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Implications of Cognitive Style for Dental Hygiene Education

THE CANADIAN DENTAL HYGIENISTS ASSOCIATION

L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIRES

THE OFFICIAL JOURNAL OF THE CANADIAN DENTAL HYGIENISTS ASSOCIATION

Strength in Numbers

by Diane Thériault, RDH

OVER THE PAST 40 YEARS, DENTAL hygienists in Canada have had the privilege of being recognized as professional oral health care providers. We often take for granted the respect and confidence bestowed upon us by the public and other stakeholders in field of oral health care, but this respect and confidence has been fostered by the hard work of our professional association, the Canadian Dental Hygienists Association (CDHA).

Strength in numbers and increasing membership will give CDHA a stronger voice that will help us control our destiny.

Over the years, CDHA has partnered with various associations, organizations, and companies in order to increase our profile in the eyes of the general public, other health care professionals, and government decision makers. Through these activities of CDHA, dental hygienists are recognized as knowledgeable and skilled professionals who can be relied upon to maintain the oral health of Canadians. Furthermore, CDHA has collaborated with most provincial associations in their struggles to remove all barriers to quality preventive oral care services for Canadians. The fruit of this hard work is seeing the dental hygiene profession self-regulated in five provinces and many barriers to dental hygienists being able to work in various practice settings removed.

We cannot rest on our laurels and assume that the future of the dental hygiene profession will always be bright and full of promise. A case in point: various provincial associations are facing challenges to their self-governance status and/or are experiencing considerable difficulties in making required changes to provincial legislation with regards to scope of practice. That is why all dental hygienists throughout Canada must stand together to make certain that our profession moves forward and continues its march to autonomy in dental hygiene education, licensure, and practice. After all, by virtue of our education, expertise, and experience, we are better qualified to regulate the profession of dental hygiene than a board composed primarily of our employer- dentists. As the only national association for dental hygiene in Canada, CDHA

Strength in Numbers *…continued on page 235*

La force du nombre

par Diane Thériault, RDH

AU COURS DES QUARANTE DERNIÈRES ANNÉES, les hygiénistes dentaires au Canada ont eu le privilège d'être reconnus comme fournisseurs de soins de santé bucco-dentaire. Nous tenons souvent pour acquis le respect et la confiance que nous accordent le public et les autres intervenants dans le domaine de la santé bucco-dentaire. Mais les efforts déployés par notre association professionnelle, l'Association canadienne des hygiénistes dentaires (ACHD), ont tout de même favorisé ce respect et cette confiance.

Au fil des ans, l'ACHD s'est associée à diverses associations, organisations et entreprises afin d'accroître sa visibilité auprès du grand public, des autres professionnels de la santé et des décideurs publics. Grâce à ces activités de l'ACHD, les hygiénistes dentaires sont reconnus comme des professionnels qualifiés, qui s'y connaissent et sur qui l'on peut compter pour préserver la santé bucco-dentaire des Canadiennes et des Canadiens. En outre, l'ACHD a collaboré avec la plupart des associations provinciales dans leurs luttes en vue de supprimer tous les obstacles à la qualité des services préventifs de santé bucco-dentaire destinés à la population canadienne. Ce dur labeur a porté fruit : la profession d'hygiéniste dentaire est autoréglementée dans cinq provinces et de nombreux obstacles qui empêchent les hygiénistes dentaires d'exercer leur travail dans divers cadres de pratique sont éliminés.

La force du nombre et l'accroissement de l'effectif de l'Association affermiront la voix de l'ACHD, ce qui nous aidera à maîtriser notre destinée.

Nous ne pouvons pas nous reposer sur nos lauriers et supposer que l'avenir de la profession d'hygiéniste dentaire sera toujours brillant et prometteur. En voici un bon exemple : diverses associations provinciales ont des difficultés à surmonter au chapitre de l'autorégulation ou éprouvent beaucoup de mal à obtenir les changements nécessaires aux lois provinciales en ce qui concerne l'étendue de leur pratique. C'est pourquoi tous les hygiénistes dentaires du Canada doivent faire front commun pour s'assurer que leur profession va de l'avant et poursuit son cheminement vers l'autonomie sur le plan de l'enseignement de l'hygiène dentaire, de l'octroi de

La force du nombre *…suite page 232*

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EVIDENCE FOR PRACTICE

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Please see our advertisements on pages 198, 233 and 239

The Choice Is Clear

by Susan Ziebarth, BSc, MHA, CHE

Our choice is clear,
we may share
your choice,
declare
meaning and rhythm and grace
in each daily act.
– from "Dodona" by Hilda Doolittle (1886–1961)

FALL IN CANADA IS FOR MANY OF US LIKE THE BEGINNING of a new year. We have had our summer respite and are now preparing for new school years, new wardrobes, new hockey seasons, and new television shows. In the life of your professional association, it is also the beginning of a new year. For most of our members, this is a time of choice: Will I be a member of CDHA this year? We are optimistic that the choice to renew is clear.

Will I be a member of CDHA this year? We are optimistic that the choice to renew is clear.

What are some of the factors you consider when making a choice to join your professional association? In a study on librarians,[1] Sue Kamm found that most members joined to have the opportunity to network with colleagues, influence their professional goals, and remain current with the field through their professional journals. She notes that most members of library associations, much like CDHA's membership, pay their own dues and therefore look for a return on investment and relevance to their work. Ms. Kamm describes the importance of quality, the opportunity to contribute to the profession, and a strong advocacy mission as all being relevant to the librarian population studied. Our interactions with you have confirmed this research study's findings.

Arian Ward is an award-winning strategic leader. He indicates that knowledge sharing, learning, and conversa-

The Choice Is Clear *…continued on page 213*

1. Kamm S. To join or not to join: how librarians make membership decisions about their associations. Library Trends. 1997;46(2): 295-306.
2. Ward A. "Getting strategic value from constellations of communities. Strategy & leadership. 2000;28(2):4.
3. Wenger E. Communities of practice. New York: Cambridge University Press; 1998. As cited in: Ward A. "Getting strategic value from constellations of communities."

Le choix est clair

par Susan Ziebarth, B.Sc., M.H.A., C.H.E.

Notre choix est clair,
nous pouvons peut-être partager
votre choix,
attribuer
une signification, un rythme et de la grâce
à chaque geste quotidien.
– Extrait de « Dodona », par Hilda Doolittle (1886-1961) [Traduction.]

AU CANADA, L'AUTOMNE REPRÉSENTE POUR BON nombre d'entre nous le début d'une nouvelle année. Nous avons eu un répit pendant l'été et nous nous préparons maintenant à une nouvelle année scolaire, à une nouvelle garde-robe, à une nouvelle saison de hockey ainsi qu'à de nouvelles émissions de télévision. Dans la vie de votre association professionnelle, l'automne marque aussi le début d'une nouvelle année. Pour la majorité de nos membres, c'est le moment de choisir : vais-je faire partie de l'ACHD cette année? Pour notre part, nous sommes optimistes et pensons que le choix de renouveler votre adhésion est clair.

Vais-je faire partie de l'ACHD cette année? Pour notre part, nous sommes optimistes et pensons que le choix de renouveler votre adhésion est clair.

Quels sont les facteurs qui entrent en ligne de compte au moment de choisir de faire partie d'une association professionnelle? Dans une étude à propos des bibliothécaires[1], Sue Kamm constate que la plupart des membres ont adhéré à leur association pour avoir la possibilité d'entretenir des liens avec des collègues, d'exercer une influence sur leurs objectifs professionnels et de se tenir à jour dans leur domaine grâce à leurs revues profession-

Le choix est clair *…suite page 222*

1. S. Kamm, « To join or not to join: how librarians make membership decisions about their associations », *Library Trends*, vol. 46 (2), 1997, p. 295-306.
2. A. Ward, « Getting strategic value from constellations of communities », *Strategy & leadership*, vol. 28(2), 2000, p. 4.
3. E. Wenger, *Communities of practice*, New York, Cambridge University Press, 1998, cité dans Ward, « Getting strategic value… ».

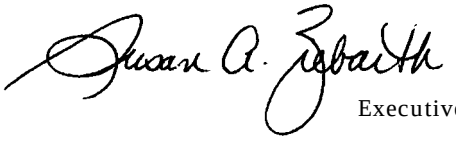
NOTICE OF ANNUAL GENERAL MEETING OF MEMBERS OF THE CANADIAN DENTAL HYGIENISTS ASSOCIATION (CDHA)

NOTICE is hereby given that the annual meeting of the members of **CANADIAN DENTAL HYGIENISTS ASSOCIATION** will be held at CDHA, 96 Centrepointe Drive, Ottawa, Ontario, on Saturday the 29th day of October, 2005, at the hour of 9:00 in the morning to:

I. receive the financial statement of the corporation for the fiscal period ended April 30, 2005, and the report of the auditors thereon;
II. appoint auditors; and
III. transact such further and other business as may properly brought before the meeting or any adjournment thereof.

Copies of the financial statements and the auditors' report are available for review at the corporation's head office during normal business hours.

DATED the 15th day of September, 2005.
BY THE ORDER OF THE BOARD OF DIRECTORS



Executive Director

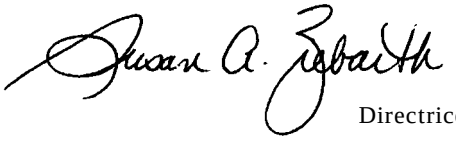
AVIS DE CONVOCATION DE L'ASSEMBLÉE GÉNÉRALE ANNUELLE DES MEMBRES DE L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIRES (ACHD)

AVIS est par les présentes donné que l'assemblée annuelle des membres de **L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIRES** aura lieu à l'ACHD au 96, promenade Centrepointe, à Ottawa (Ontario) le samedi 29 octobre 2005, à neuf heures. En voici l'ordre du jour:

I. recevoir l'état financier de l'Association pour l'exercice ayant pris fin le 30 avril 2005 et le rapport des vérificateurs à ce sujet;
II. nommer les vérificateurs et;
III. régler toute autre question dûment soulevée à l'assemblée annuelle ou à toute nouvelle assemblée convoquée en cas d'ajournement de l'assemblée annuelle.

Des exemplaires des états financiers et du rapport des vérificateurs peuvent être examinés au siège social de l'Association pendant les heures d'affaires ordinaires.

FAIT le 15 septembre 2005.
PAR DÉCRET DU CONSEIL D'ADMINISTRATION



Directrice génerale

CORRECTION: Credit was inadvertently omitted from the article "HIV/AIDS and the Dental Hygienist" in the July-August 2005 issue of *CJDH*. This article is based on an article written by CDHA and the Canadian Public Health Association that was published on the Canadian Health Network's web site at <www.canadian-health-network.ca> under "HIV/AIDS." Sponsors for the article include the Canadian Health Network, the Canadian Public Health Association, and the Canadian Dental Hygienists Association. We sincerely apologize for this omission.

ANNUAL GENERAL MEETING OF MEMBERS
OF THE CANADIAN DENTAL HYGIENISTS ASSOCIATION (CDHA)

Proxy

The undersigned hereby appoints Diane Thériault or, failing her, Patty Wickstrom, or instead of the foregoing*

_____

as proxyholder of the undersigned with full power of substitution to attend and vote at the Annual General Meeting of the members of the Canadian Dental Hygienists Association on October 29, 2005 and at any adjournment thereof (each a "Meeting") with the same powers as if the undersigned were personally present. This proxy revokes any and all previous proxies executed by the member in respect of the relevant Meeting.

Signature of Voting Member _____ Date (please print)_____

Voting Members Name (please print) _____

* A Voting Member has the right to appoint a person (who must be another Voting Member of the Canadian Dental Hygienists Association)

To be valid this proxy must be signed by the Voting Member; and received at the Canadian Dental Hygienists Association, 96 Centrepointe Drive, Ottawa, Ontario, K2G 6B1 (by mail or facsimile to 613-224-7283) not later than 9 am ET October 27, 2005; and shall be valid only for the meeting for which it was specifically given or for any adjournment thereof.

ASSEMBLÉE GÉNÉRALE ANNUELLE DES MEMBRES
DE L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIRES (ACHD)

Formulaire de procuration

La personne soussignée nomme par la présente Diane Thériault, ou, à défaut, Patty Wickstrom, ou, à la place des personnes susmentionnées*,

_____

comme fondée ou fondé de pouvoir avec pleins pouvoirs de substitution pour assister et voter en son nom à l'assemblée générale annuelle des membres de l'Association canadienne des hygiénistes dentaires, le 29 octobre 2005, ainsi qu'à toute reprise en cas d'ajournement de cette assemblée (chacune constituant une « réunion »), avec les mêmes pouvoirs que si la personne soussignée y assistait personnellement. La présente procuration révoque toute autre procuration donnée antérieurement par le membre relativement à l'assemblée en question.

Signature du membre votant _____ Date (en lettres moulées)_____

Nom du membre votant (en lettres moulées) _____

* Tout membre votant a le droit de désigner une personne (qui doit être un autre membre votant de l'Association canadienne des hygiénistes dentaires).

Pour être valide, cette procuration doit être signée par le membre votant; elle doit être reçue aux bureaux de l'Association canadienne des hygiénistes dentaires, 96, promenade Centrepointe, Ottawa (Ontario), K2G 6B1 (par la poste ou par télécopieur, au 613-224-7283) le 27 octobre 2005 à 9 h HE, au plus tard; en outre, elle n'est valide que pour la réunion pour laquelle elle a été expressément donnée ou pour toute reprise en cas d'ajournement.

Implications of Cognitive Style for Dental Hygiene Education

by Cindy M. Isaak-Ploegman, MEd, BA, RDH, and Christian Chinien, PhD, Ed.†*

This paper is based on a presentation at the CDHA Annual Professional Conference, June 2005, in Ottawa, Ontario

ABSTRACT

An analytical survey was performed using the integrative review methodology to examine any implications that the cognitive style construct field dependence/independence may have for dental hygiene education. One finding of the review was that field independent students consistently outperform field dependent students. This difference in achievement across field independence was measured predominantly by multiple-choice test scores. The literature examined also revealed potential implications of field independence for teaching, learning, and student/teacher interactions. Results also indicate that the cognitive construct field dependence/independence has considerable implications for the roles dental hygiene educators assume as curriculum designers, lecturers, clinical course coordinators, and clinical instructors. Consequently, the results of this integrative review were organized to provide dental hygiene educators with an effective way of seeing how they can adapt their programs or courses to accommodate students of varying levels of field independence. These instructional adaptations can be carried out during course planning as well as during implementation stages.

Keywords: field dependence, field theory (psychology), field dependence/independence, cognitive style

RÉSUMÉ

La technique de l'analyse intégrative a permis d'examiner les incidences que pouvait avoir le style cognitif – la dépendance ou l'indépendance du champ – sur l'enseignement de l'hygiène dentaire. Il se dégage de cette analyse que les étudiants à l'esprit analytique dépassent systématiquement ceux qui sont dépendants du champ. La documentation examinée révèle également les effets possibles de l'indépendance du champ sur l'enseignement, l'apprentissage et les rapports étudiant-enseignant. Les résultats indiquent également que le style cognitif (la dépendance ou l'indépendance du champ) a des incidences considérables sur chacun des trois rôles que joue l'enseignant en hygiène dentaire, soit l'enseignement magistral, l'enseignement clinique et l'encadrement clinique. C'est pourquoi nous présentons les résultats de cette analyse intégrative de façon à procurer aux enseignants en hygiène dentaire un moyen efficace d'adapter leurs programmes ou leurs cours en fonction d'étudiants de divers niveaux d'indépendance du champ, selon le rôle qu'ils jouent dans leurs programmes ou leurs cours. Ces adaptations pédagogiques peuvent être apportées tant au stade de la préparation de cours qu'à celui de la mise en application.

Mots clés : dépendance du champ, théorie des champs (psychologie), dépendance ou indépendance du champ, style cognitif

THE CONSTRUCT OF FIELD INDEPENDENCE / DEPENDENCE

The study of cognitive style is the "how" (the manner in which behaviour occurs) and not the "what" (intellectual ability) of thought processes.[1] It is how students acquire and process information. There are several dimensions of cognitive style,[2] but the dimension with many educational implications is that of field independence/dependence (FI/FD).[3,4] Research focusing on the cognitive style dimension of field independence/dependence began during World War II to investigate why some army pilots consistently flew out of fog upside down, while others were able to remain right side up.[2] This phenomenon generated interest in studying why some people are able to separate themselves from their environment and perceive what is really occurring, while others seem to be embedded in their environment.[2] Herman Witkin, a psychologist, measured subjects' ability to align their bodies with a true vertical bar. In experiments, he adjusted their environment by angling the room or their chair. In spite of the interference, some people determine the true vertical, while others do not.[2]

Differences between students' level of field independence represent differences in their restructuring ability. Students' level of field independence is measured by their ability to successfully extract an embedded figure from a complex design. This construct of restructuring may include the ability to (1) break up an organized field so that the discreet background is separate from its parts;

* Dental Hygiene Instructor, School of Dental Hygiene, University of Manitoba. <isaakplo@ms.umanitoba.ca>

† Professor, Department of Adult and Vocational Education, Faculty of Education, University of Manitoba

(2) provide organization to a field lacking in it; and (3) organize a different field than the initial one provided.[5]

The Hidden Figures Test (HFT) measures the level of field independence/dependence.[6] This is a timed, pencil and paper test that requires the subject to disembed a simple figure from a complex figure. This ability to disembed is measured on a continuum with the two poles of extreme field independence or field dependence. A score between 1 and 16 on the HFT would correspond to a field dependent individual's ability to successfully disembed that number of figures in 24 minutes. A score of between 17 and 32 would be representative of a field independent individual. However, designated representative scores are dependent on the researcher. Copies of this HFT, along with a licence required to administer the test, may be acquired from the Educational Testing Services based in Princeton, New Jersey.

The construct of FD/FI is stable over time.[3,7] Research of boys of ages 10, 14, 17, and 24 years old found the predictability of their levels of field independence was highly correlated.[8] Vitols[9] studied adult learners, comparing their level of field independence over their adult years from traditional student age (18–22 years) to re-entry college age (23–63 years), and confirmed that there are no significant changes to adult learners' cognitive styles over time.

Women tend to be more field dependent than men, but gender differences can differ with respect to field independence, because gender roles are dependent on culture.[3,10] An individual's level of field dependence/independence (FD/FI) can also vary depending on their cultural background.[11] Kühnen's study of subjects from individualistic societies of the United States and Germany showed them to be relatively very field independent when compared with those from collectivist societies of Malaysia and Russia.[11] This is explained by the fact that Malaysian and Russian cultures represent "tighter" societies where a subject's sense of self is more embedded with their social environment and hence residents are more field dependent.[11]

Van Blerkom[12] and Watkins and Astilla[13] believed that differences in cognitive style (field independence/dependence) account for more of the difference in performance between students than intelligence. Bertini[10] provided the following summary of educational implications of FD/FI: "how students learn material, the use of mediators in learning, the effects of reinforcement, …how teachers teach, how teachers and students interact, career differentiation, educational-vocational interests, educational-vocational choices and achievement.[10,p.93] Another educational implication is the inability of a field dependent student to pick up, aside from the most obvious one, other relevant stimuli needed for learning.[14]

The purpose of this paper is to examine differences in academic performance that may exist between FD and FI students and to suggest possible instructional design interventions or adaptations that can be adopted to accommodate possible individual differences due to the level of field-dependent and field-independent cognitive styles.

Cognitive style is… how students acquire and process information.

