

CJDH



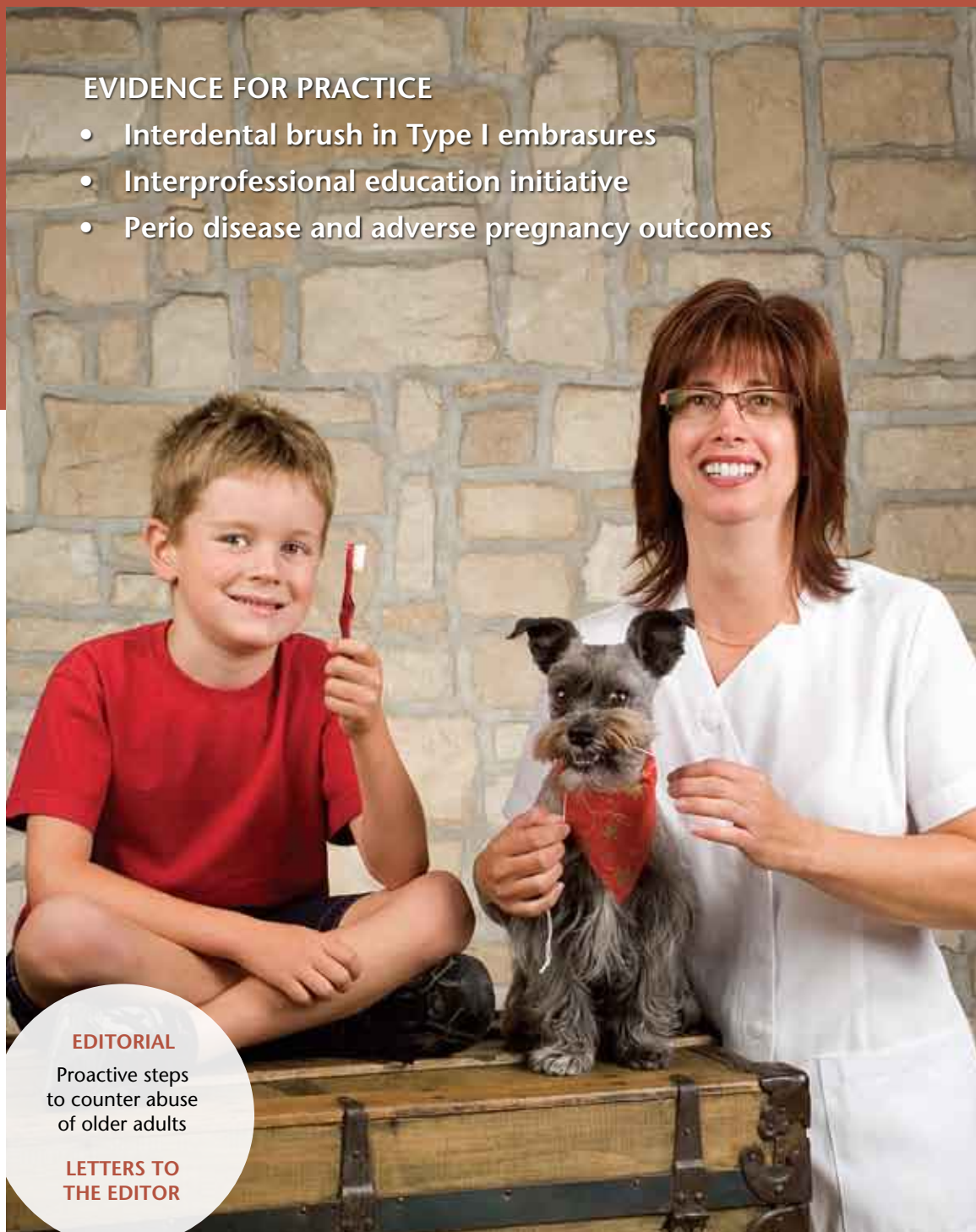
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QUARTERLY ISSUE · FEBRUARY 2011

VOL. 45, NO. 1

EVIDENCE FOR PRACTICE

- Interdental brush in Type I embrasures
- Interprofessional education initiative
- Perio disease and adverse pregnancy outcomes



EDITORIAL

Proactive steps
to counter abuse
of older adults

LETTERS TO THE EDITOR

Christine and Zakary, with their dog, Pepper, 62

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Dental hygienists as communicators and collaborators

Communication is the key to the exchange of ideas and to finding innovative applications for the practice of dental hygiene. We live in interesting times processing a wealth of online information through such tools as Social Networking, including Facebook and Twitter, as well as through mobile apps that have become our leading sources for seeking and sharing information on the go. Current and ongoing analyses of the use of the CDHA website and e-newsletters reveal a wealth of data on the information highway as a new generation of dental hygienists seeks information "instantly".

One dedicated CDHA group, the *Educators Community*, fosters the profession's continuing evolution through the exchange of ideas. Being part of this community has reinforced the notion that dental hygienists, as communicators, are integral to the growth of the oral health profession, and in promoting oral health to their clients.

Within this vibrant community of communicators, discussion has centred around interdisciplinary oral health care, and in educating a generation of dental hygienists who are prepared to practise interprofessionally, and to practise as collaborators.

Indeed, the stage has been set. Through self regulation, legislative change, and the recognition for the need of advanced education opportunities, an empowered generation of dental hygienists will bring the full scope of practice as primary oral health care providers to the public through collaboration and innovation.

Outside the box thinking abounds, but are these thoughts just concepts, or will they become a reality for practice in the near future? We might consider a collaborative alliance between a dental hygienist and a nurse specialist. This might include establishing oral health programs in schools by contracting services to school boards. In addition, dental hygienists might be hired as policy consultants to governments and organizations that address ongoing disparities in oral health. Or dental hygienists might set up interprofessional wellness clinics.

The new generation of dental hygienists link oral health as part of the overall healthcare system. They connect the mouth to the body. Armed with this vision, I feel confident that finding opportunities to practise outside the walls of the traditional practice settings will be the future for the dental hygiene profession.

Be active in the CDHA. Let your association know what you need in order to advance the profession. Do you prefer to learn from webinars on topics such as writing request for proposals (RFPs) for contracting oral health services

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CDHA welcomes your feedback: president@cdha.ca



Palmer Nelson,
BA(Bio.), DDH, RDH

Les hygiénistes dentaires, communicatrices et collaboratrices

La communication est la clé de l'échange des idées et de la découverte de nouvelles applications pour la pratique de l'hygiène dentaire. Nous vivons une période intéressante de transmission de données en ligne grâce à des outils comme le Réseautage social, notamment Facebook et Twitter, ainsi qu'aux appareils mobiles qui sont devenus nos principales sources de recherche et de partage immédiat de l'information. Les analyses courantes et en cours de l'utilisation du site Web et des courriels de l'ACHD révèlent une mine de données sur le vaste cheminement de l'information alors qu'une nouvelle génération d'hygiénistes dentaires recherche l'information « instantanée ».

Un groupe dévoué de l'ACHD, la Communauté d'éducation, encourage l'évolution continue de la profession par l'échange d'idées. L'appartenance à cette communauté a renforcé l'idée qu'à titre de communicatrices, les hygiénistes dentaires participent intégralement à la croissance de la profession de la santé buccale, et à la promotion de la santé buccale chez leurs clientèles.

Dans cette vibrante communauté de communicatrices, la discussion se concentre sur les soins interdisciplinaires en santé buccale et sur la formation d'une génération d'hygiénistes dentaires qui seront prêtes à exercer dans un cadre interdisciplinaire, et cela à titre de collaboratrices.

En effet, le terrain est prêt. Grâce à l'autorégulation, aux modifications législatives et à la reconnaissance du besoin de possibilités de formation avancée, une génération d'hygiénistes dentaires habilitées portera globalement l'étendue de la pratique à celle de dispensatrices de soins primaires en santé buccale auprès de la population par le biais de la collaboration et de l'innovation.

Par ailleurs, la réflexion abonde, mais ces pensées sont-elles uniquement de simples concepts ou se traduiront-elles en pratiques réelles dans un proche avenir? Nous pourrions considérer une alliance de collaboration entre une hygiéniste dentaire et une spécialiste en soins infirmiers. Cela pourrait comprendre l'établissement de programmes de soins de santé buccale dans les écoles par le biais de contrats de service avec les conseils scolaires. En outre, les hygiénistes dentaires pourraient être embauchées à titre de conseillères politiques auprès des gouvernements et organisations touchant les disparités courantes en matière de santé buccale. Les hygiénistes dentaires pourraient aussi instituer des cliniques de bien-être interprofessionnelles, liant ainsi la nouvelle génération d'hygiénistes dentaires au système général des soins de santé. Elles rattacheraient ainsi la bouche au corps. Armée d'une telle vision, j'ai confiance que la découverte de nouvelles opportunités de pratique hors du cadre traditionnel de pratique marquera l'avenir de la profession de l'hygiène dentaire.

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The *Canadian Journal of Dental Hygiene (CJDH)* is the official publication of the Canadian Dental Hygienists Association. The CDHA invites submissions of original research, discussion papers and statements of opinion of interest to the dental hygiene profession. All manuscripts are refereed anonymously.

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Position for commercial advertisement

Position for commercial advertisement

A focus on priorities

In 2011, CDHA plans to increase its advocacy and public awareness efforts. To be successful, we need to make sure that the public understand who we are and what we do. While we continue to lobby government for changes in legislation, we also align priorities to build working partnerships with other groups such as First Nations, the Health Action Lobby (Heal), the Canadian Coalition for Public Health in the 21st Century (CCPH21) as well work with groups that concentrate on women and children's issues such as the Status of Women. Dental hygienists know that the links between oral health and overall health are well documented and as such, the CDHA is committed to advocacy and educational programs to support preventive strategies that address these health issues and others. Canadians, in general, rank healthy behaviours and prevention as the top factors influencing health.¹ It seems important that as health professionals, dental hygienists reinforce this belief.

CDHA launched a webinar on oral cancer in January. The webinar precedes the release of an online course designed to educate the dental hygienist on the topic. CDHA is also taking on another health related issue. Seniors are a growing population with their own genre of problems. The number of seniors living below the low income mark rose 25% between 2007–2008;² nearly 80% of poor seniors are women.² This poses a problem for adult children who will be expected to help financially while still supporting their own families.² In February, CDHA launches a program, *Federal Elder Abuse Initiative*, in partnership with Human Resources and Skills Development Canada. Similar in format to the *Oral Cancer Awareness* program, an introductory webinar will promote the topic followed by an online professional development course. A special editorial, *Proactive steps to address abuse of older adults*, is featured in this issue of the journal. You may well ask how programs such as these promote advocacy and public awareness for dental hygiene. Dental hygienists are often the primary contact for an oral health examination, whether they work in their own practice or as a member of the team in a dental practice. This places dental hygienists in an optimum position to recognize a problem, whether it arises from an oral examination or from the client interview and health review. As health professionals, dental hygienists are then accountable to ensure that their clients receive proper referral and follow up.

CDHA also works to generate media coverage that highlights the role of dental hygienists. In December of last year the CDHA and BCDHA partnered to insert an advertisement on oral health in the widely read newspaper, *Vancouver Sun*. This initiative follows CDHA's successful media ventures of editorial pieces in the *Globe and Mail* and in the *National Post* in 2009 and 2010. We welcome the oppor-

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CDHA welcomes your feedback: info@cdha.ca



Ann E. Wright,
RDH, MBA

Pleins feux sur les priorités

En 2011, l'ACHD projette de multiplier ses interventions et ses efforts de sensibilisation publique. Pour y arriver, nous devons nous assurer que le public comprendra bien qui nous sommes et ce que nous faisons. Tout en poursuivant nos démarches auprès du gouvernement pour modifier les lois, nous accorderons aussi priorité au dévelop-

pement de partenariats de travail avec d'autres groupes, telles les Premières Nations, le Groupe d'intervention Action Santé (HEAL), l'Association canadienne pour la santé publique au 21^e siècle (ACSP21) ainsi que les groupes qui se concentrent sur les problèmes de la femme et des enfants, tel celui du Statut de la femme. Les hygiénistes dentaires savent que les liens entre la santé buccale et la santé globale sont bien documentés. L'ACHD s'engage donc dans des programmes d'intervention et d'éducation visant à soutenir des stratégies de prévention touchant ces problèmes de santé et autres.¹ Il semble important que comme professionnelles de la santé, les hygiénistes dentaires renforcent cette conviction.

En janvier, l'ACHD lançait un webinaire sur le cancer buccal. Ce webinaire précède le lancement d'un cours en ligne qui a pour objet d'instruire l'hygiéniste dentaire sur ce sujet. L'ACHD aborde aussi un autre problème de santé, celui de la croissance de la population âgée qui a son propre genre de problèmes. Le nombre d'âinés à faible revenu a augmenté de 25 % de 2007 à 2008,² et près de 80 % de ces personnes sont des femmes.² Cela pose un problème aux enfants adultes qui seront appelés à les aider financièrement en plus de veiller au soutien de leurs propres familles.² En février, l'ACHD lançait le programme Violence à l'égard des aînés, en partenariat avec Ressources humaines et Développement des compétences Canada. Comme pour le programme de Sensibilisation au cancer buccal, un webinaire introduira le sujet et un cours de formation professionnelle en ligne suivra. La présente édition du journal compte un éditorial spécial, intitulé Mesures dynamiques pour contrer la violence à l'égard des aînés. Vous vous demandez peut-être comment ces programmes vont promouvoir l'intervention et la sensibilisation du public à l'hygiène dentaire ? Les hygiénistes dentaires sont souvent les premières à examiner l'état de santé buccale, dans leur propre clinique ou dans le cadre d'une équipe de soins dentaires. Cela les situe en première position pour déceler un problème : examen de la bouche, interrogation de la clientèle ou revue des états de santé. Il incombe donc à ces professionnelles de la santé de bien orienter la clientèle et de veiller au suivi approprié.

L'ACHD travaille aussi à susciter une couverture médiatique qui soulignera le rôle des hygiénistes dentaires. En décembre dernier, l'ACHD et l'AHDCB ont diffusé un publi-reportage sur la santé buccale dans le journal à grand tirage, le *Vancouver Sun*. L'ACHD s'est aussi attiré la publication d'articles dans le *Globe and Mail* et le *National Post* en 2009 et 2010. Nous

...suite page 50

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Pressure laminated mouthguards: Role in prevention/reduction of injuries to athletes' mouth and brain in contact sports

Bernadette MacKay has been in the dental field for the past 29 years, the last 13 as a dental hygienist, and is president of Allsportsguards.com. Her interest and experience in the field of preventive dental injury through the use of mouthguards has prompted her to write this letter so that more dental hygienists may be aware of the various aspects of mouthguards.

Dear editor:

As a dental hygiene educator, one of the challenges I face is in educating executive committees, coaches, parents, and athletes on the merits of a custom fit, laminated mouthguard. While any mouthguard will provide a certain level of protection against tooth and orofacial injuries, it is only a quality, custom fit, laminated mouthguard that may actually provide some level of concussion prevention or reduced traumatic brain injury (TBI).¹

The subject is being investigated by the sports industry as well as by research specialists in medicine/neurology. The three possible theories are:

- i. direct dissipation with or without absorption of force of an upward blow to the jaw,
- ii. increased separation of the head of the condyle and glenoid fossa,
- iii. increased head stabilization by activating and strengthening neck muscles.¹

Concussion can be defined as a short lived loss of brain function due to head trauma that resolves spontaneously. With concussion, function may be interrupted, but there is no structural damage to the brain. The brain floats in cerebrospinal fluid, and is encased in the skull. These protections allow it to withstand many of the minor injuries that occur in day to day life. However, if there is sufficient force to cause the brain to bounce against the rigid bones of the skull, then there is potential for injury. It is the acceleration and deceleration of the brain against the inside of the skull that can cause the brain to be irritated, and interrupt its function. While temporary loss of consciousness due to injury means that a concussion has taken place, most concussions occur without the patient being knocked out. The International Conference on Concussion in Sports recommended that concussion be divided into two groups — simple and complex. In a simple concussion, the person's symptoms gradually resolve,

and the patient returns to normal function in 7–10 days. In complex concussions, symptoms persist and thought processes are affected. Athletes with repeated concussions would fall into the complex category.²

The four choices for mouthguards are:

- i. Stock (already made) which are inexpensive, but do not offer as good a fit or comfort for breathing and speaking as other types of mouthguards. They offer the least protection.
- ii. Mouth formed (boil and bite mouthguards) are relatively inexpensive. They are molded in the mouth after being softened in boiling water. They come in limited sizes, and with little attempt at proper fit.
- iii. Custom formed are made by a dentist or dental hygienist from a model of an athlete's mouth using a vacuum machine. Until recently, they were believed to be the best type of mouthguard available. Over time they can change and become loose, with thinning and perforating. There is no way to ensure their proper thickness.
- iv. Then there are pressure laminated, custom made on a model from several layers of mouthguard material in a special heat/pressure lamination machine. Due to the method of production the material maintains its fit and protective thickness over prolonged periods of time.³

Whether mouthguards are eventually shown to prevent concussion or not, they are very important to wear because they protect an athlete's teeth, mouth, lips, cheeks, gums, tongue and jaw.³

The late Dr. Tom Pashby was involved with the hockey team, Toronto Maple Leafs, and chaired the Canadian



▲ Entry level mouthguard for ages 3–9 for sports with minimal contact. Two sheets of EVA material are processed together in one step.



▲ Mouthguard with a triple layer placed over the front teeth. Indications are: previously restored anterior teeth, e.g., crowns. Recommended for high impact sports such as rugby, basketball, boxing, and lacrosse.



▲ For sports with more contact such as hockey and football for juniors, and up to adult age. This mouthguard is manufactured as a two step process for greater thickness.

Standards Association from 1975–1995. Dr. Pashby, an ophthalmologist, became involved due to the number of eye injuries that hockey players received during play. Dr. Pashby was instrumental in advocating the use of safety equipment for hockey players including mandatory helmets and faceguards.

According to Pashby Sports Safety Fund Concussion Site,³ the following guidelines should be followed regarding mouthguards:

- i. They should cover all teeth, including molars.
- ii. Children aged 6–14 should have their mouthguards checked approximately every 3 months.
- iii. Athletes younger than 16 years should replace their mouthguards annually.
- iv. Adults should replace their mouthguards every two years because mouthguards lose their resiliency and flexibility over time.³

The Canadian Dental Hygienists Association position statement⁴ on sports mouthguards research shows that orofacial injury in sports is prevalent, and carries significant medical, financial, cognitive, psychological, and social costs. Research also confirms that mouthguards can prevent orofacial injuries.⁴ The CDHA therefore strongly recommends that dental hygienists play an integral role in the prevention of orofacial injury in sports, and that dental hygienists promote properly fitted mouthguards as an essential piece of protective equipment in sports that present a risk of orofacial injury at the recreational and competitive level, in both practices and games.⁴

A study article published in *Journal of Athletic Training*⁵ stated the greatest emphasis was on the thickness of the guard in the posterior areas, that thickness being 3–4 mm. The only way that this is achievable is through the use of a heat/pressure laminate machine such as a Druformat. The material used in this study was a polyvinyl acetate copolymer, but there are different types of vinyls used and studied.⁵ Over the past 35 years, quality has been sacrificed for a quick fix, that is, low cost, ill fitting mouthguards. These mouthguards do not hold their shape, and fit so poorly that athletes sometimes alter them for speaking and comfort, foregoing the posterior thickness that might provide needed protection if a blow were delivered to the mandibular complex. Also stated in the article⁵ was, "... education of all those involved is the key."

A study, published in *Dental Traumatology*⁶, compared energy absorption of three mouthguard materials. The three materials studied for energy absorption were ethylene vinyl acetate (EVA, T&S Dental and Plastics), ProForm (Dental Resources Inc.) and Polyshok™ (Sportsguard Laboratories). The three materials were tested in three different environments, and it was concluded that the Polyshok™ material showed superior energy absorption attributed to the polyurethane additive to the material.⁶

In a recent study by Benson, Rose and Meeuwisse⁷ at the Faculty of Medicine, University of Calgary, specific risk factors to ice hockey players wearing full face shields compared with half face shields (visors) were investigated. The results included players wearing mouthguards with half face shields and full face shields. Players who wore

half face shields and no mouthguards at the time of concussion missed significantly more playing time (5.7 sessions per concussion; 95% Confidence interval 2.14 to 3.55). Players who wore full face shields and mouthguards at the time of concussion lost no playing time compared with 1.80 sessions lost per concussion (95% Confidence interval 1.38 to 2.34) for players wearing full face shields and no mouthguards.⁷

The number of mild traumatic brain injury (MTBI) and cerebral concussions is increasing, and cannot be eliminated by any kind of equipment. Prevention strategies, such as the introduction of "checking from behind" rules, have become effective in decreasing the number of severe spinal injuries.¹ A new "head checking" rule should reduce MTBI in the same way in the following years. Mouthguards should be mandatory as an effective device for the prevention of dental and orofacial injuries, as well as in reducing the incidence and severity of MTBI.

The damage that concussions can cause to the brain is being studied more than ever. Boston University Medical School opened the *Center for the Study of Traumatic Encephalopathy* in 2008, and researchers there, such as Ann McKee, have so far studied the brains of six deceased athletes to understand the damage that concussion causes.

Dr. Brian Benson's recent analysis of data, on NHL ice hockey players over one season, is to be made public soon. Every person who is involved at one level of sports or another has a responsibility to see that their athletes are playing as safely as possible.

In conclusion, from research and reading many articles on sports injuries, I draw on three commonalities:

- there is a lack of education and mouthguard use,
- more research is needed to study the merits of mouthguard use, and third,
- more mouthguard use is needed.

Regards

Bernadette MacKay, RDH

b.mackay@cogeco.ca

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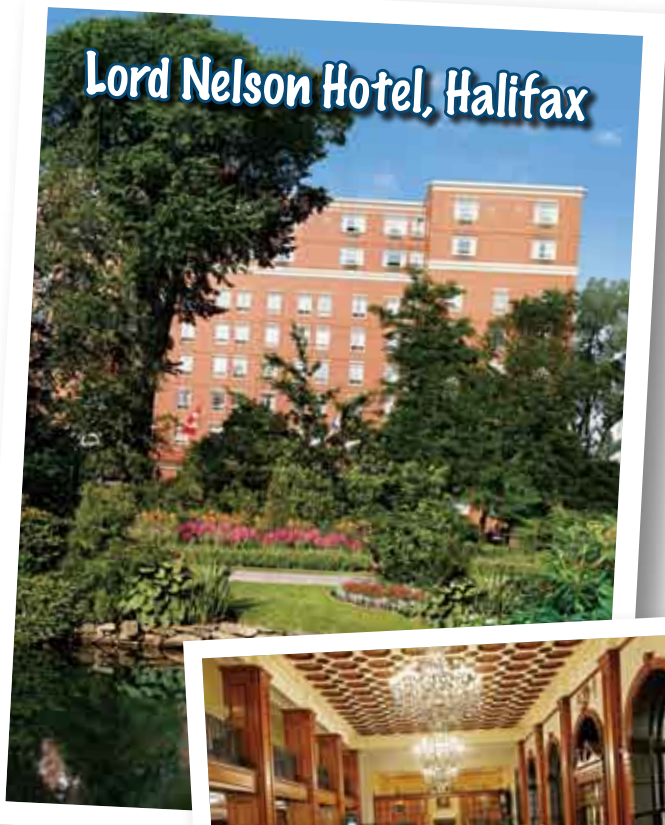
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SAMPLE OF THE PROGRAMME ATTRACTIONS...

