbody>
</table>

---

**Appendix D**

Epworth Sleepiness Scale

Name: 

Date: 

Your age: (Yr) __________ Your sex: ☐ Male ☐ Female

How likely are you to doze off or fall asleep in the situations described below, in contrast to feeling just tired?

This refers to your usual way of life in recent times.

Even if you haven’t done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the most appropriate number for each situation:

- 0 = would never doze
- 1 = Slight chance of dozing
- 2 = Moderate chance of dozing
- 3 = High chance of dozing

**Situation** | **Chance of dozing**
--- | ---
Sitting and reading | 
Watching TV | 
Sitting, inactive in a public place (e.g. a theatre or a meeting) | 
As a passenger in a car for an hour without a break | 
Lying down to rest in the afternoon when circumstances permit | 
Sitting and talking to someone | 
Sitting quietly after a lunch without alcohol | 
In a car, while stopped for a few minutes in the traffic | 
**Total** | 

**Score:**

- 0-10 Normal range
- 10-12 Borderline
- 12-24 Abnormal
Abstract

Biofilm induced implant diseases have been reported to occur between 19-63% of all implants placed worldwide. Despite the high prevalence of these diseases, currently there is not a universally accepted and reliable treatment modality. Peri-implantitis is an inflammatory reaction which can cause bleeding, suppuration and the pathological loss of bone around dental implants, resulting in a saucer shaped bone defect. This inflammatory process can occur some years after implant placement, and can lead to eventual loss of the implant. The major contributing factors to peri-implantitis are patient susceptibility (i.e. a previous history of periodontitis and systemic modifying factors), the formation of a biofilm on the surface of the implant abutment and subsequently on the surface of the implant fixture itself.

While regular professional and home care can maintain health peri-implant tissues, once a mature biofilm has established itself on the subgingival implant surface, it becomes problematic because the surface is microscopically rough and notoriously difficult to clean. Despite a range of studies into various debridement techniques, most studies report varying clinical results.

Aims:

The overall aims of this PhD project were to explore how biofilm can be removed from textured implant surfaces using a variety of methods for closed (non-surgical) debridement, without causing surface damage or other undesirable modifications. Different in vitro models were used to assess the performance of conventional and novel methods of surface debridement.

Methods:

Titanium discs with various degrees of surface roughness and topographies were utilised to simulate the same textured surfaces as exist on commercial implants. Samples were generated with smooth surfaces, abraded surfaces, and surfaces which had been both abraded and etched (SLA) to resemble existing implant systems. The performance of various conventional debridement techniques was assessed, testing them against each type of surface, first without a biofilm present – to assess surface damage, and then with a biofilm present, to assess biofilm removal and accompanying surface damage. Surfaces were characterised by scanning electron microscopy and by laser profilometry, while biofilm removal was assessed numerically using assays (crystal violet and XTT), and qualitatively by confocal scanning laser microscopy. The studies were designed to test how complex mixed biofilms of natural origin (produced from human saliva as the inoculum) were removed by the various methods. In later chapters, the performance of novel techniques such as fluids agitated by middle infrared pulsed lasers, and electrochemical methods are explored.

Findings:

A number of debridement methods were tested on different type of implant surfaces, and it appears that modifications to surface risk is technique dependent. Biofilm removal is also technique dependent. Mechanical instruments such as hand curettes, ultrasonics and brushes appeared to have a limited effect in removing biofilm but was at high risk for creating a surface smear layer thus should not be recommended on rough surfaces, irrespective for the type of material construct. It appears that Er:YAG laser used with water, abrasive particles (air polishing) with glycine powder, application of citric acid and electrolysis at a low current are moderately effective at removing or inactivating the biofilm while preserving the integrity of the original surface. Electrolysis appears to be promising for inactivating biofilm but did not give physical removal, unlike laser or air polishing methods.

These are promising areas to explore further, since these treatments are likely to either enhance biocompatibility, or at the very least, will not lower the surface energy, while different debridement approaches have been shown to give varying effects on different surfaces, additional work is needed to test if a combination approach would be a better than a single debridement method.

Carols thesis is available electronically at: https://espace.library.uq.edu.au/view/UQ:681745
Abstract

**Background:** Head and neck cancers (HNC) account for 3.5% of the overall Australian cancer incidence. Despite forming only a subset of the national incidence, these cancers often cause significant personal morbidity and may affect multiple domains of quality of life (QoL). The mouth is central to eating and communicating and treatment for cancers of the oral cavity or oropharynx may cause profound changes in function and comfort. Surgery, radiotherapy and chemotherapy independently cause side-effects that affect the oral cavity, and have a cumulative effect when combined. High intensity multi-modal treatments have improved survival outcomes; but also result in a greater burden of treatment-related toxicities including mucositis, pain, dysphagia, xerostomia and fatigue.