METHOD

An integrative review of literature was the methodology implemented. An integrative review of literature includes examining a particular topic for any contradictions, themes, or implications and reporting the resulting recommendations to educational practitioners.[15] A review was conducted on ERIC and PsycInfo databases using the search terms "field dependence," "field theory (psychology)," or "field dependence and field independence" near each other in the article or as major or minor descriptor terms dated in material from the period 1950 until September 2002. A search was completed of Dissertation Abstracts using "education" as the subject heading and the keywords of "field dependence" and "adult" as the subject. An advanced search was also made of Ebsco Host "field dependence and field independence" from 1985 until September 2002. A total of 115 articles, books, and dissertations written in English by educators, education administrators, or psychologists were analyzed whose study subjects were adults between the ages of 18 and 60 years. Studies included which offered insight into the construct of field independence in which the subjects were children or adolescence, are indicated. The articles were selected based on their availability, relevance, and soundness of the research design.

RESULTS AND ANALYSIS

Differential learning gain

The review of the literature indicated that field independent students consistently outperform field dependent students in academic achievement, regardless of the subject matter content.[16-28] The literature, however, also indicates that this gap in differential learning gain may be bridged with a few minor changes in teaching strategies and students' learning strategies. These recommended changes in instruction to accommodate cognitive style come from the characteristics associated with the two poles of the dimension of FD/FI.

Characteristics associated with field independence/dependence

The results of the analytical survey reveal specific characteristics associated with a students' level of field independence. Witkin and Goodenough report that the level of a person's field independence affects his/her ability to function more autonomously in the interpersonal domain.[5] Field dependent individuals rely more on information from others to arrive at their own views than do field independent people in circumstances where the available information is ambiguous. Other researchers characterize field independent people as showing initiative, taking responsibility, thinking for themselves, and being self-reliant.[3]

Structure elements

Field dependent learners are also less able to learn material that requires them to provide structure and organization. In contrast, Witkin, Goodenough, Moore, and Cox suggest that field independent learners will benefit more from learning situations requiring them to develop their own learning strategies.[3] Grimes notes that one disadvantage of distance dental hygiene education is that students have more responsibility.[29] Research shows a positive relationship between students' achievement in distance education courses and their level of field independence.[30-32] Similarly, given that field independent learners have internal frames of reference, they are more able to have self-defined reinforcements and goals than field dependent learners who are mostly externally guided.[3] Because of this inner directedness, field independent learners are more able to learn under conditions requiring intrinsic motivation. An example of a learning situation requiring intrinsic motivation is distance modes of education. Moore suggests that the greater the psychological and communication gap between instructors and students in distance education settings, the more self-directedness is required of the student.[33]

Educational implications – Educators can help field dependent students organize themselves to learn successfully by providing them with structure in the form of lecture outlines, structure charts, summaries, and with instructions on how to organize and analyze topics.[34-38] Conversely, Newell suggests that dental hygiene educators need to allow field independent learners to define their own learning goals.[14]

Social orientation

Field dependent subjects prefer contact with others to solitary situations. They also pick vocations and educational choices that are more socially oriented. On the other hand, field independent students are drawn to vocations, which require analyzing and structuring skills.[3] Raskin did not discover any connection between the choice of a major at college entry and a students' level of field independence. Raskin did find, however, that field independence was significantly associated with the choice of major at college graduation and at graduate school entrance.[4] The most field independent students eventually majored or specialized in math and sciences. Education students were the most field dependent. It should be noted that the education students in this case were all women. They also found that the reason students drop their initial choice of major was not related to unsatisfactory grades.

Within one vocational area, there can be a variety of skills required that appeal to both FD and FI individuals. One example is psychology where the experimental work may appeal more to field independent people and the clinical tasks to field dependent individuals. In nursing, for example, competent psychiatric nursing students were more field dependent, whereas competent surgical nurses were field independent.[39]

Field dependent people prefer physical closeness in their social interactions and are more likely to share their feelings than field independent subjects.[3] Field dependent subjects are characterized as "warm, affectionate, tactful, accommodating, nonevaluative, accepting of others, and not likely to express hostility."[5, p. 44] In contrast, Witkin characterizes field independent subjects as "demanding, inconsiderate, manipulating others as a means of achieving personal ends, cold and distant in relations with others." (5, p. 44)

Field dependent group members tend to be better able at managing conflict resolution.[40] Witkin and Goodenough claim that field dependent subjects are more competent at compiling information about other people and interacting with them.[5] Consequently, they are more effective interpersonally and get along with people better than field independent people. This difference, posited by Witkin and Goodenough,[5] is derived from the need of field dependent people to rely on external referents (people, in the case of social interaction). Architects are more field independent than writers, who rely on interpersonal relations to accurately portray people.[41]

Educational implications – Bertini speculates the implications that cognitive style has for teaching stem from the level of social orientation and sense of identity a field independent/dependent teacher or student possesses.[10] Field independent students are more autonomous in social settings.[42] Field dependent people rely more on visual cues and on people in general.[43] Field dependent persons tend to learn and remember materials involving social content better than field independent learners.[3]

Research suggests that since field dependent students are more socially aware, they would benefit more from learning in interactive learning settings than field independent students. Grimes reports that one disadvantage of distance education settings is the decrease in student contact and discussion.[29] Dental hygiene educators can create interactive learning settings to include any collaborative learning opportunities such as peer group discussions, chat rooms, or jigsaw peer teaching groups.[34,44,45] Personalizing course content through personal stories and anecdotes can also help to humanize instruction for field dependent learners.[21,46] Newell suggests that dental hygiene educators help field dependent learners relate to the social content of information by bringing it to focal attention.[14] Newell also suggests that educators should be careful when using negative feedback with field dependent learners as they are more sensitive to negative social reinforcement.[14]

Teaching strategies

Research indicates that field dependent teachers favour the use of discussion in teaching and allow students to play a more important role in structuring the learning environment. In contrast, field independent teachers use questioning and more of a discovery or lecture approach.[3] The discovery or lecture approach gives greater control to the instructor for organizing and providing information to students. Field dependent teachers feel class discussion is more conducive to learning than lecture or discovery approaches. This not only maximizes the social interac-

tion but also allows the student to participate in structuring the class direction. Mahlios found that field independent teachers initiate more academic interactions with their students in the class as a whole, and field dependent teachers interact more with students individually and in small groups.[47] Field independent teachers ask questions that are more academic in nature and analytical, while field dependent teachers ask significantly more factual, descriptive questions. Field independent teachers also encourage students to apply principles and provide more corrective feedback.

Educational implications – One implication from this evidence-based information is that field independent teachers can try to accommodate the needs of field dependent students for socialization by consciously introducing more group discussions into their teaching strategies and by interacting more with students one-on-one. On the other hand, field dependent teachers can adapt their instruction to include more analysis-level questioning and provide more corrective feedback to students. This adaptation would likely be beneficial for both field independent and field dependent students. Miller suggests that instructors have assignments due within short periods of each other in order to closely monitor their students' academic progress.[48] This will help to decrease the differential learning gain across cognitive style.

Learning strategies

Berger and Goldberger found field independent students were more task oriented than field dependent students and more able to focus their attention on relevant aspects of the task.[49] They also found that field independent learners are more able to remember detail, make letter-sound associations, memorize spelling lists, and learn rules. Comprehension has also been proven to be easier for the field independent learner, especially in paragraph meaning, word recognition, and locating main ideas. Rasinski concluded that field dependent learners were more able to summarize, compare, and remember concepts by visualizing them in their entirety.[50] Witkin, Goodenough, Moore, and Cox also discuss how field dependent learners use a spectator approach to learning versus a hypothesis approach, which the field independent learner utilizes.[3]

Educational implications – Research findings establishing how field independent/dependent students learn suggest that instructors should try to present learning material in a global manner by stressing the whole, then the parts[51] and eliminate any potential distractions in order to accommodate field dependent learners.[50] Research also suggests that field dependent learners should be trained to use a hypothesis approach to problem solving. Additionally, instructors should become more aware of ways to help students vary their learning strategies to overcome differences in achievement due to their cognitive style dimension.[3]

Learning task

Field independent learners are more able to perform tasks that require breaking an existing structure or taking several parts and regrouping them separately when compared to field dependent learners.[10] Field dependent students usually have difficulties when dealing with problems that involve using a critical element in a different context.[3] Field independent students, on the other hand, are able to overcome the field or context within which the problem was presented. Ronning, McCurdy and Ballinger found that field independent junior high school students outperformed field dependent students in solving science problems.[52] Students were given science problems to solve and their verbal responses were videotaped during individual "think-aloud" sessions. The students' problem-solving ability was scored qualitatively and based on their correct solution to the problem.

Educational implications – To accommodate field dependent students' difficulty in disembedding a problem from its field, Niaz suggests diminishing the field factor in learning tasks.[53] He suggests that the correct response on a test question not correspond to the question requiring a student to engage in disembedding. If care were not taken to prevent this, there would be a link between student's level of field dependence and their level of achievement. Providing instruction about a variety of problem-solving strategies can assist field dependent learners, especially in learning tasks that involve ill-defined problem solving activities.[54] An example is Newell's suggestion to incorporate a wider range of cues or to focus the field dependent students' attention on relevant cues.[14] Educators should take care when using pictures, diagrams, and graphs in order to diminish the effect the background may have on distracting students from the important information on tests or learning packages.

Field independence and dental hygiene educators

Suddick, Yancey, Devine, and Wilson conducted a study to determine if a person's level of field dependence/independence is a predictor of clinical grades and performance in dental education.[55] Their results revealed that a student who tends to be more field independent may have an advantage in the dental school's clinical curriculum. Linder also found that dental students were, as a whole, field independent and those in the upper third of the class by course grades were the most field independent.[56] He also found that right-handed students were predominantly field independent while field dependent students tended to be left-handed. Since the clinical skills of dental hygiene and dental clinical education are similar, the above studies reveal the potential for implications of cognitive style research in the context of dental hygiene education.

This literature review reveals a need for dental hygiene educators to bridge the gap in differential learning gain across cognitive style. Table 1 shows the adaptations that dental hygiene educators may make to their teaching strategies to reduce the differential learning gain between field dependent and field independent students. These

Teaching approaches, recommended adaptations	FI students	FD students
Modeling cognitive style flexibility: • Field independent teachers: try to interact more with students one-on-one or in small groups • Field dependent teachers: try to ask more analytical level questions, teach applying principles, and provide corrective feedback.[47]	x	x
Challenge students to use a style not their own by having them use a variety of cognitive skills to do the same task.[57]	x	x
Model cognitive style flexibility by having open-ended labs, and assignments, self-pacing, and advance organizers for theoretical dialogue opportunities.[58]		x
Design students' programs to ensure they develop skills conducive to both poles of field independence.[59]	x	x
Model cognitive flexibility by teaching a variety of problem-solving approaches.[54]		x
Encourage field independent students to interact with field dependent students to gain social skills. Encourage field dependent students to work with field independent students to become more task- and achievement-oriented.[5]	x	x
Stress the whole, then the parts, when giving instructions.[51]		x
Provide directions for hypothesis approaches.[3]		x
Diminish perceptual field factors in the learning task.[53]		x
Use both factual and inferential questioning.[60]	x	x
Try to have a constructivist approach to education.[61] In the constructivist approach to teaching, meaning is made by the student based on previous or current knowledge structure.[62] For example, use group discussions prior to clinic sessions to solve an upcoming challenging clinic case.		x
Introduce panel discussions, Discussion Web, peer teaching, reciprocal teaching, and simulations.[34,44,45]		x
Give signals for note taking.[63]		x
Use personal examples, events, stories, and anecdotes in instructional material to "socialize" course content for field dependent students.[21,46]		x
Reduce interfering conditions.[50] For example, reduce excessive distractions in instructional course such as excessive clip-art or busy PowerPoint templates.		x
Revise instructional material by obtaining both field dependent and field independent students' input.[64]		x
Use subliminal captions in television learning.[65]		x
Use computer animation to teach science concepts.[66]		x
Stress to students that it is not necessarily time-on-task but the quality of time that matters.[47]	x	x
Prescribe learning material that is already organized.[14]		x
Reduce the amount of information to be learned, provide frequent feedback, provide students with a plan for studying specific material, and avoid using the expository method of teaching.[14]		x
Provide inherent organization and structure in the form of lecture outlines, structure charts, summaries, and instructions on how to organize and analyze topics.[34-38]		x
Incorporate aids to facilitate a wider range of cues and focus students' attention on relevant ones.[14]		x
Evaluation, recommended adaptations	**FI students**	**FD students**
Have the correct response not be the one suggested by the field factor.[53]		x
Monitor students by having assignments due within short periods of each other to ensure self-pacing occurs.[48]		x
Carefully administer negative social reinforcement (feedback).[14]		x
"Evaluate your evaluation" to prevent biasing your evaluation more positively for a student who may match your own cognitive style.[67,68,69]	x	x
Provide a variety of assignments to choose from: take-home exams; group and individual projects; multiple-choice, fill-in-the-blank, matching, short answer, and essay questions.[51]		x

Table 1. Adaptations to dental hygiene instruction to accommodate field independence

adaptations include minor revisions to teaching approaches, student support, and evaluation. An "x" indicates the relevance of the adaptation to students of differing levels of field independence.

In dental hygiene education, a curriculum designer or lecturer would have the most influence in adapting instruction to accommodate the needs of FD and FI learners since they are involved in the didactic portions of coursework and the planning of assessment tools. Clinic course coordinators have a little more influence in these processes because they instruct students on creating realistic goals for achieving clinical competence during short intervals. Clinical instructors still play an important role in a students' clinical progress and have opportunities to bridge the gap in differential learning gain by adapting their teaching approach.

DISCUSSION

Style flexing

After examining the characteristics of a "typical" field independent and dependent student, it became obvious that it would be highly desirable for a dental hygienist to have the qualities associated with both poles of the continuum of the cognitive style dimension field dependence/independence. Dental hygiene students are evaluated on whether they have an organized approach to their clinic sessions and projects. They also need to possess the appropriate social skills: to get information from their clients with respect to their medical and dental histories; to put their clients at ease; and to maintain communication throughout their treatment. Although dental hygienists are mostly involved in independent work activities, they also need to be able to collaborate and work cordially with fellow dental health care team members.

Adapting instruction to reduce the differential learning gain between field dependent and field independent learners will be of benefit only for a short-term objective. Murray states that it would be unfair to teach students only according to their cognitive styles if the world of work calls for proficiency in both cognitive style dimensions.[59] Because cognitive style flexibility is a requirement of a competent dental hygienist, it is important for dental hygiene educators to promote the development of cognitive style flexibility in course planning and delivery.

Suggestions for further research include determining the level of field independence of dental hygiene students across Canada, especially for those students requiring remediation. Research could also be carried out to validate the recommended adaptations outlined in table 1 through primary educational research for dental hygiene students; the current analytical survey included research that involved subjects from a variety of subject matter domains and contexts.

As the literature examined was set specifically in educational contexts, this project's data can not be generalized to adapting oral health care instructions for clients of varying levels of field independence. This, however, is another potential area for future research.

CONCLUSION

The analytical survey offers the explanation that the cognitive style dimension of field independence/dependence impacts student learning and suggests strategies for addressing varying levels of field independence.

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The Choice Is Clear *(continued from page 199)*

tion weave communities together to form "powerful strategic fabric."[2] Over the last several years, CDHA has focused its efforts on engaging our members in what we call the "4 C's": coordination, collaboration, communication, and community. Using interactive web-based tools, we have sought to connect with you to "share your choices" and perform our work on your behalf with "meaning and rhythm and grace." We have also met face to face with many of you at stakeholder workshops, conferences, and meetings or spoken or corresponded with you. These interactions have enabled us to move forward on advocacy and expand our membership benefits to include on-line continuing education, a professional development tracking tool, and discounts for many products including the new *DVD Journal of Dental Hygiene*, uniforms, hotel rooms, computers, and cell phones. You can also receive enhanced performance through group participation in our RRSP program, mortgage program, disability and home and auto insurance.

Etienne Wenger describes the concept of a constellation of communities. "The term constellation refers to a grouping of stellar objects that are seen as a configuration even though they may not be particularly close to one another, of the same kind, or of the same size."[3] This is an apt metaphor for CDHA and its provincial and local society partner associations as we move forward in this membership year, building on past successes to provide you with strong local and provincial resources. Watch for more information on these exciting projects throughout the fall.

One librarian respondent in the above-mentioned research said that she chose to belong to her national association due to "sheer professionalism." We believe that with

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A Profile of Non-Practising Dental Hygienists Residing in British Columbia

by Deby Gullekson,[§] DipDH, BDSc (DH), and Bonnie J. Craig,[†] DipDH, MEd

ABSTRACT

An investigation was carried out to profile non-practising dental hygienists living in British Columbia. A questionnaire was sent to all eligible and consenting registered dental hygienists residing in the province who, at the time of writing, held non-practising registration with the College of Dental Hygienists of British Columbia (CDHBC). The written questionnaire gathered demographic information and measured career satisfaction. The results of the questionnaire were evaluated to determine the areas on which the dental hygiene profession should focus in order to encourage dental hygienists to remain in the profession. No research has been carried out so far in British Columbia with this target population.

The overall response rate was 66%. Results showed that most respondents lived in the Lower Mainland or on Vancouver Island, were female, between 30 and 39 years old, married or in common-law relationships. Those with children had an average of 2.1 in either the 0–10-year-old age group or the 20+ year group. The majority had obtained a diploma in dental hygiene and had worked in clinical practice for more than 10 years. Most were employees who worked between 17 and 40 hours per week. The primary reason for the non-practising status was physical disability (all types combined). Other major reasons for non-practising status were child care, maternity leave, or stress leave. The majority of respondents had seriously considered a career change. Most were unsure if they would return to practice, but about one-third did not intend to return permanently to the dental hygiene field. Most had been inactive for at least one year. Most respondents believed that dental hygienists' scope of practice should be increased and were interested in restorative dentistry as an expanded function.

Dental hygienists were generally satisfied with their career choice. The areas that caused the greatest career dissatisfaction were the physical demands, lack of career advancement, and lack of benefits. Other areas scoring relatively high in dissatisfaction were the cost of registration, supervision issues, continuing education cost, mentoring, marketing expectations, chemical exposure, physical demands, radiation exposure, level of creativity, and level of variation in daily routine.

Key words: Career choice, career mobility, dental hygienists, employment

INTRODUCTION

DENTAL HYGIENISTS PLAY AN IMPORTANT ROLE IN ORAL health care and these preventive professionals are generally satisfied with their career choice and enjoy their work. However, there are dental hygienists registered with the College of Dental Hygienists of British Columbia (CDHBC) in a non-practising category. This study looks at these non-practising dental hygienists to discover their demographic characteristics and why they have decided to leave practice, either temporarily or permanently. This study's findings may assist in the retention of registered dental hygienists, thereby decreasing the cost to society for training more dental hygienists or for retraining dental hygienists who chose another career path.*

A limited number of studies exist on dental hygienists' career satisfaction and attrition rates. Attrition is here defined as dental hygienists leaving the profession permanently. Not only is the number limited but many of the references are not that recent.

Patricia Johnson did an exhaustive study of dental hygiene practice in Canada in 2001.[1] Across Canada, dental hygienists participating in the workforce increased from 79.6% in 1977 to 92.6% in 2001 (p. 383). Johnson

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* *Note from the Registrar, College of Dental Hygienists of British Columbia (CDHBC):* The following paper details an investigation that took place in order to better understand the profile of non-practising registrants in British Columbia. At the time of the investigation, the CDHBC was reviewing and renewing its continuing competency program. The College had proposed the inclusion of a certain number of clinical practice hours as a requirement for full registration in British Columbia. Although this requirement never made it past the consultation process, many registrants believed that the College had implemented the change. Therefore, the College would like readers to be aware that some of the feedback collected in this investigation reflects the beliefs of registrants, rather than the regulatory requirements for registration in British Columbia. In addition, readers should be aware that the College has made and continues to make efforts to support the return of non-practising dental hygienists to the profession. The regulation of safe and ethical dental hygiene practice in British Columbia is the primary concern and focus of the CDHBC.

notes that the "pool of inactive dental hygienists...[was] an estimated 7.0% of the population, a decrease from 8.0% in 1987 and 14.7% in 1977."(p. 393) Satisfaction with wage income was moderate but dental hygienists were less satisfied with job security and employment benefits.(p. 108). "The vast majority [of dental hygienists] does not receive standard employment benefits, especially if they work in a private dental office (as 9 out of 10 did in 2001)" (p. 394).