SPEAKERS

SHORT TITLE OF TOPIC

Dr. Laura Dempster	<i>Role of clinician/client interactions in dental anxiety</i>
Lisa Taylor, RDH, BA, BEd	<i>Dental hygiene curriculum: Investigating transition from student to clinical practice</i>
Laura MacDonald, DipDH, BScD(DH), MEd	<i>Just how and where to begin for dental hygienists involved in interprofessional practice</i>
Fran Richardson, RDH, BSdD, MEd, MTS	<i>Going on your own: Dental hygienists who have opened their own practices</i>
Ruth McMullan, RDH, BEd	<i>Dental hygienists in interdisciplinary healthcare for the homeless</i>
Alison Leaney, MSW	<i>Meeting the challenge of responding to abuse of older adults</i>
Jane Keir, RDH, BSc, BEd	<i>Characteristics that place dental hygienists at risk of providing substandard client care</i>

POSTER PRESENTATIONS

Nancy Neish, BA, DDH, MEd	<i>Interprofessional learning modules for dental and dental hygiene students</i>
Janet Munn, RDH, DipDH, BSc(DH)	<i>Developing an oral health education program for personal care providers</i>
Dr. Shahrokh Gheisari	<i>Parents' knowledge about preventive methods of fluoride therapy at Shiraz, Iran</i>
Alison MacDougall, RDH, DipDH	<i>Periodontal disease and adverse pregnancy outcomes</i>



Helping Hands: A dental aid mission to the Bosawas, Nicaragua

In January 2010, the author participated in a dental aid mission, jointly organized by two non government organizations, "Change for Children Association" (CFCA) and "Kindness in Action" (KIA), to Bosawas, Nicaragua. In order to promote awareness of such opportunities, the author decided to write about her experiences with the hope that others may choose to contribute in similar regions of need. For those who may be interested, information on upcoming missions can be found at www.changeforchildren.org and www.kindnessinaction.ca

Dear editor:

The Bosawas region was designated a UNESCO biosphere reserve¹ in 1998, and is the largest protected area complex of tropical mountain moist forest north of the Amazon basin. This 20,000 km² (2 million hectare) area, referred to as the "Lungs of Central America", rests in northern Nicaragua along the border of Honduras, and is home to approximately 34,000 indigenous Mayangna¹ and Miskito² peoples.¹ These populations have little medical care and no access to dental care whatsoever apart from these annual brigades. Our brigade³ consisted of 23 Canadian volunteers including: 7 dentists, 6 dental hygienists, 2 dental assistants, 2 physicians, 4 non dental helpers, 1 translator/logistics officer, and myself, cross trained in dental hygiene and dental assisting.

The isolated nature of our destination carried some daunting logistical challenges. Preparation began nine months in advance as everything that our brigade needed to eat, live, and provide care for had to be brought with us. CFCA and KIA provided informative pamphlets on the immunizations, clothing and equipment required, and the living and working conditions to expect. I was impressed by the support that the Canadian community offered this mission in the form of dental, medical, and humanitarian donations. Included in our equipment, were a portable generator and restorative unit as we would be the first mission to the Bosawas to offer restorative services.

Upon arrival at Managua, all team members were issued a hammock and a 5 gallon plastic bucket with instructions to fill the bucket with as much non perishable food supplies as required for our eight day stay in the jungle. The next morning a convoy of seven 4WD trucks transported our team and equipment across gruelling terrain on a day and a half journey to the Rio Coco. Paved highways gave way to gravel roads which became dirt tracks. The final 25 kilometre stretch took over 3 hours through the Isabella mountain range to the river's launch site. Six 50-foot dugout canoes, each powered by a small outboard motor, waited to transport us down the river. Also climbing aboard, were our armed national police and military escort to protect us on our journey.

In total we provided dental care and aid to five separate communities in the Bosawas along the Rio Coco. The communities were simple but intriguing. Nestled among lush vegetation, wooden houses were built on stilts above ground to protect from flooding and snakes. At night we tied up our hammocks to sleep in the same buildings where we provided treatment in the morning — usually a two-room school house, church or barn. Every morning, after being woken up at 4 a.m. by our "rooster alarm clock", we would tear down our sleeping quarters, eat a meagre "bucket breakfast", and set up the clinic for a day of treatments.

By the time we were ready to begin, the line of clients, some of whom had walked days to reach us, would extend around the building. It was hard to imagine working without power, lights, suction, or sterilization units, but we managed. Wooden tables and benches were brought in and covered with



▲ Our brigade prepares to travel down the Rio Coco. Photo credit: R. Lee.



▲ The author with military and police escort in the community of Walakitang. Photo credit: R. Lee.



▲ D. Gregory, RDH, providing care in the community of Pamkiwas. *Photo credit:* R. Lee.



▲ H. Rusich at the sterilization table in the community of Yakalpanini. *Photo credit:* A. Tegnander.



▲ A Miskito child in the community of Aniwas, receives dental care at the hands of R. Basso, RDH. *Photo credit:* A. Tegnander.

black plastic sheets to serve as dental chairs. Clients would lie down to have their teeth pulled, restored or cleaned. Black garbage bags taped to the side of the table were used as spit-traps and sterilization was all chemical. Treatments would start at daybreak and finish when the sun set.

We were also able to set up an oral hygiene instruction session for the children in one community. Our focus was to educate children on proper brushing techniques and the importance of having a healthy mouth. For some, this was the first time they had ever seen and received a toothbrush.

The clinics were very busy but seemed to fly by, and before we knew it we had reached our last day. Any items that could be spared were donated to the communities as a final gesture of goodwill. We boarded our canoes before dawn and away we went. The 12 hour canoe ride back upstream allowed for plenty of time to reflect on what we had just completed. In the end we were able to provide 2,685 treatments for 1,256 clients including 2,160 extractions, 440 restorations and 85 cleanings. I was so proud to have participated in this mission, and I left with a strong feeling of accomplishment both personally and professionally.

I believe that health professionals hold a social responsibility to promote awareness wherever they can. Having been able to provide dental treatment in one of the most remote and beautiful places on Earth was truly an honour. Now that I've completed my first dental aid mission I am much more familiar with what supplies I need, don't need, and need more of (bug spray anyone?). It is also a rewarding way to travel and see the world.

Yours sincerely,
Alana Tegnander, RDH
E-mail: ategnander@hotmail.com

Acknowledgement

The author would like to acknowledge Richard Lee for his contribution to this article.

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Proactive steps to address abuse of older adults

April Struthers, MEd, RCC, and Alison Leaney, MSW, RSW

Introduction

Mrs. B, aged 76 years, has come for her 6-month continuing care appointment and you notice that she seems uncharacteristically withdrawn. She gives you one word non committal responses when you ask her how she is, and how she is enjoying the visit from her son and his family. When it is time for her to pay her bill she discovers, apparently for the first time, that the money she thought was in her wallet is not there. She becomes embarrassed and very agitated. You feel worried for her, and wonder what the most appropriate next step might be.

Mrs. B's plight is not as unusual as you might expect. In Canada, it is thought that anywhere from 4 to 10% of older adults will experience some form of abuse during their later years.¹

The *National Survey on Abuse of the Elderly in Canada: the Ryerson Study*, published more than fifteen years ago, is the most comprehensive appraisal in Canada to date of numbers of seniors affected.¹ Based on a telephone survey of 2,000 older adults in private homes, the survey established that at least 4 per cent of older adults outside of institutions, that is about 100,000 older Canadians, had experienced some form of harm or ill treatment.

These numbers are estimated by researchers and practitioners to be lower than the actual incidence of abuse. It is suspected that there is significant under reporting because many older adults do not, or are prevented from, speaking about the abuse, which also means they are not getting connected with someone who can help. The need for further research is clear in order to determine the extent of the various forms of abuse, associated precursors, risk and protective factors.

Abuse of older adults can take many forms, some of which constitute criminal offences. Abuse can be physical, sexual, financial, psychological, or neglect.

The Federal Elder Abuse Initiative

The Government of Canada launched the first ever *Federal Elder Abuse Initiative* in 2008 to raise awareness about abuse of older adults.² They committed \$13 million over three years. The four federal government departments implementing the *Initiative* are: Human Resources and Skills Development Canada (HRSDC), the Public Health Agency of Canada (PHAC), the Royal Canadian Mounted Police (RCMP), and Justice Canada (JC). Together these ministries and agencies have:

- created and aired television ads to raise awareness,
- begun implementation of a national research agenda (including laying the preparatory definitional groundwork, should a national prevalence study soon be possible),
- made funds available to regional organizations to raise awareness, build or strengthen local networks and exchange knowledge, and
- developed many tools to assist health care providers and other responders in addressing and preventing abuse of older adults.

In addition, national professional associations, seen as having a central role to play in educating their members, led to the announcement of funding to do just that. The Canadian Dental Hygienists Association (CDHA) was one of the successful applicants. Implementation of this exciting two year project has just commenced. CDHA joins the Canadian Nurses Association, the Canadian Association of Occupational Therapists, la Fédération des associations de juristes d'expression française, la Fédération des locataires d'habitations à loyer modique du Québec, and the Fondation du Centre de santé et de services sociaux de la Vieille-Capitale in developing professional education for members.

The dental hygienist's role

The *Federal Elder Abuse Initiative* and the funding it provides to professional associations affords the opportunity to raise awareness of this issue. CDHA members have an increased opportunity to interact and build relationships with older adults due to changes in and the expansion of practice settings resulting from legislative reform (collective or facility care, public health settings, and mobile or private home based practices). Combined with the fact that Canadian demographic projections reflect a growing aging population, the time for dental hygienists to take proactive and substantive action has arrived. Health Canada predicts that by 2026 every fifth Canadian will be over 65; seniors are the fastest growing population group; and the number of oldest seniors is the most numerous within the senior group.³

There is a level of trust that comes with the designation of "registered dental hygienist". Clients confide in their dental hygienists, who are recognized as caring oral health professionals, and who may be among the few people with whom the older adult has any contact. Further, there is potential for long term relationships that enable changes in a person's presentation, general hygiene, and emotional tone to be noticed and considered.

CDHA's role

The CDHA is utilizing its existing approach on delivery models expanding professional response to produce an online course on recognizing and responding to elder abuse. The course consists of four online modules, supported by a resource manual, chair-side educational resource and wallet card, and a series of webinars. Overall, the course includes an overview of the issue and dynamics of abuse, factors that raise and mitigate risks, possible effective responses, and case scenarios.

The delivery models focus on the select fraternity of CDHA members, as well as practising dental hygienists and dental hygiene students across Canada. The online course will be launched in the first quarter of 2011 with three follow up webinars in March, April, and November 2011, focussing on typical client cases and practical approaches. A session highlighting the course will also take place at the annual CDHA Conference in Halifax in June 2011.

What dental hygienists can do about abuse of older adults

CDHA's professional development initiative on abuse of older adults will result in resources and support tools to empower dental hygienists to take necessary action where abuse of an older adult is suspected. Background information about causes and signs of abuse, and how to intervene safely will be presented in the online course, chair-side resources, and the webinars.

Case studies will be offered to provide scenarios and suggestions of ways of dealing with the situation. CDHA members will be much better informed on what to do.

For example, in the case of Mrs. B, a dental hygienist might:

- Note that Mrs. B seems upset and agitated
- Gently ask Mrs. B if she would like to talk more about what is going on
- Listen to and believe Mrs. B's perspective
- Ask Mrs. B how she would like to be supported and let her know that she is not alone and that there are people who can assist
- Check what the policies and procedures are in the work place when such a situation arises
- Let the supervisor know about the situation if Mrs. B is living in a care facility

Conclusion

CDHA welcomes this opportunity to be part of the *Federal Elder Abuse Initiative* activities, and to inform and support members to enhance their role with older Canadian adults. Dental hygienists are well positioned to be "eyes and ears" to detect possible abuse situations and to advocate for and help with practical solutions for their clients.

Together we can make a difference in combating the issue of abuse of older adults.

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About the authors

The authors of this peer reviewed, informational editorial, were recruited as consultants by the CDHA to develop learning resources under the oversight, coordination, and assistance of Laura Myers, CDHA's Director of Education. CDHA is one of six organizations receiving funding from the federal government for the purpose of increasing awareness of service providers in order to help prevent the abuse of older adults.

April Struthers, MEd, RCC, is an organizational consultant with clinical qualifications, and a practice that ranges from British Columbia to the UK. She works across sectors to develop anti abusive workplaces and communities. April has an interest in prevention research generally, and in developing approaches which are culturally safe for First Nations and aboriginal communities. She often works at the strategic level in the field of prevention of adult abuse, has done national scans of activities in the field, and authored a draft national strategy to combat abuse of older adults.

Alison Leaney, MSW, RSW, is the National Project Coordinator for the Elder Abuse Theme Team's Knowledge to Action Project, of the National Initiative for the Care of the Elderly (NICE). Her role is to put evidence based tools in the hands of senior abuse responders. As a social worker, Alison has more than 15 years experience in the senior abuse field. She is a former Chair of the Canadian Network for the Prevention of Elder Abuse (CNPEA) and is one of two finalists for the Premier's Innovation and Excellence Legacy Award for the collaborative provincial approach she led to address adult abuse/neglect in British Columbia. ©CDHA



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1. Hypnosis for children undergoing dental treatment

Al-Harasi S, Ashley PF, Moles DR, Parekh S, Walters V

Summary

Hypnosis for children undergoing dental treatment

Children are often anxious or non-compliant during dental treatment. Anecdotal evidence as well as published articles indicate hypnosis can be used with great effect in paediatric behavioural management. The aim of this review was therefore to see what evidence there is to support the use of hypnosis with children and adolescents undergoing dental procedures. Only three randomised controlled trials (with 69 participants) fulfilled the inclusion criteria for this review. Two of these three studies reported positive outcomes in favour of hypnosis however statistical analysis and meta-analysis were not possible due to insufficient studies meeting the inclusion criteria.

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Abstract

Background

Managing children is a challenge that many dentists face. Many non-pharmacological techniques have been developed to manage anxiety and behavioural problems in children, such as: 'tell, show & do', positive reinforcement, modelling and hypnosis. The use of hypnosis is generally an overlooked area, hence the need for this review.

Objectives

This systematic review attempted to answer the question: What is the effectiveness of hypnosis (with or without sedation) for behaviour management of children who are receiving dental care in order to allow successful completion of treatment?

Null hypothesis: Hypnosis has no effect on the outcome of dental treatment of children.

Search strategy

We searched the Cochrane Oral Health Group's Trials Register, CENTRAL, MEDLINE (OVID), EMBASE (OVID), and PsycINFO. Electronic and manual searches were performed using controlled vocabulary and free text terms with no language restrictions. Date of last search: 11th June 2010.

Selection criteria

All children and adolescents aged up to 16 years of age.

Children having any dental treatment, such as: simple restorative treatment with or without local anaesthetic, simple extractions or management of dental trauma.

Data collection and analysis

Information regarding methods, participants, interventions, outcome measures and results were independently extracted, in duplicate, by two review authors. Authors of trials were contacted for details of randomisation and withdrawals and a quality assessment was carried out. The methodological quality of randomised controlled trials (RCTs) was assessed using the criteria described in the *Cochrane Handbook for Systematic Reviews of Interventions* 5.0.2.

Main results

Only three RCTs (with 69 participants) fulfilled the inclusion criteria. Statistical analysis and meta-analysis were not possible due to insufficient number of studies.

Authors' conclusions

Although there are a considerable number of anecdotal accounts indicating the benefits of using hypnosis in paediatric dentistry, on the basis of the three studies meeting the inclusion criteria for this review there is not yet enough evidence to suggest its beneficial effects.

2. Sedation of anxious children undergoing dental treatment

Matharu L, Ashley PF

Summary

Sedation of anxious children undergoing dental treatment

Fear of the dentist or behaviour management problems can result in a child's tooth decay going untreated. Behavioural techniques play an important role in managing anxiety, however, some children still find it difficult to tolerate dental treatment and may require sedation. This review examined the effectiveness of drugs that sedate a child whilst keeping them conscious. Due to the poor quality of the research, the review was unable to determine which drugs or methods of sedation are the best for managing a child's anxiety or behaviour.

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Abstract

Background

Anxiety about dental treatment or behaviour management problems can be a barrier to its uptake in children. Sedation can be used to relieve anxiety and manage behaviour, unfortunately it is difficult to determine from published research which agents, dosages and techniques are effective.

Objectives

To evaluate the relative efficacy of the various conscious sedation techniques and dosages for behaviour management in paediatric dentistry.

Search strategy

Computerised: MEDLINE, PubMed, EMBASE, Cochrane Central Register of Controlled Trials, Dissertation Abstracts, SIGLE, the World Wide Web (Google) and the Community of Science Database were searched for relevant trials and references up to December 2004. Reference lists from relevant articles were scanned and the authors contacted to identify trials and obtain additional information. There were no language restrictions. Trials pre-1966 were not searched.

Selection criteria

Studies were selected if they met the following criteria: randomised controlled trials of conscious sedation comparing two or more drugs/techniques/placebo undertaken by the dentist or one of the dental team in anxious children up to 16 years of age.

Data collection and analysis

Information regarding methods, participants, interventions and outcome measures and results were independently extracted, in duplicate, by two authors. Authors of trials were contacted for details of randomisation and withdrawals and a quality assessment was carried out not using any formal scoring system. The Cochrane Collaboration statistical guidelines were followed.

Main results

Sixty-one studies were included with 3246 subjects in total. Overall quality of studies was found to be disappointing with poor reporting often the main problem. Data reported could not be easily aggregated into groups to facilitate description of results. Meta-analysis of the available data was also not possible for the same reason. The variety of differing drug regimens compared made it difficult to isolate groups of studies that were sufficiently similar in design to allow sensible comparison. Where groups of studies could be isolated, then the differing outcome measures used made their meta-analysis impossible.

Authors' conclusions

Review authors were not able to reach any definitive conclusion on which was the most effective drug or method of sedation used for anxious children. A list of proposed areas of study was described.

3. Combinations of topical fluoride (toothpastes, mouthrinses, gels, varnishes) versus single topical fluoride for preventing dental caries in children and adolescents

Marinho VCC, Higgins JPT, Sheiham A, Logan S

Summary

Combinations of topical fluoride (toothpastes, mouthrinses, gels, varnishes) versus single topical fluoride for preventing dental caries in children and adolescents

Additional forms of topical fluoride can reduce tooth decay in children and adolescents more than fluoride toothpaste alone, but the extra benefit is not great.

Tooth decay (dental caries) is painful, expensive to treat and can seriously damage teeth. Fluoride is a mineral that prevents tooth decay.

Fluoride is added to the water supply in many areas. It can also be applied in the form of toothpastes, mouthrinses, gels or varnishes. The review of trials found that children and adolescents who used another form of topical fluoride in addition to fluoride toothpaste experienced some additional reduction in tooth decay compared with children who only used fluoride toothpaste. However, the additional benefit was not great, and the trials did not provide data about adverse effects.

Cochrane Database of Systematic Reviews 2010 Issue 11, Art. No.: CD002781. DOI: 10.1002/14651858.CD002781.pub2
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Abstract

Background

Topical fluoride therapy (TFT) in the form of toothpastes, mouthrinses, varnishes and gels are effective caries preventive measures. However, there is uncertainty about the relative value of these interventions when used together.

Objectives

To compare the effectiveness of two TFT modalities combined with one of them alone (mainly toothpaste) when used for the prevention of dental caries in children.

Search strategy

We searched the Cochrane Oral Health Group's Trials Register (May 2000), the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2000, Issue 2), MEDLINE (1966 to January 2000), plus several other databases. We handsearched journals, reference lists of articles and contacted selected authors and manufacturers.

Selection criteria

Randomized or quasi-randomized controlled trials with blind outcome assessment, comparing fluoride varnish, gel, mouthrinse, or toothpaste in combination with each other in children up to 16 years during at least 1 year. The main outcome was caries increment measured by the change in decayed, missing and filled tooth surfaces (D(M)FS).

Data collection and analysis

Inclusion decisions, quality assessment and data extraction were duplicated in a random sample of one third of studies, and consensus achieved by discussion or a third party. Authors were contacted for missing data. The primary measure of effect was the prevented fraction (PF) that is the difference in mean caries increments between the

'treatment' and 'control' groups expressed as a percentage of the mean increment in the control group. Random-effects meta-analyses were performed where data could be pooled.

Main results

Eleven of the 12 included studies contributed data for the meta-analyses. For the nine trials that provided data for the main meta-analysis on the effect of fluoride mouthrinses, gels or varnishes used in combination with toothpaste (involving 4026 children) the D(M)FS pooled PF was 10% (95% CI, 2% to 17%; $P = 0.01$) in favour of the combined regimens. Heterogeneity was not substantial in these results ($I^2 = 32\%$). The separate meta-analyses of fluoride gel or mouthrinse combined with toothpaste versus toothpaste alone favour the combined regimens, but differences were not statistically significant; the significant difference in favour of the combined use of fluoride varnish and toothpaste accrues from a very small trial and appears likely to be a spurious result. Not all other combinations of possible practical value were tested in the included studies. The only other statistically significant result was in favour of the combined use of fluoride gel and mouthrinse in comparison to gel alone (pooled DMFS PF 23%; 95% CI, 4% to 43%; $P = 0.02$), based on two trials. No other combinations of TFT were consistently superior to a single TFT.

Authors' conclusions

Topical fluorides (mouthrinses, gels, or varnishes) used in addition to fluoride toothpaste achieve a modest reduction in caries compared to toothpaste used alone. No conclusions about any adverse effects could be reached, because data were scarcely reported in the trials.

4. Fluoride varnishes for preventing dental caries in children and adolescents

Marinho VCC, Higgins JPT, Logan S, Sheiham A

Summary

Fluoride varnishes for preventing dental caries in children and adolescents

Fluoride varnishes applied professionally two to four times a year would substantially reduce tooth decay in children.

Fluoride is a mineral that prevents tooth decay (dental caries). Since widespread use of fluoride toothpastes and water fluoridation, the value of additional fluoride has been questioned. Fluoride varnishes can be professionally applied at a frequency from two to four times a year. The review of trials found that fluoride varnish can substantially reduce tooth decay in both milk teeth and permanent teeth. However, more high quality research is needed to be sure of how big a difference the treatment makes, and to study acceptability and adverse effects.

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Abstract

Background

Topically applied fluoride varnishes have been used extensively as an operator-applied caries-preventive intervention for over 2 decades.

Objectives

To determine the effectiveness and safety of fluoride varnishes in the prevention of dental caries in children and to examine factors potentially modifying their effect.

Search strategy

Multiple electronic database searches, reference lists of articles, journal handsearch, selected authors and manufacturers.

Selection criteria

Randomised or quasi-randomised controlled trials with blind outcome assessment, comparing fluoride varnish with placebo or no treatment in children up to 16 years during at least 1 year. The main outcome was caries increment measured by the change in decayed, missing and filled tooth surfaces (D(M)FS).

Data collection and analysis

Inclusion decisions, quality assessment and data extraction were duplicated in a random sample of one third of studies, and consensus achieved by discussion or a third party. Study authors were contacted for missing data. The primary measure of effect was the prevented fraction (PF), that is the difference in caries increments between the treatment and control groups expressed as a percentage

of the increment in the control group. Random-effects meta-analyses were performed where data could be pooled. Potential sources of heterogeneity were examined in random-effects metaregression analyses.

Main results

Nine studies were included, involving 2709 children. For the seven that contributed data for the main meta-analysis, the D(M)FS pooled prevented fraction estimate was 46% (95% CI, 30% to 63%; $P < 0.0001$). There was substantial heterogeneity, confirmed statistically ($P < 0.0001$). The pooled d(e/m)fs prevented fraction estimate was 33% (95% CI, 19% to 48%; $P < 0.0001$). No significant association between estimates of D(M)FS prevented fractions and baseline caries severity or background exposure to fluorides was found in metaregression, and a funnel plot of the seven studies indicated no relationship between prevented fraction and study precision. In both methods, power is limited when only a few trials are included.

Authors' conclusions

The review suggests a substantial caries-inhibiting effect of fluoride varnish in both the permanent and the deciduous dentitions based largely on trials with no treatment controls. There is little information concerning acceptability of treatment or possible side effects in the included trials. Given the relatively poor quality of most of the included studies and the wide confidence intervals around the estimates of effect, there remains a need for further trials. It is important that these trials should be of high quality and include assessment of potential adverse effects.

5. Slow-release fluoride devices for the control of dental decay

Bonner BC, Clarkson JE, Dobbyn L, Khanna S

Summary

Slow-release fluoride devices for the control of dental decay

Slowly dissolving fluoride-releasing glass beads may help reduce dental decay if retained in the mouth over time, but retention of the beads is a problem.