Despite the vital importance of a well-functioning mouth to maintaining nutritional, aesthetic and social wellbeing there is a paucity of literature describing oral health outcomes after HNC. A majority of prior research in this field has reported findings from structured questionnaires. This approach may assist in evaluating outcomes across the broader HNC population, however lacks the flexibility to capture nuanced treatment experiences, or to understand how an individual’s social, environmental or medical context influence QoL perceptions.

**Aims:** This thesis aimed to explore QoL and supportive care needs following HNC; with a focus on exploring how oral changes are experienced and managed post treatment. Thus, this thesis aimed to explore the conceptually distinct constructs of symptom experience, QoL and supportive care needs and how these are experienced and evaluated from the patient perspective.

**Methods:** A mixed-methodology was used to explore oral health quality of life and supportive care needs. Mixed methods in the context of this thesis refers to a series of studies that varied in methodological approach (i.e. quantitative and qualitative), but contributed its findings to the overall thesis aims and objectives. These constructs were evaluated at varying points of treatment recovery and survivorship by a series of discrete studies. Perceived supportive care needs and influence on QoL was explored, using qualitative methods, among people who had previously been treated for HNC. The role of cognitive appraisal, coping and adjustment to chronic stressful outcomes were discussed, using the theory of stress, appraisal and coping as a framework. This framework was also applied to investigating how oral health was experienced and managed six months post treatment, in a separate study.

Quality of life over the first six months following the diagnosis and treatment of head and neck cancer was explored prospectively among a convenience sample of HNC patients. Changes in scores to the University of Washington Quality of Life Questionnaire, version 4 (UW–QoL v4) between pre-treatment, one month and six months post treatment were described, in addition to the influence of geographical location on QoL outcomes. Analysis of open-ended responses to the UW–QoL was conducted using automated content analysis, and the potential use of text data to identify QoL issues and opportunities for supportive care intervention was discussed.

Oral health, quality of life and supportive care needs were further extended by the final qualitative study, which explored the management of oral health from behavioural and access to care perspectives. Qualitative data was gathered from semi-structured interviews and analysis was performed by thematic analysis.

**Findings:** QoL in most UW–QoL domains decreased between baseline and one month post treatment and increased towards pre-treatment scores at the six month follow up (with the exception of anxiety and saliva). Pain at baseline was significantly worse in the regional–remote participants compared to metropolitan participants. The themes identified in free-text responses also changed at each follow up. At six months post treatment the most frequently identified difficulties concerned the mouth and eating.

The cognitive appraisal and coping process influenced the perceived impact of unmet needs on QoL, and the threat of acute, stressful outcomes of treatment changed as time since treatment progressed. The use of problem-focused coping, meaning-focused coping and accepting a ‘new normal’, contributed to downplaying the impact of these changes on overall quality of life. This was also observed in regard to permanent oral health outcomes. Oral health was perceived to have a new meaning following treatment, and the motivation to promote oral health was greater than before treatment. Factors that affected QoL and the management of oral health included social support networks, ability to fund oral health and the motivation to promote oral health was greater than before.

Oral health-related supportive care needs stemmed from structural gaps in the organisation and provision of dental oncology services. Support needs relating to the continuity of care and quality and appropriateness of dental care were also identified. The need for ongoing psychosocial support emerged throughout the thesis findings. Initiatives to address unmet supportive care needs include establishing peer support networks to facilitate the cognitive appraisal...
...continued from page 23

and adjustment process, ongoing psychological support services, and greater integration between medical and dental oncology services.

**How to access thesis:**

**Papers arising from thesis (note surname changed from Pateman to Moore):**


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Websites of Interest

Dementia Language Guidelines: What Is Appropriate Language For Talking About Dementia And Why Do We Need It?
Alzheimer’s Australia
This article by Alzheimer’s Australia, a member of Alzheimer’s Disease International, gives information and recommendations on using respectful and non-offensive language in verbal and written communication related to dementia. As oral health therapists move into the broader health sector, it is important to be familiar with the appropriate terminology. This comprehensive guideline is beneficial for everyone working with older people.

Mouth Healthy Kids
American Dental Association
This online educational resource for school children and teachers is provided by the American Dental Association. It has a good number of oral health–related activities for children as well as oral health–related educational material suitable for teaching pre-school through grade eight students.
http://www.mouthhealthykids.org/en

World Health Organization (WHO)
For a global perspective, information about oral health, including global statistics, data bases, policies, strategies for dental disease prevention and oral health promotion is available on the World Health Organization’s Oral Health page:
http://www.who.int/oral_health/en/

Stop Thumb Sucking Today With Thumbguard NZ and Tguard
Thumbguard New Zealand
Offers a range of devices for stopping thumb and finger sucking in children. The site gives comprehensive information on the products, and thumb sucking habit
http://www.thumbguard.net.nz/

New Zealand Dental Association (NZDA) Online Courses
A range of dental and oral health continuing professional development courses are offered through the New Zealand Dental Association. To access these courses, please visit the following website.
https://www.nzda.org.nz/courses–events