Johns and colleagues carried out a study in 2001 on career satisfaction and retention of dental hygienists in Texas.[2] The survey population consisted of dental hygienists with an active licence to practise in Texas. Seventy-eight per cent of respondents were currently working, 18% were not working, and 4% did not respond to this employment question (p. 139). Those who had left practice identified the most common reasons for leaving (in order of importance) as "family responsibility, boredom, lack of benefits, inadequate salary, and lack of participation in decision making." Seventy per cent cited family responsibility as the main reason for leaving (p. 140). Interestingly, for 50% of those who stayed in active practice, salary was the main motivator for remaining in the field (p. 140).

Another study looking at dental hygiene retention was carried out in 1996 by Calley and associates who looked at dental hygienists who had remained in the same private office practice for five years or more.[3] Of the licensed dental hygienists in the sample population, 85.7% were practising. Of these, nearly two-thirds (63.3%) had remained in the same practice location for at least five years. The dental hygienists identified six main factors that influenced their decision not to change jobs or to leave the profession entirely: "(1) quality/safe work environment, (2) time management for high-quality dental hygiene services, (3) effective employer office policies/procedures and personnel management, (4) employer support of professional career, (5) supportive work environment, and (6) variety in scope of practice."[3]

A study in the United States, based on per-1991 information, estimated the attrition rate to be between 4% and 9.8%.[4] Miller carried out a study in 1991 to investigate this and found a 3.5% rate.[4] The most common reasons for leaving were family responsibilities or continuing education in another field. Other reasons were lack of employment opportunities, licensure difficulty, and disinterest or dissatisfaction in dental hygiene. Many other factors may contribute to dental hygienists leaving the work force—regulatory, social, ethical, physiological, psychological, economic. The five major reasons were boredom, inadequate salary, lack of benefits, concern with infectious disease, and lack of decision-making opportunities. Miller also developed a profile for dental hygienists most likely to leave the field: female (99%); Caucasian (98%); older than 38 years (56%); married (78%); diploma graduate (64%); 7–16 years of experience (52%); employed by a dentist (85%); non-practising from 0 to 2 years.[4]

RÉSUMÉ

Une enquête a été effectuée afin de dresser le profil des hygiénistes dentaires vivant en Colombie-Britannique sans y exercer leur profession. Un questionnaire a été envoyé à tous les hygiénistes dentaires autorisés, admissibles et consentants, qui vivent dans la province mais qui, au moment de la rédaction, étaient inscrits auprès du College of Dental Hygienists of British Columbia (CDHBC) comme n'exerçant pas leur profession. Ce questionnaire écrit a permis de recueillir des renseignements démographiques et de mesurer la satisfaction sur le plan professionnel. Les résultats obtenus ont été évalués afin de déterminer les domaines sur lesquels la profession d'hygiéniste dentaire devrait se concentrer afin d'inciter les hygiénistes dentaires à ne pas quitter la profession. Jusqu'à présent, cette population cible n'avait fait l'objet d'aucune recherche en Colombie-Britannique.

Dans l'ensemble, le taux de réponse s'établit à 66 %. D'après les résultats, la plupart des répondants habitent le Lower Mainland ou l'île de Vancouver, sont des femmes, ont entre 30 et 39 ans et sont mariés ou en union de fait. Les répondants qui ont des enfants ont en moyenne 2,1 enfants de 0 à 10 ans ou de 20 ans et plus. La majorité d'entre eux ont obtenu un diplôme en hygiène dentaire et ont travaillé en pratique clinique pendant plus de dix ans. La plupart étaient employés et travaillaient 17 à 40 heures par semaine. L'incapacité physique (tous types combinés) est la raison principale pour laquelle ils n'exercent pas leur profession. Les autres raisons importantes sont la garde d'enfants, un congé de maternité ou un congé lié au stress. La majorité des répondants ont songé sérieusement à changer de carrière. La plupart ne savaient pas s'ils reprendraient l'exercice de la profession; le tiers n'avait pas l'intention de retourner travailler à temps plein dans le domaine de l'hygiène dentaire. Presque tous étaient inactifs depuis au moins une année. Une grande partie des répondants estime que le champ de pratique des hygiénistes dentaires devrait être élargi et manifeste de l'intérêt pour la dentisterie de restauration comme nouvelle avenue.

En général, les hygiénistes dentaires se montrent satisfaits de leur choix de carrière. Les aspects qui leur causent le plus d'insatisfaction sont les exigences physiques, l'absence d'avancement dans la carrière et l'absence d'avantages sociaux. Les autres éléments d'insatisfaction qui obtiennent un score relativement élevé sont le coût de l'enregistrement, les questions relatives à la supervision, le coût de la formation continue, l'encadrement, les attentes sur le plan du marketing, l'exposition aux produits chimiques, les exigences physiques, l'exposition aux radiations, le niveau de créativité ainsi que le degré de variation dans les activités quotidiennes.

Mots clés : Choix de carrière, mobilité professionnelle, hygiénistes dentaires, emploi

The three primary reasons for not practising dental hygiene were maternity leave..., child care..., and stress leave...

Another study by Boyer in 1994 examined career retention and found that attrition was not an issue within the first six years of graduation.[5] Those who had left the profession permanently cited a wide range of reasons that correlated with findings in other studies. Family responsibilities were the primary reason for not practising while other reasons for considering leaving—or actually leaving—were economic and psychological (stress, burnout, bored, etc.).[5]

Dental hygienists generally are satisfied with their career choice.[6-9] Boyer, in the 1994 study, reviewed 31 articles on job satisfaction and found that most dental hygienists liked working with people, providing a service, and working independently.[5] They were least satisfied with repetition, lack of variety, physical and emotional demands, and lack of advancement.[5]

Body in 1988 also reviewed career satisfaction.[10] She found dental hygienists' dissatisfaction with their career was correlated with variety of work, lack of advancement opportunity, individual personal value system, and education level. She discovered that dental hygienists, particularly those with a baccalaureate education, felt underutilized and overeducated due to limitations in clinical responsibility. There were contrasting conclusions about whether expanding the dental hygienist's scope of practice increased career satisfaction. She concluded that dental hygienists were underutilized regardless of expanded duties and suggested possibly decreasing the scope of practice but expanding the education within the scope.[10]

Of course, caution must be used in interpreting some of these studies as most were done in the United States. When research for the present paper was carried out, dental hygienists in the United States were paid less than in Canada and had a higher rate of unemployment.[4-6,9,10] Baccalaureate dental hygienists were paid more than those with a diploma and it has been documented that they had different career expectations.[4-6,9,10] The information elicited depends greatly on the format of the questionnaire and the questions asked. These of course vary with individual studies.

It can be difficult to ascertain the reasons for choosing non-practising status. Sometimes it may be obvious; at other times, it may be unclear why people choose to leave a profession. Every profession loses practitioners, some at higher rates than others. The decision to leave may be arrived at gradually as the result of many factors, rather than being taken abruptly. This has been shown in the literature.[4,5,10] In the field of dental hygiene, this slow withdrawal may be accomplished by holding non-practising registration. This entails paying a reduced fee to the College of Dental Hygienists of British Columbia (CDHBC) to remain registered; this does not, however, allow registrants to work unless they change their registration category.[11] At this point, we cannot assume that holding non-practising registration means a registrant has left the profession permanently and that they may not be recruited back into the field.

This study investigates non-practising dental hygienists in British Columbia to discover the reasons why they choose not to practise and to suggest some areas for improvement so they will be encouraged to re-enter the field.

MATERIALS AND METHODS

A written questionnaire was designed to measure career satisfaction and to develop a profile of dental hygienists holding non-practising registration. From this, the significance of the profile will be determined. The results of the questionnaire were evaluated to determine areas the dental hygiene profession may need to focus on in order to encourage and support dental hygienists to remain active in the profession. The questionnaire included 5 open-ended questions, 16 closed questions, and 1 question focusing on career satisfaction. A Likert scale was used to measure responses.

As of September 2002, the total of all registrants in British Columbia registered with the CDHBC was 1,974; of these, 128 held non-practising registration. Of those in the non-practising category, 36 resided in British Columbia at the time of the study.*,[12] After ethical approval, the questionnaire was sent to 32 of these 36 dental hygienists who resided in the province and who currently held non-practising registration with the CDHBC. (Four registrants did not want to receive mailings from sources other than CDHBC so could not be included in the study.[13]) As the study looked only at non-practising dental hygienists who lived in British Columbia, we did not send questionnaires to other dental hygienists living outside the province and who held non-practising registration with CDHBC.

The research was designed as a blinded, cross-sectional case study that was exploratory in nature. No hypothesis was planned. Sampling was not considered necessary as at the time of the study, we believed the entire population had the opportunity to be included in the study. Respondents were given two weeks to return the questionnaire. Data was analyzed using SPSS 10.0. Frequency counts and a chi-square analysis were done although statistical significance was not calculated.

RESULTS

The overall response rate was 66%. One questionnaire, however, was incomplete and this dropped the completed response rate to 63%. Results showed that most respondents lived in the Lower Mainland (43%) or on Vancouver Island (33%). The rest were either in the Okanagan (19%) or Cariboo North (5%). The majority of respondents were 30–39 years old (52%) with the next-largest age group

* The current registrar of CDHBC notes that at the time this study was conducted, the College did not provide the author with the correct number, which is 47.

	N	%
Region		
Cariboo North	1	4.8
Vancouver Island/ Coast	7	33.3
Lower Mainland	9	**42.9**
Okanagan	4	19.0
Age		
20–29 years	1	4.8
30–39 years	11	**52.4**
40–49 years	3	14.3
50–59 years	5	23.8
60+ years	1	4.8
Gender		
Male	0	0
Female	21	**100**
Marital status		
Single	1	4.8
Married/common-law	18	**85.7**
Divorced/Sep/Widow	2	9.5
Children		
No	5	23.8
Yes	16	**76.2**
Paid hours		
0–16 hours	2	10
17–24 hours	6	**30**
25–32 hours	6	**30**
33–40 hours	6	**30**

	N	%
Education level		
Diploma	14	**66.7**
BDSc in dental hygiene	2	9.5
Bachelor, other field	2	9.5
Masters	3	14.3
Years since graduation		
0–4 years	2	9.5
5–9 years	3	14.3
10–14 years	6	**28.6**
15–19 years	3	14.3
20–24 years	4	19.0
30+ years	3	14.3
Area of practice		
Clinical practice	16	**76.2**
Education	1	4.8
Research	1	4.8
Community health	2	9.5
Student	1	4.8
Type of employment		
Self-employed	2	9.5
Employee	18	**85.7**
Volunteer	1	4.8
Length of time non-practising		
7mos- 1 year	4	19.0
1– 1 ½ years	1	4.8
1 ½ – 2 years	5	23.8
2 ½ – 3 years	7	**33.3**
3+ years	4	19.0

	N	%
How many children		
1	6	**37.5**
2	4	25.0
3	5	31.3
4	1	6.3
Ages of children		
0-1 years	7	21.2
2-5 years	7	21.2
6-10 years	6	18.2
11-15 years	2	6.1
16-20 years	3	9.1
20+ years	8	**24.2**
Considered career change		
Yes	12	**60**
No	8	40
Increase scope		
Yes	14	**66.7**
No	3	14.3
Undecided	3	14.3
Ideal number of days		
0 days	1	5
1 day	2	10
2 days	4	20
3 days	5	**30**
4 days	1	5

N=21. Analysis does not always result in 100% total due to 1 incomplete survey that was partially included.

Table 1. Profile of non-practising CDHBC registrants residing in British Columbia

being the 50–59 year old group (24%). The remainder fell into the 40–49 year age group (14%) or in either the 60+ or 20-29 year old group with 5% each. All were female. The group consisted overwhelmingly of married/common law females (86%), with only 10% widowed/separated/divorced, and 5% single (see table 1).

The respondents were more likely to have children (76%) than not (24%). There was an average of 2.1 children for women who had children. The number of children per family varied: 38% had one child; 25% had two; 31% had three; and 6% had four. The age ranges of these children were as follows: 20+ years (24%); 0–1 and 2–5 years old (21% each); 6–10 years (18%); 16–20 years (9%); and 10–15 years (6%). The majority of respondents had obtained a diploma in dental hygiene (67%); 10% had a BDSc in Dental Hygiene; 10% had a bachelor's degree in another field (psychology, health education); and 14% had a masters degree (in education, forestry and educational psychology/counselling). None had obtained a doctorate.

Most respondents had graduated 10–14 years previously (29%), followed by 20–24 years ago (19%). The other groupings for "years since graduation," 5–9 year, 15–19 year, or 30+ years, each accounted for 14%. The remaining 10% were in the 0–4 year group.

In the past, most of the registrants had worked in clinical practice (76%) with the others either in community dental health (10%), education, research, or continuing their studies (5% each). The vast majority of dental hygienists were employees (85.76%) with only 9.5% self-employed and 4.8% working as unpaid volunteers. Most worked between 17–24, 25–32, or 33–40 hours per week (30% each category). The remaining 10% worked 8–16 hours per week.

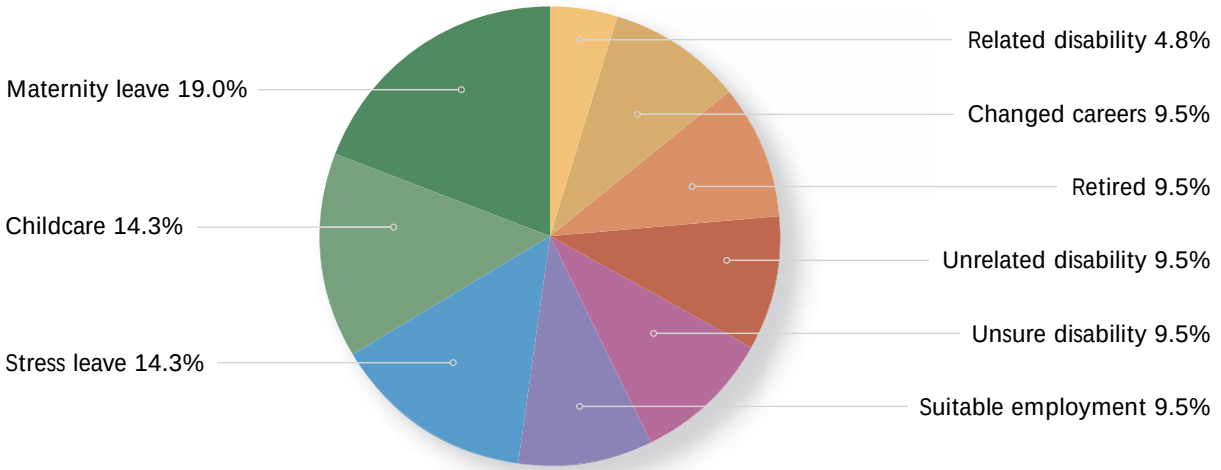

Figure 1. Primary reasons for non-practising status

N=21 with 21 responses

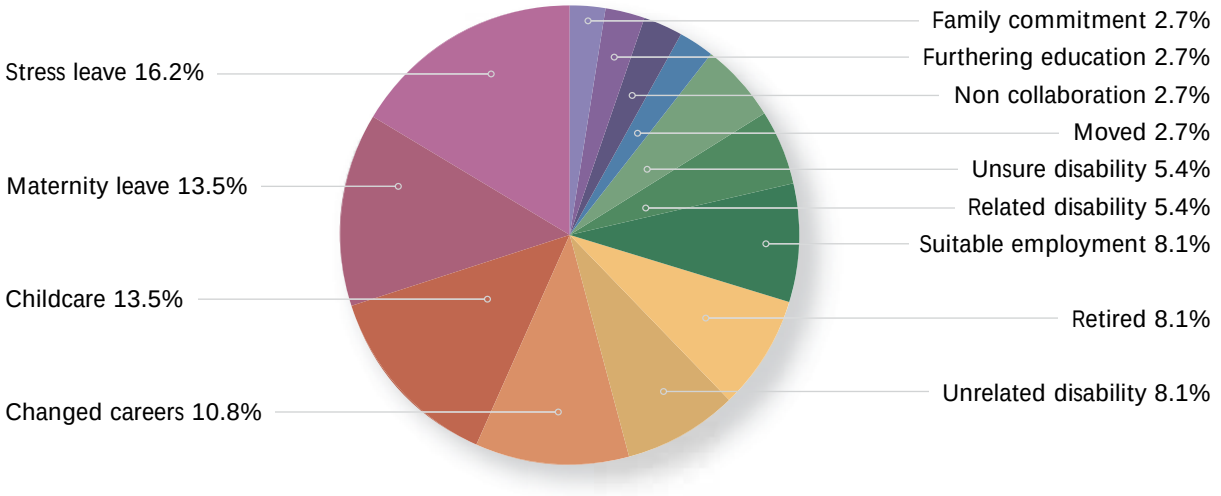

Figure 2. All reasons for non-practising

N=21 with 38 responses

The three primary reasons for not practising dental hygiene were maternity leave (19%), child care (14%), and stress leave (14%). These were followed by retirement (9.5%), change in careers (9.5%), inability to find suitable work (9.5%), physical disability related to work (4.8%), physical disability unrelated to work (9.5%), or a physical disability where it was uncertain if it was related to work or not (9.5%) Thus physical disability of all types accounted for nearly 24% of the reasons for leaving practice, a combined figure greater than the single number one reason—maternity leave (see figure 1).

When looking at all the reasons people gave for not being employed in dental hygiene, the following statistics emerged (see figure 2): 16% were on stress leave; 14% were looking after children; 14% were on maternity leave; 11% had a change of careers; 8% retired, were unable to find suitable work, or had a unrelated physical disability; 5% had a physical disability either related to or unsure if related to work; 3% moved, furthered education in fields other than dental hygiene, had family commitments, or were unable to achieve a collaborative relationship with dentists.

The majority of people (60%) had seriously considered a career change with many different careers being examined (own private franchise, business development/e-commerce, accounting/MBA, farming, consulting, teacher's aide, information technology professional, small business owner, dental reception, law, audiology, real estate agent). Most respondents were unsure if they would return to practice (43%) with 33% having decided not to return to dental hygiene (see figure 3). The reasons given by these two groups for not practising were varied and often consisted of more than one reason. The remaining 24% were inactive temporarily due to maternity/childcare responsibilities.