This review concludes that slow-release fluoride devices have the potential to protect against tooth decay if they can be kept in place, in the mouth, for 2 years. The evidence, so far, is considered to be weak and unreliable. In a single study a reduction of 0.72 in mean caries increment (assessed as decayed, filled, or missing teeth) compared to control was reported (caries increment in the intervention group was 0.19 versus 0.91 in the control group). However, this analysis excluded 52% of available participants, whose beads had become dislodged.

Cochrane Database of Systematic Reviews 2010 Issue 11, Art. No.: CD005101. DOI: 10.1002/14651858.CD005101.pub2
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Abstract

Background

Slow-release fluoride devices have been investigated as a potentially cost-effective method of reducing dental caries in those with high risk of disease.

Objectives

To evaluate the effectiveness of different types of slow-release fluoride devices on preventing, arresting, or reversing the progression of carious lesions on all surface types of deciduous and permanent teeth.

Search strategy

We searched (up until February 2005) multiple electronic databases (Cochrane Oral Health Group's Trials Register, CENTRAL, MEDLINE, EMBASE), bibliographic references of identified randomised controlled trials (RCTs), textbooks, review articles, and meta-analyses. Letters were sent to authors of identified RCTs asking for clarifications and unpublished or ongoing research. Relevant journals were handsearched for more recent reports than those obtained from databases.

Selection criteria

Randomised or quasi-randomised controlled trials (RCTs) comparing slow-release fluoride devices with an alternative fluoride treatment, placebo, or no intervention in all age groups. The main outcomes measures sought were changes in numbers of decayed, missing, and filled teeth or surfaces (DMFT/DMFS in permanent teeth or dmft/dmfs in primary teeth) and progression of carious lesions through enamel and into dentine.

Data collection and analysis

Abstracts of all reports identified were considered independently by two review authors and full reports obtained of any potentially relevant articles to allow further assessment for relevance and validity. Data extraction and quality assessment were conducted independently by two and three review authors respectively, with arbitration by the fourth. Where uncertainty existed, authors were contacted for additional information.

Main results

Only one trial involving 174 children fully met the criteria for inclusion in this review. Although 132 children were still included in the trial at the 2-year completion point, examination and statistical analysis was performed on only the 63 children who had retained the beads. Thirty-one of these were in the intervention group and 32 in the control group.

Amongst these 63 children, caries increment was reported to be statistically significantly lower in the intervention group than in the placebo group (mean difference: -0.72 DMFT, 95% confidence interval -1.23 to -0.21 and -1.52 DMFS, 95% confidence interval -2.68 to -0.36).

Authors' conclusions

There is some evidence of a caries-inhibiting effect of slow-release fluoride glass beads. This evidence is regarded as weak and unreliable because the results were from participants selected on the basis of bead retention rather than an intention-to-treat analysis.

6. Antibacterial agents in composite restorations for the prevention of dental caries

Pereira-Cenci T, Cenci MS, Fedorowicz Z, Marchesan MA

Summary

Antibacterial agents in composite restorations for the prevention of dental caries

When tooth decay (caries) has caused a cavity in a tooth a range of materials can be used as fillings. These include resin composite, glass ionomer cement, amalgam and compomers. Secondary caries (tooth decay that may appear near or underneath a filling at a later stage) is a common concern in dental practice and may reduce the life span of these fillings. Antibacterial agents may be incorporated in some dental fillings i.e. resin composites to help prevent the development of secondary caries. This review failed to find any trials supporting or refuting the effectiveness of antibacterial agents incorporated into composite restorations to prevent dental caries. The authors concluded that future research should aim to provide evidence for clinicians to make informed decisions about whether antibacterial agents are effective in improving clinical outcomes in composite restorations and that further randomised controlled trials should be well designed and reported according to the Consolidated Standards of Reporting Trials (CONSORT) Statement.

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Abstract

Background

Dental caries is a multifactorial disease in which the fermentation of food sugars by bacteria from the biofilm (dental plaque) leads to localised demineralisation of tooth surfaces, which may ultimately result in cavity formation. Resin composites are widely used in dentistry to restore teeth. These restorations can fail for a number of reasons, such as secondary caries, excessive wear, marginal degradation, tooth sensitivity, pulpal death, and restorative material fracture. Caries adjacent to restorations is one of the main causes for restoration replacement. The presence of antibacterials in both the filling material and the bonding systems would theoretically be able to affect the initiation and progression of caries adjacent to restorations.

Objectives

To assess the effects of antibacterial agents incorporated into composite restorations for the prevention of dental caries.

Search strategy

We searched the following databases in February 2009: the Cochrane Oral Health Group's Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2009, Issue 1); MEDLINE via OVID (1950 to February 2009) without filter; and EMBASE via OVID (1980 to February 2009) without filter.

Selection criteria

Randomised controlled clinical trials (RCTs) comparing resin composite restorations containing antibacterial agents with non-antibacterial containing composite restorations.

Data collection and analysis

Two review authors conducted screening of studies in duplicate and independently, and although no eligible trials were identified, the two authors had planned to extract data independently and assess trial quality using standard Cochrane Collaboration methodologies.

Main results

We retrieved 128 references to studies, none of which matched the inclusion criteria for this review and all of which were excluded.

Authors' conclusions

We were unable to identify any randomised controlled trials on the effects of antibacterial agents incorporated into composite restorations for the prevention of dental caries. The absence of high level evidence for the effectiveness of this intervention emphasises the need for well designed, adequately powered, randomised controlled clinical trials.

7. Pit and fissure sealants for preventing dental decay in the permanent teeth of children and adolescents

Ahovuo-Saloranta A, Hiiri A, Nordblad A, Mäkelä M, Worthington HV

Summary

Pit and fissure sealants for preventing dental decay in the permanent teeth of children and adolescents

Children who have their molar teeth covered by a sealant are less likely to have dental decay in their molar teeth than children without sealant.

Sealants are coatings applied by the dentist or by another person in dental care on the grooves of mainly molar teeth. These coatings are intended to prevent the growth of bacteria that promote decay in grooves of molar teeth. The review shows that after 4.5 years the sealed permanent molar teeth of children aged 5 to 10 had over 50% reduction in decay on biting surfaces compared to teeth without sealants. One study with longer follow up showed that after 9 years only 27% of sealed tooth surfaces were decayed compared to 77% of tooth surfaces without sealant.

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Abstract

Background

Although pit and fissure sealants are effective in preventing caries, their efficacy may be related to the caries prevalence in the population.

Objectives

The primary objective of this review was to evaluate the caries prevention of pit and fissure sealants in children and adolescents.

Search strategy

We searched the Cochrane Oral Health Group Trials Register, CENTRAL (*The Cochrane Library* 2007, Issue 3) and MEDLINE (to October 2007); EMBASE (to June 2007); SCISEARCH, CAPLUS, INSPEC, NTIS, PASCAL, DARE, NHS EED and HTA (to February 2008). There were no language or publication restrictions.

Selection criteria

Randomised or quasi-randomised controlled trials of at least 12 months in duration comparing sealants with no sealant or sealants from different classes of materials for preventing occlusal caries in children and adolescents under 20 years. The primary outcome was the increment in the numbers of carious occlusal surfaces of premolars and molars.

Data collection and analysis

Two review authors independently screened search results, extracted data and quality assessed trials. Risk ratios (RR) were calculated for differences between intervention and control groups and in split-mouth studies for

differences of paired tooth surfaces being carious or not. The meta-analyses were conducted using a random-effects model.

Main results

Sixteen studies were included in the review; 7 studies provided data for comparison of sealant versus control without sealant and 10 studies for comparison of sealant versus sealant. Five split-mouth studies and one parallel group study with 5 to 10 year old children found a significant difference in favour of second or third generation resin-based sealants on first permanent molars, compared to a control without sealant, with a pooled RR of 0.13 (95% confidence interval (CI) 0.09 to 0.20), 0.22 (95% CI 0.15 to 0.34), 0.30 (95% CI 0.22 to 0.40), and 0.40 (95% CI 0.31 to 0.51) at 12, 24, 36 and 48–54 months follow up, respectively. Further, one of those studies with 9 years of follow up found significantly more caries in the control group compared to resin sealant group; 27% of sealed surfaces were decayed compared to 77% of surfaces without sealant. The results of the studies comparing different sealant materials were conflicting.

Authors' conclusions

Sealing is a recommended procedure to prevent caries of the occlusal surfaces of permanent molars. The effectiveness of sealants is obvious at high caries risk but information on the benefits of sealing specific to different caries risks is lacking.

8. Pit and fissure sealants versus fluoride varnishes for preventing dental decay in children and adolescents

Hiiri A, Ahovuo-Saloranta A, Nordblad A, Mäkelä M

Summary

Pit and fissure sealants versus fluoride varnishes for preventing dental decay in children and adolescents

Dental sealants reduce more tooth decay in the grooves of back teeth in children than fluoride varnish application but the number of studies supporting this evidence is very low. Therefore, more high quality research is needed.

Sealants are coatings applied by the dentist or by another person in dental care on the grooves of back teeth. These coatings are intended to prevent decay in the grooves of back teeth.

Fluoride varnishes are sticky pastes that are professionally applied on teeth at a frequency of two to four times a year.

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Abstract

Background

The majority of the detected increment in dental caries among children and adolescents is confined to pit and fissure surfaces of first molars.

Objectives

The objective of this study was to compare the effectiveness of pit and fissure sealants with fluoride varnishes in the prevention of dental decay on occlusal surfaces.

Search strategy

The Cochrane Oral Health Group's Trials Register, CENTRAL, MEDLINE, EMBASE and 10 other databases were searched to November 2009. There were no language or publication restrictions.

Selection criteria

Random or quasi-random allocation study design; sealants versus fluoride varnish or sealants and fluoride varnish combination versus fluoride varnish alone; and subjects under 20 years of age. The primary outcome of interest was the increment in the numbers of carious occlusal surfaces of permanent premolars and molars.

Data collection and analysis

Two review authors independently screened search results, extracted data and assessed the risk of bias of trials. Risk ratios (RR) were calculated for differences between intervention and control groups and in split-mouth studies

for differences of paired tooth surfaces being carious or not. No data could be combined or meta-analyses undertaken due to the clinical and methodological diversity between study designs.

Main results

Four studies were eligible for inclusion in the review. Results of one split-mouth study at low risk of bias and one cluster randomised study at moderate/high risk of bias revealed the effectiveness of pit and fissure sealants to be statistically significantly higher than an application of fluoride varnish every 6 months in preventing occlusal decays of first molars at 23 months (with a RR of 0.74, 95% confidence interval (CI) 0.58 to 0.95); and at 4 years and 9 years (with a RR of 0.42, 95% CI 0.21 to 0.84 and RR of 0.48, 95% CI 0.29 to 0.79, respectively). One small parallel group study at moderate/high risk of bias failed to find a difference between sealants and fluoride varnishes. Further, one split-mouth study at low risk of bias with 24 months of follow-up found significantly more caries on the fluoride varnished tooth surfaces, compared to sealed plus fluoride varnished surfaces, with a RR of 0.36 (95% CI 0.21 to 0.61).

Authors' conclusions

There was some evidence on the superiority of pit and fissure sealants over fluoride varnish application in the prevention of occlusal decays. However, current scarce data limit recommendations on whether to apply pit and fissure sealants or fluoride varnishes on occlusal surfaces.

Interdental brush in Type I embrasures: Examiner blinded randomized clinical trial of bleeding and plaque efficacy

Pauline H. Imai, MSc, and Penny C. Hatzimanolakis, MSc

ABSTRACT

Background: Daily oral biofilm disruption is necessary for periodontal health; however, clients' dental flossing compliance is low. This study explores the interdental brush for bleeding and plaque reduction in sites of intact interdental papillae. **Methods:** Examiner blinded, randomized, split mouth, 12 week clinical trial comparing interdental brush (n = 224 sites) to dental floss (n = 223 sites) for bleeding and plaque reduction in thirty volunteers with a minimum of 4 bleeding sites per side. Non surgical debridement performed at Week 2 with oral hygiene instructions at Weeks 0 and 6. Bleeding and plaque indices at Weeks 0, 6, and 12. **Results:** One way ANOVA comparing interdental brush mean bleeding sites 1.08 (SD 0.27, CI 1.04 to 1.12) to dental floss sites, mean 1.19 (SD 0.39, CI 1.14 to 1.25), demonstrated statistical significance, p = 0.01. There was no statistical difference between interdental brush mean 5.14 (SD 2.62, CI 4.80 to 5.49) and dental floss mean of 5.12 (SD 2.51, CI 4.79 to 5.45) for plaque sites, p = 0.93. Post hoc analyses at the subject level, interdental brush mean bleeding was 0.08 (SD 0.02, CI 0.07 to 0.09) and dental floss mean was 0.2 (SD 0.04, CI 0.18 to 0.21) at Week 12, p = 0.01.

Conclusion: Interdental brush significantly reduces bleeding sites in subjects with Type I embrasures. Both interdental aids significantly reduced plaque over 12 weeks.

RÉSUMÉ

Contexte : La rupture quotidienne du biofilm buccal est nécessaire pour la santé parodontale, mais la clientèle utilise rarement la soie dentaire. Cette étude examine le brossage entre les dents pour réduire le saignement et la plaque dans les sites de la papille interdentaire intacte. **Méthodes :** Examen à l'insu, randomisation, scission de la bouche, 12 semaines d'essais cliniques comparant la brosse interdentaire (n = 224 sites) à la soie dentaire (m = 223 sites) pour réduire le saignement et la plaque chez trente volontaires ayant un minimum de 4 sites saignants de chaque côté. Débridement non chirurgical effectué dans la Semaine 2 avec enseignement de l'hygiène buccale durant Semaines 0 et 6. Indices de saignement et de plaque durant les Semaines 0, 6 et 12. **Résultats :** La comparaison ANOVA à sens unique des sites de saignement au brossage interdentaire, moyenne de 1,08 (ÉT 0,27, CI 1,04 à 1,12) et des sites nettoyés à la soie dentaire, moyenne de 1,19 (ÉT 0,39, CI 1,14 à 1,25), a démontré une statistique importante : p = 0,01. Il n'y avait pas d'écart statistique entre la moyenne de 5,14 (ÉT 2,62, CI 4,80 à 5,49) du brossage interdentaire et la moyenne de 5,12 de la soie dentaire (ÉT 2,51, CI 4,79 à 5,45) pour les sites de plaque, p = 0,93. Aux analyses ultérieures au niveau du sujet, la moyenne de saignement au brossage interdentaire était de 0,08 (ÉT 0,02, CI 0,07 à 0,09) et la moyenne de la soie dentaire était de 0,2 (ÉT 0,04, CI 0,18 à 0,21) dans la Semaine 12, p = 0,01. **Conclusion :** Le brossage interdentaire réduit de façon significative le saignement des sites chez les sujets avec embrasure de type 1. Les deux modes de nettoyage interdentaire ont réduit considérablement la plaque sur la période de 12 semaines.

Key words: interdental cleansing, dental devices, plaque and bleeding indices, gingivitis, oral hygiene

Clinical relevance

Scientific rationale for study: Dental floss is usually recommended for type I embrasures, but few clients floss daily. The interdental brush is easy to use, but has not been studied in Type I embrasures.

Principal findings: The interdental brush reduced bleeding and plaque, and was preferred by subjects.

Practical implications: The novel interdental brush system:

- is time and cost efficient for oral health professionals to select an optimal sized interdental brush for their client's oral self care needs, and
- provides an evidence based alternative for clients who do not comply with dental floss.

Clinicaltrials.gov Identifier: NCT00743548

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Oral Biological Medical Sciences, Faculty of Dentistry, University of British Columbia

Correspondence to: Pauline H. Imai; imai@dentistry.ubc.ca; Faculty of Dentistry, University of British Columbia, Vancouver, BC

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Introduction

Daily effective disruption of the oral biofilm by mechanical self care such as tooth brushing and dental flossing is a common method for achieving and maintaining oral health. The accumulation and maturation of the oral biofilm results in a shift in the health–disease equilibrium such that periopathogens proliferate and the host responds with inflammatory processes that results in periodontium destruction.^{1,2} Although professional mechanical therapy, such as non surgical debridement is effective for lowering the microbial load and creating a more favourable subgingival environment for health,^{3,4} effective daily plaque disruption by clients is also necessary to slow the colonization of supragingival biofilm, and thus, its extension subgingivally.^{4–6}

Tooth brushing is the primary and most widely accepted mechanical method for disrupting the oral biofilm, but it cannot effectively reach the interproximal areas where periodontal disease is prevalent.^{7–10} Dental floss is a common interdental mechanical method for interdental oral biofilm disruption; however, daily compliance ranges from 11% to 30% due to clients' lack of ability and motivation.^{11–14} Subjects in previous studies indicated that dental flossing was difficult and time consuming to use;¹⁵ therefore, follow up studies have focused on other interdental self care aids such as interdental brushes. Studies comparing interdental brush to dental floss have demonstrated client preference for the interdental brush because of its ease of use.^{15,16} Furthermore, the interdental brush has effectively demonstrated reductions in dental plaque and bleeding in subjects with clinical attachment loss, and thus, open embrasure areas.^{9,17,18} However, there is no information on the efficacy of interdental brushes in subjects with Type I embrasures because these subjects were not considered suitable candidates for the large diameter interdental brushes that were previously available. Type I embrasures are defined as interdental papillae that fill the interdental spaces between adjacent teeth that are in contact.¹⁹ For the purposes of function and esthetics, preserving the interdental papillae with daily interdental oral self care is desirable.²⁰

Since the prevention and early treatment of periodontal disease is preferred, oral health professionals need to encourage their clients, who have gingivitis, to comply with daily interdental oral self care. Therefore, the purposes of this study were two fold:

- i. to determine the interdental brush's effectiveness for reducing plaque and gingival inflammation as indicated by gingival bleeding upon stimulation in subjects with intact interdental papillae, and
- ii. to determine whether the subjects' perceptions of the interdental brush's ease of use would have a positive influence on their daily self care compliance.

The study subjects' preference for interdental self care products may be found in the article, *Encouraging client compliance for interdental care with the interdental brush: the client's perspective*.²¹ This paper will focus on the clinical parameters of the randomized controlled trial.

Materials and methods

Study design

The study was an examiner blinded, split mouth, 3 month, randomized controlled trial comparing interdental brush (Curaprox Prime Series, Curaden Swiss, Amlehnstrasse, Switzerland) to dental floss on premolars and 1st and 2nd molars in 33 healthy adults with bleeding Type I embrasures (Figure 1). The study's primary outcome parameter was reduction of bleeding, and the secondary outcome was reduction of plaque.

Study recruitment and enrollment

The study protocol was reviewed and approved by the University of British Columbia Clinical Research Ethics Committee in Vancouver, Canada. Subjects were recruited from the general population via a newspaper advertisement in the local paper, Vancouver Craigslist, and flyers posted on UBC campus from September 2008 to February 2009. Subjects were not dental or dental hygiene students. Participation was not limited by race or gender, and all subjects signed a consent form.

The target population was adults with plaque induced gingivitis, as determined by having red, bleeding upon stimulation gingival tissues, and probing depths of 4 mm or less. The inclusion criteria consisted of:

1. a minimum of four interproximal areas per side with intact interdental papillae that could accommodate a minimum 0.6 mm interdental brush width as determined with the colour coded probe (Curaprox Prime Series, Curaden Swiss, Amlehnstrasse, Switzerland);
2. a minimum of four interproximal bleeding sites per side upon stimulation with a Stimu-Dent™ inserted horizontally four times;
3. dexterity to use waxed dental floss without any additional aids, and
4. ability to attend 5 visits.

Subjects were excluded from the study if: 1) they required premedication with antibiotics prior to dental therapy; 2) used chlorhexidine or over-the-counter mouthwash during the study; 3) used tobacco products; 4) had full orthodontia and/or 5) had taken antibiotics one month prior to the study (Figure 1).

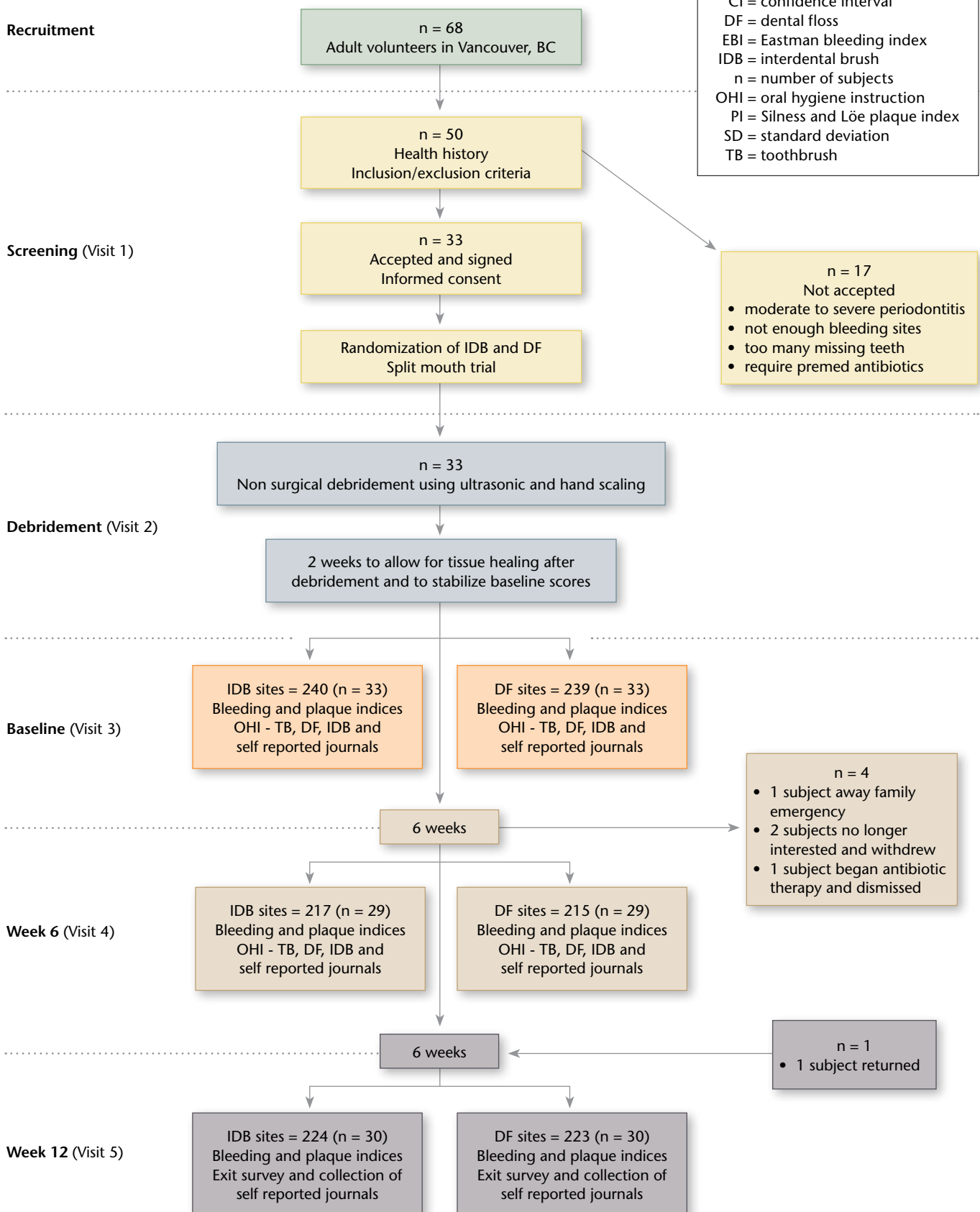
Blinding

This was an examiner blinded trial. Blinding was achieved by keeping all the clinical records collected by the examiner separate from the enrollment and randomization process conducted by the study organizer. Only the examiner, who was unaware of the product randomization throughout the study, collected the clinical measurements at baseline, 6, and 12 weeks.

Confidentiality and randomization

Upon entering the study, subjects were assigned an individual identification number. Only the medical health history form contained the subjects' personal information, and this was separated from the clinical data collection forms by the study organizer. The interdental brush was randomly assigned to the left or right side of the subjects' mouths with the dental floss assigned to the remaining

Figure 1. Consort flow chart of study.



side (Figure 1). Subjects used both products. Randomization of products to left or right side of the mouth was determined by a flip of coin by the study organizer. All subjects were right handed as determined by observing them write in their medical health histories, and confirmed later when subjects participated in the oral hygiene instruction sessions.