National Institutes of Health (NIH)
The National Institutes of Health provides information about research results, clinical trial information (including a toolkit), as well as grant funding and career opportunities in the United States and globally. For more information, please see:
https://niddcr.nih.gov/OralHealth/

Rethink Sugary Drinks Cancer Council Australia
Keep your eye on this campaign as it ramps up–recently announced grants of up to $500,000 for local councils to promote healthy drink options and reduce the availability and promotion of sugary drinks in leisure centres and sports venues.
http://www.rethinksugarydrink.org.au/

How Probiotics Can Help You: Tooth Decay & Gum Disease
Blis Technologies (Commercial Site)
Blis Technologies are the developers of the world’s first advanced oral probiotics. This website introduces specific probiotic bacteria, and explains their beneficial role in maintaining oral health. ToothGuard and ToothGuard Jr. are advanced oral probiotics that contain BLIS M18™ – a patented strain of Streptococcus salivarius that has been clinically proven to support and promote healthy teeth and gums.
https://blis.co.nz/conditions/tooth–decay–gum–disease
NZDHA & NZDOHTA
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CHRISTCHURCH	JULY 20th & 21st

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For more information go to www.adohta.net.au

ADOHTA QLD
3 March 2018 – Country Cabinet Rockhampton

ADOHTA QLD
4 March 2018 – Meet the New Graduates, Adelaide SA

ADX18
23–25 March 2018 – ADOHTA Leadership, Sydney NSW

ADOHTA QLD
5 May – Country Cabinet Brisbane, QLD

ADOHTA WA
25 May 2018 – We’ve got it covered, Perth WA

ADOHTA QLD
14 July 2018 – Country Cabinet Townsville QLD

ADOHTA VIC
11 August 2018 – Melbourne in conjunction with ADIA Trade show

ADOHTA QLD
1 September 2018 – Country Cabinet Brisbane QLD

2018

Australian Dental and Oral Health Therapists’ Association (ADOHTA) Online CPD Courses
The Australian Dental and Oral Health Therapists’ Association offers a number of online CPD courses for dental hygienists and therapists and oral health therapists ranging from Local Anaesthesia to Oral Cancer to Dental Implants.
https://www.adohta.net.au/content/ONLINE–CPD

ADA NSW. The Basics in Clinical Photography
St Leonards, NSW
7 February
The course provides an introduction to clinical photography, from taking quality images to the utilization of photographs to enhance patient treatment and education.

11th Asian Pacific Orthodontic Congress (APOC 2018)
5–7 March
Boracay Ecowillage Resort & Convention Center, Boracay Island, Malay.
http://www.apoc2018.org

International Association for Pediatric Dentistry (IAPD)
South Africa Johannesburg 16–20 March
http://iapdregional.org

2018

6th National Rural Health Alliance Conference
Hyatt Hotel Canberra, ACT 11–12 April
‘Infront Outback’ Rural and Remote Health Scientific Symposium.
http://ruralhealth.org.au/6rrhss/

IADR London (International Association for Dental Research)
IADR 25–28 July (Meeting 24 July)
General Session and Exhibition, including the Pan European Congress. Includes International Society for Oral Health Inequalities Research and Policy. Call for Papers closes 2 Feb, 2018.
http://www.icohirp.com

ADOHTA 5th International Conference
Hobart Tasmania
Come Exploring With Us – Hotel Grand Chancellor 27–29 September
Call For Papers Now Open.
www.adohta.net.au

College of Oral Health Academics Annual Meeting
University of Sydney November 2018
University Of Melbourne 14–16 November
http://ecommerce.dent.unimelb.edu.au

2019

Health Promotion and Public Health Conference
Rotorua, New Zealand
April 2019
Public Health NZ, The Health Promotion Forum of New Zealand, the International Union for Health Promotion and Education (IUHPE) and their partners are looking forward to hosting this important global public health event.
http://www.hapai.co.nz/content/iuhpe–world–conference–2019

International Federation of Dental Hygiene Symposium
Australian Health Promotion Conference; No More Harm Australia.
Pullman on the Park – Melbourne 12-13 April
https://www.healthpromotion.org.au/events

5–17 August 2019 International Federation of Dental Hygiene Symposium Brisbane Brisbane, Australia House of Delegate Business Meeting: August 14-16
ISDH: August 15-17
https://www.isdh2019.com/
World Cavity Free Future Day

Welcome to a brand new year. We hope you enjoyed the festive holiday break and are now feeling refreshed and ready to face 2018. As you look to the year ahead you may like to keep in mind a great opportunity to promote oral health that will be happening on October 14. Put the date in your diaries now!

In 2017 the Alliance for a Cavity Free Future (ACFF), in partnership with Colgate and the ADA, reached 1.4 million people in the ANZ region with #ChooseWater on World Cavity Free Future Day. The campaign encouraged people to drink water instead of sugary drinks in an effort to prevent dental decay.

Look out for a continuation of the campaign to encourage people to look after their teeth and their general health this year and be sure to join the fun!

#ChooseWater