Most respondents had been inactive for more than 1½ years: 33% had not practised for 2½–3 years; 24% for 1½–2 years; 19% for both categories of more than 3 years, or 7 months to 1 year; and 5% for 1–1½ years. Many reasons—perceived as barriers—were given for not returning to the

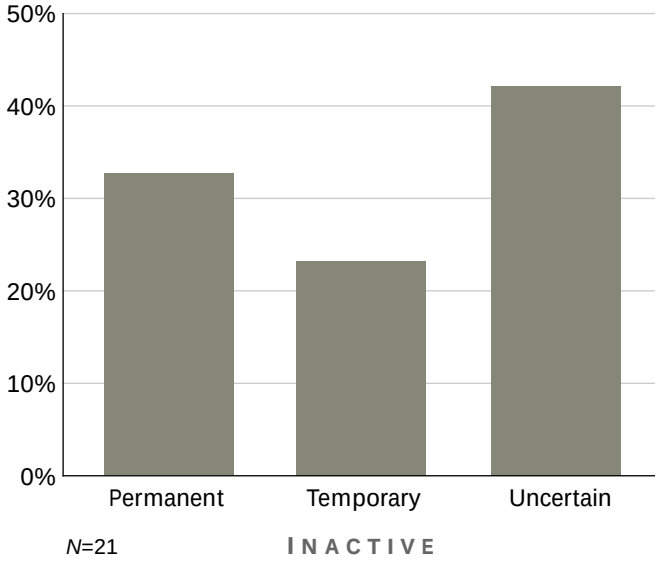

Figure 3. Non-practising status

workforce. Most common were physical disability, physical demands of the job, childcare/daycare issues, the 500 practice hours required,* and lack of community dental health jobs. Other reasons included lack of required continuing education hours, lack of confidence with local anesthetic, need to travel to find suitable work, board exams, latex/chemical allergies, non-collaborative working relationships with dentist employers, and family commitments.

Most registrants (70%) believed the scope of practice should be increased with 15% either undecided or against. For those who believed it should be increased, most felt that restorative dentistry should be considered. Many of these hygienists had been trained previously in this area. Other ideas for increasing scope included following the example of the nurse practitioner model, expanded duties in the long-term care field, removing the 365-day rule, treatment planning focus, increasing leadership roles in public health and management of dental hygiene clinics, more variety overall, rehabilitation research and disability management, Botox injections, acupuncture, and an increased focus on the areas in which dental hygienists are already educated (that in itself would expand the scope of practice). For those who were uncertain about returning or who are not practising only temporarily, a workweek of 2–3 days was considered ideal: 10% chose one day a week; 20% chose two; 30%, a three-day week; and 5%, a four-day workweek.

In general, non-practising registrants were satisfied with their choice of career (see table 2). The section on career satisfaction was broken down into six main areas: regulatory, social, ethical, physiological, psychological, and economic. An arbitrary cut-off point was set at 50% in order to analyze career satisfaction. The data was further analyzed two ways: the areas of least satisfaction (20% to 49% of respondents dissatisfied) and areas of most dissatisfaction (50% or more of respondents dissatisfied). When analyzing areas of most dissatisfaction, physical demands, lack of career advancement and benefits scored the highest. When analyzing the areas of least satisfaction, the following were included: cost of registration, supervision issues, continuing education costs, mentoring, marketing expectations, chemical exposure, radiation exposure, level of creativity, and level of variation in daily routine.

* This was a misconception of the respondents; this requirement had been discussed by the CDHBC but not put into force.

DISCUSSION

Significance testing is appropriate in a sample survey when utilizing a random sample of a population.[14] This study was considered a population census; therefore performing tests for statistical significance was not deemed necessary. A comparison analysis utilizing counts and/or percentages was considered adequate.[14,15]

A comparison group would have provided more information in assessing differences and similarities between practising and non-practising registrants. It is recommended that further research be performed with this group. It is therefore very important that the information from this group of non-practising registrants not be generalized to reflect the opinions of practising dental hygienists or of other non-practising registrants who do not reside in British Columbia.

One limitation of the study is the response rate (66%) with one incomplete survey that reduces the response rate to 63%. The entire population consisted of only 36 registrants with non-practising status: four of those did not want mailings other than from CDHBC. Due to the small number in the group (20 completed and one incomplete questionnaire), all answers had a fairly significant impact on the outcome. If 100% of the questionnaires were returned, this study would have greater significance; however, the study does give us some important information about this group. Keeping this limitation in mind, some stronger indications about issues can be considered important, particularly those questions with high levels of agreement, whether positive or negative. An in-person interview, not possible due to geographic challenges, could have provided more information for statistical analysis with less chance for misinterpretation of questions.

One of the questions measured career satisfaction, but in retrospect, it was really designed for those dental hygienists who had been in clinical practice rather than in other areas of dental hygiene practice. The answers may have been skewed to some extent when including those dental hygienists who had worked in community dental health or as educators; these dental hygienists made up 14% of the group. However, as these non-practising registrants were part of the group, the answers were included for analysis. Dental hygienists in the public/community health or education areas of practice also stated they had difficulty finding appropriate work—this was described as a barrier to re-entry or a reason for not being employed in the field. Those working in public/community health or education also had a tendency to be more satisfied with

Regulatory issues	S (%)	U (%)	D (%)
Cost of registration	45	20	35
Cost of liability insurance	85	5	10
Supervision issues (LA, 365-day rule)	50	15	35
Continuing education cost	40	15	45
Continuing education hours required	65	10	25
Social issues			
Opportunity to make decisions	80	5	15
Office staff interactions	75	15	10
Networking	60	25	15
Mentoring	45	30	25
BCDHA support	60	35	5
Ethical issues			
Ethical relations with employer	70	20	10
Time allotted (scheduling)	65	10	25
Ability to perform scope of practice	70	5	25
Clinical abilities of employer	60	25	15
Diagnosis of employer (over/under)	70	20	10
Marketing expectations	50	40	10
Physiological issues			
Chemical exposure	45	25	30
Physical demands	35	5	60
Radiation exposure	50	30	20
Infectious disease exposure	55	20	25
Psychological issues			
Patient's behaviour in office	90	10	0
Patient compliance	65	20	15
Value placed on you by patients	95	5	0
Value placed on you by employer	75	10	15
Collegial respect from dentists	60	15	25
Level of creativity in job	35	40	25
Career advancement opportunity	25	25	50
Level of variation in daily routine	50	10	40
Personal reward (not financial)	60	15	25
Economics			
Salary	95	5	0
Benefits	35	15	50
Job security	85	10	5

Table 2. Career satisfaction

N=20 Data is grouped combining very satisfied and satisfied together and dissatisfied and extremely dissatisfied together; S=satisfied, U=unsure, D=dissatisfied

the variation, creativity and benefits provided by their work than those in clinical practice.

The survey respondents may not have distinguished between job satisfaction and career satisfaction. This is an important. Although asked to think of career satisfaction when answering, this may not have been the case. As there were not many responses in the extremely satisfied or extremely dissatisfied ends of the scale, these answers have been combined with "satisfied" and "dissatisfied" respectively.

For length of time registrants had held non-practising registration, one of the response choices ("greater than 3 years") had not been included on the survey instrument. Many of the respondents marked their answers to reflect greater than 3 years, but some may not have considered this option. As well, some questions had only "yes" and "no" answers and some respondents chose to write "uncertain" on their questionnaires. A separate category for both of these issues was included for statistical analysis, but results may have been different if those categories had been included in the questionnaire originally.

The results of this study agree with many others that have been done in determining that family responsibilities (maternity leave, childcare) were overwhelmingly the main reason registrants are not practising.[4,5,7] Some studies have determined that psychological factors such as burnout are reasons people leave the field.[5,8,10] As well, lack of variety, career advancement, and benefits have also been found as a reason for dissatisfaction in career.[8,10,12] Even in this group that is not currently practising or has already left the profession, a high degree of career satisfaction exists. The results from this study agree with other studies done with dental hygienists in this area.[6-10]

There were some misconceptions discovered with non-practising dental hygienists related to requirements to re-enter practice. Some registrants perceived barriers that did not in fact exist, particularly in the regulatory area.[11,13] It would appear that some non-practising registrants are not aware of by-laws and requirements to switch back to practising status. This may be one area to focus on in order to persuade dental hygienists in this category to re-enter practice.

CONCLUSIONS

Most hygienists were satisfied with their career choice. The primary reasons for non-practising registration were maternity leave, childcare, or stress leave. The main areas of dissatisfaction with a career in dental hygiene were related to physical demands, lack of career advancement, and lack of benefits. Areas that registrants rated lower on the satisfaction scale should be areas the profession focuses on in order to prevent them from becoming future areas of discontent. These include cost of registration, supervision issues, continuing education costs, lack of mentoring, marketing expectations of dentist employers, chemical exposure, radiation exposure, level of creativity, and level

of variation in daily routine. Further investigation into stress leave and burnout should be carried out to investigate its relevance to registrants' non-practising status and to determine its significance to practising dental hygienists. As well, further research should be done to determine career satisfaction for practising registrants (working both full- and part-time) to see if findings agree with this paper.

As the dental hygiene profession evolves and changes, new issues will develop in the profession and in the relationship dental hygienists have with their dentist colleagues. Input from practising dental hygienists is strongly encouraged as the profession advances. Although there are some areas that create some dissatisfaction, there is also a high degree of overall career satisfaction in dental hygiene.

ACKNOWLEDGMENTS

The author would like to thank Bonnie Craig, mentor and co-investigator on this project, for her time and effort. There was no funding for this study. Research was undertaken as part of a requirement for a Bachelor of Dental Science in Dental Hygiene degree at University of British Columbia.

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Le choix est clair *(suite de la page 199)*

nelles. L'auteure fait remarquer que la plupart des membres d'associations de bibliothécaires, comme les membres de l'ACHD, paient leur cotisation de leur poche et s'attendent par conséquent à un rendement sur leur investissement et à ce que celui-ci soit pertinent pour leur travail. Selon elle, l'importance de la qualité, la possibilité de contribuer à la profession et une solide mission de défense de leurs intérêts sont tous des facteurs pertinents pour la population de bibliothécaires visée par son étude. Nos rapports avec vous confirment les conclusions de cette étude.

Arian Ward est un leader stratégique primé. Selon lui, le partage des connaissances, l'apprentissage et les conversations contribuent à la formation de l'esprit de corps et produisent « un tissu stratégique puissant[2] ». Ces dernières années, l'ACHD s'est employée à mobiliser ses membres en faveur de ce qu'elle appelle les quatre « C » : la coordination, la collaboration, la communication et la collectivité. Au moyen d'outils interactifs diffusés sur le Web, nous avons cherché à communiquer avec vous pour « partager vos choix » et accomplir notre travail en votre nom en lui donnant « une signification, un rythme et de la grâce ». Nous avons également rencontré personnellement bon nombre d'entre vous lors d'ateliers, de conférences et de réunions pour intéressés; nous avons aussi eu des entretiens ou échangé des lettres avec vous. À la faveur de ces interactions, nous avons progressé dans la défense de nos intérêts et multiplié les avantages de l'adhésion à l'Association. Ceux-ci comprennent désormais la formation continue en ligne, un outil de suivi du perfectionnement professionnel en ligne ainsi que des rabais sur de nombreux produits – uniformes, chambres d'hôtel, ordinateurs et téléphones cellulaires, sans compter le nouveau *DVD Journal of Dental Hygiene*. Vous pouvez également profiter d'un rendement accru en participant à nos programmes de groupe : REÉR, prêts hypothécaires, assurance invalidité, assurance habitation et assurance automobile.

Etienne Wenger décrit la notion de constellation de collectivités. « Le terme constellation, dit-il, fait référence à un regroupement d'objets stellaires qui sont perçus comme une configuration, même s'il se peut qu'ils ne soient pas particulièrement rapprochés les uns des autres, du même genre ou de la même taille[3]. » Voilà une métaphore juste pour l'ACHD et ses partenaires, les associations provinciales et locales, alors que nous avançons dans l'année de cotisation, mettant à profit nos succès passés pour vous offrir de solides ressources provinciales et locales. Soyez à l'affût de plus amples renseignements sur ces projets stimulants tout au long de l'automne.

Une bibliothécaire qui a participé à l'étude susmentionnée a déclaré qu'elle avait choisi de faire partie de l'association en raison de « son professionnalisme pur et simple ». À notre avis, avec

de l'information utile pour la carrière…
un soutien professionnel incomparable…
des rabais incroyables destinés aux membres…
le **choix** est **clair!**

Long-Term Disability (LTD) Claims

*by Robert Rivard, BA, BCL/LLB**

A NUMBER OF AREAS IN THE FIELD OF LONG-TERM DISability claims are important and arise repeatedly. This article reviews some of these areas briefly in order to raise awareness of their existence.

A. Dealing with the insurance company

1. Get the insurance policy or booklet from your employer to determine whether you are covered under the policy or not. Your entitlement to long-term disability (LTD) is governed by the policy that was in place at the time you became entitled to make a claim. If the insurance company is sold or the company changes the contract with your employer, that does not change what governs your entitlement to LTD.
2. You must be sure to provide all the documents requested by the insurance company from your doctor. There will be quite a few documents but all are important and must be submitted to the company.
3. You should deal with the company in writing as much as possible. When there are telephone calls, confirm *in writing* who said what. So if you have a brief phone call with Mary Joe at XWZ Insurance Company, make extensive notes and follow the call with a letter to Mary Joe that basically recounts who said what in the conversation so that it is documented. At the very least, make notes while you are on the telephone or immediate afterwards, marking down as much detail as possible. Having records of conversations can prevent misunderstandings.

B. Dealing with physicians

1. It is important that your family doctor refer you to the appropriate specialists for your condition as insurance companies use their own medical specialists to review your claim. I cannot overstate the importance of specialists in this matter. Physicians are the most important people in this process. You should be sure to have regularly scheduled visits with at least your family doctor/general practitioner every two months even if there is no significant change. Some policies' provisions require you to be under regular medical care. Therefore, if you do not see your doctor for six months, even though there is nothing he or she can do for you, you may not be complying with the policy requirements and this may negate your claim.

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Your entitlement to long-term disability (LTD) is governed by the policy that was in place at the time you became entitled to make a claim.

2. As medical specialists can have different opinions about a case, there is no harm in sounding a specialist out—either in conversation with your family doctor before the referral or when you first meet the specialist—to determine whether they are favourably disposed to your situation. This can be important if the specialist employed by the insurance company disagrees with your specialist's opinion.
3. It is very important to articulate all the problems you are having including, for example, moving around, sleeping, lifting, and any fine or gross motor problems. *Every single problem* should be mentioned to your doctor. If you do not mention the problems, they cannot be charted in your medical history. And if problems are not charted, your physicians will not be able to discuss them with the insurance company or your lawyer if you need to retain a one.

C. Surveillance

1. This often occurs but do not be concerned. An insurance company may approach neighbours for information or may observe your movements from a van. If you are worried about this, you may report it to the police. The police will approach the van's occupants, determine their purpose in following you, and then get back to you. If the police indicate that those in the van have a lawful purpose, you can take it to mean they are the insurance company. However, there is nothing you can do about this as it is all happening in the public area. Sometimes the insurance company may approach you at home to see how you are able to move around.
   It is very rare, however, that surveillance poses a problem.

D. Negotiating with the insurance company

1. One thing we have been able to do is to negotiate lump sum settlements with the insurance companies in this area. The first step is to get an actuary to calculate your future benefits in present-day dollars. This will be a

Long-Term Disability (LTD) Claims
...continued on page 246

Oral-B Health Promotion Awards Announcement

We want to hear how creative you've been in promoting your profession this year. Send us your stories and photos. Entries will be judged on their creativity, planning, volunteer recruitment, educational elements, community impressions, and impact as well as innovative partnerships. Entries must be received by December 9, 2005, at CDHA, 96 Centrepointe Drive, Ottawa, Ontario, K2G 6B1.

To help you get your submission ready, please e-mail us at **info@cdha.ca**, call toll-free 1-800-267-5235, or fax us at 613-224-7283 to request an Oral-B Health Promotion Award kit. Hurry – quantities are limited. Please remember that members must make the request themselves and are limited to one kit each.

Once again, Oral-B has put together an outstanding *free* kit for CDHA members. Materials include Oral-B products and samples, as well as educational information and high-value coupons for clients.

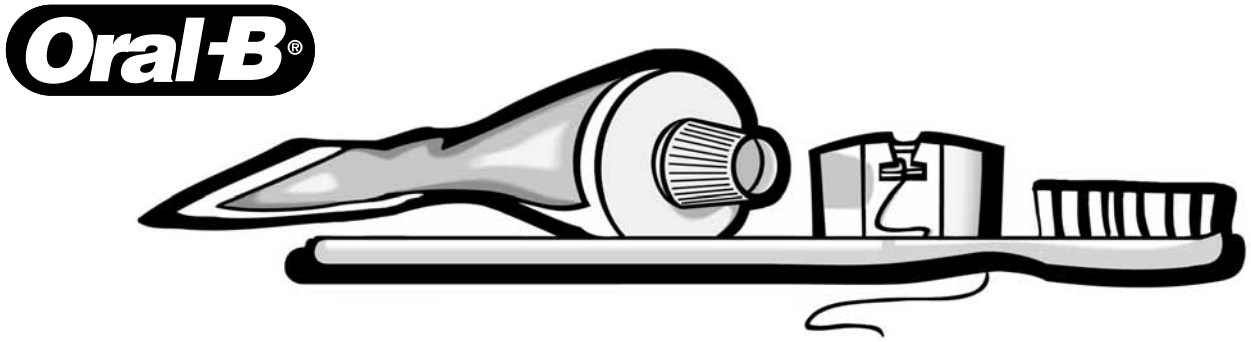
Get involved and you could win!

Enter by Friday, December 9, 2005

- **Individuals $1,000;**
- **clinic teams $2,000;**
- **dental hygiene schools $2,000**

Half of each prize will be shared with the winner's local dental hygiene chapter.

Remember — the deadline for entry submission is December 9, 2005



La Bourse Promotion Santé Oral-B - Annonce

Dites-nous dans quelle mesure, cette année, vous avez exercé votre créativité pour faire la promotion de votre profession. Faites-nous parvenir des anecdotes et des photos. Les envois seront jugés par rapport à leurs résultats au niveau de la créativité, de la planification, du recrutement de bénévoles, des éléments éducatifs, des impressions faites sur la collectivité et de leur impact ainsi que sur la dimension innovatrice des partenariats créés. Les envois doivent parvenir à l'ACHD au plus tard le 9 décembre 2005, 96 promenade Centrepointe, Ottawa, Ontario, K2G 6B1.

Pour qu'on puisse vous aider à préparer votre présentation, faites-nous parvenir un courriel à **info@cdha.ca;** ou appelez sans frais le 800-267-5235 ou télécopiez au 613-224-7283 pour recevoir la trousse pour la Bourse promotion santé Oral-B.

Oral-B a assemblé de nouveau une superbe trousse *gratuite* pour les membres de l'ACHD. Elle contient des produits et échantillons Oral-B, ainsi que des renseignements éducatifs et des coupons de grande valeur pour les clients.

5 000 $ en prix !

Inscrivez-vous au plus tard le vendredi 9 décembre 2005

- **individus, 1 000 $;**
- **équipes de cliniques, 2 000 $; et**
- **écoles d'hygiène dentaire, 2 000 $**

La moitié de chaque prix sera partagée avec le chapitre local de l'association d'hygiène dentaire de la gagnante.

N'oubliez pas — la date limite pour la présentation de votre participation est le 9 décembre 2005.

ABSTRACTS

The International Association for Dental Research (IADR), in association with the American Association for Dental Research (AADR), and the Canadian Association for Dental Research (CADR) held a combined meeting and exhibition March 9–12, 2005, in Baltimore, Maryland. The IADR General Session consisted of approximately 3,500 scientific presentations: about 1,100 oral/slid presentations and 2,400 poster presentations. Scientists and researchers from around the world present their research findings for discussion. The IADR has given us permission to publish a selection of abstracts presented at that meeting.