Study schedule

Subjects had a minimum of 5 visits: screening, debridement, baseline, week 6 and week 12 data collection (Figure 1). At baseline, week 6, and week 12, the examiner collected the subjects' plaque and bleeding scores. Subjects' teeth were disclosed using disclosing solution (Trace disclosing solution, Young Dental Manufacturing, Earth City, MO, USA) and the Silness and Løe plaque index, which was modified to determine plaque scores on four interproximal surfaces (mesial–buccal, distal–buccal, mesial–lingual, and distal–lingual) of the premolars and 1st and 2nd molars using an ordinal scale of 0 to 3; 0 indicated no plaque, 1 was light plaque, 2 was moderate plaque, and 3 was heavy plaque accumulation.²³ The Eastman Bleeding index was used to determine the presence or absence of interproximal bleeding posterior to the canines; score of 0 was no bleeding, and 1 was presence of bleeding.²² The study organizer measured the subjects' embrasures with the colour coded probe (Curaprox Prime Series, Curaden Swiss, Amlehnstrasse, Switzerland), which was inserted horizontally from the buccal aspect until snug and observing the visible colour. Each colour on the probe corresponds to a matching colour coded interdental brush. The interdental brush diameters range from 0.6 mm (dark green on the probe) to 1.1 mm (light green). Five brush diameters were available: 0.6 mm, 0.7 mm, 0.8 mm, 0.9 mm, and 1.1 mm. A maximum of three interdental brush sizes were chosen per subject. When more than three brush sizes were required, a smaller already identified diameter was used for that site.

Subjects were instructed, with no time limit, in the use of:

- the modified Bass tooth brushing method using a soft manual toothbrush (Curaprox CS 5460 Prime™ ultrasoft toothbrush, Curaden Swiss, Amlehnstrasse, Switzerland),
- manual flossing with waxed dental floss (Johnson & Johnson Inc., NB, Canada), and
- interdental brush (Curaprox Prime Series, Curaden Swiss, Amlehnstrasse, Switzerland).

Subjects were instructed to brush their teeth twice a day, once in the morning and again at night, and to use the dental floss and interdental brush once a day on the assigned side, preferably at night. Subjects were instructed in dental flossing techniques to ensure maximum floss adaptation around the interproximal tooth surfaces. Interdental brush instruction consisted of inserting the interdental brush from the facial aspect, slightly apical until the tip passed under the contact point then horizontally through the embrasure area. The interdental brush was inserted once and removed. Subjects were cautioned not to thrust the interdental brush interproximally and

repeatedly in a brushing motion. The study organizer demonstrated the difference between a new and worn interdental brush, and encouraged subjects to replace their interdental brush as needed. Based on the manufacturer's prospectus, this occurred between 10 and 14 days. Subjects received enough supplies to last 6 weeks, but could request more supplies from the study organizer at any time. All subjects were instructed to only use these products and the provided toothpaste (Colgate Cavity Protection Regular toothpaste, Colgate-Palmolive Canada Inc., Canada), and to refrain from professional dental hygiene services, and over-the-counter and prescription mouthwashes during the study period.

Subjects were also given a daily journal at baseline to self report their daily compliance with interdental brushing and dental flossing (Figure 1). The journal, which the subjects were encouraged to place in their bathroom as a reminder, included a diagram of the teeth and indications as to where to use the specific interdental brush and dental floss.

Throughout our study, the examiner assessed the subjects for soft tissue trauma as indicated by clinically visible gingival cuts, redness, abraded areas, or damaged interdental papilla, and the study organizer addressed subjects' concerns.

Statistical analyses

According to a study by Jackson et al.,²⁴ who demonstrated positive results with a parallel randomized controlled trial comparing interdental brush and dental floss over 12 weeks, 34 participants per group were needed to detect a 15% difference between the products for mean plaque index at 12 weeks. Yost et al.¹⁸ had approximately 30 subjects per group, and demonstrated statistically greater reductions in gingival index for the interdental brushes compared to dental floss. Our study enrolled 33 subjects to compare interdental brush to dental floss. Descriptive statistics, one way ANOVA, and paired t-tests (SPSS 17) were used to analyze the quantitative data. One way ANOVA compared interdental brush to dental floss sites at Weeks 0, 6, and 12. Paired t-tests were used to monitor the reduction in bleeding and plaque from baseline to week 12 for interdental brush and dental floss sites. Post hoc analyses were conducted at the subject level for the primary outcome of bleeding reduction between interdental brush and dental floss at Week 12. All analyses were conducted with alpha set at 0.05 and 95% confidence intervals.

Results

Thirty adults (20 women, 10 men) completed the three month study, contributing 224 interdental brush sites and 223 dental floss sites. All participants were right handed.

At baseline (Week 0), there was no statistically significant difference between the interdental brush and dental floss sites for bleeding and plaque scores (Tables 1 and 2). Comparing interdental brush to dental floss sites at Weeks 6 and 12, demonstrated statistically significant differences between the products for reduction in bleeding sites (Table 1). However, both products performed similarly for reduction of plaque site mean scores at Weeks 6 and 12 (Table 2).

Table 1. Comparison of Mean Bleeding Scores Between Interdental Brush (IDB) and Dental Floss (DF) Sites at Weeks 0, 6, and 12.

Product	Week	n (sites)	Mean	SD	95% CI (lower, upper bound)	p-value
IDB	0	240	1.32	0.47	1.26, 1.38	0.243
DF	0	239	1.27	0.45	1.22, 1.33	
IDB	6	217	1.11	0.31	1.06, 1.15	0.035
DF	6	215	1.18	0.38	1.13, 1.23	
IDB	12	224	1.08	0.27	1.04, 1.12	0.001
DF	12	223	1.19	0.40	1.14, 1.25	

Table 2. Comparison of mean plaque scores between interdental brush (IDB) and dental floss (DF) sites at weeks 0, 6, and 12.

Product	Week	n (sites)	Mean	SD	95% CI (lower, upper bound)	p-value
IDB	0	240	6.43	2.82	6.07, 6.79	0.262
DF	0	239	6.14	2.78	5.79, 6.50	
IDB	6	217	5.06	2.39	4.74, 5.38	0.344
DF	6	215	4.85	2.29	4.54, 5.15	
IDB	12	224	5.14	2.62	4.80, 5.49	0.928
DF	12	223	5.12	2.51	4.79, 5.45	

Table 3. Comparison of mean bleeding scores between interdental brush (IDB) and dental floss (DF) in subjects at weeks 0, 6, and 12.

Product	Week	n (subjects)	Mean	SD	95% CI (lower, upper bound)	p-value
IDB	0	30	0.30	0.05	0.28, 0.32	0.31
DF	0	30	0.27	0.06	0.25, 0.29	
IDB	6	29	0.11	0.03	0.10, 0.12	0.14
DF	6	29	0.17	0.04	0.15, 0.18	
IDB	12	30	0.08	0.02	0.07, 0.09	0.01
DF	12	30	0.20	0.04	0.18, 0.21	

Table legend: CI = confidence interval; DF = dental floss; EBI = Eastman bleeding index; IDB = interdental brush; n = number of subjects; OHI = oral hygiene instruction; PI = Silness and Løe plaque index; SD = standard deviation; TB = toothbrush

Post hoc analyses at the subject level continued to support the interdental brush for statistically significant reduction in bleeding compared to dental floss at Week 12 (Table 3), but maintained the non significant differences between the products for plaque scores (Table 4).

From baseline to Week 6, as well as baseline to Week 12, mean bleeding and plaque scores were significantly reduced in interdental brush sites (Table 5). Mean plaque scores were also significantly reduced in dental floss sites

from baseline to Week 6 and baseline to Week 12 (Table 5). Although mean bleeding scores did not reach statistical significance for dental floss sites from baseline to Week 6, it became significant over the 12 weeks (Table 5).

Subject compliance with interdental brush and dental floss, determined by self reported journal entries, and approximation of product use was high. At Week 6, subjects were using the interdental brush 89.13% of the time (SD 19.85) and the dental floss 88.93% (SD 19.70). At

Table 4. Comparison of mean plaque scores between interdental brush (IDB) and dental floss (DF) in subjects at weeks 0, 6, and 12.

Product	Week	n (subjects)	Mean	SD	95% CI (lower, upper bound)	p-value
IDB	0	30	1.68	0.36	1.55, 1.82	0.20
DF	0	30	1.55	0.30	1.44, 1.67	
IDB	6	29	1.23	0.18	1.17, 1.30	0.47
DF	6	29	1.23	0.18	1.16, 1.29	
IDB	12	30	1.26	0.24	1.17, 1.35	0.43
DF	12	30	1.28	0.22	1.20, 1.37	

Table 5. Comparison of mean bleeding and plaque scores of interdental brush (IDB) and dental floss (DF) sites from baseline to week 6 and baseline to week 12.

			Paired Differences				
					95% Confidence Interval of the Difference		
Weeks	Product	Index	Mean	SD	Lower	Upper	Sig (2 tailed)
0 – 6	IDB	EBI	0.19	0.49	0.12	0.25	<0.001
0 – 6	DF	EBI	0.65	0.53	- 0.01	0.14	0.07
0 – 12	IDB	EBI	0.23	0.51	0.16	0.29	<0.001
0 – 12	DF	EBI	0.08	0.52	0.01	0.14	0.03
0 – 6	IDB	PI	1.45	2.80	1.08	1.83	<0.001
0 – 6	DF	PI	1.34	2.60	0.99	1.69	<0.001
0 – 12	IDB	PI	1.49	3.02	1.09	1.89	<0.001
0 – 12	DF	PI	1.14	2.87	0.77	1.52	<0.001

Table legend: CI = confidence interval; DF = dental floss; EBI = Eastman bleeding index; IDB = interdental brush; n = number of subjects; OHI = oral hygiene instruction; PI = Silness and Løe plaque index; SD = standard deviation; TB = toothbrush

Week 12, compliance remained high with subjects using the interdental brush 92.70% of the time (SD 7.77) and the dental floss 92.34% (SD 8.70). There were no statistically significant differences between interdental brush and dental floss for subject compliance at Week 6 ($p = 0.97$) and Week 12 ($p = 0.88$). There were no adverse events or side effects at any of the time points for interdental brush or dental floss.

Discussion

Daily oral self care is an essential part of the health disease equilibrium,⁹ and this study demonstrated the positive effects of daily interdental oral self care. The absence of bleeding, which is a clinical sign of gingival health,²⁵ was significantly better in interdental brush sites. Interdental brushes are effective for the central part of the interdental space compared to dental floss, which cannot effectively

remove plaque from the invaginated axial cervical tooth surfaces.^{15,26} The bristles of an appropriately sized interdental brush are able to disrupt the interdental oral biofilm, especially in the concave tooth and root anatomy of premolars and molars.^{27–29} This study used a measuring tool to determine the best fitting interdental brush per site. The result was effective disruption of the oral biofilm interproximally compared to other studies that used a one-size-fits-all interdental brush for the subjects' interdental sites, and thus, demonstrated no statistical difference among the products for bleeding scores.^{18,30}

Similar to other studies, our study demonstrated plaque reduction over the 12 weeks for interdental and dental floss sites, but no statistical difference between the products.^{18,30} Only Jackson et al.²⁴ demonstrated a statistical difference between interdental brush and dental floss for plaque scores. Subjects in Jackson et al.'s study²⁴

were diagnosed with chronic periodontitis and recruited from a periodontal waiting list. As such they were likely to have open embrasures, which may have enhanced the subjects' ability to remove interproximal plaque with the interdental brush, and increased the examiner's visibility for plaque scoring.²⁴ In our study, subjects had intact interdental papillae, which limited the subjects' and examiner's visibility of the disclosed plaque on interproximal tooth and root surfaces.

Also, subjects in our study received professional debridement prior to the intervention phase unlike those in Jackson et al.²⁴ Professional debridement has been shown to have positive influences on gingival health by removing the oral biofilm and altering the interproximal and subgingival environments, especially in the root grooves and concavities of molars and premolars, areas that dental floss cannot effectively deplaque.^{4,15,26,29,30} Similar to Yost et al.,¹⁸ the lack of plaque score differences between the interdental brush and dental floss in our study may be related to the pre-intervention debridement.

The repeated nature of the oral hygiene instructions may have also had an effect on the clinical improvements demonstrated in our study. In order for dental floss to be effective, clients must have effective flossing techniques.^{10,32} According to one study,³² 40% of subjects were not using proper flossing technique. The subjects in the Segelnick study³² demonstrated similar difficulties with dental floss at the baseline oral hygiene instruction sessions such as incorrect adaptation of the floss around the teeth, and inadequate mechanical motions to remove the disclosed plaque deposits. However, after receiving repeated, intensive one-on-one instructions, most subjects demonstrated effective dental flossing technique and were able to remove the visible, disclosed plaque deposits. Evidence for this improvement in flossing technique is demonstrated by the statistically significant reductions of plaque scores over time. This finding supports the conclusions of other studies, namely that dental flossing technique plays a significant role in effective plaque biofilm disruption.^{9,32}

Subjects who participate in a study often exhibit compliance with behaviours that may or may not continue beyond the study's parameters. Daily compliance with dental flossing is historically low,^{11–14} but subjects in this study had high compliance with daily dental flossing, which had positive influences on the clinical parameters. Therefore, one must consider that it may not be the specific interdental aid that has a significant effect on the client's oral health status, but rather their compliance with daily self care. Oral health professionals need to provide continual oral health education and support for clients who demonstrate a readiness to change their oral self care behaviours to demonstrate the clinical benefits of daily interdental oral self care.

Although our study demonstrated no statistical difference between the interdental brush and dental floss for plaque scores, the interdental brush demonstrated statistically significant reductions in bleeding, a histological supported clinical manifestation of gingival inflammation.²⁵ It would appear that the interdental brush was disrupting the interproximal oral biofilm sufficiently

to cause a shift in the equilibrium towards gingival health compared to the dental floss sites. The results of our study support the recommendation of the interdental brush for oral self care in clients with intact interdental papillae, especially for clients who prefer not to use dental floss to achieve and maintain oral health.

Acknowledgement

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CDHA's professional publication, the *Canadian Journal of Dental Hygiene*, is now a quarterly issue. This important editorial decision was made with the intent to publish more scientific content in each peer reviewed issue, and ultimately, to be indexed on the world's largest medical and biomedical database, Medline. The publication dates are the first day of February, May, August, and November.

The editorial board welcomes research contributions, case reports, editorials, and letters to the editor from Canadian and international oral health professionals for consideration in the journal. The journal's *Guidelines for authors* provides key information to potential authors.

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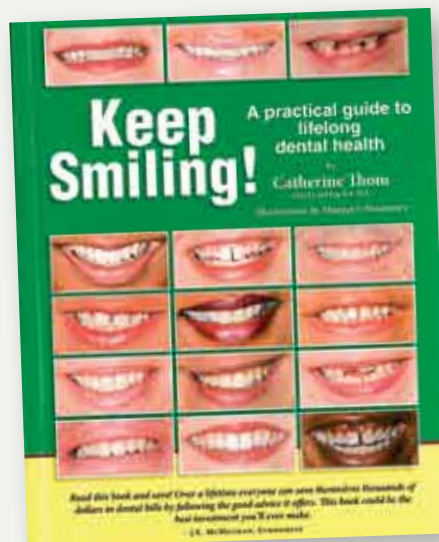
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Un appel à l'action

Le *Rapport des résultats du module sur la santé buccodentaire de l'Enquête canadienne sur les mesures de la santé 2007–2009*, qui a récemment été publié, est un bulletin de santé buccodentaire qui donne un aperçu de l'état de santé buccodentaire des Canadiens. Il s'agit d'un appel à l'action pour investir dans ce domaine. Tous les segments de la population ne jouissent pas au même degré d'une bonne santé buccodentaire en raison des disparités qui existent dans l'accès aux professionnels de la santé dentaire et qui touchent un groupe précis de la population.

RECOMMANDATIONS :

Le gouvernement fédéral collabore avec les provinces et les territoires à la révision de la *Stratégie canadienne de santé bucco-dentaire* (SCSBD) en s'appuyant sur les nouvelles données du *Rapport des résultats du module sur la santé buccodentaire de l'Enquête canadienne sur les mesures de la santé 2007–2009*. Un plan de mise en œuvre fédéral ou provincial sera intégré à la SCSBD et comprendra les activités suivantes, sans s'y limiter :

Ressources humaines en santé publique

- Le gouvernement fédéral collabore avec les gouvernements provinciaux ou territoriaux à l'élaboration d'un plan détaillé visant la promotion de la santé buccodentaire et la prévention de la maladie pour tous les

Canadiens, dans le cadre du continuum des soins de la *Loi canadienne sur la santé*.

- Le gouvernement fédéral investit 10 millions de dollars chaque année dans un fonds particulier pour permettre aux provinces de renforcer les ressources humaines en santé dentaire publique.

Collecte de données

- Intégrer un volet sur la santé buccodentaire dans l'*Enquête canadienne sur les mesures de la santé*, tous les cinq ans.
- En 2011, accorder du financement en vue de mener une enquête canadienne sur la santé buccodentaire des bébés, des jeunes enfants et des aînés.

Santé buccodentaire des Premières nations et des Inuits

- Le gouvernement fédéral travaille en collaboration avec les intervenants, y compris les organismes des Premières nations et des Inuits, pour élaborer un plan détaillé à long terme qui comprendra un financement garanti et stable afin d'aborder les questions liées à la santé buccodentaire qui seront relevées dans le rapport à venir sur la santé buccodentaire des Premières nations et des Inuits.

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Gendarmerie royale
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Programme de choix (PDC) 04 – services de soins dentaires

Hygiénistes dentaires – toutes les provinces

Décembre 2010

La Gendarmerie royale du Canada (GRC) est heureuse de vous informer qu'à compter du 15 septembre 2010, les services offerts par les hygiénistes dentaires autorisés seront approuvés dans les provinces où cette profession est réglementée.

Les services seront limités à ceux qui sont autorisés par l'organisme de réglementation provincial. Le paiement des réclamations sera effectué à 100 pour cent du guide des honoraires en vigueur dans les provinces où un guide d'honoraires est publié pour les hygiénistes dentaires autorisés. Lorsqu'aucun guide d'honoraires n'est en vigueur, le paiement sera fait selon les frais habituels et courants.

Veillez communiquer cette information à vos membres. Si certains de vos membres désirent de plus amples renseignements sur la façon de s'inscrire comme fournisseur de services, veuillez leur demander de communiquer avec Croix Bleue au numéro sans frais 1-888-261-4033.

À l'avenir, nous aimerions communiquer avec les membres de votre association par courriel. Une fois qu'ils sont des fournisseurs inscrits, ils peuvent visiter le site Web de Croix Bleue Medavie à www.medavie.croixbleue.ca. Sur le site, ils doivent cliquer sur le lien *Professionnels de la santé* et aller plus bas au lien *Mettre à jour vos coordonnées*. À cet endroit, ils doivent entrer l'adresse électronique à la page *Demande du fournisseur* ou *mettre à jour les coordonnées*. Les adresses électroniques seront ajoutées à la liste de distribution électronique de Croix Bleue Medavie et seront utilisées uniquement pour tenir vous et les membres de votre association au courant des changements importants apportés aux programmes et aux avantages (p. ex. : taux, fréquences, etc.), et ce, par courriel. Vous et vos membres pouvez aussi consulter le site Web de Croix Bleue Medavie pour visualiser tous les bulletins à l'intention des fournisseurs ainsi que pour télécharger et imprimer les formulaires de demande de règlement.

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Program of choice (POC) 04 – dental services

Dental hygienists – all provinces

December 2010

The Royal Canadian Mounted Police (RCMP) is pleased to advise you that effective September 15, 2010, services rendered by Registered Dental Hygienists will be approved in those provinces where this profession is regulated. Services will be limited to those allowed by the provincial regulating body. Payment of claims will be made at 100% of current fee guide in those provinces where a fee guide is published for Registered Dental Hygienists. In cases where no fee guide is in effect, payment will be made in accordance to usual and customary fees.

Please communicate this information to your members. If any of your members would like more information on how to become registered as a service provider, please ask them to contact Blue Cross toll-free at 1-888-261-4033.

In future we would like to communicate with your Association members by e-mail. Once they become registered providers, they can visit the Medavie Blue Cross website at www.medavie.bluecross.ca and click on the *Health Professionals* link, and then scroll down to the *Update Your Contact Information* link where they would enter their e-mail address on the Provider Application page or update other contact information. E-mail addresses will be added to the Medavie Blue Cross electronic mailing list and will only be used to keep you and your Association members up to date on important changes to programs and benefits (i.e. rates, frequencies, etc.) via e-mail. You and your members can also visit the Medavie Blue Cross website to view all provider bulletins, and to download and print claim forms.

An interprofessional education initiative between students of Dental Hygiene and Bachelor of Science in Nursing

Lynne Grant^Δ, RDH; Linda K. McKay^Δ, RDH, BScD; Lisa G. Rogers^Δ, RDH, BEd; Sandy Wiesenthal[§], RN, MN; Shari L. Cherney[§], RN, MHS; Lorraine A. Betts[§], RN, BSc, BScN

ABSTRACT

Introduction: Interprofessional education (IPE) is defined as occasions when two or more professions learn about, from, and with each other to improve collaboration and the quality of care. Nursing and dental hygiene students at George Brown College were brought together in an IPE initiative to learn about, from, and with each other in regards to the overlapping roles they share in oral health and blood pressure monitoring. The World Health Organization (WHO) has long advocated for “multiprofessional” education among undergraduate healthcare students to build “the skills necessary for solving the priority health problems of individuals and communities that are known to be particularly amenable to team-work”.

Discussion: The discussion will present developments the Ministry of Health and Long Term Care (MOHLTC) in Ontario, Health Force Ontario, the Registered Nurses Association of Ontario (RNAO) and the Office of the Chief Dental Officer (OCDO) are making to improve collaboration and quality of care within healthcare. The new National Competencies for Dental Hygiene also advocates such collaborative practices.

Findings: There is evidence of the connection between oral health and systemic health, and the increased need for proper daily oral health assessment and care for populations within acute and long term care. At present, members of the nursing profession whose scope of practice includes providing oral assessment and daily oral care are the front line caregivers for these populations. The increase in high blood pressure within the general population is also a priority health problem. Dental hygienists are front line health professionals in oral assessment and oral care education whose scope of practice includes taking blood pressure and pulse. **Conclusions:** The results of the Canadian Health Measures Survey (CHMS) show that approximately 70 per cent of the population sees an oral health practitioner on an annual basis. Dental hygienists are in an ideal position to monitor and screen for high blood pressure. This paper reports the lessons learned from the IPE initiative, rationales for continuing this initiative, and the future directions of this initiative in fulfilling aspects of the proposal by George Brown College (GBC) to implement IPE initiatives.

RÉSUMÉ

Contexte : La formation interprofessionnelle (FIP) se définit comme étant une source d'occasions pour deux professions et plus de s'instruire et de se former mutuellement afin d'améliorer la collaboration et la qualité des soins. Les étudiantes en soins infirmiers et en hygiène dentaire du Collège George Brown ont été réunies dans une initiative de FIP pour s'instruire et se former réciproquement sur le partage des rôles qui se recoupent dans les soins buccaux et le monitoring de la pression artérielle. L'Organisation mondiale de la santé (OMS) préconise depuis longtemps la formation « pluriprofessionnelle » des étudiantes en soins buccaux pour établir « les compétences nécessaires visant à résoudre les problèmes prioritaires de la santé des personnes et des collectivités qui se prêtent particulièrement au travail d'équipe ». **Discussion :** La discussion présente les échanges entre le Ministère de la santé et des soins de longue durée (MSSLDO) d'Ontario, ProfessionsSantéOntario, l'Association des infirmières et infirmiers autorisés de l'Ontario (AIIAO) et le Bureau du dentiste en chef (BDC) visant à améliorer la collaboration et la qualité des soins dans le cadre des soins de la santé. Les nouvelles Compétences nationales en hygiène dentaire préconisent de telles pratiques de collaboration. **Résultats :** Les données témoignent du lien qu'il y a entre la santé buccale et la santé générale et du besoin de plus en plus grand d'évaluer correctement et quotidiennement la santé buccale des populations sous soins intensifs de longue durée. Actuellement, les membres de la profession des soins infirmiers dont le champ de pratique comprend l'évaluation buccale et les soins buccaux quotidiens sont en première ligne du personnel soignant de ces populations. L'augmentation de la tension artérielle de la population en général est aussi un problème de santé prioritaire. Les hygiénistes dentaires sont en première ligne des professionnelles de la santé concernant l'évaluation buccale et l'éducation des soins de santé dont le champ de pratique comprend la tension artérielle et le pouls. **Conclusions :** Les résultats de l'Enquête canadienne sur les mesures de la santé (ECMS) montrent qu'approximativement 70 pour cent de la population consulte annuellement la praticienne en santé buccale. Les hygiénistes dentaires sont ainsi dans une position idéale pour surveiller et dépister la haute tension artérielle. L'étude fait état des leçons de l'initiative de FIP, les raisons de poursuivre l'initiative et les orientations à lui donner pour réaliser la proposition du Collège George Brown (GBC) sous ses divers aspects et mener à bien les initiatives de FIP.