CARIOLOGY

0252 ASSOCIATION BETWEEN DENTAL CARIES ACTIVITY AND CORONARY HEART DISEASE SEVERITY

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The link between dental diseases and a wide range of systemic medical conditions has recently acquired increased attention. Periodontal disease, in particular, has been implicated as a marker of cardiac disease. Dental caries, the most common oral infection, should be considered as a potential risk factor for all systemic diseases. Few studies have investigated this association. **Objectives:** To investigate the potential relationship between dental caries activity, dental plaque levels and presence of mutans streptococci (Ms) in saliva (independent variables) and coronary heart disease (CHD) severity (dependent variable). **Methods:** 219 cardiac patients in a hospital cardiac clinic were included. Dental caries activity was evaluated by the "D" or "untreated" component of the DMFT index, dental plaque was measured according to the Turesky index, and the number (CFU\ml) of salivary Ms were measured on MSB-agar. CHD severity was assessed according to extent of vessel blockage; function and size of left ventricle according to results of LV-Gram catheterization; Stress tests were categorized by physiological symptoms of CHD; previous hospitalization (due to CHD) was recorded. **Results:** Previously hospitalized patients due to CHD had 3.03 untreated carious teeth as compared with 1.84 among patients not previously hospitalized (Mann-Whitney, p=0.032). Levels of MS were lowest among patients who had no coronary blockage: 11.63 million CFU\ml, as compared to patients with single, double, or triple vessel blockage: 12.97, 30.64, 21.11 million CFU\ml respectively (ANOVA, p=0.031). Plaque index levels were lowest among patients with no coronary blockage (2.80) as compared with patients with single, double or triple vessel blockage: 3.56, 3.31, 3.54 respectively (ANOVA, p=0.049). **Conclusions:** These data consistently indicate a potential association between dental caries activity and CHD severity and emphasize the role of preventive dentistry in the promotion of general health.

839 EFFECTS OF TOPICAL FLUORIDE AND LASER IRRADIATION ON CARIES INHIBITION

M. YOUSEF, M. FONTANA, C. GONZALEZ-CABEZAS, A. MARTINEZ-MIER, and G. ECKERT, Indiana University - Indianapolis, USA

Several studies have demonstrated the ability of lasers used alone or with fluoride to enhance enamel and dentin's resistance to dissolution in acid. However, little is known on which commercially available is best to accomplish this purpose. **Objective:** The purpose of this study was to compare the effectiveness of different commercial lasers (alone or with APF gel) in enhancing enamel resistance to demineralization. **Methods:** Three lasers were tested: Nd:YAG laser (dLase 300 plus), CO2 laser (Luxar laser LX-20, Luxarcare), and argon laser (Lasermed). 132 extracted human molars were divided in the following 11 treatment groups: each laser alone, each laser in combination with an APF gel (before or after irradiation), a positive control (APF alone), and a negative control (no treatment). After their respective treatment, specimens were demineralized for 96 hours in a lactic acid/carbopol solution (pH 5.0), at 37 ¢ªC. Specimens were then analyzed for firmly and loosely bound fluoride, and lesion size using confocal microscopy. **Results:** Combining APF (before or after) with the CO2 and argon lasers completely prevented development of lesions. Nd:YAG laser followed by APF also prevented development of lesions, however, APF followed by Nd:YAG laser produced lesions, which were significantly shallower than those produced in the Nd:YAG, CO2, argon, and negative control groups. All 3 laser-only treated groups developed significantly shallower lesions than the negative control. The APF group developed significantly shallower lesions than fluoride-Nd:YAG, Nd:YAG, CO2, argon, and the negative control. The uptake of loosely bound fluoride was significantly higher at 30µ depth than at 90µ for all treated groups. Fluoride uptake was significantly higher at 30µ than at 90µ depth for argon, argon-fluoride, CO2, Nd:YAG, and the positive control. **Conclusion:** All 3 commercial lasers tested, either alone or combined with APF, significantly enhanced enamel resistance to chemical dissolution.

2045 COMPARISON OF CONVENTIONAL CARIES DETECTION AND CARIES DETECTOR DYE

F. ARBABZADEH ZAVAREH[1], M. BOUZARI[2], and M. YAZDIZADEH[1], [1] Isfahan Medical Science University, Iran, [2] Isfahan University, Isfhan, Iran

Objectives: Tactile and visual methods are not completely efficient in caries diagnosis. **Methods:** A visual method reinforced by a dye (Kuraray, Japan) was used to evaluate accuracy of the conventional methods. Two hundred and four teeth with cavities (class I & II) already confirmed caries free by specialists in patients were chosen. The cavities dried and stained with a drop of the dye and were washed by water after ten seconds. Chi-square and Z tests were used for statistical analyses. **Results:** The remained caries, especially in dentinoenamel junction (DEJ) stained dark pink color. Out of 102 class I cavities, 43 (42%) were stained in DEJ (10 in mesial, 14 in distal, 19 in buccal and 19 in lingual walls). Out of 102 class II cavities, 49 (48%) were stained in DEJ (27 in gingival, 10 in lingual, 19 in buccal, 3 in mesial or distal (axial), 19 in buccal box and 8 in lingual box walls). The difference observed between class I and class II cavities was not significant (P< 0.05). In class I cavities no significant differences was observed among different parts involved (P< 0.05). In class II cavities the rate of caries was significantly higher in gingival wall (P< 0.05). Out of 44 maxillary and 58 mandibular teeth of class I cavities 17 and 26 had remained caries respectively. The difference was not significant (P< 0.05). Out of 57 mandibular and 45 maxillary teeth of class II cavities 34 and 15 had remained caries respectively. The difference was significant (P< 0.05). Totally the rate of caries was significantly higher in mandibular teeth (P< 0.05). **Conclusion:** Accuracy of tactile and visual method was about 55%; therefore more attention should be paid in diagnosis and removal of caries in DEJ. The use of caries detector dye was suggested

3258 CHLORHEXIDINE EFFECT ON ARTIFICIAL CARIES USING AN INTRA-ORAL CROWN MODEL

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The use of chlorhexidine (CHX) as a topically applied oral antiseptic is well documented; however, clinical studies examining the effects of

CHX gel on *in-situ* dental caries are limited. **Objective:** The goal of this study was to examine the effects of 1% CHX gel on enamel and root caries using an intra-oral single-section crown model. Materials and **Methods:** Thirty patients were recruited based on their need for a mandibular, full crown. Artificial caries lesions were created in extracted, human teeth and enamel and root tissue sections approximately 100µm thick were characterized using polarized light microscopy. The sections were fixed in an interproximal slot and the study crown was placed on the prepared tooth. Using a modified, three round crossover design, participants were randomly assigned either a placebo toothpaste with no fluoride, a toothpaste with 1100ppm F or an 1100ppm F toothpaste plus 1ml of 1% CHX gel administered at day 1 and day 14 (CHX+). Patients were instructed to brush twice daily for 1min for the entire 4wk round. Following each round, the sections were removed from the crown and replaced with a new set of sections. The sections were re-characterized and any changes in the lesions were quantified. Means were compared using ANOVA and the level of significance was 0.05 for all comparisons. **Results:** The CHX+ group significantly out-performed placebo using enamel and root tissue. CHX+ reduced lesion area in enamel more than the 1100ppm F dentifrice ($p<0.015$) in regions of the lesions with the greatest mineral loss. CHX+ and the 1100ppm F dentifrice alone inhibited root lesion progression better than placebo ($p<0.01$). **Conclusions:** CHX, in conjunction with a fluoride-containing dentifrice, appears to be an effective intervention therapy in fighting active caries in both root and enamel tissue. This study was supported by NIH /NIDCR grant PO1 DE13540.

3282 THE EFFECTS OF XYLITOL ON SALIVARY STREPTOCOCCUS MUTANS IN CHILDREN

D. MASSOTH, G. MASSOTH, W. SHI, C. HU, I.R. MASSOTH, and L. LAFLAMME, University of California - Los Angeles, USA

Objectives: A study was performed to test the effects of xylitol chewing gum on Streptococcus mutans in the saliva of children in the Los Angeles Unified School District. Highly-specified monoclonal antibodies have been developed at the UCLA Oral Microbiology Laboratory to detect different levels of Streptococcus mutans in human saliva. The purpose of the study was to identify children at high risk for dental caries and to develop a protocol for testing in a public school setting. **Methods:** Saliva samples were collected from ninety-one children and sent to the UCLA Oral Microbiology Laboratory. Seventeen students tested below 10^4 S. mutans/ml and were eliminated from the study. Seventy-four students were given a twenty-one day supply of xylitol chewing gum consisting of 84 tablets. Each parent was given a letter with instructions to chew the gum 4 times per day for five minutes and to record each chewing on the given compliance checklist. When the 21 days had elapsed, sixty-nine saliva samples were taken and processed. **Results:** Twenty-three children tested above 15 x 10^4/ml S. mutans and were categorized into a high caries index subgroup. The remaining forty-six chidren below 15 x 10^4/ml S. mutans were placed into a moderate caries index subgroup. Twenty-two of the twenty-three children in the high caries index subgroup showed decreases in their salivary levels of S. mutans after the xylitol chewing. The mean decrease for the twenty-three high caries risk students was 61.7%. The mean compliance rate for all sixty-nine students was 90.7%. **Conclusion:** An effective testing program can be established in public schools with the cooperation of the school nurses. It appears that xylitol gum is an extremely promising, easy, low cost anticariogenic agent for those children at the highest risk for dental caries. Partial funding from a grant from the California Dental Association Foundation.

FLUORIDE

0841 ANALYSIS OF FLUORIDE CONCENTRATIONS IN SOME COMMERCIALLY AVAILABLE PRODUCTS

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Objective: The level of fluoridation of communal water supplies in a particular area is determined by the amount of fluoride the residents are receiving from various sources. With the increasing availability of fluoride-containing products, questions may arise concerning the need for fluoridation of communal water supplies. This study examined the fluoride concentration in various brands of commercially available mouthrinses, salts, toothpastes, and bottled water collected from different supermarkets/pharmacies, determined if significant differences existed among the different brands of the same product, and compared the values to that depicted on the label and to the ADA guidelines for optimally fluoridated water. **Method:** Following dilutions of toothpastes (200mg/100 ml water) and salts (5g/100 ml water), and meter calibration, fluoride concentrations in each product were determined using Orion ISE/pH meter and a fluoride electrode. Data were analyzed using ANOVA and Turkey's test (α=0.05). **Results:** Significant differences ($p<0.001$) existed in fluoride concentrations among the various brands of the same products. Fluoride levels in bottled water ranged from 0.0-0.3 ppm. Salt levels ranged from 0-0.25% fluoride. Toothpaste levels ranged from 0-1.8%. Fluoride in high-fluoride and normal mouthrinse brands ranged from 250-1450 ppm and 0-1.9 ppm respectively. Most products (with values on the label) demonstrated concentrations higher than that reported by the manufacturers. **Conclusions:** Toothpastes and mouthrinses are the most available and consistent source of optimal fluoride. Salt is the most unreliable and variable source of optimal fluoride. No bottled water sample tested in this study met the ADA guidelines for optimally fluoridated water content; hence despite increasing use of the fluoride-containing products, fluoridation of communal water supplies may still be necessary. Legislation on mandatory labeling of the correct fluoride content of products is essential for accurate determination of the appropriate level of fluoridation required, and the need for prescription of fluoride supplements.

2387 FLUORIDE IN INFANT FOODS: CONCENTRATIONS AND ASSOCIATED INTAKES

B. CHOW, D. CHOW, and G.M. WHITFORD, Medical College of Georgia, Augusta, USA

Background: It is generally agreed that optimal fluoride intake is 0.05 mg/kg/day (range 0.03-0.07). **Objective:** To determine the fluoride concentrations ([F]s) in foods and beverages for infants during the first year of life and to estimate daily intake. **Methods:** The products were purchased and analyzed in Augusta, GA during July 2004. They included concentrated soy (n=5) and milk (7) formulas which were reconstituted with tap (0.9 ppm) or deionized water, juices (19), fruits (35), puddings (13), vegetables (25), meats (24), pasta (6) and cereals (4). The analyses were done in duplicate using the ion-specific electrode after overnight HMDS-facilitated diffusion. **Results:** The Table shows the [F]s and the amounts of F per serving.

	-------[F], ppm-------			---F, µg per Serving---		
Food Category	**Mean±SD**	**Min**	**Max**	**Mean±SD**	**Min**	**Max**
Juices & Puddings	0.26±0.21	0.01	0.80	31±23	0.6	90
Fruits & Vegetables	0.16±0.19	0.01	0.64	18±23	0.4	97
Cereal	2.00±1.87	0.84	4.77	30±28	12.7	72
Meat	0.43±0.53	0.01	2.54	40±41	0.8	181
Pasta	0.54±0.24	0.06	0.71	85±43	6.9	121
Formula w/Tap H_2O	0.54±0.07	0.43	0.62	79±10	62.9	91
Formula w/dH_2O	0.13±0.06	0.06	0.24	20±9	8.4	36

There was wide variation in the [F]s among the products in each food category. The average amounts of F per serving were lowest for fruits and vegetables and formula reconstituted with deionized water and highest for pasta and formula reconstituted with tap water. Daily F intakes from typical diets were calculated. **Conclusions:** Using the mean [F]s shown in the Table and mean body weights, daily intakes throughout the first year of life were within the optimal range only if formulas were reconstituted with deionized water. Using the maximum [F]s, including that for formula reconstituted with deionized water, the average intake was 0.15 mg/kg/day (range 0.09-0.20), a value well above the optimal range.

3263 FLUORIDE INTAKE BY CHILDREN: COMPARISON BETWEEN CONVENTIONAL AND CHILDREN'S DENTIFRICE

S.M. PAIVA[1], M.J. OLIVEIRA[1], L.H. MARTINS[1], Y.B.O. LIMA[2], and J.A. CURY[2], [1] Universidade Federal de Minas Gerais, Belo Horizonte, Brazil, [2] State University of Campinas, Campinas, SP, Brazil

Objectives: The objective of this paper was to determine fluoride intake as a function of the type of dentifrice used by children. **Methods:** The study consisted of 42 children within the age group of 20 to 30 months (27.12 ± 3.68); 42.9% were girls and 57.1% boys, all residents of Belo Horizonte, Brazil, a city with an optimised public water supply (0.7 ppm F, varying from 0.6 to 0.8). The protocol for this research was approved by the Ethical Committee at the School of Dentistry of Minas Gerais University (Report ETIC no. 185/01). Tooth brushing was supervised using conventional and children's dentifrice (brushing three times a day for each type). The amount of fluoride ingested was determined by subtracting the amount recovered from that used (weight of dentifrice). Fluoride analysis was undertaken with specific electrodes. **Results:** It was shown that fluoride intake using conventional or children's dentifrice was respectively 0.630 ± 0.320 a and 0.567 ± 0.300 b mg F/day, which corresponded to doses of 0.051 ± 0.026 a and 0.046 ± 0.023 b mg F/kg/day. Children who use children's dentifrice are exposed to a dose of fluoride slightly above that obtained through the use of conventional dentifrice. **Conclusions:** Though fluoride intake was greater using children's dentifrice, for both types of dentifrice the dose that children were being exposed to was very close to what is considered the limit (0.05 to 0.07 mg F/kg/day).

ANTIMICROBIALS

2596 ANTIMICROBIAL MOUTHRINSE REDUCES SUBGINGIVAL PLAQUE ORGANISMS AFTER TWO WEEKS USE

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Objectives: Within the last 4 years, it has been demonstrated that supragingival plaque can potentially act as a reservoir for and have an influence on potentially pathogenic subgingival organisms. It has been suggested that supragingival plaque control can influence the levels and composition of subgingival plaque. The purpose of this study was to determine the influence of a two week course of an antimicrobial essential oil mouthrinse (EOM) on representative subgingival plaque organisms from periodontally healthy subjects. **Methods:** 15 subjects in good dental health, with ≥ 1000 CFU/ml subgingivally of *Veillonella* species, *F. nucleatum* and *Capnocytophaga* species were entered into this double-blind crossover design study. Supragingival and subgingival plaque samples from tooth #'s 13 and 15 were taken, gently sonicated, serially diluted and plated on appropriate agars for enumeration of total anaerobic counts for the above organisms. Subjects were then randomly given either the EOM or a 5% hydroalcohol control rinse (CR) for twice daily use for 14 days. At day 14, tooth #'s 12 and 14 plaque were sampled and plated for microbial analysis. Following a two-week washout period the procedure was repeated using the alternative mouthrinse. **Results:** Statistically significant reductions in both subgingival and supragingival *Veillonella* species, *F. nucleatum* and *Capnocytophaga* species were seen for the 14 day EOM treatment versus CR adjusted for baseline counts. Subgingival *Veillonella, F. nucleatum* and *Capnocytophaga* species showed 0.34 ($p<0.001$), 0.50 ($p<0.001$) and 0.44 ($p<0.001$) points reduction in log scale with EOM treatment compared to CR. Supragingival *Veillonella*, *F. nucleatum* and *Capnocytophaga* species showed 0.32 ($p=0.002$), 0.73 ($p<0.001$) and 0.59 ($p<0.001$) points reduction in log scale with EOM treatment compared to CR. **Conclusion:** This is a first report of an OTC antimicrobial essential oil mouthrinse in reducing subgingival microbial levels after a two week course of use.

3413 MICROBIOLOGICAL EVALUATION OF ESSENTIAL OILS IN ORAL CARE STRIPS

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Essential oils have been recommended by dentists as an adjunct to brushing and flossing. The unique combination of thymol, eucalyptol, methyl salicylate and menthol allow the agent to kill oral microorganisms on contact. The bactericidal activity is effective against gram positive and gram negative microorganisms. Recently, Listerine PocketPaks Oral Care Strips were introduced. The strips dissolve on the tongue and are marketed for use when brushing and flossing cannot be performed. **Objective:** The purpose was to determine if a significant difference exists between the ability of mouthrinse and oral strips to kill microorganisms. **Methods:** Four bacterial species were chosen: Streptococcus mutans, Streptococcus salivarius, Streptococcus sanguis, Lactobacillus. A quantitative analysis (viable count) was performed to assess the percent inhibition of live microorganisms by both products. A log phase culture containing about 10^8 cells/ml was used. Two milliliters of each culture were treated with either a strip or 2ml of mouthrinse for 30 seconds. Serial dilutions to 1x10^-6 were completed. Dilutions 10^-4 through 10^-6 were plated in triplicate and incubated 48 hours for viable counts. Percent inhibition was then determined by comparison to the original culture. Qualitative analysis measured zones of inhibition on bacterial lawns. **Results:** Quantitative analysis demonstrated nearly all test samples had an average inhibition of 99% or greater and consecutive dilutions of treated microorganisms exhibited a quantitative reduction in the number of colony forming units compared to the control. Qualitative analysis exhibited an equivalent antimicrobial effectiveness of both products, as shown by the increasing size of zones of inhibition found as product concentration increased. **Conclusion:** Test strips are effective in eliminating four species of bacteria found in plaque. The strips may be used to eliminate bacteria on the tongue and mucosal surfaces, however more studies are needed to determine effectiveness in sulcular and interproximal regions.

GERIATRIC ORAL RESEARCH

1944 MERCURY EXPOSURE FROM DENTAL AMALGAM AND PARKINSON'S AND ALZHEIMER'S DISEASES

G. GATA, G. NAVARRETE, A. ELIAS, C. BUXO, and L. LOPEZ, University of Puerto Rico, San Juan, USA

Exposure to mercury from dental amalgam has been related to changes in memory, motor-visual and neurobehavioral changes, renal and neurological disorders. **Objective:** The purpose of this case-control study is to explore the association between mercury exposure from dental amalgam and Parkinson's and Alzheimer's diseases in people 50 years and older. **Methods:** A sample of 108 male and female volunteers were selected and divided into cases (Parkinson's and Alzheimer's) and controls (without neurological disorders) selected from the same source. Participants signed consents approved by IRB and questionnaire was administered before oral examination. The questionnaire consists of four sections to eliminate confounders like other exposure sources to mercury different from dental amalgam. Trained examiners using the NIDCR diagnostic criteria performed oral examinations blinded for neurological disorders. Mean decayed, missing, and filled component of the DMFS Index were calculated by participant and group using ANOVA analysis of variance. **Results:** In the present study, no statistical association was observed between dental amalgams and neurological disorders ($p=0.92$). Statistically significant associations with neurological disorders were found for mean decayed surfaces, DMFS, and tooth loss due to periodontal disease ($p<0.05$). Significant association between periodontal disease and neurological disorders (OR=28.8) was observed; Alzheimer's ($p=0.000$) and a clinical tendency for Parkinson's (OR= 7.429 and $p=0.10$). **Conclusion:** Tooth loss findings from periodontal disease or caries agree with the reported leading causes of tooth loss in older adults. The association between periodontal disease and neurological disorders are relevant for the prevention and control of neurological disorders in the projected increase in population of older adults.