Key words: interprofessional education, oral health, blood pressure, Dental Hygiene, Nursing

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[§] Faculty of Nursing, Community Services and Health Sciences, George Brown College

^Δ Faculty of Dental Hygiene, Community Services and Health Sciences, George Brown College

Correspondence to: Lynne Grant, Professor; lgrant@georgebrown.ca

Centre for Health Sciences, School of Dental Health, George Brown College, Toronto, Ontario

Introduction

This paper describes an interprofessional education (IPE) initiative involving students of Dental Hygiene (DH) and Bachelor of Science in Nursing (BScN) at George Brown College (GBC) in Toronto, Ontario. It focuses on the development of an IPE initiative within the IPE curriculum at GBC. This initiative is comprised of two distinct components: i.) oral health assessment/daily oral care, and ii.) blood pressure/pulse. It utilizes the connection between oral and systemic health as an agent for an interprofessional collaboration between the dental hygiene and nursing professions. Summaries of the feedback given by the students from each of the components are provided as well as suggestions for expansion of this initiative.

The scientific community that informs both dental and non dental healthcare professions, recognizes an association between oral and systemic health. As well, healthcare experts have called for action for collaborative approaches to address the need for interventions to improve health outcomes and quality of life. As a result, educational institutions are focusing effort and attention on defining their role in preparing healthcare workers for collaborative practice.

Development of initiatives within the IPE curriculum at GBC

In 2005, proposals were requested by the Centre for Health Sciences at GBC to develop and implement interprofessional education (IPE) curriculum pilot initiatives that supported the College's new *interprofessional education* learning outcomes.¹ See also Figure 1.

1. Appraise the relationship between one's own profession and the background, roles and scopes of other healthcare professions.
2. Evaluate one's ability to work in a team.
3. Participate collaboratively as a health team member to support patients/clients' achievement of their expected health outcomes.
4. Assess the impact of the broader legislative and ethical framework on inter professional practice.

At that time, an initiative was proposed and developed between the collaborative BScN (George Brown site) and the Dental Hygiene (DH) programs. It reflected the *Applied Interactive Activity involving two or more programs* which was one of the six possibilities that were recommended in the call for proposals. This initiative included two interprofessional learning components:

The first utilized 2nd year DH students to guide 1st year BScN students in the practice of oral assessment and daily oral care appropriate for cooperative long term care patients or clients.

The second involved 2nd and 3rd year students from the BScN program guiding 1st year DH students in the practice of taking a manual blood pressure and pulse.

Questionnaires were developed for students to complete anonymously at the end of each of the oral health and blood pressure sessions. The information gathered from the questionnaires has aided in the design and evaluation of both components of the IPE initiative for future iteration.

Design of the IPE initiative

1. Oral health component

This component consisted of eight 2nd year DH students, two DH faculty mentors, two hundred 1st year BScN students, and four BScN supervising faculty mentors. Over the course of four days in the simulation lab setting, dental hygiene student "teachers" facilitated the nursing student "learners" practice of daily oral assessment and oral care appropriate for cooperative patients. Each day consisted of two, 2-hour sessions, which served approximately fifty BScN student "learners". DH student "teachers" presented a short demonstration session about oral assessment, daily oral healthcare procedures and care for various oral prostheses (e.g., dentures). Following the demonstrations, simulation exercises began with DH student "teachers" assigned to clinician-patient teams of BScN student "learners". Time was provided for each BScN student "learner" to switch roles in the practice session. See Figure 2. The DH faculty provided guidance to both student "learners" and student "teachers".

2. Blood pressure component

Approximately fifteen volunteer 2nd year BScN students and three of their faculty mentors met at the GBC Dental Clinic to work with DH students and their supervising faculty during one of the pre-clinical health assessment sessions. The session began with a BScN student "teacher" demonstrating the skills for taking a manual blood pressure and pulse to each of four pairs of DH student "learners". Once the demonstrations were completed, the BScN student "teacher" returned to each DH student "learner" pair and facilitated the practice of the skills as demonstrated. See Figure 3. The BScN faculty provided guidance to both the student "learners" and student "teachers".

Student feedback from both components of this IPE initiative

At the end of the blood pressure and oral health components of this IPE initiative, questionnaires were given to the student "learners" and the student "teachers" to answer anonymously for the purposes of program development. Table 1 shows the statements that both the student "learners" and student "teachers" were asked to evaluate. Students were asked to rate their answers on a five point Likert scale, ranging from '1' (strongly disagree) to '5' (strongly agree). Students from GBC's Health Information Management Program, also a part of the Centre for Health Sciences, entered and analyzed the data from the questionnaires using SPSS version 17.

In both components of the initiative, the data revealed that students agreed or strongly agreed with the statements regarding accuracy of information presented, ease of understanding and knowledge level of the "student teachers". See Table 2. In addition, most, if not all, student "teachers" felt able to answer questions they were asked by the student "learners" (Box 7 and 17 in Table 2); and the student "learners" liked practising the skills with their student "teachers" (Box 9 and 19 in Table 2). Both student "learners" and student "teachers" reported that they enjoyed working with students from another profession

Figure 1. Interprofessional education experiences map.

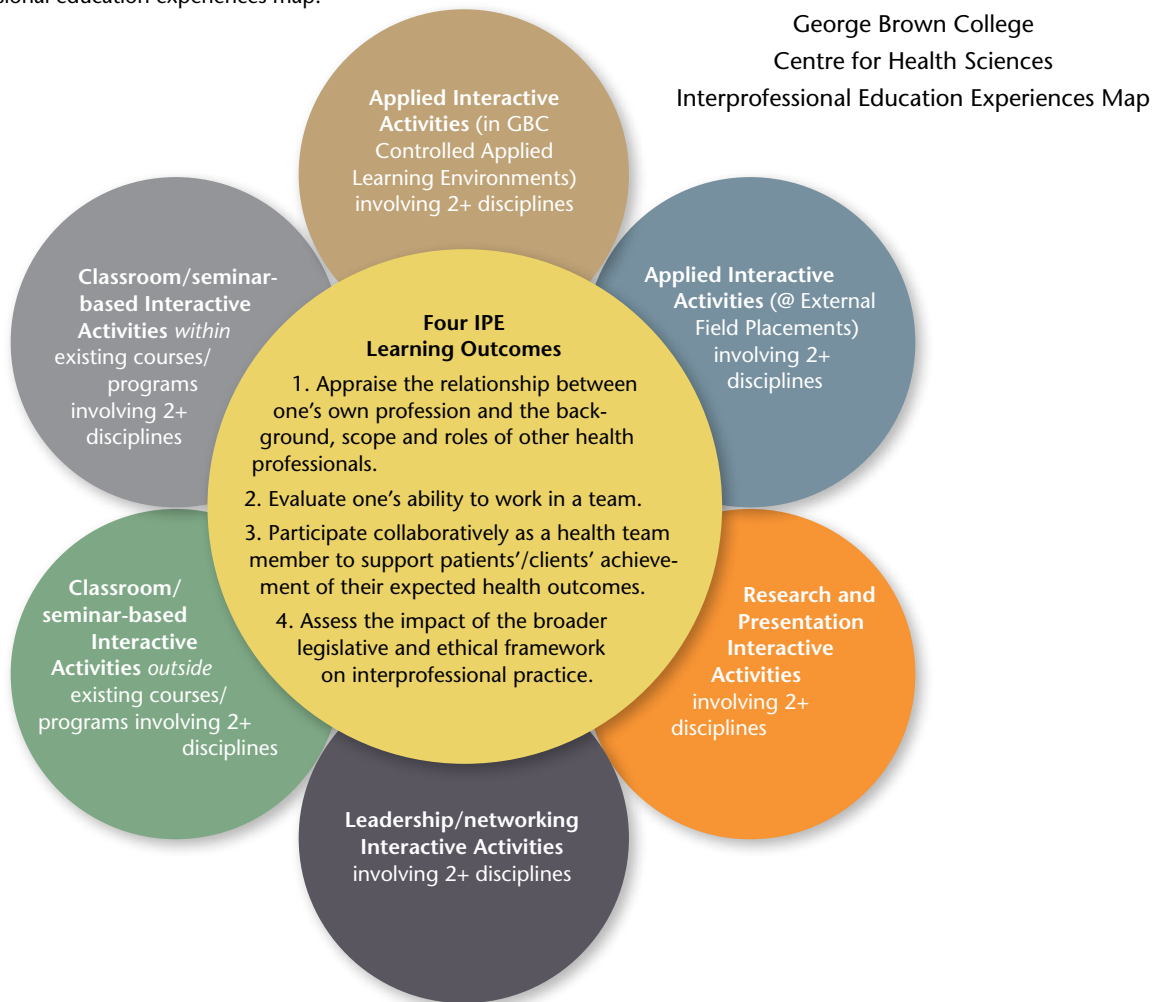


Figure 2. Flowchart of oral health component of IPE initiative.

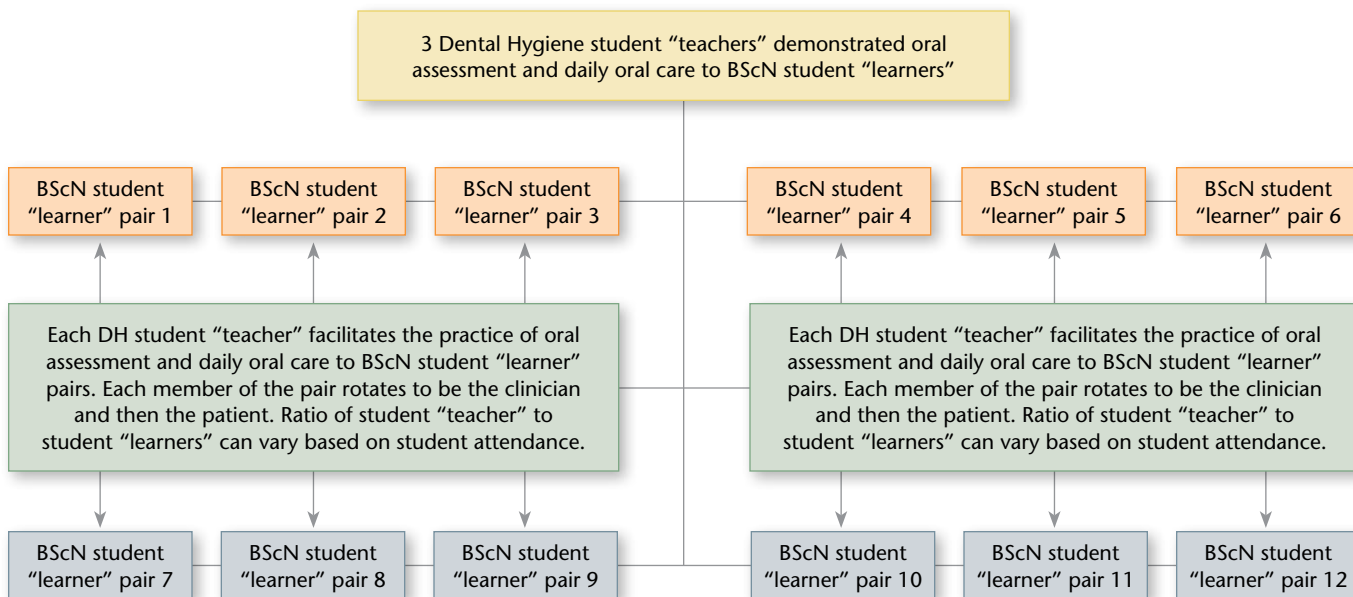
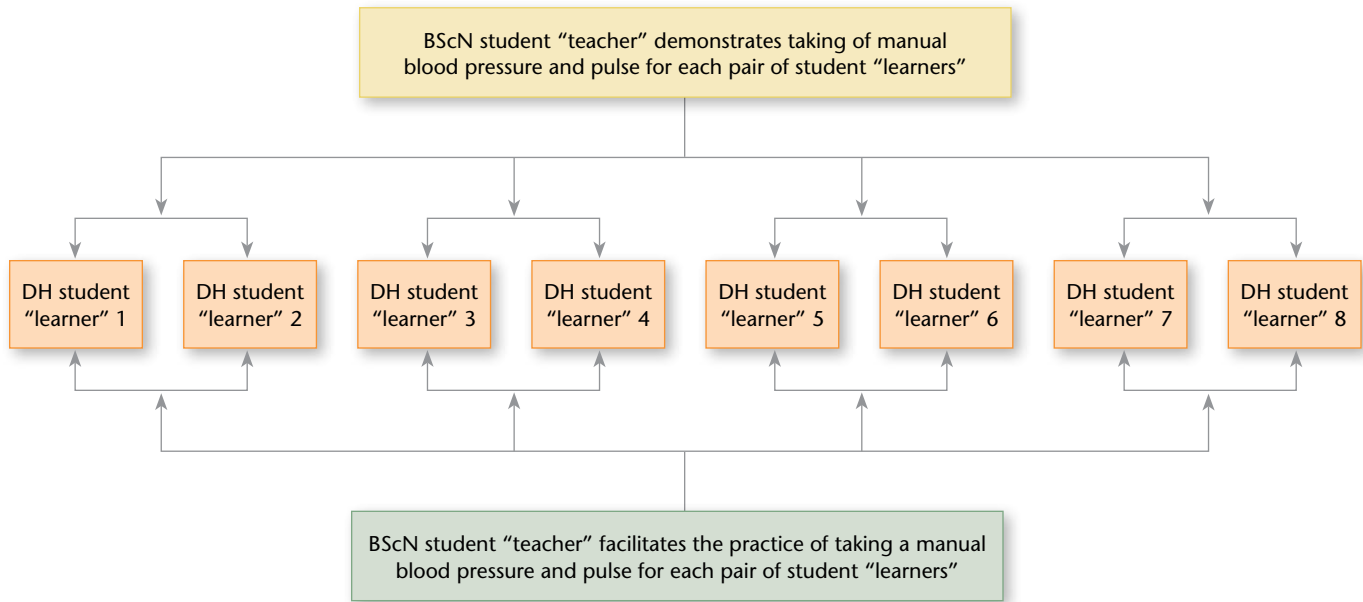


Figure 3. Flowchart of blood pressure component of IPE initiative.



(Box 5, 10, 15 and 20 in Table 2). The BScN student “teachers” all felt they understood the information that they were to demonstrate to the DH students about taking a manual blood pressure (Box 6 in Table 2).

However, in two instances the data revealed that students disagreed or strongly disagreed. In the first instance, DH student “teachers” in the oral health component felt that the BScN students did not have adequate understanding of the theory of oral assessment or daily oral care prior to the demonstration (Box 18 in Table 2). In the second, DH student “learners” in the blood pressure component reported that they would not feel comfortable taking a manual blood pressure and pulse after this one teaching session (Box 4 in Table 2).

Analysis of the questionnaires has provided feedback that has been utilized to improve both the oral health and blood pressure components of this IPE initiative.

Discussion

Call for collaboration from the scientific and healthcare community

The scientific community has indicated a low to moderate association between periodontal disease and heart disease, and a moderate association between periodontal disease and stroke.² Additionally, there is mounting evidence of a probable two way association between periodontal disease and diabetes.² Research is emerging regarding improved oral hygiene and the reduction in respiratory infections in long term care settings.³ There is also growing recognition of the importance of oral health to quality of life.³

The World Health Organization’s (WHO) 1948 definition of health⁴ states, “Health is a state of complete

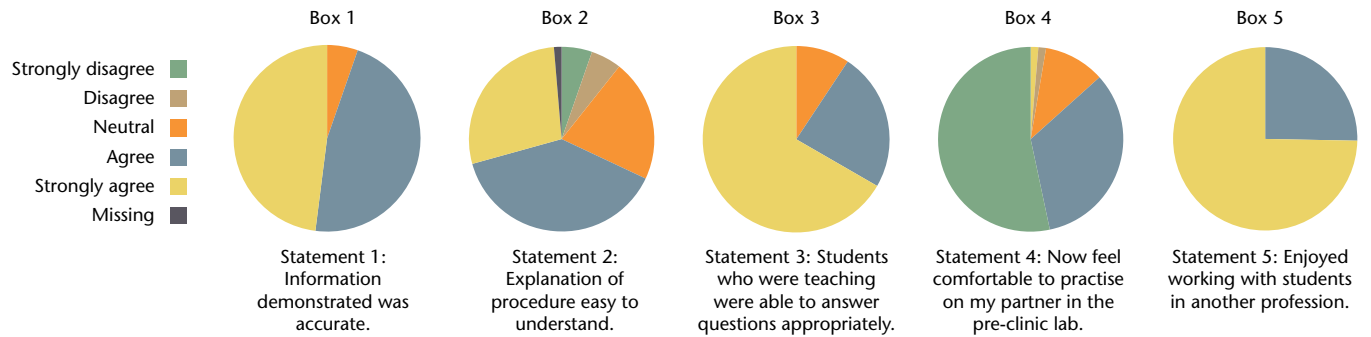
physical, mental and social well-being and not merely the absence of disease or infirmity.” With an ever increasing awareness of the connection between the health of the oral cavity and the health of the whole body, the American Surgeon General’s (ASG) report⁵, in 2000, focused on the relationship between oral health and overall good health throughout life. The report described the mouth as a “mirror for general health and well-being and the

Table 1. Statements from the student “learners” and student “teachers” questionnaires.

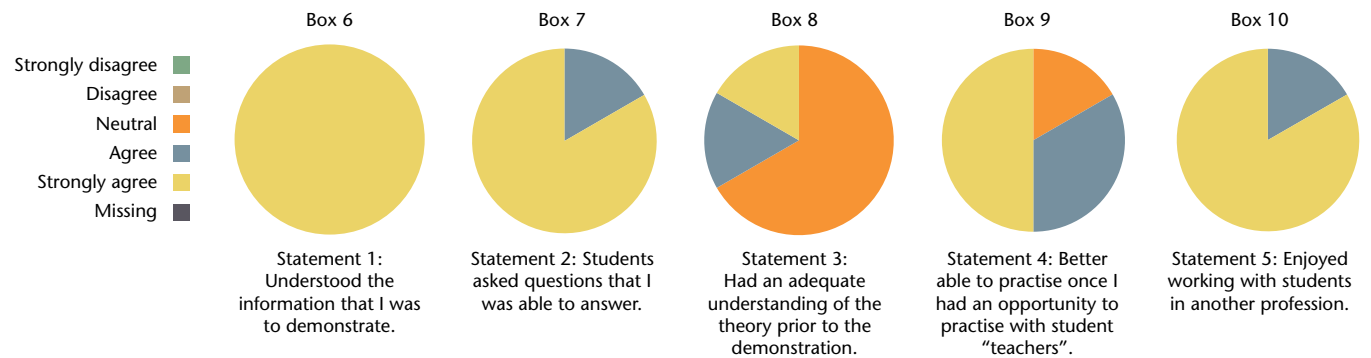
Statements for the student “learners” to evaluate	Statements for the student “teachers” to evaluate
1. The information demonstrated was accurate	1. I understood the information that I was to demonstrate
2. Explanation of the procedure was easy to understand	2. The students asked questions that I was able to answer
3. The students who were teaching were able to answer questions appropriately	3. The student learners had an adequate understanding of the theory prior to the demonstration
4. I now feel comfortable to practice on my partner in the pre-clinic lab	4. The student learners were better able to practice once I had an opportunity to practice with them
5. I enjoyed working with students in another profession	5. I enjoyed working with students in another profession

Table 2. Pie charts from student “learner” and student “teacher” questionnaires.

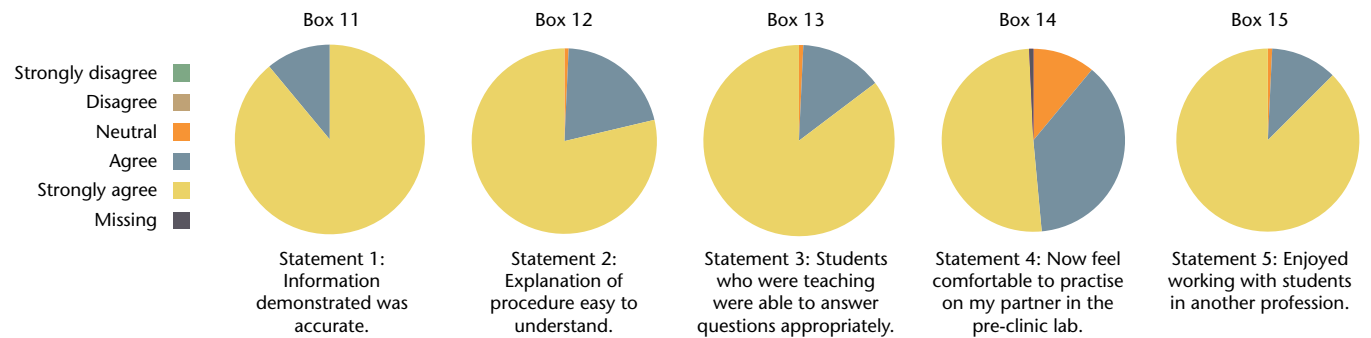
Questionnaire results from **Student “learners”** in the Blood Pressure Clinic



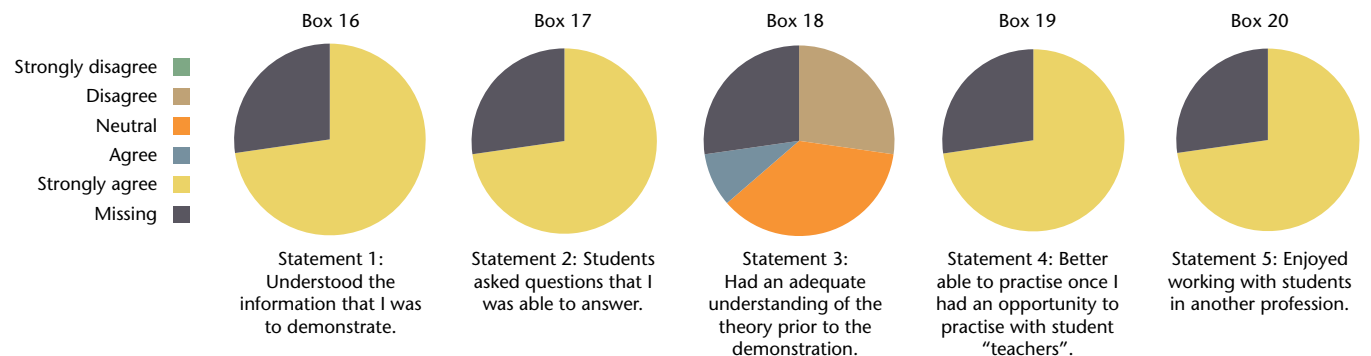
Questionnaire results from **Student “teachers”** in the Blood Pressure Clinic



Questionnaire results from **Student “learners”** in the Oral Health Clinic



Questionnaire results from **Student “teachers”** in the Oral Health Clinic



association between oral health problems and other health problems.”⁵ Lawrence and Leake⁶ in their article *Canadian Perspective of the US Surgeon General’s report on Oral Health* state that one of the calls to action within the report was to “educate non-dental health professionals about oral health and disease and their role in ensuring that patients receive good oral healthcare”. They also indicate that more research is needed as in the US, and that Canada should apply interventions that demonstrate effectiveness in eliminating oral health disparities.⁶ The philosophies of both the ASG and the WHO are increasingly recognized by governments, scientific communities, and members of the public. Additionally, in 2004, the Canadian government established the Office of the Chief Dental Officer (OCDO) to provide strategies to support the oral health of Canadians focused on increasing access to oral healthcare, and using a collaborative approach to health promotion.⁷

Oral health data from the *Canadian Health Measures Survey* (CHMS) were released in 2010.⁸ The CHMS, supported by both Health Canada and Statistics Canada, was undertaken to collect key information relevant to the health of Canadians. It provides a national baseline level of the oral health of Canadians including decayed, missing, filled teeth scores (DMFT) for Canadians from 6 to 79 years of age. The 2010 results show that only 6% of adult Canadians are edentulous. While, in 1972 data indicated the edentulous rate was 24%. This represents a vast improvement in the number of people who retain their teeth.⁸

The Chief Dental Officer of Canada also reports findings of the CHMS that demonstrate oral health disparities exist for a number of population groups. Key to addressing these disparities is research that asks why and how disparities occur, who are the most vulnerable, and what can be done to improve oral health for all.⁸ The Canadian Institutes of Health Research (CIHR) is currently investigating these issues. “This research is focused on finding ways to influence health and economic policies, education and dental services for the benefit of Canadians who have difficulty accessing oral healthcare”.⁸

There is evidence from Statistics Canada that the number of seniors in the Canadian population is rising—7.7% (1966) to 13.7% (2006).⁹ In the next twenty-five years it is projected that the population of seniors could nearly double.¹⁰ Also, life expectancy of Canadians stands at 82.5 years for women and 77.7 years for men.¹⁰ Eighty-seven per cent of older women and 92.7% of older men say they have one or more chronic health problems.¹¹

Since Canadians are living longer and retaining their teeth there is a demonstrated need for health professionals to be experienced in oral assessment and daily oral care, particularly when working with vulnerable populations such as those in either acute or long term care. There is a growing consensus that health professionals working as partners, in a team approach, will produce better health outcomes, improved access to services, improved use of resources, and greater satisfaction for both patients and providers. Such teams are better positioned to focus on health promotion and to improve the management of chronic diseases.¹²

Health Force Ontario is a provincial government body

that addresses Ontario’s health human resource needs to ensure that Ontarians have access to the right number and mix of qualified healthcare providers, now and in the future.¹³ Health Force Ontario has been engaging partners in education and healthcare to develop skilled, knowledgeable providers, and to create interprofessional healthcare delivery teams. The implementation of interprofessional care is to provide comprehensive health services to patients or clients by multiple health care givers, who work collaboratively to deliver quality care within and across healthcare settings.¹⁴ Interprofessional care has the potential to provide the needed services to Ontarians. The education system needs to prepare current and future health professionals to work in multidisciplinary, collaborative, team based models. The BScN–DH initiative provides a partnership and collaboration to enhance the outcomes of improved oral assessment and daily oral care for the public.

Additionally, changing guidelines from the Ministry of Health and Long-Term Care regarding oral assessment and daily oral care for residents within long term care are becoming more precisely defined. Nurses are the front line delivery health professionals responsible for assessing oral health status and implementing daily oral care within acute or long term care settings. Dental hygienists can provide knowledge and expertise to nurses for outcomes required by government and nursing regulatory bodies. Dental hygienists are well positioned to work as integrated members of healthcare teams addressing oral health issues across a continuum of care in conjunction with physicians, radiation therapists, dentists, social workers, occupational therapists, registered dietitians and most importantly, patients or clients.

The recent *Long Term Care Home Act*¹⁵ in Ontario places the care of the mouth for residents in long term care [LTC] under the skin and wound care program for LTC facilities. The *Standards and Criteria for Resident Care and Services*¹⁶ implemented in 2006 by the Ontario Ministry of Health and Long Term Care (MOHLTC) indicated that each LTC home operator shall develop and follow policies on the management of skin care, including care of the skin, nails, feet and mouth. An interdisciplinary team shall coordinate the LTC home operator’s program of skin care and wound management. This interdisciplinary team shall include a skin care coordinator and a regulated health professional who will coordinate the required expertise to educate and support the team on skin care and wound management, and knowledge of current “best practices”.¹⁶ In addition, the Registered Nurses Association of Ontario (RNAO) released *Nursing Best Practice Guidelines on Oral Health: Nursing Assessment and Interventions*.¹⁷ The target users of the guidelines are nurses in various practice settings who work with vulnerable populations of those who need assistance to meet their oral hygiene needs. Nursing faculty in the collaborative Bachelor of Science in Nursing (BScN) program at the George Brown College site recognized the opportunity for improved education for nursing students related to oral health assessments and daily oral healthcare in acute and chronic care facilities.

Dental hygienists work with their clients to establish a

dental hygiene treatment plan that includes disease prevention, therapeutic interventions, and appropriate referrals. Recent amendments to the *Dental Hygiene Act*¹⁸ in Ontario allow the public increased access to dental hygiene services. This access creates the potential for more Ontarians to be assessed for oral health problems that may impact their overall health. Moreover, it provides an opportunity for dental hygienists to work with other health professionals in multiple practice settings to ensure that the oral health needs of Ontarians are addressed safely, effectively, and efficiently.¹⁸ As a result, dental hygienists are now even better positioned to be part of the interdisciplinary team identified by the *LTCHA* required to educate and support staff on skin care and wound management, and knowledge of current best practices.

New *National Dental Hygiene Competencies for Entry-to-Practice* were developed and released in 2008.¹⁹ One of the domains calls for dental hygienists to be communicators and collaborators. This is supported by competencies from the Public Health Agency of Canada²⁰ which states

“Communication involves an interchange of ideas opinions and information. This category addresses numerous dimensions of communication including internal and external exchanges; written verbal, non-verbal and listening skills; computer literacy; providing appropriate information to different audiences; working with the media and social marketing techniques. Collaboration captures the abilities required to influence and work with others to improve the health and well-being of the public through the pursuit of a common goal. Partnership and collaboration optimize performance through shared resources and responsibilities.”

During the oral health component of the IPE initiative, both students and faculty had an opportunity to experience each other’s professional language, and learned that this is a necessary step for improved communication between health professionals. By way of example the term *calibration* was used by nursing and dental hygiene faculty during the blood pressure component to mean distinctly different things. BScN faculty defined the term “calibration” as a “measurement for the blood pressure instrument”, while the DH faculty use the term to refer to “consistency of knowledge and skill among clinical teaching faculty”. It demonstrated the confusion that can result and the need for good communication skills when working in an interprofessional team.

Both components of this IPE initiative provided the opportunity for all participating students to observe and better understand the importance of communication professionals within the healthcare community. An improved understanding puts students closer to being “workplace ready”; a concern which is high on the list of priorities for employers.²¹

Findings

Lessons learned from this IPE initiative

There have been many lessons learned by both students

and faculty over the multiple iterations of this initiative. The lessons students learned are summarized below.

1. Students report recognizing how much they have learned when given the opportunity to teach others outside their profession.
2. Students learned there are shared skill sets across the dental hygiene and nursing professions.
3. BScN student “learners” discovered that dental hygienists need to take a manual blood pressure and pulse.
4. DH student “learners” discovered that nurses are responsible for providing daily oral healthcare for clients in acute and LTC settings.
5. BScN student “learners” recognized that there are differences in the roles of a DH and a Dental Assistant (DA).
6. DH student “learners” gained insight into the various types of nursing professionals such as a BScN, a Registered Practical Nurse (RPN) and a Personal Support Worker (PSW).
7. BScN faculty recognized the need for additional Personal Protective Equipment (PPE) when providing oral care to patients (i.e., eye protection, masks and gloves).
8. DH faculty recognized the need for improved bedside ergonomics for providers of oral care to patients or clients.

The challenges and lessons learned by faculty members related to both components of this initiative are reported in the list below.

1. The first and most persistent challenge in this type of endeavor is scheduling:
 - i. There is a complexity about time tabling across two programs and two campuses that requires specific focused attention to lab availability, supplies, and time to coordinate the initiative.
 - ii. Scheduling issues create logistical challenges on other involved faculty members not directly involved in both programs related to pre-existing class times and clinics.
 - iii. Students who participated and then had to make up any missed regularly scheduled clinics or labs were also affected by this initiative’s scheduling. Both programs continue to review strategies in future planning to consider ways in which more seamless scheduling can minimize or eliminate missed classes or clinic time.
2. Flexibility and a willingness to work together are essential to make a project of this nature work.
3. An overview of the principles and benefits of IPE for students and faculty is critical to the success of the project.
4. The feedback from the student “teachers” questionnaire regarding the need for better understanding of theory prior to the demonstration of the skill has resulted in provision of additional up to date resources related to the theory of oral assessment and daily oral care to the BScN faculty.²² These up to date resources will now be available for nursing student “learners” by the nursing faculty in future

iterations of this IPE initiative.

5. Feedback from DH student “learners” blood pressure and pulse questionnaires informed faculty of the need to implement additional practice sessions for DH students in the health promotion centre. Nursing students are onsite weekly to provide assistance to all health sciences students who are practising the skill of taking a manual blood pressure and pulse. This provided students with another interprofessional opportunity. It was determined that 3rd year BScN students were better suited to be student “teachers” due to the extra year of gained experience in their learning regarding vital signs.
6. This initiative allowed us to think more broadly about partnerships. Accordingly we connected with students from the Health Services Management program who entered and analyzed the data from the questionnaires. While they contributed to the project outcomes, they were not a part of the IPE education dynamic, as they did not learn about, from and with the BScN and DH students. Attention to this will be necessary in future endeavours to ensure that the most is made of the partnership.
7. The initiative allowed faculty who normally do not have an opportunity to work together to collaborate, and to realize that the IPE benefits extend beyond students and patients or clients to the faculty members themselves.

Recommendations for future IPE initiatives

Faculties are now focused on better defining learning outcomes specific to this initiative. In addition, work continues on how best to evaluate interprofessional experiential learning as a sustainable aspect of the curricula of both programs. Currently, all 1st year students in the BScN program participate in the oral health initiative. It is felt that students in the Registered Practical Nurse (RPN) and Personal Support Worker (PSW) programs should participate in an oral health IPE initiative as they are the health professionals most likely to be providing this care. It is suggested that all DH students would benefit from participation in this type of initiative to enhance communication and interprofessional collaboration as outlined in the new *National Dental Hygiene Competencies for Entry-to-Practice*.¹⁸ As well, it is believed that all BScN students would benefit from participating in a manual blood pressure and pulse IPE initiative with other health science students who are in need of learning this skill. Furthermore, there is a need to establish academic credit for students participating in IPE initiatives to embed effectively interprofessional education within curriculums.

Efforts are underway to expand the oral health aspect of this project into settings where both DH and BScN students have clinical experiences within common long term care and rehabilitation centres. It is believed that collaborative problem solving between the two professional groups “in the field”, regarding the oral care needs and challenges of selected clients, could result in improved quality of oral care for clients and expanded and improved skills amongst the students.

In addition to the lessons learned, we offer the following thoughts and recommendations for those considering an initiative of this nature:

1. Choose a primary skill or competency from your health profession that is also a skill or competency that can or is required to be performed by another health professional.
2. Be flexible in making arrangements and willing to think “outside the box”.
3. Implement a pilot version first. Include an evaluation component to survey the student participants for their feedback from both the pilot and newly implemented activities.
4. Plan joint debriefing sessions for the faculty involved.
5. Plan debriefing sessions for the student “teachers” involved.
6. Schedule adequate planning time for each academic year.
7. Schedule voluntary focus groups for student “learners” for further feedback.

Conclusion

The scientific and healthcare communities indicate the need for collaborative interprofessional approaches to care that are initiated in the education of health professionals. Furthermore, evidence is clear that there is an association between the health of the oral cavity and the health of the whole body.^{2,3} Heart disease, strokes, diabetes, and respiratory disease are among the top chronic diseases afflicting the general population¹¹ which could potentially relate to increased costs to the healthcare system. Added to that are the ever increasing numbers of the population moving into their senior years who are expected to live longer and retain their dentitions. This IPE initiative is an effective vehicle to enable all BScN, RPN, PSW, and DH students to learn about, from and with each other, and this initiative lends itself to the development of interprofessional teams of students. Our hope is that IPE initiatives such as those we have described and experienced will be a model for others in establishing IPE learning opportunities for their students.

In closing, it is critically important to state that while it was beyond the scope of this initiative, it is recognized that properly designed research is required to better test the outcomes from an IPE initiative of this nature. Any future research should also include following graduates into their practice settings to determine the extent that these interprofessional learning experiences have informed their professional practice.

Acknowledgement

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Évaluation par les pairs : Tous les articles sont d'abord soumis à une réviseuse scientifique qui en vérifie la pertinence, avec l'aide du comité de rédaction. Les articles retenus sont alors soumis à un comité d'évaluation par les pairs formé d'au moins deux personnes. On peut aussi solliciter au besoin un avis de spécialiste, de la statistique par exemple.

Révision : Lorsqu'un manuscrit est renvoyé aux auteures correspondantes pour révision, la version révisée doit être présentée dans un délai de 6 semaines après réception de l'avis des lectrices spécialisées. Les auteures indiquent ensuite par courrier si elles acceptent ou réfutent les révisions. Le retour d'un manuscrit révisé est alors considéré comme étant une nouvelle soumission. La directrice de l'édition peut, à sa discrétion, allouer sur demande plus de temps pour la révision.

Un appel de réévaluation peut être adressé par courriel à la rédactrice scientifique (journal@cdha) qui le fera suivre au Comité consultatif de la recherche de l'ACHD. Les membres du comité peuvent acquiescer à la demande ou la rejeter, mais les auteures ne pourront pas demander un deuxième appel.

Les composantes du manuscrit :

1. **Page de titre** : Le titre doit désigner clairement le contenu de la soumission en 12 mots. Il devrait être suivi du nom de chacune des auteurs (prénom, initiale et nom de famille) ainsi que leurs titres universitaires et leurs institutions. Nom de l'auteur correspondante, adresse postale et courriel. Toutes les auteures doivent avoir participé suffisamment à l'ouvrage pour en assumer le contenu.
2. **Résumé** : Il ne doit contenir ni références ni titres de section. En voici les formats typiques :
 - a. **Compte-rendu d'étude et de recherche** : Contexte (question à l'étude, problème traité et raisons); Méthodes (comment l'étude a été effectuée); Résultats (principales données statistiques); Examen et conclusion (ce que les auteures ont tiré des résultats).
 - b. **Revue de la littérature** : Contexte (sujet ou procédure examinés); Méthodes (stratégie suivie, avec données de base); Résultats et discussion (constatations et analyse de la documentation); Conclusion (ce que les auteures ont tiré de l'analyse).
 - c. **Exposé de principe** : (même structure que la précédente)
 - d. **Observation**: Introduction (nature générale de la condition ou du programme); Description du cas (avec données); Discussion (du cas fondée sur la documentation), Conclusion.
3. **Mots clés** : Fournir une liste de 6 mots clés tout au plus ou de courtes phrases extraites du texte aux fins d'indexation. On

utilisera de préférence les termes de la liste *Index Medicus* du *Medical Subject Headings* (MeSH).

4. **Texte**

a. **Compte-rendu d'étude et de recherche** : Travail original d'exploration sur les questions faisant l'objet de la recherche. La présentation de l'étude variera selon le type de recherche. **Introduction** : Énoncé concis du contexte et des raisons de l'étude. Elle devrait comprendre l'objet de l'étude et sa pertinence pour la pratique et la profession. Un bref aperçu des principaux thèmes tirés de la littérature courante indiquera le contexte permettant de comprendre l'objet de la recherche. **Méthodes** : Description claire de la méthodologie, y compris au besoin l'information afférente (nom et adresse du fabricant; ville-État-province-pays). Le plan de recherche doit être clair et approprié au sujet traité. **Approbation déontologique** : Toute recherche utilisant des êtres humains ou des animaux doit, selon le cas, s'accompagner d'une déclaration explicite attestant l'examen et l'approbation de chaque étude par un comité de déontologie, conformément à l'*Énoncé de politique des trois Conseils : Éthique de la recherche*, ou la Déclaration d'Helsinki. Les éditeurs se réservent le droit de refuser un article s'ils doutent que la procédure appropriée ait été suivie. **Résultats** : Suite logique selon la méthode utilisée. Les données tabulaires devraient comprendre les statistiques des tests pertinents fondés sur les tests statistiques utilisés. **Discussion** : Interprétation des travaux à la lumière des autres travaux déjà publiés dans l'aire de recherche. Elle devrait souligner la contribution de l'étude à la pratique de l'hygiène dentaire ainsi que ses limites. **Conclusions** : Tirées de l'ensemble de l'étude originale dans le contexte de la littérature sur le thème étudié. On peut aussi souligner d'autres aires de recherches futures pour soutenir le développement des connaissances dans le secteur.

b. **Revue de la littérature** : Synthèse des travaux publiés dans une aire de recherche particulière. Sa structure peut varier, allant de la revue systématique à un survol moins organisé de la documentation. Elle doit cependant être organisée logiquement. L'on encourage l'utilisation de tableaux, d'illustrations et de photographies. **Objet** : Énoncé concis du contexte et raisons de l'investigation. Il devrait en comprendre l'intention et la pertinence à la pratique et à la profession. **Méthodes** : Brève description des stratégies de recherche utilisées, notamment les bases de données consultées et les mots-clés utilisés dans les recherches. L'on documentera aussi les critères d'inclusion et d'exclusion, le cas échéant. **Résultats et discussion** : Résultats de la revue de la littérature, comparaisons et contrastes, ainsi qu'un relevé des écarts entre les résultats. **Conclusion** : Implications de l'enquête pour la pratique et la profession. La conclusion doit se fonder sur la littérature analysée.

c. **Exposé de principe** : L'organisme soutenant l'énoncé doit être indiqué visiblement. Structure ouverte avec sous-titres selon la pertinence au sujet traité.

d. **Observations** : Présentation de cas qui apportent un éclairage particulier pour la prise de décision face aux problèmes de la pratique. Le cas en question devrait différer dans une certaine mesure de ce que l'on considère comme étant un problème commun rencontré dans la pratique. Par exemple, il pourrait s'agir d'une perspective ou d'un défi unique en matière de diagnostic ou de traitement. Ce peut être aussi une question relevant d'un programme ou d'une intervention unique et de ses résultats. Les auteures doivent présenter le consentement écrit de la clientèle identifiée dans le texte ou toute illustration au moment de la soumission du manuscrit, sans lequel celui-ci ne serait pas considéré. **Introduction** : S'il s'agit d'un cas clinique, énoncé du problème en question et bref aperçu de la maladie ou de la condition. S'il s'agit d'un cas de santé ou d'éducation affectant une collectivité ou une population, il faut décrire le problème ou la situation qui fait l'objet de l'étude. Quel avantage tirera-t-on de sa lecture? **Description du cas** : Caractère démographique de la clientèle ou population

- étudiée, avec intervention(s) cliniques ou autres. Si la prise en charge de la clientèle ou de la situation a impliqué la participation d'une équipe, décrire brièvement le rôle de chaque professionnel de la santé et donner les résultats des actions ou interventions. **Discussion** : Appréciation des résultats en regard de la documentation. À quoi devrait-on s'attendre particulièrement dans ce cas ou dans une situation semblable ? **Conclusions** : Implications de l'étude pour la pratique clinique, les soins communautaires ou l'éducation publique. La conclusion doit se fonder sur le ou les cas présentés.
- e. **Tribune libre** : Discussion ou expression équilibrée d'opinions sur les questions d'actualité soulevées dans la profession d'hygiéniste dentaire, ou réactions à des articles déjà publiés dans le journal dans les 6 mois précédents. La directrice de l'édition se réserve le droit de réviser les textes à des fins de clarté, mais le courrier ne sera pas soumis à l'évaluation par les pairs.
 5. **Remerciements** : Reconnaissance de l'aide ou du soutien apporté par les personnes, organisations, institutions ou entreprises. Les personnes ou organismes mentionnés doivent avoir consenti, document à l'appui, à la publication de leurs noms, vu que cela peut laisser entendre qu'elles adhèrent au contenu, aux données ou aux conclusions de l'article.
 6. **Conflit d'intérêts** : Aux fins de transparence, les auteures doivent déclarer tout intérêt concurrent dans leur soumission, tel le financement de la recherche pour l'étude.
 7. **Maquette** : Elle comprend les illustrations, figures, photos, graphiques et toute autre expression graphique qui soutiennent ou rehaussent le texte dans le format de leurs fichiers originaux (fichiers sources).
 - Sont acceptables les formats de fichier .eps, .pdf, .tif, .jpg, .ai, .cdr haute résolution, prêts à imprimer :
 - i. minimum de 300 dpi pour les gammes de gris et les demi-teintes couleurs,
 - ii. 600 dpi pour les dessins au trait,
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 - Les illustrations en couleur doivent toutes être en mode couleur CMYK (et non en RGB).
 - Elles devraient être numérotées à la suite les unes des autres et indiquées dans le texte.
 - Les auteures doivent présenter une attestation par écrit du consentement de la source pour toute reproduction documentaire et en faire état dans la légende.
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 8. **Données et tableaux** : Présentation en format Excel ou Word. Ces tableaux et données peuvent aussi être inclus à la fin du document Word.
 9. **Abréviations et unités** : Elles doivent être conformes au Système international d'unités (SI). On peut utiliser les symboles SI et les symboles des éléments chimiques sans les définir dans le corps de l'article. Les abréviations doivent être indiquées entre parenthèses après la première mention de l'expression concernée dans le texte; ne pas dresser de liste d'abréviations.
 10. **Information supplémentaire** : Toute information supplémentaire doit être fournie dans son format définitif, car elle ne sera pas corrigée et paraîtra en ligne exactement comme elle aura été présentée. Veuillez vous renseigner auprès de la Rédaction avant d'envoyer des fichiers de plus de 1 Mbit. L'information supplémentaire est une matière évaluée par les pairs, qui a directement rapport avec les conclusions de l'article mais qui ne peut être incluse dans la version imprimée à cause des contraintes d'espace ou de format. Elle est affichée dans le site Web du journal et rattachée à l'article quand celui-ci est publié et peut comprendre du texte additionnel, des illustrations, des vidéos ou des tables exhaustives. Les sources d'information supplémentaire doivent être indiquées dans le texte et l'on doit faire parvenir à la Rédaction l'autorisation de s'en servir en même temps que la soumission.

11. Ressources utiles pour l'auteur :

<http://www.equator-network.org/index.aspx>
<http://icmje.org/>
<http://www.biomedcentral.com/1472-6947/5/15>

12. **Style des références et citations** : La présentation des références s'inspire du style Vancouver, le préféré des journaux médicaux. Les références devraient être numérotées dans l'ordre où elles sont citées dans le texte. Une référence citée plus d'une fois dans un même texte conservera toujours son numéro et l'auteur en fera rappel en utilisant des adverbes ou abréviations telles que *op cit*, *ibidem* ou *ibid*. On utilisera des chiffres arabes en exposant pour identifier les références dans le texte (e.g. ^{1,2} ou ³⁻⁶). La liste de la section Références suivra l'ordre numérique paraissant dans le texte. http://www.nlm.nih.gov/bsd/uniform_requirements.html

Samples

Journal articles
 Books and other monographs
 Other publications
 Unpublished material
 Electronic material

Journal articles

Standard article

Orban B, Manella VB. A macroscopic and microscopic study of instruments designed for root planing. *J Periodontol*. 1956;27:120-35.

Volume with supplement

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Austin C, Hamilton JC, Austin TL. Factors affecting the efficacy of air abrasion

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Personal authors

Hooymann NR, Kiyak HA. *Social gerontology: a multidisciplinary perspective*. 6th ed. Boston: Allyn & Bacon; 2002.

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Cairns, J Jr, Niederlehner BR, Orvosm DR, editors. *Predicting ecosystem risk*. Princeton (NJ): Princeton Scientific Publications; 1992.

No author

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Weinstein L, Swartz MN. Pathological

properties of invading organisms. In: Soderman WA Jr, Soderman WA, editors. *Pathological physiology: mechanisms of disease*. Philadelphia: WB Saunders; 1974. p. 457-72.