DISINFECTION AND INFECTION CONTROL

3463 SCREENING FOR CONTAMINATED AEROSOLS IN A DENTAL OFFICE

J.S. HUBAR, and W. PELON, Louisiana State University, New Orleans, USA

Objectives: Aerosols generated by high speed drills in dental offices are often contaminated with blood and bacteria. These airborne particles are attracted to operating cathode ray tubes (CRT) used as computer monitor screens. Routine surveys of screens could detect the presence of pathogenic airborne microbial contaminants. To confirm this, samples were collected from computer monitors throughout LSU School of Dentistry to identify pathogenic strains of Staphylococcus aureus. **Methods:** Samples were obtained by swabbing screens of 44 CRT monitors using sterile cotton swabs moistened with sterile water. The swabs were streaked over the surfaces of Petri dishes containing trypticase soy agar and 5% sheep blood, then incubated for 48 hours at 37 C. Yellow hemolytic colonies were inoculated onto mannnitol-salt agar and MacConkey agar and incubated overnight at 37 C. Gram stains were performed on the representative colonies that resulted from incubation. FAStaph test was used to identify Gram + isolates as Staphylococcus aureus. The latter were tested for resistance to the antibiotic, oxicillin and coagulase test was used to detect pathogenicity. **Results:** 1,735 isolations were made from 44 CRT monitors. 84 yellow beta-hemolytic colonies were suspected of being Staphylococci: Grams stain revealed 74 of the 84 colonies to be Gram-positive cocci. Thirteen of the 74 coccus isolates were Staphylococcus aureus and all 13 were found to be sensitive to oxicillin. Of these, 4 strains were pathogenic. **Conclusion:** CRT screens could serve as an alternative means for collecting, detecting and evaluating potential threats by airborne microbial contaminants in a dental office. Pathogenic Staphylococcus aureus were found on CRTs within the dental school.

3465 MICROWAVE IRRADIATION DISINFECTION OF COMPLETE DENTURES: A MICROBIOLOGICAL STUDY

M.M. SILVA, C.E. VERGANI, A.C. PAVARINA, D.M.P. SPOLID"RIO, and K.H. NEPPELENBROEK, Universidade Est. Paulista Julio Mesquita, Araraquara, Brazil

Objectives: The aim of this study was to evaluate the effectiveness of microwave irradiation on sterilization of complete dentures contaminated with individual suspension of 3 bacteria (*P. aeruginosa*, *S. aureus* and *B. subtilis*) and one fungus (*C. albicans*). **Methods:** Eighty simulated maxillary complete dentures were fabricated in a standardized procedure and subjected to ethylene oxide sterilization. The dentures were individually inoculated (10^7 cfu/mL) with Tryptic Soy Broth (TSB) media containing one of the tested microorganisms. After incubation at 37°C for 48h, forty dentures were immersed in 200mL of water and submitted to microwave irradiation at 650W for 6 min. Forty non-irradiated dentures were used as positive controls. Using 0.9% sodium chlorine solution as diluent, tenfold serial dilutions 10^{-3} - 10^{-6} were plated onto 4 selective media appropriate for each organism: Manitol Salt Agar for *S. aureus*, Miller Hinton for *P. aeruginosa*, Sabourand Agar containing 5µg/mL gentamicin for *C. albicans*, and Tryptic Soy Agar for *B. subtilis*. All plates were incubated at 37°C for 48h and colonies counts of each plate were quantified (ufc/mL). To verify the long-term effectiveness of microwave sterilization, the TSB beakers with the microwaved specimens were incubated at 37°C for 7 days. Data were statistically analyzed by Kruskal-Wallis's test (α=05). **Results:** Irradiated dentures showed consistent sterilization of *S. aureus*, *B. subtilis* and *C. albicans* after 48h. Compared to *P. aeruginosa* control, a very low number of colonies were detected only in two plates ($1x10^2$ and $2x10^2$ cfu/mL). Turbidity was observed in three broth beckers, two from *P. aeruginosa* and one from *B. subtilis*, after 7 days incubation at 37°C. All control dentures showed microbial growth on the plates. **Conclusion:** Microwave irradiation for 6 min at 650W proved to be effective for the sterilization of complete dentures contaminated with *S. aureus* and *C. albicans*.

0076 A STUDY ON INTERNAL CONTAMINATION OF AIR-DRIVEN SLOW-SPEED HANDPIECES

H. VU[1], J.R. CHIN[2], C. MILLER[1], and C. PALENIK[1], [1] Indiana University, Indianapolis, USA, [2] Oral Health Research Institute, Indianapolis, IN, USA

Objective: This study was designed to determine if the interior of slow-speed handpiece/prophy angle systems becomes contaminated. **Methods:** Two types of handpieces were attached to 7 different types of disposable prophy angles and 1 type of reusable metal prophy angle. Sterile handpieces were covered with plastic sleeves and the angles were attached. Angle heads were submerged into 12.5 mL of 2.0 x 10^6/mL *Geobacillus stearothermophilus* in 10% sheep's blood. Rotating angle cups were pressed against the beaker sides and released. The process was repeated 30 times within 60 seconds. Handpiece components were aseptically disassembled and the inside surfaces of the angle, nosecone, gears of the nosecone and motor were sampled and aerobically incubated in TSB containing 0.25% glucose at 56°C for 7 days. The process was tested in reverse when 0.1 mL of the spore-blood suspension was inoculated onto the gears of sterilized motors. Angle heads were submerged in beakers containing 12.5 mL of sterile phosphate buffered saline (PBS). Operation was as previously described. The PBS, the inside of the angle and nosecone, the gears of the nosecone and motor were sampled for contamination. Both methods were tested ten times for each prophy angle type. **Results:** In the 160 tests of handpieces contaminated at the prophy cup end, the spores *traveled down and inside* the motor gears 47 times **(29%)**. In another 160 tests where the motor gears were contaminated, the spores *traveled up inside* to the prophy cup and out in 74 instances **(46%)**. All types of prophy angles and handpieces exhibited contamination for both methods. **Conclusions:** These data suggest that slow-speed handpiece motors can become contaminated with oral flora during use with prophy angles. Also, internal contaminants appear to be released out of the handpiece. It appears that unless properly sterilized, slow-speed handpieces pose a risk for cross-infection.

NUTRITION

0814 ENAMEL EROSION ASSOCIATED WITH CALCIUM FORTIFIED JUICES

R. DAVIS, T.A. MARSHALL, J.J. WARREN, J. WEFEL, M.A. LARSON, J.D. HARLESS, and M.M. HOGAN, University of Iowa, Iowa City, USA

Exposure to acidic beverages, including 100% juice, has the potential to demineralize enamel leading to erosion. Other investigations have suggested that the presence of calcium in juice could limit the erosion. We hypothesized that exposure to calcium-fortified 100% juices would result in less enamel erosion than exposure to unfortified juices. **Objective:** Our objective was to compare the extent of erosion between 100% juices with and without calcium available to United States consumers. We explored associations among pH and buffering capacity as potential explanatory variables. **Methods:** The pH and buffering capacity of representative 100% juices with and without calcium were measured. Enamel sections from extracted teeth (n = 4/beverage) were exposed to orange, apple and grape juices both with and without calcium fortification to assess erosion. Enamel windows (1x4 mm) were exposed to each juice for a total of 25 hours, with beverages refreshed every 5 hours. Teeth were then sectioned with a microtome and photographed using a polarized light microscope. Lesion depths were measured using Image Pro Plus software. Spearman correlation coefficients were used to identify associations among calcium, pH and buffering capacity. The Kruskal-Wallis test was used to test for differences in lesion depth between teeth exposed to different juices with and without calcium. **Results:** The % Daily Value for calcium and pH were associated (r = 0.47; p = 0.047). Calcium was not associated with buffering capacity of juices (r = -0.09; p = 0.723). Mean lesion depths following exposure to unfortified apple, grape, and orange juices (106±13, 104±14, 69±9 ìm, respectively) were greater than to fortified apple, grape, and orange juices (0, 0, 0 ìm, respectively; p < .0001). **Conclusion:** Calcium fortification of 100% juice appears to protect against enamel erosion; this protection is not entirely explained by the relationships between calcium and pH or buffering capacity.

0801 MEASURES OF CHILDHOOD OBESITY AND CARIES EXPERIENCE AT 5 YEARS

T.A. MARSHALL, J. EICHENBERGER-GILMORE, B. BROFFITT, S. LEVY, M. CUNNINGHAM, and J.J. WARREN, University of Iowa, Iowa City, USA

Dietary factors, including sugared beverages, are associated with an increased risk of both obesity and dental caries. Previous attempts to investigate associations between childhood obesity and caries have been equivocal. **Objective:** Our objective was to describe associations between measures of obesity and caries in children about 5 years old participating in the Iowa Fluoride Study. **Methods:** Energy, soda-pop and 100% juice intakes were obtained from 3-day food and beverage diaries completed at 1, 2, 3, 4, and 5 years of age. Fluoride intakes were estimated from all water sources, other beverages, selected foods and fluoride supplements reported by questionnaire. Weight and height were measured, and primary tooth dental examinations were completed at 4.5-6.9 years of age. Children were categorized as "normal" (n = 331), "at risk of overweight" (n = 87) or "overweight" (n = 25) using age- and gender-specific Centers for Disease Control and Prevention body mass index (BMI; kg/m2) definitions. Demographic variables, dietary intakes and caries rates were compared among BMI categories. Logistic regression models were developed to predict caries experience. **Results:** Caries prevalence, adjusted for age at dental exam, differed among normal BMI (28.5%), at risk BMI (39.0%) and overweight BMI (17.4%) categories ($p = 0.04$). Height, parental ages, and both age 5 year and 1-5 year energy, soda-pop and 100% juice intakes were not significantly different among BMI categories. After adjustment for age at dental exam and fluoride intake, at risk BMI predicted caries ($p < 0.004$) and overweight BMI did not ($p = 0.703$). **Conclusions:** These data suggest an association between dental caries and at risk for overweight, but not actual overweight status. Genetics is a strong contributor to obesity, and additional research is needed to define the relative contributions of genetics and environment to the childhood obesity-caries relationship. Support: ATPM/CDC, NIDCR and GCRCP.

ORAL HEALTH

2116 TEMPERATURE DEPENDENCE OF CHEMICAL AND MECHANICAL ACTIVITY OF TRADITIONAL DENTIFRICES

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Although the majority of consumers brush their teeth with cold water, many prefer to use warm water citing dentinal sensitivity concerns. Both anecdotal evidence and kinetic theory suggest that the chemical activity of the surfactants and fluoride salts present in dentifrices may also be improved by a warmer temperature of application. However, the effect of higher temperatures on the largely mechanical cleaning action of the abrasive constituents was undetermined. **Objectives:** In this study, the fluoride uptake and cleaning efficacy of a typical sodium fluoride/silica-based dentifrice was evaluated at ambient and elevated temperatures. **Methods:** Baseline measurements at ambient temperature were obtained by following traditional EFU (FDA Method 40) and PCR protocols. Modifications to the standard test equipment and procedures were introduced in order to facilitate retesting at 40° C. **Results:** By increasing the application temperature from ambient to 40° C, fluoride uptake was significantly increased from 1108 +/- 43 ppm to 1322 +/- 56 ppm. However, for the same change in temperature, cleaning performance surprisingly did not change significantly. (Average PCR scores of 59.95 +/- 3.83 and 61.29 +/- 2.35 for ambient and 40° C, respectively.) **Conclusion:** In-vitro testing suggests that relatively small changes in temperature can significantly impact therapeutic performance while having minimal effect on cleaning performance.

0098 BLINDED CLINICAL EVALUATION OF A NEW TOOTHBRUSH

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Objectives: The purpose of this single-blind crossover study was to compare plaque removal associated with a new toothbrush, the Curvex™ (test), and a best-selling commercially available toothbrush, the Oral-B 40® (control). The test toothbrush has a convex head which follows the contour of both the upper and lower lingual arches. Its tapered bristle array provides optimal contact with all of the tooth surfaces and reduces bristle "splaying." It has a curved neck and handle which allows deeper reach to the back molars by curving away from the roof of the mouth. Both toothbrushes have a texture range of soft (the test toothbrush uses a .006 filament, and the control toothbrush uses a .008 filament). **Methods:** Over a 5-week period, 21 subjects participated in this investigation. Ten of the subjects started with the test toothbrush, and the remaining subjects began with the control toothbrush. Crossover occurred after a 2-week use of each brush (a 1-week washout period in between). Plaque was scored before and after brushing using the Turesky modification of the Quigley-Hein index (T/Q-H). **Results:** Plaque scores were measured in each subject (up to 168 sites) on each of four occasions. The average baseline and test plaque scores for the control brush were 2.41 and 1.72; for the test brush these values were 2.34 and 1.69. Repeated measures ANOVA revealed no difference between brushes. Paired-comparison t-tests were conducted on each of the 168 evaluated sites, and no patterns of superiority for either brush were identified. Although both toothbrushes effectively reduced mean plaque scores, ANOVA demonstrated no significant difference between toothbrushes. **Conclusion:** The test toothbrush is as effective as the control toothbrush in removing plaque. Questionnaires returned by the subjects indicated a preference for the test toothbrush. This study was supported by Ergonomic Dental Technologies, Inc.

0099 SONIC POWERED TOOTHBRUSHES AND REVERSAL OF EXPERIMENTAL GINGIVITIS

G. VAN DER WEIJDEN, P.A. VERSTEEG, M.F. TIMMERMAN, N.A.M. ROSEMA, and U. VAN DER VELDEN, Academic Center for Dentistry - Amsterdam, EA Amsterdam, Netherlands

Objectives: This study compared two sonic toothbrushes, the Oral-B Sonic Complete toothbrush (S18) and the Sonicare Elite (SE) in relation to reversal of experimental gingivitis. **Methods:** The study had a randomised, examiner-blind, split-mouth design. After dental prophylaxis, subjects refrained from brushing mandibular teeth for 21 days to allow development of gingivitis. During a 4-week treatment phase, the right or left side of the mouth was brushed with either the S18 or the SE toothbrush as randomly allocated. Plaque and gingivitis were assessed at baseline (day 0), after 21 days of no oral hygiene, and after 1, 2 and 4 weeks of brushing twice daily. Gingival abrasion was assessed at baseline (day 0) and after 1, 2 and 4 weeks of product use. **Results:** Of the 37 subjects who entered the study, 34 subjects provided valuable data. The experimentally induced gingivitis (EIG) period resulted in higher bleeding and plaque scores compared to baseline. After 4 weeks of use, the mean plaque scores changed from 3.09 (day 21) to 1.30 for the S18 and from 3.02 (day 21) to 1.21 for the SE. The mean bleeding scores changed from 1.87 (day 21) to 0.97 for the S18. For the SE these changes were from 1.83 (day 21) to 0.92. For the assessments at 1, 2, and 4 weeks post-EIG, both brushes showed a significant decreases in bleeding scores but there were no significant differences between both brushes. The overall gingival abrasion score at the 4 week assessment was 1.91 for the S18 and 1.26 for the SE which did not differ significantly ($p=0.257$). **Conclusions:** There was no significant difference with regard to resolving experimental gingivitis between both sonic brushes. Under the conditions of the trial both brushes also appeared to be safe to oral tissues. This study was sponsored by Oral-B Laboratories

TOBACCO

1084 LONG-TERM INFLUENCE OF SMOKING TO THE PERIODONTAL TISSUE

M. SCHATZLE, H. LÖE, H. BOYSEN, A. ANERUD, W. BÜRGIN, and N.P. LANG, University of Berne, Switzerland

Objectives: The purpose of this investigation was to examine the long-term influence of smoking on periodontal health. **Methods:** The data derived from a 20-year longitudinal study of a group of Norwegian middle class males characterized by good to moderate oral hygiene and regular dental check-ups. At each of 6 surveys between 1969 and 1988, the mesial and buccal surfaces and from 1975 onwards also the distal and lingual sites were scored for dental and periodontal parameters. The subjects were subset according to their smoking history into non-smokers and smokers. **Results:** Before 20 years of age the non-smokers exhibited higher Gingival Index scores, but after the age of 30-years the smokers had more sites that bled on probing. The smokers exhibited more subgingival calculus formation in the maxilla and incisors of the mandible after the age of 30 years. Smokers exhibited higher mean Calculus Index scores in the maxilla and at the incisors in the mandible in the 3rd and 4th decade of life. This corresponds to the fluctuation levels of the mean Gingival Index scores. The gingival recession level was quite stable for the smokers, while the non-smokers showed increasing recession values with age, but at the end of the 4th decade there was no difference. There were significantly more sites with deeper pocket depths in the smoking subjects than in the non-smokers. At baseline, the 2 groups showed the same amount of attachment loss (0.14mm), but with increasing age and observation time, the periodontal loss increased significantly faster in the smoker cohort, yielding values of 1.59mm and 2.22 mm respectively. **Conclusions:** Smoking was highly associated with increased calculus formation, especially in maxillary teeth and the incisors of the mandible, and was confirmed as an important risk factor of periodontal disease progression.

PERIODONTOLOGY

1066 ASSESSING THE RELATIONSHIP BETWEEN THE PERIODONTAL INDEX AND PROBING DEPTH

V. SPOLSKY, M. MARCUS, and L. QIAN, University of California, Los Angeles, USA

Objective: The purpose of this pilot study is to examine the relationship between the Periodontal Index (Russell) and full mouth 6 sites per tooth measurements using the criteria used by NIDCR to assess periodontal destruction. **Methods:** A convenience sample of 22 adults (16 Male/6 Female), age 30 to 72 (mean 41.9, ±2.7), with ≥20 teeth and no prophylaxis during previous 12 months was used. The NIDCR (Miller et al. 1987) diagnostic criteria and instruments were used to conduct full mouth examinations of gingival bleeding, dental calculus, pocket depth (probe depth) and attachment loss. Descriptive statistics, correlational analyses and tests of agreement between the two methods of measuring periodontal disease were conducted. **Results:** Clinically the group mean Periodontal Index (PI) score (2.07, SE 0.14) equated to "beginning destructive periodontal disease" which was similar to the clinical diagnosis of localized mild to moderate chronic periodontitis based on six sites per tooth. Pearson correlation coefficients between the PI and Calculus ($r=0.7693$, $p<0.001$) and Marginal Bleeding ($r=0.5163$, $p= 0.0129$) were meaningful and statistically significant. Correlations between the PI and probe depth ($r=0.2508$, ns) and attachment loss (AL) ($r=0.1753$, ns) were weak. The percentage of agreement between the PI scores and pocket depth and attachment loss ≥4 mm were poor with Kappa coefficients ranging from -0.0669 to 0.0199 respectively. For pocket depth (< and ≥4mm), observed agreement was 30.0% ($p=0.9930$); and for attachment loss, 38.7% ($p=0.1942$). The PI underestimated the frequency of periodontal pockets ≥4 mm by 63.2% (CI 59.3 to 67.1%) and overestimated the frequency < 4 mm by 6.8% (CI 4.8 to 8.8%). A similar pattern existed for attachment loss. **Conclusions:** In this sample of adults with clinically mild to moderate chronic periodontitis, the PI significantly underestimated the presence of periodontal pockets ≥4 mm.