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Calder BL, Sawatzky J. A team approach: providing off-campus baccalaureate programs for nurses. In: Doe AA, Smith BB, editors. Proceedings of the 9th Annual Conference on Distance Teaching and Learning; 1993 Sep 13-15; Ann Arbor, MI. Madison (WI): Ann Arbor Publishers; 1993. p. 23-26.

Scientific or technical report

Murray J, Zelmer M, Antia Z. *International financial crises and flexible exchange rates*. Ottawa: Bank of Canada; 2000 Apr. Technical Report No. 88.

Personal communication

These should be cited in parentheses in the body of the text. The author should

obtain permission from the source to cite the communication.

Other publications

Newspaper article

Rensberger B, Specter B. CFCs may be destroyed by natural process. *Globe and Mail*. 1989 Aug 7;Sect. B:24.

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Wood RM, editor. *New horizons in esthetic dentistry* (videocassette). Chicago: Chicago Dental Society; 1989.

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National Library of Canada. *Canadiana quick reference* [monograph on the Internet]. Ottawa: The Library; 2000 [cited 2003 Nov 30]. Available from: <http://www.nlc-bnc.ca/8/11/index-e.html>

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Walsh MM. Improving health and saving

lives. *Dimensions Dent Hyg* [serial on Internet] 2003 Nov/Dec [cited 2004 Jan 12] Available from: http://www.dimensionsof-dentalhygiene.com/nov_dec/saving_lives.htm

Homepage/web site

Canadian Dental Hygienists Association [homepage on the Internet]. Ottawa: CDHA; c1995 – [cited 2003 Nov 20]. Available from: <http://www.cdha.ca/>

(Last updated: October 2010)

■ **President's message**, *Dental hygienists as communicators and collaborators...*continued from 3

to long term care facilities, publishing evidence based literature for allied health professions, setting up advocacy programs, or learning the fine art of grant writing ... ? The world is your oyster.

I encourage you to become an engaged participant of a community of communicators. Exchange ideas and advance the profession through sharing, mentoring, and collaboration. In the wise words of Mahatma Gandhi: *You must be the change you want to see in the world.*

The future is bright. The future is you.



■ **Message de la présidente**, *Une promotion à l'œuvre ! Une étape à la fois...*suite 3

Participez activement à l'ACHD. Dites à votre association ce dont vous avez besoin pour progresser dans la profession. Préférez-vous apprendre dans les webinaires traitant de sujets comme la rédaction de demandes de propositions (RDP) de contrats de services en soins buccaux aux établissements de soins à long terme, la publication d'une littérature fondée sur des données probantes pour les professions connexes de la santé, la création de programmes d'intervention ou d'apprentissage de l'art de rédiger des demandes de subventions... Le monde vous appartient.

Je vous encourage à devenir une participante engagée dans une communauté de communication. Échangez des idées et faites progresser la profession par le partage, le mentorat et la collaboration. Comme le dit le Mahatma Gandhi : Vous devez être le changement que vous voulez voir dans le monde.

L'avenir est brillant! L'avenir, c'est vous!

Editor's note:

A link to the Educators Community can be found on the homepage of the CDHA website, www.cdha.ca. Follow us on **Facebook** <http://www.facebook.com/theCDHA> and on **Twitter** <http://twitter.com/theCDHA>

Contribute to the blog **Grassroots** on the CDHA website <http://community.cdha.ca/welcome.htm>  ©CDHA

Note de la rédaction :

Le lien avec Educators Community se trouve sur la page d'accueil du site Web de l'ACHD, www.cdha.ca. Suivez-nous sur **Facebook** <http://www.facebook.com/theCDHA> et sur **Twitter** <http://twitter.com/theCDHA>

Contribuez au blogue **Grassroots** sur le site Web de l'ACHD <http://community.cdha.ca/welcome.htm>  ©CDHA

Canadian Journal of Dental Hygiene — STUDENT SUBMISSIONS

Senior students in an undergraduate degree or diploma program are encouraged to work with their faculty members as mentors and submit their work for publication in the *Student Corner* of the journal. Submissions to be no longer than 4,000 words, and can include as many references as required.

Manuscripts must be accompanied by a letter from a faculty member indicating approval of the submission.

We proudly announce that the first accepted peer reviewed student submission will be published in our next issue, volume 45.2 (May 2011); *An overview of health behavioural change theories and models: Interventions for the dental hygienist to improve client motivation and compliance* by Shannon M. Collins, Camosun College, Victoria, British Columbia.



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ⁱ Canadian Cancer Society & National Cancer Institute of Canada. (2009). Canadian Cancer Statistics 2009. Toronto: Canada. Retrieved on February 10, 2010 from http://www.cancer.ca/canada-wide/about%20cancer/cancer%20statistics/~/_media/CCS/Canada%20wide/Files%20List/English%20files%20heading/pdf%20not%20in%20publications%20section/Stats%202009E%20Cdn%20Cancer.ashx. P. 65.

ⁱⁱ Laronde, D. et al. Oral Cancer: Just the Facts. JCDA. 2008; 74(3): 269.

ⁱⁱⁱ SEER Cancer Statistics Review, 1975-2006. Bethesda, Md: US Department of Health and Human Services. Available from: http://seer.cancer.gov/csr/1975_2006/browse_csr.php?section=20&page=sect_20_table.07A.html



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■ ED's Corner 2011, A focus on priorities...continued from 7

tunity to collaborate with other provinces to build on the culture of public awareness in the role of dental hygienists in Canada.

CDHA has a keen interest in promoting our members' successes. In December, a member from Ontario let us know that she had been chosen to receive the *Excellence in Business Award for 2010* in Barrie, Ontario. This year the CDHA will promote member heroes. Each issue of the journal will feature a dental hygienist giving back to the community on its front cover. I will mention just a few of such heroes. We have members who travel to Honduras, South America, and the Caribbean to provide oral health care. Back at home, the *Gift From the Heart* program has provided oral health promotion and care for members of the public. Other members volunteer for programs such as *About Face* providing aid for individuals who have facial disfigurement. Wherever your interests lie, become an ambassador for dental hygiene. The costs are minimal.

The results are priceless. ©CDHA

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1. Ipsos Reid. Media release 1 December 2010. Available at: <http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5061>
2. Friesen J. Number of seniors living in poverty soars nearly 25%. *Globe and Mail*. 24 November 2010. Available at: <http://www.theglobeandmail.com/news/national/number-of-seniors-living-in-poverty-soars-nearly-25/article1812798/>

■ Le coin 2011 de la DG, Pleins feux sur les priorités...suite 7

accueillons toute occasion de collaborer avec les autres provinces pour profiter de la sensibilisation du public sur le rôle des hygiénistes dentaires au Canada.

L'ACHD est aussi fort intéressée à promouvoir les réussites de nos membres. En décembre, une collègue de l'Ontario nous informait qu'on lui avait décerné le Prix annuel d'excellence en affaires, de Barrie, Ontario. Cette année l'ACHD fera la promotion de l'héroïsme de ses membres. Chaque édition du journal soulignera en couverture la générosité d'une hygiéniste dentaire dans sa collectivité. Je ne mentionnerai que quelques-unes de ces héros, car nous avons aussi des membres qui voyagent au Honduras, en Amérique du Sud et dans les Caraïbes pour dispenser des soins buccaux. Chez nous, le programme Don du cœur fait la promotion de la santé et des soins buccaux dans la population. D'autres membres se dévouent bénévolement à des programmes comme About Face qui aide les personnes qui ont une défiguration faciale. Quel que soit votre intérêt, devenez ambassadrices de l'hygiène dentaire. Les coûts sont minimes.

Les résultats ont une valeur inestimable. ©CDHA

Références

1. Ipsos Reid. Media release 1 December 2010. Available at: <http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5061>
2. Friesen J. Number of seniors living in poverty soars nearly 25%. *Globe and Mail*. 24 November 2010. Available at: <http://www.theglobeandmail.com/news/national/number-of-seniors-living-in-poverty-soars-nearly-25/article1812798/>

Canadian dental hygienist guides new Quintessence children's storybook:

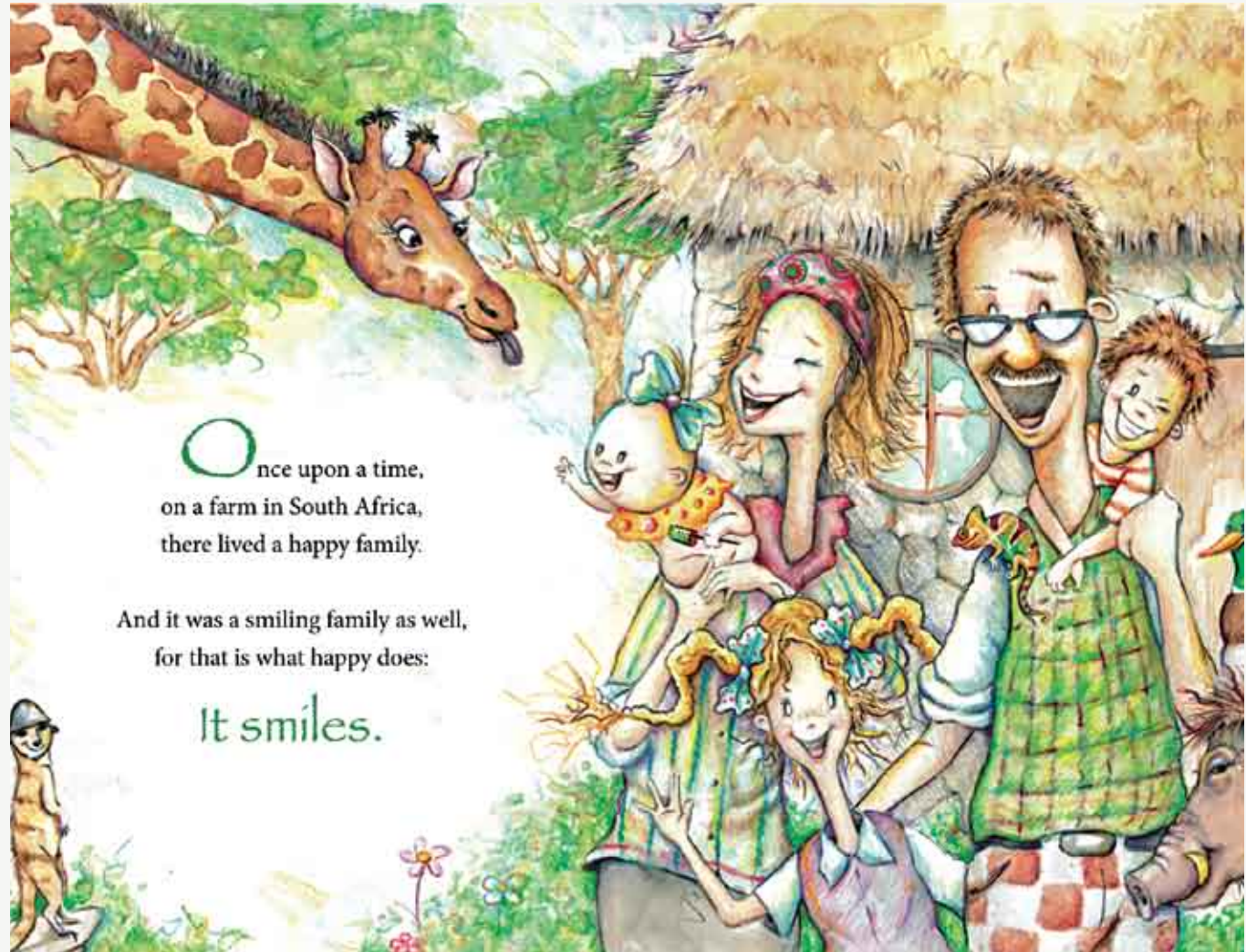
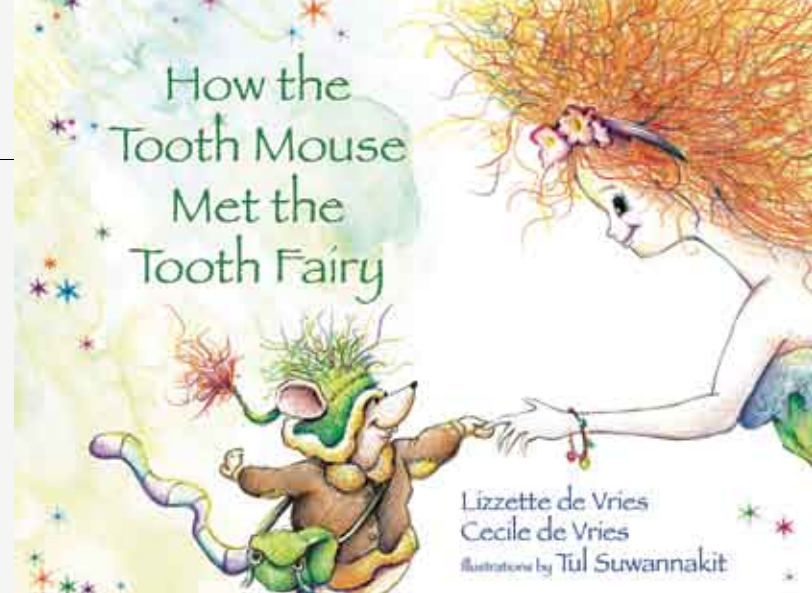
How the Tooth Mouse Met the Tooth Fairy

The story: Bobby is about to lose his first baby tooth and he can hardly wait to leave it for Max, the Tooth Mouse. But before the wobbly tooth actually falls out, Bobby's parents announce that the family is moving from South Africa to Canada! Will Max be able to find Bobby's tooth all the way in Canada? Learn what happens when Max goes to Canada and comes face to face with Fia, the Tooth Fairy.

The authors and content: Combining her love for teaching children and philanthropy, Lizzette de Vries spearheaded and co-authored *How the Tooth Mouse Met the Tooth Fairy* with her daughter, Cecile. The storybook is based on their real life adventure of relocating from South Africa to Winnipeg, Canada. Published by Quintessence in 2010, this charming tale is beautifully illustrated by Tul Suwannakit, an artist from Thailand, and guided in content by Mickey Wener, a dental hygienist. While the story is entertaining, it also provides evidence based oral health information for both the children, and for those that love and care for them. Canadian dental hygienists will appreciate:

1. accurate advice such as advising brushing as soon as the first tooth appears,
2. that dental hygienists are recognized as key members of the dental team, and
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Is periodontal disease related to adverse pregnancy outcomes? A scoping review

Alison C. MacDougall*, RDH, DipDH; Sandra J. Cobban[§], RDH, MDE; Sharon M. Compton[^], RDH, BSc, MA(Ed), PhD

ABSTRACT

Background: The objective of this scoping review is to examine the existing science on the relationship between periodontal disease and adverse pregnancy outcomes. Confirmation of periodontal disease as a risk factor for adverse pregnancy outcomes would be a huge public health benefit because periodontal disease is both treatable and preventable. **Methods:** A search was conducted in the Cochrane, Medline, CINAHL, EMBASE, PUBMED, and BioMed Central online databases. Of the 72 papers identified, 9 systematic reviews and meta analyses were included in the review. **Findings:** Some studies have reported an association between periodontal disease and adverse pregnancy outcomes. However, heterogeneity among studies in definitions of periodontal disease and adverse pregnancy outcomes, inadequate control for known risk factors and confounders, small sample size, and unclear study design strongly influence the validity of the findings. To date, there is no evidence to support providing periodontal treatment during pregnancy to reduce the occurrence of an adverse pregnancy outcome. Since association does not indicate causation we recommend that larger, methodologically rigorous studies using universally accepted definitions be undertaken. **Conclusion:** Dental hygienists should encourage their pregnant clients to seek non surgical periodontal treatment, especially during the second trimester, because it has been shown to be safe and effective in reducing the signs of maternal periodontal disease.

RÉSUMÉ

Contexte : Cette vue d'ensemble a pour objet d'examiner l'état actuel de la science sur les relations entre la maladie parodontale et les conséquences défavorables pour la grossesse. La confirmation de la maladie parodontale comme facteur de risque de conséquences défavorables sur la grossesse serait fort avantageuse pour la santé publique parce que la maladie parodontale est à la fois traitable et évitable. **Méthodes :** Une recherche a été effectuée dans les bases de données en ligne de Cochrane, Medline, CINAHL, EMBASE, PUBMED et BioMed Central. Parmi les 72 articles identifiés, 9 études systématiques et méta analyses a été retenue pour la revue. **Résultats :** Certaines études font état d'une association entre la maladie parodontale et les conséquences défavorables pour la grossesse. Toutefois, l'hétérogénéité des définitions de la maladie parodontale et des conséquences défavorables pour la grossesse, le contrôle inadéquat des facteurs et des variables confondantes, la petite taille des échantillons et la clarté insuffisante de la structure des études affectent considérablement la validité des résultats. À ce jour, aucune preuve ne soutient que le traitement parodontal pendant la grossesse réduise l'occurrence de conséquences défavorables pour la grossesse. Comme l'association n'indique pas de cause, nous recommandons l'amorce d'études plus larges et rigoureuses, avec des définitions reconnues universellement. **Conclusion :** Les hygiénistes dentaires devraient encourager leurs clientes enceintes à demander le traitement non chirurgical, surtout dans le second trimestre, parce que le traitement s'avère sûr et efficace pour réduire les signes de maladie parodontale maternelle.

Key words: Periodontal disease, adverse pregnancy outcomes, pregnancy, periodontal therapy, dental hygienists, pregnancy complications, scoping review

Introduction

There is a growing body of knowledge that supports a connection between oral health and total body health.¹ Oral health and its relationship to systemic health is an important societal issue because approximately 90 per cent of the worldwide population is affected by periodontal disease—either gingivitis or periodontitis.² Current evidence suggests that oral diseases may have an association with the occurrence and severity of the following conditions: diabetes mellitus, heart disease, and lung disease.³ Untreated oral infection has systemic effects, as the microorganisms and their associated endotoxins generate a localized host

mediated, tissue destructive, immune response that spills over into the circulatory system in the form of bacteremia and endotoxemia.⁴ It is estimated that over 50 per cent of pregnant women suffer from some form of gingival disease, either gingivitis or periodontitis.⁵ However, evidence does not support a causal relationship between periodontal disease and adverse pregnancy outcomes.

During pregnancy, changes in hormone levels promote an inflammatory response that increases the risk of developing gingivitis and periodontitis.⁵ Increased levels of the hormones, estrogen and progesterone, can make the small blood vessels of the gingiva more permeable,

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[§] Associate Professor, Dental Hygiene Program, Faculty of Medicine & Dentistry, University of Alberta, Edmonton, Alberta

[^] Professor & Director, Dental Hygiene Program, Faculty of Medicine & Dentistry, University of Alberta, Edmonton, Alberta

Correspondence to: Alison C. MacDougall; alisonmacdougall@hotmail.com

* Undergraduate student in Dental Hygiene (Distance), Dental Hygiene Program, University of Alberta

Figure 1. Search strategy

Database	Number of citations
Cochrane Wiley Interscience	30
Medline–Ovid	153
CINAHL	72
EMBASE	30
BioMed Central	21
PubMed	55
TOTAL	361

Search Terms: Pregnancy, pregnancy outcome*, adverse pregnancy outcomes, pregnancy complications, AND periodontal therapy, periodontal disease* AND dental hygienists

Limits: English language, scholarly (peer reviewed) OR core clinical journals, research articles, clinical trial, journal article, systematic review, randomized controlled trial, comparative study, meta analysis

and thereby increase the pregnant woman's susceptibility to oral infections caused by dental plaque.^{5,6} Preterm birth (PTB) is delivery at less than 37 weeks gestation, and since 1990, the rate of PTB has increased more than 20 per cent in the United States.⁵ Prematurity is the leading cause of death in the first month, causing up to 70 per cent of all perinatal deaths.⁷ Premature infants have a greater risk of feeding difficulties, thermal instability, respiratory distress syndrome, jaundice, and delayed brain development.⁵ The nationwide cost of PTB in the USA in 2005 was \$26.2 billion for healthcare, educational costs, and lost productivity.⁵

The relationship between maternal periodontal disease and the delivery of a preterm infant was first reported by Offenbacher et al.⁸ in 1996, and their study was the catalyst for the growing body of literature that has been generated to study the possibility of an association or a causal relationship between poor maternal periodontal health and the adverse pregnancy outcome of preterm low birth weight.

PTB with or without low birth weight (LBW) continues to be a significant cause of infant morbidity and mortality,^{9–11} and approximately 70 per cent of PTB are spontaneous with no specific cause identified.¹¹ Systemic maternal infection is a risk factor for PTB/LBW infants,¹² and some studies have reported an association between periodontal disease status in pregnant women and increased risk of PTB/LBW.¹³ Periodontal disease can stimulate a pregnant woman's body to produce inflammatory chemicals such as prostaglandins. Prostaglandins are known to cause the cervix to dilate and initiate uterine contractions, resulting in a premature LBW baby.¹⁴ The hypothesis, that periodontal conditions influence the outcome of a pregnancy, dates back to 1931 when Galloway conducted experiments on pregnant guinea pigs to support his theory that removal

of a known focal infection from a pregnant woman was more beneficial than allowing the infection to harbour throughout the pregnancy.¹⁵ Confirmation of periodontal disease as a risk factor for adverse pregnancy outcomes (APO) would be of great importance to public health because periodontal disease is treatable, preventable, and reversible in the early stages of the disease.^{9,16}

Periodontal disease can be painless, and this can result in considerable damage to supporting oral structures before a diagnosis is delivered. Dental hygienists can play an active role in helping their pregnant clients achieve good oral health by providing an assessment, and by developing an education and treatment plan to help these clients prevent gingivitis and periodontitis. The dental hygienist can identify women who are pregnant or planning a pregnancy by conducting a thorough medical history, and then can provide them with a customized or comprehensive treatment plan to reduce the negative oral and possibly systemic effects caused by periodontal infection. The purpose of our paper is to examine the existing evidence regarding the association between periodontal disease and adverse pregnancy outcomes so as to provide dental hygienists with an evidence based resource for optimally treating pregnant clients.

Methods

The objective of this scoping review is to examine the existing science on the relationship between periodontal disease and adverse pregnancy outcomes. A scoping review is used as a technique to quickly map relevant literature in a field of interest and provide a narrative or descriptive account of available research.¹⁷ Scoping reviews may be undertaken to examine the extent, range, and nature of research activity; to determine the value of undertaking a full systematic review; to summarize and disseminate research findings, or to identify research gaps in existing literature.¹⁷ The research question to be addressed acts as the guide to how search strategies are created and the whole point of scoping the field is to be as comprehensive as possible in identifying research that is suitable for answering the central research question.¹⁷ Systematic reviews can take a long period of time to conduct, whereas scoping reviews (depending on their nature) can be accomplished in a shorter period of time. This makes them practical and useful.

An initial search was conducted in the Cochrane, Medline, CINAHL, EMBASE, PUBMED, and BioMed Central online databases, and is illustrated in detail in Figure 1. The search was limited to studies on humans and those articles written in English. The following search algorithm was used: pregnancy, pregnancy outcome, adverse pregnancy outcome, pregnancy complications AND periodontal therapy, periodontal disease AND dental hygienists. The following limits were used to retrieve strong forms of evidence from scholarly (peer reviewed) journals: clinical trial, comparative study, meta analysis, multi centre study, randomized controlled trial, systematic review, practice guideline and journal article. As a result of the initial search, 361 citations were retrieved and after removing duplicates and citations that did not

met search limit criteria, there were 71 abstracts remaining. One further citation was obtained by hand searching reference sections of included articles.

Two co-authors reviewed the initial citations and all three authors screened all abstracts. Data extraction was performed by the corresponding author, and verified by the co-authors. We categorized the remaining citations as follows:

- 11 prospective cohort studies
- 2 surveys of attitudes/knowledge
- 12 case control studies
- 7 systematic reviews/meta analyses
- 1 critical review
- 2 non randomized intervention studies
- 4 pilot studies
- 5 randomized intervention studies
- 2 secondary analyses
- 5 narrative literature reviews
- 1 immunocytochemistry analysis
- 1 consensus report
- 1 cross sectional study
- 16 had not enough information in abstract (or missing abstract) to determine study type.

Due to the evidence based focus of this scoping review, it was decided to focus only on studies that conducted systematic reviews and/or meta analysis. We chose to do this because systematic reviews evaluate the risk of bias and quality of included studies, permitting greater confidence in their conclusions. Further, many of the individual

methodological limitations of studies, and characteristics of study populations.

Results and discussion

Many individual studies reported an association between periodontal disease and adverse pregnancy outcomes. However, there were several limitations that affected the strength of these findings. Quality appraisals during the systematic reviews identified the following limitations: 1) methodological heterogeneity of the science, 2) undervaluing the role of risk and confounding factors, 3) variation in sample size, 4) inconsistency in periodontal disease definitions, 5) inconsistency in APO definitions, and 6) possible effect modification by known and unknown factors.

1. State of the science

There was a significant statistical heterogeneity across studies that examined the connection between periodontal disease and APO. Table 1 and 2 summarize the studies utilized in this scoping review. Methodological inconsistencies such as varying definitions of periodontal disease and APO, lack of control for known risk and confounding factors, small sample size, unclear study methods, and statistical heterogeneity strongly influence the validity of the research.^{9,10,13,20} All of the systematic reviews and meta analyses included called for more methodologically rigorous studies utilizing reliable outcome and exposure measures to be conducted.

Figure 2. Flow diagram



studies identified by our search were included in the systematic reviews. Of the seventy-two abstracts screened, eleven studies were considered to be potentially relevant, and were retrieved and reviewed. Of these eleven studies, two studies were excluded, and Figure 2 illustrates this process. Nugent et al.¹⁸ was a commentary on another systematic review, and the information contained in the consensus report by Kinane et al.¹⁹ was already covered in Wimmer et al.¹³ Therefore nine papers with a total of 253 individual studies were included in this analysis.^{9-13,16,20-22} We chose to include the critical review by Wimmer et al.¹³ although it is not a systematic review, because two of the aims were to critically review literature regarding APO and periodontal diseases—our specific topic—and to assess the overall quality of the science on this issue. Since these aims fit well with our purpose, and the assessment of the quality of the science would enhance our review, we chose to include this paper along with the systematic reviews and meta analyses. Charting of the data was accomplished by using cue cards to identify key ideas and themes such as: author(s), and year of publication, important findings, types of studies included in the review,

2. Undervaluing the role of risk and confounding factors

Periodontal disease and adverse pregnancy outcomes are associated with a variety of risk factors also called confounding factors, and those such as low socioeconomic status and smoking are common to both.^{10,13} Many of the studies exploring the association between periodontal disease and APO were not consistent in controlling for known risk factors, which are listed in Table 3.

A previous history of a preterm birth is one of the strongest predictive risk factors for PTB, and in studies that looked at the effect of periodontal disease treatment during pregnancy, the absence of a history of PTB was a strong determinant of treatment success.^{11,13} Many confounding factors that influence the incidence of adverse pregnancy outcomes have been identified. It has also been suggested that some yet unidentified, residual confounding effects may be playing a causal role.^{9,13,16} Several important confounders associated with APO include a previous history of an APO, maternal infections, antibiotic use during pregnancy, excessive body mass index, low

Table 1. Meta analysis overview.

Authors	Studies included	Outcomes	Conclusions
Conde-Agudelo et al.(2008) ²²	49 (27 case control, 19 cohort studies, 3 cross sectional studies)	<ul style="list-style-type: none"> The risk of pre-eclampsia was increased in pregnant women with UTI (pooled OR ranging from 1.45 to 1.70) and PD (pooled OR ranging from 1.43 to 2.18) 	<ul style="list-style-type: none"> UTI and PD during pregnancy are associated with an increased risk of pre-eclampsia More studies are required to verify this and to explore whether the relationships are causal or if other mechanisms were involved
Khader & Ta'ani (2005) ²¹	5 (2 case control, 3 cohort studies)	<ul style="list-style-type: none"> PTB: OR 4.28 (2.62–6.99) PLBW: OR 5.28 (2.21–12.62) PTB or LBW 2.30 (1.21–4.38) 	<ul style="list-style-type: none"> PD in the pregnant mother significantly increases the risk of subsequent PTB birth or LBW
Polyzos et al. (2009) ¹¹	7 (randomized trials)	<ul style="list-style-type: none"> All of the trials reported PTBs 136 (9.7%) PTBs were observed in women receiving periodontal treatment and 165 (14.7%) in those who received no treatments Pooled OR was 0.55 (0.35–0.86) suggesting the treatment of PD during pregnancy reduces the incidence of PTB Data regarding LBW in 5 of 7 trials and the OR was 0.48 (0.23–1.00) suggesting treatment of PD during pregnancy might result in lower rate of LBW infants 	<ul style="list-style-type: none"> Moderate between-study heterogeneity was observed Absence of a history of a PTB was a strong determinant of treatment success Treatment more effective in patients with less severe disease Discussed the need to look to ongoing large and well designed randomized trials to shed light in this field
Vergnes & Sixou (2007) ¹⁰	17 (11 case control, 4 cohort, 2 cross sectional studies)	<ul style="list-style-type: none"> OR 2.83 (1.95–4.10) Of 7151 women, 1056 delivered PLBW 	<ul style="list-style-type: none"> Likely association of PD and APO
Xiong et al. (2007) ¹⁶	44 (26 case control, 13 cohort studies, and 5 controlled trials)	<ul style="list-style-type: none"> 29 positive OR (ranging from 1.10 to 20.0) 15 negative OR (ranging from 0.78 to 2.54) 5 trials: periodontal intervention may reduce PLBW: RR: 0.53 (0.30–0.95) NSD reduction of PTB: RR 0.79 (0.55–1.11) or LBW: RR 0.86 (0.58–1.29) 	<ul style="list-style-type: none"> PD may be associated with increased risk of APO

Legend: APO–adverse pregnancy outcome; LBW–low birth weight; OR–odds ratio; NSD–no statistical difference; PD–periodontal disease; PTB–pre-term birth; PLBW–pre-term low birth weight; RR–relative risk; UTI–urinary tract infection, SS–statistically significant

Based on Wimmer & Philstrom(2008)¹³ with data from Conde-Agudelo et al.(2008)²² and Polyzos et al.(2009).¹¹

socioeconomic status, smoking, ethnicity, and maternal disorders such as diabetes and hypertension.^{9,10,20,22} One of the major shortcomings of many studies was the inconsistency in researchers controlling for confounders and this issue raises serious doubts as to the conclusions of all such studies.²⁰

Studies carried out in economically disadvantaged populations demonstrated a greater association between periodontal disease and APO while studies from European countries and Canada found no such associations.^{9,16} This suggests that effects of periodontal disease on APO may be different according to socioeconomic status, access to dental care, and access to universal health care.^{9,16}

When considering all confounders, the most significant differences were noted between studies that did not take ethnicity or socioeconomic status into account and those that did.¹⁰ Some researchers mention the possibility of some residual underlying confounding effect that may be in the causal pathway of preterm birth and periodontal

disease. Studies need to be designed to minimize the effects of potential bias from confounding factors, and failing to take these factors into account raises doubt regarding the validity of conclusions for all such studies.^{9,10,13,16}

3. Variation in sample size

This is a limitation of many of the studies included in the systematic reviews and meta analyses, and is problematic because it increases the potential for associations observed by chance, random error, or lack of statistical power.⁹ Sample size needs to be sufficiently large to assess the effects of periodontal disease and possible interactions between periodontal disease and other risk factors such as smoking, ethnicity, and socioeconomic status.^{9,16}

4. Inconsistency in periodontal disease definitions

An important bias found in studies regarding the connection between periodontal disease and adverse pregnancy outcomes was the great variation in periodontal disease

Table 2. Systematic reviews summary.

Authors	Studies included	Outcomes	Conclusions
Scannapieco et al.(2003) ¹²	12 (6 case control, 3 cross sectional and longitudinal, and 3 intervention studies)	<ul style="list-style-type: none"> • 5 case control studies positive, 1 negative • 3 cross sectional studies positive • 3 intervention studies positive 	<ul style="list-style-type: none"> • PD may be a risk factor for PTB/LBW • Unclear if PD has causal role in APO
Vettore et al.(2006) ²⁰	36 (27 case control, 6 cohort studies, and 3 RCTs)	<ul style="list-style-type: none"> • 26 positive • 3 cohort studies and 1 clinical trial did not present info on loss to follow up 	<ul style="list-style-type: none"> • Methodological limitations of studies did not allow conclusions concerning the effects of PD on APO
Wimmer & Philstrom (2008) ¹³	58 (3 systematic reviews, 3 meta analysis, 22 case control, 23 cohort studies and 7 clinical trials)	<ul style="list-style-type: none"> • 3 systematic reviews^{9,12,15} did not report a conclusive relationship b/w PD and APO(s) • 3 meta analysis • Khader et al.(2005)²¹ concluded maternal PD was strongly associated with risk for PTB OR 4.28 (2.20–6.99) • Vergnes et Sixou(2007)¹⁰ reported a probable association b/w PD and APO • Xiong et al.(2006)⁹ reported that PD may be associated with an increased risk of APO but no evidence to support periodontal treatment to reduce APO • 12 case control studies showed a SS association of PD and APO; 10 showed no SS association • 15 cohort studies reported a SS association of PD and APO; 8 reported no SS association of PD and APO • 5 clinical trials reported a SS association of PD and APO; 2 reported no SS association of PD and APO 	<ul style="list-style-type: none"> • Variability among the studies in definitions of PD and APO • Inadequate control for confounding factors and possible effect modification make it difficult to base meaningful conclusions on published data • No conclusive evidence that treating PD improves birth outcome • Non surgical mechanical periodontal treatment in the second trimester of pregnancy is safe and effective in reducing the signs of maternal PD, it does not reduce the rate of PTB • Recommend large, prospective cohort studies be conducted to assess risk for APO in populations with PD
Xiong et al. (2006) ⁹	25 (13 case control, 9 cohort studies, and 3 controlled trials)	<ul style="list-style-type: none"> • 18 positive (ORs ranging from 1.10 to 20.0) • 7 negative (ORs ranging from 0.78 to 2.54) • 3 trials: periodontal intervention can lead to 57% reduction in PLBW (RR 0.43; 0.24–0.78) and a 50% reduction PTB (RR 0.5; 0.20–1.30) 	<ul style="list-style-type: none"> • PD may be associated with increased risk of APO

Legend: APO–adverse pregnancy outcome; LBW–low birth weight; OR–odds ratio; NSD–no statistical difference; PD–periodontal disease; PTB–pre-term birth; PLBW–pre-term low birth weight; RR–relative risk; UTI–urinary tract infection, SS–statistically significant

Based on Wimmer & Philstrom(2008)¹³ with data from Conde-Agudelo et al.(2008)²² and Polyzos et al.(2009)¹¹

definitions.^{9,16,20} There is no universally accepted standard for periodontal disease diagnosis,^{9,12,13,16} and while various indices have been developed to measure periodontal disease, most have limited validity.¹⁶ In order to estimate the impact of any disease, it is critical that the disease be well characterized and accurately assessed.¹³ Commonly accepted clinical measures of periodontal disease are clinical attachment level (CAL) and probing depth (PD).²⁰ Most researchers used definitions that combined CAL and PD based on disease distribution within their selected study participants/populations.^{9,16} In one meta analysis¹⁶ the authors failed to find the same definition used in two or more studies, even by the same author(s) in different studies, and very few authors attempted to justify their

periodontal disease diagnosis criteria. Utilizing different criteria to define periodontal disease will lead to different results, and one systematic review²⁰ noted that there were thirteen different definitions of periodontal disease used in the 36 studies that met their inclusion criteria. Of the 36 studies, five used Community Periodontal Index of Treatment Needs (CPITN) to assess the degree of periodontal disease although this index is considered unsuitable for measuring the severity and prevalence of periodontal disease in clinical studies.^{13,20} Periodontitis and gingivitis are related but different diseases, and CPITN mixes both and this can result in exposure misclassification.²⁰ The Periodontal Disease Index (PDI), also used in some studies, has similar limitations and using both of these indices

Table 3. Risk factors for adverse pregnancy outcomes.

Risk factors	
i. Clinical conditions	ix. Social characteristics
ii. Individual obstetric history	x. Mother's age (< 17 or > 35)
iii. Multi fetal pregnancy	xi. Race/ethnicity
iv. Placental abnormalities	xii. Low socioeconomic status
v. Smoking	xiii. Alcohol abuse
vi. Diabetes mellitus	xiv. Drug use during pregnancy
vii. Vaginal infections	xv. Inadequate prenatal care
viii. Immune diseases	xvi. Psychological factors
ix. Presence of anticardiolipin and lymphocytotoxic antibodies	xvii. Certain type of mother's work during pregnancy

Extracted from Vettore et al.(2006)²⁰

can result in an overestimation of periodontal disease and thereby introduce a bias into the analysis.²⁰

5. Inconsistency in adverse pregnancy outcomes definitions

An issue that affects the interpretation of data regarding the association between periodontal disease and adverse pregnancy is the many different definitions used by researchers to define adverse pregnancy outcomes.^{9,10,16} Reports that do not clearly distinguish between the many types of APO, and group them into a general category such as preterm low birth weight babies (PLBW) make it challenging to derive causal based conclusions.¹³ One systematic review²⁰ noted that most of the studies that it examined did not present information on how birth weight and gestational age were assessed, and it suggested that future studies should use more than one method for gestational age estimation. Due to the potential biases and differences in the definitions of periodontal disease and APO. Xiong et al.⁹ were unable to pool the effect sizes (odds ratios or relative risks) in observational studies included in their review.

6. Possible effect modification by known and unknown factors

The possible effect modification by known and unknown factors include: a) maternal infection and adverse pregnancy outcomes, b) periodontal disease inflammation, and c) effect of periodontal therapy on incidence of preterm birth.

a) Maternal infection and adverse pregnancy outcomes

There are a number of published studies reporting an association between periodontal diseases and adverse pregnancy outcomes such as preterm birth and/or low birth weight and pre-eclampsia. Pre-eclampsia and PTB

are major causes of maternal and perinatal morbidity and mortality.^{9,12,21} Despite advances in modern day medicine, the incidence of preterm low birth weight (PLBW) in the western world appears to be rising.²¹ Preterm delivery is defined as delivery before 37 weeks of gestation and low birth weight is defined as a birth weight of less than 2500g.¹⁰ Pre-eclampsia is a common hypertensive disorder of pregnancy that complicates about 3% of all pregnancies, and is a major cause of maternal and perinatal mortality and morbidity especially in developing countries.²² While normal pregnancy evokes a mild increase in the systemic inflammatory response, it becomes considerably greater in pre-eclampsia.²² Maternal infection is a key factor in adverse pregnancy outcomes, but 70% of cases of PTB are spontaneous and no specific cause can be identified.^{9,10,11,13} Maternal infections such as intrauterine infection or bacterial vaginosis have been identified as risk factors for having a premature delivery, but questions have been raised as to whether a subclinical infection such as periodontal disease could lead to premature labour.^{10,11,12} However, causal evidence remains lacking.

b) Periodontal disease inflammation

Chronic periodontal infections can produce local and systemic host responses leading to transient bacteremia.⁹ Bacterial substances can gain access to gingival tissue, initiate and perpetuate local inflammatory reactions and "consequently increase pro-inflammatory cytokine production by the host immune response, leading to high levels circulating within the body"^{9,21} If pro inflammatory cytokines from inflamed periodontal tissue and bacteria from subgingival plaque reach the maternal-fetal interface, they can trigger or worsen maternal inflammatory response and increase plasma levels of prostaglandin and cytokines such as tumour necrosis factor.^{9,13} This is one explanation for how periodontal disease is thought to play a non specific role in various adverse pregnancy outcomes.^{10,16}

c) Effect of periodontal therapy on the incidence of PTB

The goal of several dental studies was to demonstrate that providing periodontal interventions before and during pregnancy could prevent or reduce the occurrence of APO and therefore reduce the incidence of maternal and perinatal morbidity and mortality.^{9,20} Some studies suggested that treatment of periodontal disease during pregnancy reduced the incidence of PTB. However, moderate between-study heterogeneity was observed, and the absence of a history of a PTB was a strong determinant of treatment success.¹¹ Other researchers felt there was insufficient evidence to support the provision of periodontal treatment during pregnancy for the purpose of reducing APO due to inconsistent definitions of periodontal disease and the limited number of randomized control trials.^{13,16,20,21} Women receiving treatment with periodontal scaling, with or without root planing, had significantly improved periodontal disease status compared with women who did not receive treatment. And non surgical mechanical periodontal treatment in the second trimester was shown to be safe and effective in reducing signs of

maternal periodontal disease, though it did not reduce the rate of preterm birth.^{11,13}

Use of scoping review method

We chose to use a scoping review method to obtain an indication of the nature and extent of the literature on this topic. Our search identified a broad range of study types thereby challenging our ability to synthesize findings from many different study designs and methods of data collection. Scoping reviews do not formally rate the quality of the evidence from primary studies. Thus, they do not minimize bias and may risk offering misleading conclusions. To overcome these challenges, we chose to use only systematic reviews and meta analyses as the data for our scoping review. This approach took advantage of the quality assessment those authors used to reduce the potential for bias in their studies, and enabled us to consider their findings of quality in our approach to synthesis. This in turn gives us more confidence in our findings.

While multiple databases were searched, we do not know if all relevant reports have been retrieved. It is possible that key studies may have been indexed in other databases not included in our search, and that potentially subjective decisions in data synthesis may have resulted in unreliable conclusions in our review. We did not utilize a consultation exercise in our study, and this is believed by some researchers to enhance study results and make them more useful for the intended audience. By using a quality assessment tool (such as AMSTAR)²³ to determine the quality of the systematic reviews and meta analyses, this review could be strengthened. AMSTAR would provide an increased confidence in our findings but time did not permit this activity.

Some studies have shown a possible association between periodontal disease and adverse pregnancy outcomes, but most studies did not control for confounders, thus raising serious doubts about their conclusions.^{20,22} Since association does not imply causation,¹⁰ more methodologically rigorous studies are needed for confirmation of a connection between periodontal disease and APO.^{8–12,13,16,20,21,22} While research continues into the pathophysiology of a possible cause and effect relation between oral health and pregnancy outcomes, it is prudent for the dental hygienist to help the pregnant client remain as free from periodontal disease as possible.²⁴

Conclusion

Confirmation of periodontal disease as an independent risk factor for adverse pregnancy outcomes would result in public health benefits because periodontal disease is a preventable and treatable condition.^{9,11} Periodontal therapy in pregnancy has been shown to reduce the signs of periodontal disease; the magnitude of treatment effect is insufficient to have an impact on pregnancy outcome.^{11,13} Some studies report a positive association between maternal periodontal disease and adverse pregnancy outcomes, in particular PTB, LBW, PLBW and pre-eclampsia. It is impossible to draw clear conclusions from these studies because of the many different study designs, sampling methods, definitions of periodontal disease, and adverse

pregnancy outcomes, confounding factors, and possible effect modification by known and unknown factors.^{10,13,20} In studies that reported an association, a question remains as to whether the observed association represents a causal relationship or is related to the confounding effects of other variables.^{12,20} Identifying whether a causal relationship exists is important to provide confidence that our planned interventions will in fact be effective.

Literature findings show that periodontal scaling/root planing during the second trimester of pregnancy is safe but were not vigorous enough to clinically link periodontal treatment during pregnancy for the purpose of reducing specific APO.^{11,13,16} The role of the dental hygienist is not just as oral health educator but also a promoter of overall body health. Preventive care during pregnancy has been shown to be safe and effective in reducing periodontal symptoms in pregnant clients; and dental hygienists should actively encourage pregnant clients to maintain optimal oral health during and after their pregnancy.¹³ Larger and methodologically rigorous analytical studies using reliable outcomes and more exposure measures are required to explore whether or not the relationships between periodontal disease and adverse pregnancy outcomes are causal and if so, what mechanisms are involved.^{10,12}

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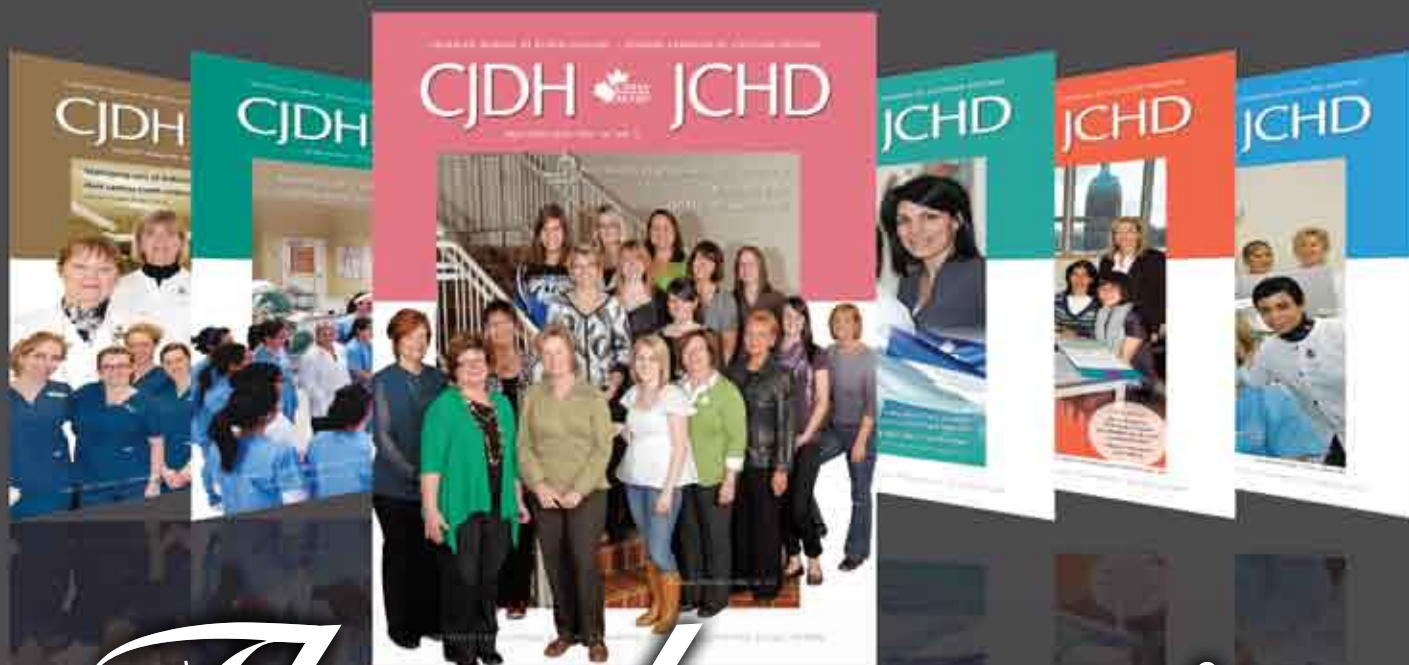
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Thank you!

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The editorial board stepped forward to mentor some authors. It recommended editorial policy to the Executive Director of the CDHA. The editorial board met through teleconferences to review the journal's progress and to implement editorial decisions.

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2011-12

UPCOMING EVENTS/ÉVÉNEMENTS À VENIR Programs may be subject to change.

	Online event	Upcoming	Live Webinar	<i>Process of Care</i>	
	Online event	Upcoming	On demand Webinar	<i>National Health Measures Survey</i>	
	Online event	Upcoming	Live Webinar	<i>Elder Abuse Series</i>	
	Online event	Upcoming	Live Webinar	<i>COCHRANE Series (en français)</i>	
	Online event	Upcoming	Live Webinar	<i>Dentin Hypersensitivity: Effective Clinical Management</i>	
	Onsite event	9–11 June 2011	Halifax, NS	<i>Advancing Dental Hygiene Practice</i> —CDHA national conference	

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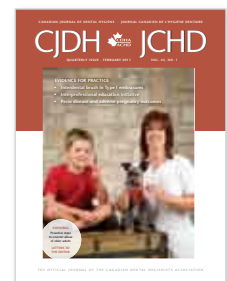
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The front covers of the journal in 2011 will feature the visual theme, *Advocacy efforts of individual dental hygienists in our communities*. *CJDH* lauds their efforts and those of other dental hygienists who contribute so much to community.
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