1080 LIP PIERCING: ASSOCIATION WITH GINGIVAL RECESSION

K.I. BLAIR, M.P. CARR, R.G. RASHID, and **D.N. TATAKIS**, Ohio State University, Columbus, USA

Objectives: Oral piercing, typically involving the tongue and/or the lip, has been associated with periodontal complications. Numerous case reports and a few clinical studies have examined the association of tongue piercing with gingival recession. However, there are no such studies on lip piercing. Therefore, the purpose of this study was to compare the prevalence of gingival recession on the buccal aspect of mandibular central incisors in subjects with lower lip piercing and in controls. **Methods:** Twenty-nine young adults with lip piercing (mean age: 21.8; 15 females) and 29 without (mean age: 22.3; 15 females) were recruited from the community and examined for gingival recession on the buccal aspect of the mandibular central incisors. **Results:** There were no demographic (age, gender distribution) differences between the 2 groups of subjects. Prevalence of recession among subjects with lip piercing (41.4%) was significantly greater than among controls (6.9%) ($p=0.0022$). The average recession depth was more than double in subjects with piercing compared to controls ($p=0.0029$). Length of time of wear was the only significantly associated demographic variable ($p=0.031$). **Conclusions:** These results indicate that lip piercing is strongly associated with increased prevalence and severity of gingival recession on the buccal aspect of mandibular central incisor teeth. Increased time of wear is associated with increased prevalence of recession.

Supported by the Sections of Primary Care and Periodontology, College of Dentistry, The Ohio State University.

WHITENING

0346 EFFECTS OF PEROXIDE BLEACHING ON HUMAN ENAMEL WEAR SUSCEPTIBILITY

S. ST. JOHN, D.J. WHITE, and J. ZOLADZ, The Procter & Gamble Company, Mason, OH, USA

Vital tooth bleaching continues to gain popularity with hygiene conscious consumers. Importantly, peroxide based tooth whiteners should provide cosmetic benefits without harming dental tissues or changing their resistance to environmental stimuli. **Objectives:** Characterize the response of enamel to abrasive wear following a period of exaggerated laboratory bleaching treatments using Crest® Whitestrips®Supreme tooth whitener. **Methods:** Human enamel blocks were mounted in methacrylate and cycled through a 21-day regimen: 1) morning and afternoon fluoridated dentifrice supernatant treatments; 2) four-times-daily, thirty-minute bleaching exposures with 14% H_2O_2 Crest®Whitestrips®Supreme incubated at 37°C. Samples soaked overnight and between treatments in human saliva. After cycling, stratified specimens either immediately underwent controlled abrasive challenges or equilibrated an additional two weeks with *bid* dentifrice treatments before assessment of wear resistance. To measure wear, samples had a pre-brush Vickers indent series made on them. Following initial measurements, specimens were stratified to abrasive (bleached and non bleached) and were brushed for a series of 500-1000-2500-4000 strokes using Oral-B®Indicator®40 soft brushes in a V-8 cross brushing machine with a 150g load. Specimens were brushed with one of three abrasive systems: Ultrabrite®(mid-high REA – alumina/silica blend), Crest®Cavity Protection (mid-low REA – silica), and Colgate®Cavity Protection (low REA – dicalcium phosphate dihydrate). At each time point, wear was assessed by examining brushed indents and new indents were impressed to measure wear at the next time point. **Results:** Digital imaging color assessments supported bleach efficacy during the study. Enamel wear followed known REA assessments. Importantly, peroxide bleaching had no effect on susceptibility of enamel to abrasive wear. Enamel lost, mm bleach/no bleach = alumina/silica blend, 13.2/14.0 > silica 6.85/6.88, > DCPC, 2.60/2.89. Abrasive differences were significant ($p < 0.05$) while bleach effects were not. **Conclusion:** Enamel wear susceptibility to toothpaste abrasives is not changed by tooth bleaching with Crest® Whitestrips®.

2128 EVALUATION OF SAFETY AND EFFICACY OF AN EXPERIMENTAL WHITENING PRODUCT

B. MAGGIO[1], C. HARDY[2], J. BOWMAN[1], S. SANDERS[1], A. GALLAGHER[1], and S. MASON[1], [1] Hill Top Research Inc, Cincinnati, OH, USA, [2] Medtrade Products Ltd, Crewe, United Kingdom

Objective: The primary objective of this randomized clinical trial was to evaluate the safety on the oral soft tissue of an experimental dental strip whitening product (6% hydrogen peroxide) which unlike other bleaching strip, dissolves during placement on the maxillary anterior teeth. The secondary objective was to determine efficacy of the products on a subset of subjects. **Methods:** This examiner blind study had twenty-five subjects (4 males / 21 females) ranging in age of 19 to 61 were screened, met inclusion criteria, signed an informed consent and were provided with a whitening product. In addition, the subset subjects (12 females between the ages of 20 to 35) all met the tooth shade inclusion criteria of A2 or darker. Safety was assessed by dentist oral examination and subject self report of tooth sensitivity. Efficacy was assessed using the Vita©Shade guide and Subject Whitening Perception Questionnaire. **Results:** Two oral adverse events of 'mild' erythema were observed by the examiner. These adverse events resolved within two days of trial conclusion. The within-treatment analysis of the experimental dental strip whitening product indicated a statistically significant change in tooth shade (darker to lighter) from baseline to Day 15 (p=0.0006).The Subject Whitening Perception Questionnaire data indicated increased whiteness and satisfaction with the whiteness of subject's teeth. **Conclusion:** Two weeks use of the dissolving experimental dental strip whitening product was shown to be safe and effective. Further research on this novel technology / delivery system is recommended.

1184 DIRECT AND INDIRECT PEROXIDE BLEACHING ON FRACTURE TOUGHNESS OF DENTIN

V.Y. KUO, A. NOROOZI, and L. TAM, University of Toronto, Canada

Objectives: The objective of this study was to evaluate the effect of tooth-bleaching agents on the fracture toughness (K1C) of human dentin. **Methods:** Recently extracted molar teeth were collected. Dentin was directly or indirectly treated to simulate a conventional overnight bleaching regimen (Opalescence® 10% carbamide peroxide (CP) or 3% hydrogen peroxide (HP), 6hr/day, 2 weeks) or an exaggerated bleaching regimen (10% CP or 3% HP, 6hr/day, 5 days/week, 8 weeks). A placebo gel (Ultradent™and distilled water (DW) acted as control materials. All the procedures were performed without dentin dehydration at 37°C, >80%RH, with fresh gel applied and rinsed off daily. The teeth were stored in DW when not being bleached. At the end of the bleaching session, compact tension test specimens (approx. 4.60 x 4.50 x 1.60 mm) were prepared from coronal dentin for fracture toughness testing and results analyzed using ANOVA and Tukey's tests ($P<0.05$). For direct bleach application, the treatment materials were applied on dentin that was already prepared as compact tension specimens. For indirect bleach application, the treatment materials were applied onto the enamel of intact teeth prior to specimen preparation. **Results:** There was a significant decrease in dentin K1C in the CP and HP groups after 8-week direct treatment ($p<.001$) and in the HP group after 8-week indirect treatment ($p=.045$). **Conclusion:** This in-vitro study suggests the potential for significant tooth weakening after the use of tooth bleach products. This can be worsened by inadvertent application of bleach products directly to dentin and/or by prolonged or repeated use.

La force du nombre *(suite de la page 195)*

l'autorisation d'exercer et de la pratique. Après tout, en vertu de l'enseignement que nous avons reçu, de nos connaissances techniques et de notre expérience, nous sommes mieux qualifiés pour réglementer la profession d'hygiéniste dentaire qu'un organe composé principalement de dentistes, nos employeurs. Seule association nationale d'hygiénistes dentaires au Canada, l'ACHD se consacre à l'avancement de la profession et à la protection des intérêts de ses membres d'un bout à l'autre du pays.

Il est très important que tous et toutes, nous nous rappelions que l'hygiène dentaire, en tant que profession, ne peut pas exister sans une solide organisation qui se consacre à l'avancement, à la promotion et à la protection de notre envergure professionnelle. Par ailleurs, aucune organisation professionnelle ne peut survivre sans un effectif nombreux et dynamique. Les membres de l'ACHD constituent le cœur de cet organisme. Votre appui et votre participation aux activités organisées par l'ACHD fournissent l'énergie qui pousse le conseil d'administration et le personnel de l'Association à faire leur possible pour améliorer la profession. Je pense que les citations suivantes sont très pertinentes :

Le travail d'équipe, c'est la capacité de collaborer à une vision commune. La capacité d'orienter des réalisations individuelles vers des objectifs organisationnels. Le carburant qui permet à des gens ordinaires de parvenir à des résultats extraordinaires.

– Andrew Carnegie

Il y a si peu de choses que nous pouvons faire seuls et tant de choses que nous pouvons faire ensemble.

– Helen Keller

Je vous félicite, vous les membres de l'ACHD, pour votre professionnalisme et votre attachement à la profession. Et je vous invite instamment à appuyer le travail de l'ACHD en renouvelant votre adhésion à l'Association et en incitant vos collègues à se joindre à notre association professionnelle.

Henry Ford a dit un jour : « Se rassembler, c'est un début; demeurer ensemble, un progrès et travailler ensemble, un succès. » La force du nombre et l'accroissement de l'effectif de l'Association affermiront la voix de l'ACHD, ce qui nous aidera à maîtriser notre destinée. Il nous faut parfois plus de temps que nous le voudrions pour atteindre nos buts, mais ensemble, nous pouvons améliorer la profession et rendre l'avenir plus brillant pour l'ensemble des hygiénistes dentaires au Canada.

Ne manquez pas de visiter le site Web de l'ACHD au <www.cdha.ca> pour voir le large éventail d'avantages offerts à nos membres. Parmi ceux-ci figurent l'accès à diverses ressources et à divers outils en ligne, les possibilités de réseautage, la formation continue, le perfectionnement professionnel, la protection en matière d'assurances et bien d'autres choses encore. Il ne faut pas oublier que l'ACHD ne peut offrir ces avantages que grâce à l'appui indéfectible de ses membres.

On peut communiquer avec Diane Thériault à l'adresse <president@cdha.ca>.

CDHA Board – Highlights of Meeting

Thursday, June 16, 2005, Ottawa

1. Monitoring reports: The board deferred acceptance of the monitoring reports provided by the Executive Director for the policies of the organization. The board will meet via teleconference on August 30, 2005, to hear recommendations of the board's audit committee and will review the monitoring reports at that time.

2. Review of governing policies: The board reviewed its compliance with governance policies and accepted them as circulated. The governance budget for 2005–2006 was approved as revised.

3. Executive limitations items for decision: The board deferred this item until the next meeting.

4. Linkage with ownership: The board reviewed and discussed results of the CDHA membership survey and previous town hall meeting reports (2003, 2004) and discussed future opportunities to link with the ownership.

5. Linkage with other boards: The board continues to link with other boards with the president's meeting with other associations. The president attended the CDA "Access to Care" meeting and a meeting with ADHA. A process was established to select a CDAC student representative.

6. Dates for next meetings: The next board meeting is scheduled for October 27–30, 2005, and will include a full-day board education session. The spring meeting will take place March 3–5, 2006. CDHA's 2006 annual conference will take place June 16–18 in Edmonton, with the board meeting planned for June 15.

Dental Hygiene Research in Canada Flourishes with New Grants

An inaugural grant from the Canadian Foundation for Dental Hygiene Research and Education has funded two dental hygiene research projects in Canada. Following a rigorous grant competition process, the following two proposals were chosen as exceptional, timely research projects that will expand the body of dental hygiene knowledge:

Project title:	A study of research utilization practices and critical thinking dispositions of Canadian dental hygienists
Primary Investigators:	Sandra Cobban, Dr. J. Profetto-McGrath
Project Title:	Utilization of research by Canadian dental hygienists
Primary Investigators:	Dr. S. Sunell, Dr. K. Öhrn, Dr. L. Rucker

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Strength in Numbers *(continued from page 195)*

is dedicated to advancing the profession and protecting the interests of its members throughout our country.

It is very important for us all to remember that dental hygiene, as a profession, cannot exist without a strong organization that is dedicated to advancing, promoting, and protecting our professional stature. At the same time, no professional organization can survive without a strong and vibrant membership. CDHA's members are the heart of this organization. Your support and participation in CDHA-sponsored activities provide the energy that propels our board of directors and staff to strive for the betterment of our profession. I believe the following quotes are very appropriate:

Teamwork is the ability to work together toward a common vision. The ability to direct individual accomplishments toward organizational objectives. It is the fuel that allows common people to attain uncommon results.

– Andrew Carnegie

Alone we can do so little; together we can do so much.

– Helen Keller

I applaud all members of CDHA for your professionalism and commitment to our profession. I also urge you to continue to support the work of CDHA by renewing your membership and to encourage your colleagues to join our professional association.

Henry Ford once said: "Coming together is a beginning, staying together is progress, and working together is success." Strength in numbers and increasing membership will give CDHA a stronger voice that will help us control our destiny. Achieving our goals sometimes take longer than we would hope, but together we will create a better profession and ensure a brighter future for all dental hygienists in Canada.

Please visit the CDHA website at <www.cdha.ca> to see the wide range of benefits our members receive. These include access to a variety of on-line resources and tools, networking opportunities, continuing education, professional development, insurance protection, and much more. Remember, the CDHA can only provide these benefits through the continued support of its members.

You can contact Diane Thériault at <president@cdha.ca>.

Finding What You Want

by CDHA Staff

We want your thesis or research papers!

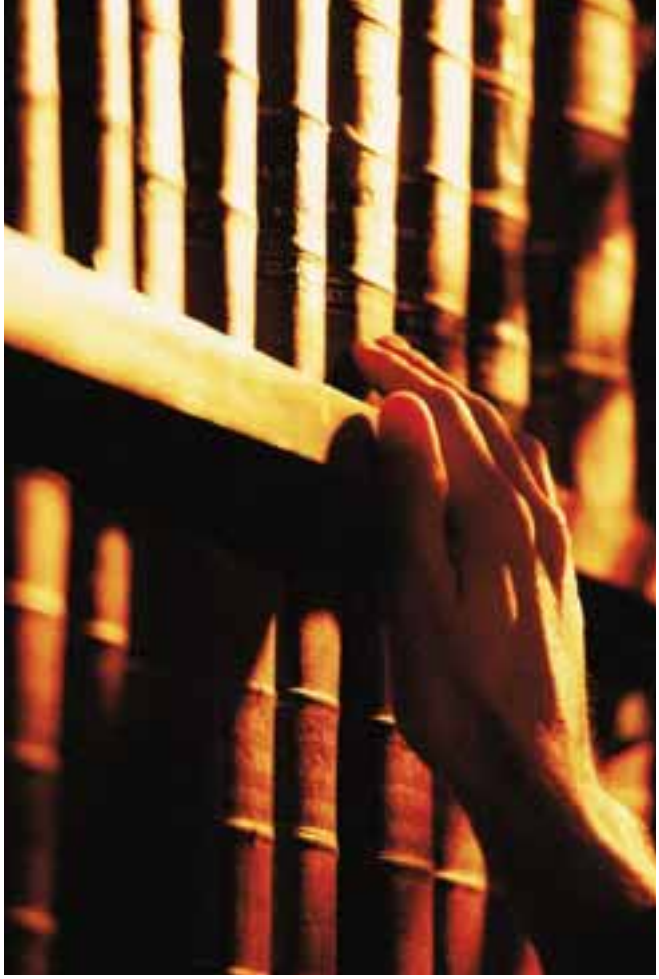
CDHA STRONGLY ENCOURAGES THE CONTINUING education of its members and the advancement of research and evidence-based practice. The Library would like to support this by developing a national repository for scholarly works that can be used by all members. However, at the moment, we have only about 16 theses. The more we have in our database, the better the knowledge base we have for those pursuing further studies in various dental hygiene topics. We will accept any format. We look forward to your input into this initiative.

I can't find anything on the internet!

Many people call the Library and they are frustrated. They have either too much information or have accumulated a lot of unrelated information or material from unreliable websites. This is a very common situation that plagues even the most seasoned searcher. But there are several strategies that will help you to be more efficient and successful when looking for information. Over the next few issues, we will feature some strategies for finding information on the Internet.

Back to the basics: an overview of the research process

1. **Formulate the question.** What is it you want to find out? Current research encourages the use of PICO statements in the research process. The September-October 2004 issue of this journal (Vol. 38, No. 5, pp. 212, 215) has a detailed explanation of the PICO statement and how it applies to research strategies.
2. **Develop keywords.** From the PICO statement, you can develop a series of keywords with which to search databases. The major problem that people run into is that they don't use the right terms for the databases they're searching. We will go into this area in detail, giving you some online resources for looking up terms.
3. **Know the search syntax for the databases.** Before you can search for information, you also need to know the search syntax used by each database you are searching. Some databases require you to put terms in "quotation marks;" some use Boolean operators (AND, OR, NOT) etc. We will provide some guidance on how to translate your question into the proper syntax for a few key databases.
4. **Investigate free databases and popular search engines.** We will provide you with information on PubMed, CHID, etc. and search engines such as Google, Google Scholar, Evidents, Dogpile, and Brainboost. We will discuss what are considered reputable sites.
5. **Search for grey literature.** Grey literature is by far the most difficult information to find even for the most seasoned searcher but it can be a rich source of data. Not published by commercial publishers, grey literature is material produced by governments, educational institutions, businesses, and industry in a variety of formats. Often it can be searched under organizations or individuals. It also includes unpublished proceedings, workshops, presentations, memos, discussion papers, surveys, statistics, and theses. We will provide some strategies for exploring this information source.
6. What to do when you have too much information or too little? When you do a literature search, often you have to stop and look at the initial findings and assess whether you are finding common thread in answering your question. If not, we'll give you guidance in what might be happening and how you can refine or revise your search strategy.



The Library would like to... develop a national repository for scholarly works that can be used by all members.

Finally, if you have specific questions or observations about searching the Internet for information, please contact the Library at <library@cdha.ca> and we'll either try to incorporate the answer into future columns or to follow up personally.

CDHA's 16th Annual Professional Conference, June 2005

Volunteer recognition

THE CDHA 16TH ANNUAL PROFESSIONAL CONFERENCE was held in the nation's capital, Ottawa, Ontario, from June 17 to 19, 2005. The conference theme, "Together, celebrating the past, present and future!" represented the two unique aspects of this year's conference. First, the bilingual scientific program permitted dental hygienists from Canada's two official linguistic groups to share and learn in their first language. The other unique aspect of this year's conference was that it culminated the year-long 40th birthday celebrations for CDHA.

The hours of hard work and dedication by the organizing committee enabled two and a half days of learning, sharing, and networking for the conference participants, lecturers, and exhibitors in both English and French. The strong scientific program provided delegates from all practice settings with presentations pertinent to their work in the profession. The on-site volunteers helped ensure delegates enjoyed their conference experience by providing a warm welcome at the registration desk, collecting tickets, introducing speakers, providing directions to the various meeting rooms, and meeting other challenging requests, like making the meeting rooms warmer! The committee also provided everyone with the opportunity to celebrate CDHA's 40th birthday at a big birthday bash on Saturday evening. Participants were treated to an evening of food, dancing, and a silent auction to benefit the Canadian Foundation for Dental Hygiene Research and Education. The evening was a true success, giving everyone the chance to celebrate with colleagues from across the province and the country.

Conference delegates were left with lasting memories of their time in the nation's capital, thanks to the organizing committee and volunteers of the CDHA 16th Annual Professional Conference. On behalf of CDHA and all the conference delegates, we thank our colleagues from the Ottawa Dental Hygiene Society and the Regroupement des hygiénistes dentaires francophones de l'Ontario for the opportunity to come together to celebrate the past, the present, and the future!

Exhibitor recognition

A very important component of the conference program is the participation of commercial exhibitors. This year's Exhibit Hall took place over two days instead of one, permitting delegates to spend more time with the representatives of the various companies who shared new trends and products in the industry. CDHA would like to thank the following companies for their time and effort and for providing delegates the opportunity to stay abreast of the possibilities emerging in the profession: Aon Reed Stenhouse Inc.; Aurum/Classic Dental Laboratories; Canadian Health Network; Cami Distribution; Dairy Farmers of Canada; Denesca; Dentsply; GlaxoSmithKline Consumer Healthcare; Henry Schein Ash Arcona; Hu-Friedy Manufacturing; Johnson & Johnson Inc; Maxill Inc.; Oral-B; Oral Science; Patterson Dental; Pfizer Consumer Healthcare; Premier Dental Products; Procter & Gamble Inc.; SheerVision; Sonicare/Philips Oral Healthcare; Sunstar Butler.

Sponsor recognition

CDHA's 16th Annual Professional Conference Sponsors

CDHA would like to thank the following sponsors of the 16th Annual Professional Conference, June 17–19, 2005. The participation of these organizations was an important element in the success of the conference.

Diamond

Oral-B®

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TD Meloche Monnex
Insurance for professionals and alumni

Gold

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SUNSTAR BUTLER

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Johnson & Johnson INC.

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QUALITY MILK

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Trident

Bronze

Mosaik

Exclusively from BMO Bank of Montreal

CDHA would also like to recognize and thank all of the dental hygienists who contributed to the success of the Saturday Evening Gala by making donations for the silent auction. Your generous contributions, too many to list, will help support the Canadian Foundation for Dental Hygiene Research and Education. Thank you all!

Call for Abstracts for the 17th Annual Professional Conference

Deadline for receipt of abstracts: Midnight EST, Monday, November 28, 2005

THE CANADIAN DENTAL HYGIENISTS ASSOCIATION (CDHA) is accepting submissions of abstracts for the scientific program of the 17th Annual Professional Conference to be held in Edmonton, Alberta, June 16–18, 2006. Any dental hygienists interested in making an oral or poster presentation at the conference are required to submit an abstract for consideration.

Scientific Program Format: There are two formats for the scientific program:

- *Oral presentations:* These will be 1 hour long and will be presented as concurrent sessions over the course of two days.
- *Poster presentations:* These will take place over a 2-hour period during the scientific program.

Abstract Themes: Abstracts can be submitted in the following themes:

- Enhancing Clinical Practice
- Culture and Community
- Education and Leadership
- Research and Technology

Submission Guidelines:

- Submission of an abstract constitutes a commitment by the identified presenting author to be in attendance at the conference if the abstract is selected.

Submission Content: Your submission must include the following:

1. ***Cover letter:*** Names of author(s); affiliation; address; city; province; postal code; e-mail; work and home telephone numbers; program format and abstract category of the submission. The author(s) must also disclose any sponsorship agreement he/she may have with regard to speaking engagements. (*Note:* If there are multiple authors, please identify the contact person with an asterisk [*] on the cover letter.)
2. ***Résumé:*** A 150-word biographical sketch for the principal presenting author.
3. ***Abstract:*** The title plus a brief statement of the Objective, Methods, Results, and Conclusions/Outcomes. Please ensure these four headings appear in the abstract immediately followed by a colon. The abstract should be in electronic form (Microsoft Word or WordPerfect), no longer than 250 words, in 12-point Times Roman, double-spaced, flush left, with no word breaks.

Submission Instructions: Please submit the abstracts and accompanying information electronically to <abstracts@cdha.ca>, no later than midnight EST, Monday, November 28, 2005.

Evaluation Criteria: Abstracts will be evaluated and selected in a masked peer-review process as follows:

- All of the requested information has been presented and properly ordered.
- The objective(s) and methods are clearly described.
- The results, including data and statistics when appropriate, are clearly described and based on accepted methodology.
- The conclusions/outcomes are clearly stated.

The selected abstracts will also be published in the Conference Program book and may be considered for publication in the *Canadian Journal of Dental Hygiene*, CDHA's official journal. All authors will be notified in writing whether their abstracts are accepted.

Remuneration: The CDHA will provide authors selected for oral presentations with a complimentary full registration for the conference as well as two (2) nights' accommodation at the headquarters hotel. Any expenses incurred for abstract submission and/or travel to the conference are the responsibility of the author(s). CDHA will provide authors selected in the poster presentation format with a discounted full conference registration. Any expenses incurred for abstract submission and/or travel to the conference are the responsibility of the authors.

Note: If there are multiple authors/presenters, only the primary presenter will be remunerated.

Honoraria and Expenses: CDHA does not provide honoraria to authors selected and does not reimburse expenses, travel costs, or any other expense incurred by the author.

All information inquiries should be directed to:
Canadian Dental Hygienists Association
Membership and Conference Coordinator
96 Centrepointe Drive, Ottawa, ON K2G 6B1
Tel: (613) 224-5515
E-mail: mmp@cdha.ca

Helpful career information...
Unparalleled professional support...
Incredible member discounts...

The choice is clear!

The Canadian Dental Hygienists Association (CDHA) is the only national professional association that focuses on *you.*

No worrying about liability insurance coverage. No running around trying to get the latest research or information about new products or advanced treatments. Your CDHA membership provides you with all the tools and support you need to reach your career goals and deliver the best possible care to your clients.

If you haven't yet renewed, your membership will expire on October 31st.

Don't miss your opportunity to continue uninterrupted support and access to the tools you need to reach your career goals and deliver the best possible care to your clients.

We've got you covered...and at no extra cost!

As an Active member of the CDHA, you receive up to $3 million in Errors & Omissions liability insurance coverage designed specifically for dental hygienists — liability insurance is required by law in some provinces — as well as legal expense coverage for disciplinary matters and coverage for the therapy and counselling of a sexually abused clients *at no extra cost!*

And the CDHA has taken extra steps to ensure proper coverage. Not only are you covered from the day you purchase your membership, but you also receive *full prior-acts coverage*. That means coverage today for claims arising out of services rendered in years past—prior to taking the membership and policy!

The coverage also extends to *all former insured members*. If you take maternity leave in 2006 (i.e. have a non-practising status with your regulatory body) and were an Active CDHA member in 2004–2005, you will continue to be covered. Similar coverage applies if you have been injured, are ill, become disabled, or retired. In addition, the policy provides coverage to heirs, estates, and beneficiaries of a deceased insured member.

Online continuing education

Continuing education is critical to your ongoing professional development. The CDHA has taken the worry out of both finding professional development courses and tracking them for you.

We are developing new courses all the time, courses that deal with cutting-edge issues that are available *at a significant discount to members*. These continuing education courses are developed specifically for dental hygienists and are based on topics suggested by our members. Get the continuing education you want from the comfort of your own home.

CDHA membership also makes tracking your continuing education even easier with the Professional Development Manager Tool! CDHA members enjoy privileged access to this tool, perhaps the best education tracking system ever—and it's online, accessible from any Internet-connected computer.

The Professional Development Manager Tool allows you to track both your completed and your ongoing continuing education initiatives. Add new ones as required and then, if the regulatory body in your province requires it, you can simply print off a progress summary and submit it with the other required records. How easy is that?

And here's some great news… sign up or renew now and get one *FREE online course!* Visit our website at <www.cdha.ca> to find out more.

Membership Renewal Drive 2004–2005 — Have you renewed yet?

The Membership Renewal Drive started on September 1st and is now in full swing. Have you received your membership renewal package by mail? If not, please contact CDHA toll free 1-800-267-5235 or by e-mail at <mmp@cdha.ca>. Remember, renewals received by regular mail will take 4–6 weeks to be processed *after* they are received at our Processing Centre. Don't wait; mail your renewal *today!*

Or, renew your membership with our ***on-line membership renewal*** option. Just visit the CDHA Members' Only website at <www.cdha.ca/members>. It's easy, quick, and secure!

Renew your membership now. The choice is clear!

With access to the latest oral health care information for your clients, exceptional career information for you *and* a growing list of member benefits, I think you'll agree that *renewing your membership in the CDHA is something you just can't afford to pass up*.

Don't wait. Renew now and you can continue to enjoy all these benefits and more right away!

CDHA is dedicated to keeping you informed by bringing you the information you need!

Here are just a few of the ways we do it:

***Canadian Journal of Dental Hygiene* —** Delivered to your door six times per year, the Journal is the only English, peer-reviewed journal published in Canada *exclusively* for you, the dental hygienist. A $135 value, the CJDH is included in your membership!

***DVD Journal of Dental Hygiene* —** Enjoy substantial savings on a subscription to the *DVD Journal of Dental Hygiene*. For just $99, you get four DVD journals over the course of the year so you can start to build your own personal library of accredited continuing education materials. The DVD journals feature an informative and practical mix of clinical presentations, practice and lifestyle "Quick Tips," and interactive Q&A activities to test your knowledge.

Resource Centre — From books and audiovisual material to comprehensive research support, the Resource Centre is your one-stop information source.

E-mail broadcasts — Stay in touch with the news that has an impact on your career and your profession and learn about activities, contests, new resources, and member benefits.

Product Directory and Product Showcase — Use this searchable online database of products from industry-leading oral health care manufacturers to learn about the latest and greatest in oral health care.

Members-only website — Download fact sheets, track your continuing education, find a long-lost colleague—you'll be surprised at just how helpful it is! Why wait another minute? Sign up now and make the best move of your career!

Members-only discount program hard to beat

At CDHA, our main goal is to give you the tools you need to enjoy the career of a lifetime. But we know that a good life is a balanced life. As an added benefit of membership, the CDHA has developed members-only discount programs with a number of companies and organizations that will help you to get out there and enjoy life—for less! Here is just a sample of how you can save hundreds of dollars each year as a member of the CDHA, your professional association.

Finances – Join the CDHA Group RRSP, Savings and Retirement Program designed exclusively for members by ***London Life***.

Hotels – Get special discounts and savings with ***CHIP Hospitality*** at their hotel properties across Canada.

Cell Phones – Receive special discounts on cellular telephone packages from ***Capital City Communications***.

Fitness – Get 50% off your initial registration fee at ***Curves*** and get all the support you need to stay fit and healthy!

Technology – Purchase the latest technology at discounts below-retail prices with the <hpshopping.ca> Member Purchase Program from ***Hewlett-Packard***.

Mortgages – Gain access to specialized mortgage products and discounted rates through the new CDHA Mortgage Discount Program with ***David Benson & Associates Inc***, a mortgage intelligence broker.

Car Rental – No matter where you're going, you can go for less with ***National Car Rental***.

Uniforms – Go to work in style thanks to special member discounts with ***Uniqueform*** and ***Wright Dental Canada Limited – Dickie's Medical Uniforms***

Personal Insurance – Look to ***Sun Life Assurance Company of Canada*** for Long Term Disability, Life, Critical Illness, Accidental Death and Dismemberment, and Extended Health Care Insurance.

Home and Auto Insurance – Enjoy preferred group rates on home and auto insurance through ***TD Meloche Monnex***. Obtain a quote through the website and you could win a new Mercedes-Benz SLK 350 Roadster!

All that—and more—for less than 40¢ per day for Active CDHA membership!

"Meth Mouth" and Tongue Piercing

by CDHA Staff

MANY NEW CHALLENGES OR "TEMPTATIONS" FACE young people these days...and two that have oral health repercussions are methamphetamine usage and tongue piercing. This month we are providing some valuable sites that will give you and your clients straightforward information about these lifestyle choices that can cause significant problems.

METH MOUTH

Methamphetamine Use – American Dental Association

www.ada.org/public/topics/methmouth.asp

This is a brief overview of methamphetamine and its impact on the body and on the teeth. It quotes some users who say their teeth are "blackened, stained, rotting, crumbling or falling apart." The result is often extraction.

MAPP-SD (Meth Awareness and Prevention Project of South Dakota)

www.mappsd.org/Meth%20Mouth2.htm

The introductory paragraph on this page reads as follows: "Meth users face some specific issues with their teeth and mouth, partly due to the ingredients and method of use.... Dentists and dental hygienists are urged to become familiar with the symptoms and what precautions to take when treating an abuser. While the symptoms alone do not *prove* Meth use, taken together with other signs, they may help health workers diagnose abuse." The page goes on to briefly discuss some of the symptoms of meth use: dry mouth, tooth decay, cracked teeth, gum disease. Graphic arrays of photographs show the devastating impact of meth use on the teeth and gums.

InfoFacts: Methamphetamine (National Institute on Drug Abuse)

www.nida.nih.gov/Infofacts/methamphetamine.html

This short information piece concentrates on the drug's impact on the various systems of the body, central nervous system, cardiovascular and respiratory systems. Heavy use can result in "symptoms like those of Parkinson's disease, a severe movement disorder," strokes, convulsions, cardiovascular collapse, and death. *Methamphetamine Abuse and Addiction*, an 8-page NIDA research report, is a valuable comprehensive overview of all aspects of the drug and is available from www.drugabuse.gov/PDF/RRMetham.pdf.

TONGUE PIERCING

With the relative popularity of tongue and body piercing among youths and young people, knowing what is available on the Internet could help you counsel or chat to your clients about the problems that could ensue. There

are a huge number of articles. The following sites can provide some information, both for the public and for the oral health researcher.

Oral body piercing – Wisdom Tooth Home Page

www.umanitoba.ca/outreach/wisdomtooth/piercing.htm

Factual, straightforward information provided by dental hygienists who are 1997 graduates of the University of Manitoba's School of Dental Hygiene.

Oral piercing – Academy of General Dentistry

www.agd.org/consumer/topics/piercing/

This page has four links, "So you want to pierce your tongue;" "To pierce or not to pierce;" "Dentists tell players, keep the mouthguard, take out the barbell;" and "Tongue studs cause more problems than chipped teeth." These are all directed at the young person who is thinking about tongue piercing.

Center for Young Women's Health, Children's Hospital, Boston

www.youngwomenshealth.org/body-piercing.html

Here is straightforward information for young people on the risks of body piercing and the length of time it takes for areas to heal (e.g., tongue, 4 weeks; ear cartilage, 4 months to a year; lip, 2 to 3 months). If the teen decides to go ahead anyway, the site provides good advice on how to choose a reputable place, how to care for the area, the type of jewelry that is best, how piercings are done, how to prevent infections, and so forth.

KidsHealth – TeensHealth – Body Piercing

www.kidshealth.org/teen/your_body/beautiful/body_piercing_safe.html

Written directly to teens, this site gives the straight information about the dangers of piercing but also gives good advice to those who decide to go ahead.

CHID online (Combined Health Information Database)

http://chid.nih.gov

This is a "bibliographic database produced by health-related agencies of the [U.S.] Federal Government. This database provides titles, abstracts, and availability information for health information and health education resources."

CLASSIFIED ADVERTISING

CDHA and *CJDH* take no responsibility for ads or their compliance with any federal or provincial/territorial legislation.

BRITISH COLUMBIA

LANGLEY We are a caring, established family practice seeking a part-time dental hygienist for two days per week. Apply to Dr. Terry Abel Inc. #307–20338 65th Ave., Langley, BC V2Y 2X3. Attn: Terry Abel. Tel: **604-532-8821**; fax: **604-532-8829**; e-mail: <**drterry@shawbiz.ca**>.

ALBERTA

JASPER Full-time hygienists required for a practice in the beautiful mountain town of Jasper, Alberta. If you are self-motivated, team-oriented, and love the outdoors, this could be the practice for you. Please fax résumé to **780-852-4048**.

LLOYDMINSTER Friendly and outgoing dental hygienists to work with our progressive dental team 2–4 days per week. Send/fax résumé to: Dr. Greg Tailleur, #201 – 5705 44th St., Lloydminster, Alberta T9V 2A1. Fax: **780-872-7428**.

SUNDRE Full-time position available for dental hygienist as of August 1st. Located in the foothills of the Rockies, just a little more than an hour from Calgary. An outdoor lover's paradise with an emphasis on horses. Easy-going, good-natured practice working 8 a.m.– 4:30 p.m. with no evenings or weekends. Solo practice; open to time off etc. Sundre Dental, Dr. Hoehne/Dorothy, Box 1188, Sundre, AB T0M 1X0. Fax: **403-638-3603**; tel: **403-636-8889**. E-mail: <**khhoehne@shaw.ca**>.

WHITECOURT Looking for a hygienist for modern, high-grossing practice in Whitecourt, Alberta. Successful applicant will be fully booked from first day. Please call **780-779-5263** or fax **780-779-5293**.

PRINCE EDWARD ISLAND

SUMMERSIDE Dental Public Health Dental Hygienist. The dental hygienist plans, coordinates, and provides preventive and oral health promotion services in extensive oral health programs, using a team approach. Good salary, excellent benefit package, including 3 weeks' paid vacation, pension plan, life and accident insurance, medical/dental plan. For more information, see our website at <**www.peidental.ca**>, the PEI government website at <**www.gov.pe.ca/jobs/**> or contact Dr. Barry Maze at **902-368-4915** or <**dbmaze@ihis.org**>.

NEWFOUNDLAND AND LABRADOR

BAY ROBERTS Busy general dentistry practice requires the services of a motivated, hard-working dental hygienist. We currently have two full-time dental hygienists, working on a commission basis. Any new hygienist joining our team will walk into a fully booked situation. All interested individuals can fax or mail their letters of interest and résumés to Dr. Michelle Zwicker, P.O. Box 1560, Bay Roberts NL A0A 1G0. Fax: **709-786-0895**; e-mail: <**mdzwicker@nf.sympatico.ca**>.

CONTINUING EDUCATION

WINNIPEG **University of Manitoba, School of Dental Hygiene** will be offering a Local Anesthesia Continuing Education Program for Licensed Dental Hygienists on November 25–27, 2005, at the Faculty of Dentistry. Self-study portion six weeks in advance. **Registration deadline is October 8, 2005**. If you are interested in participating, you can obtain further information by contacting Lisa Chrusch, Administrative Assistant for The School of Dental Hygiene at **204-789-3683** or <**lisa_chrusch@umanitoba.ca**>.

Advertisers' Index

CDHA CLASSIFIED ADS

Classified job ads appear primarily on the CDHA's website (www.cdha.ca) in the Career Centre (*Members' Only* section). On-line advertisers may also have their ad (maximum of 70 words) listed in the journal *CJDH* for an additional $50. If an advertiser wishes to advertise only in the print journal, the cost will be the same as an on-line ad. These classified ads reach over 11,000 CDHA members across Canada, ensuring that your message gets to the target audience promptly. Contact CDHA at **info@cdha.ca** or **613-224-5515** for more information.

Long-Term Disability (LTD) Claims *(continued from page 224)*

number less than the monthly payment *times* the number of months until your 65th birthday. The sum is less because you would be receiving the funds now. There are also discount factors in this area that the actuary should be aware of and take into consideration. This amount would represent the maximum settlement.

2. The insurance company will in all probability come up with a different sum. Calculations in this area are as much an art as a science and there are contingencies that the insurance company would want to factor into any lump sum. However, the insurance company usually prefers to resolve the matter rather than having their employees continue to spend time on the case and possibly incur further costs with respect to future medical examinations.

In conclusion, it is important to make sure that you develop and tap into your support system when you are in this situation. Someone on disability is dealing with a number of medical and financial issues and often is under a great deal of stress. Take care of yourself as best you can and recognize that this is a challenging situation.