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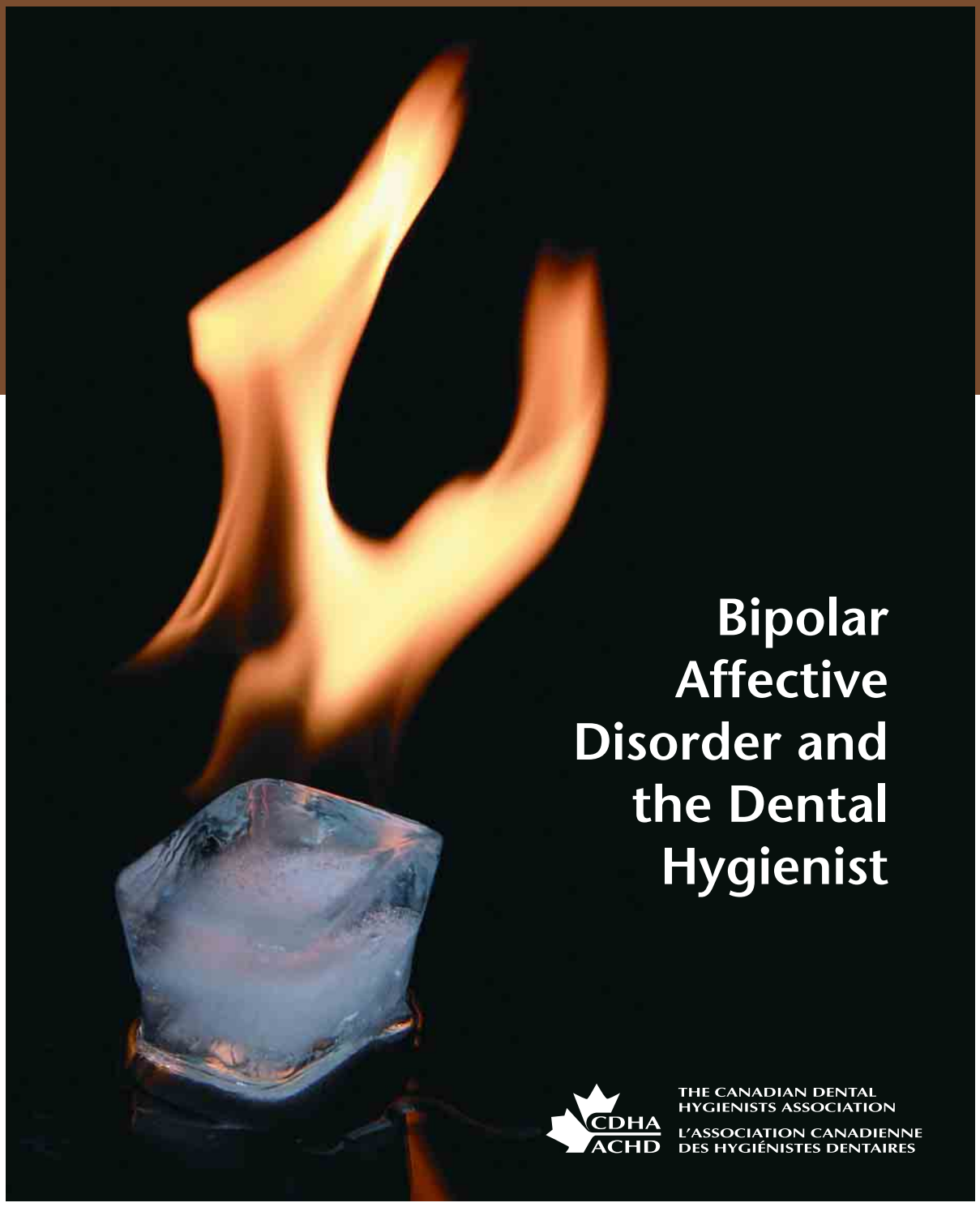

Bipolar Affective Disorder and the Dental Hygienist

THE CANADIAN DENTAL HYGIENISTS ASSOCIATION
L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIRES

THE OFFICIAL JOURNAL OF THE CANADIAN DENTAL HYGIENISTS ASSOCIATION

What Does Oral Health Month Mean to You?

by Bonnie Blank, AASc, BSc(DH), MA

This year's theme for Oral Health Month is "Good Oral Health is Good Health." April is set aside each year as an opportunity to raise awareness about the importance of oral health. As prevention professionals, we have a particular interest in educating individuals about the connection between oral health and overall health. What activities do you have in mind to spread the word in your community about how important it is to maintain oral health?

We are very fortunate to live in a time when prevention is a common theme. Historically, dental disease was viewed as something that everyone would experience at some time in his or her life. Wearing dentures and pain from decay were believed to be inevitable. With increased research and knowledge, we have been able to intervene early to protect many individuals from these experiences.

Our job is to reach as many members of the population as possible.

However, since we have not eliminated dental disease, our job is to reach as many members of the population as possible. Education and awareness are the key to prevention. Teaching new parents about the risks of early childhood caries and other oral habits that promote decay is one example of early prevention. School-age children can benefit from hearing about the importance of healthy habits such as proper diet and oral care.

During this oral health month, there are a number of activities to get the word of prevention to Canadians. Here are a few ideas. Create an informational brochure that could be circulated in clinics in your community. Guide your clients to resources that are available to support their learning and increase their knowledge about the correlation between oral health and their overall health. Visit a classroom or daycare centre to conduct a "Brush-In" that could inspire children and help to set patterns for the rest of their lives. Sometimes these small steps have far-reaching effects. Take a moment to access the CDHA website (under "Oral Care Centre") and participate in the activities

What Does Oral Health Month Mean to You? *…continued on page 84*

* Wener ME, Yakiwchuk C-A. Healthy mouth ~ healthy body. Probe. 2003;37(1):15-23.

Qu'est-ce que le mois de la santé buccodentaire signifie pour vous?

par Bonnie Blank, A.A.Sc., B.Sc.(DH), M.A.

Le thème de cette année pour le mois de la santé buccodentaire est « La bonne santé buccodentaire favorise la bonne santé en général ». Le mois d'avril a été fixé pour être, chaque année, une occasion de sensibiliser les gens sur l'importance de la santé buccodentaire. En tant que professionnels et professionnelles de la prévention, nous avons un rôle à jouer dans l'éducation des gens sur le lien qui existe entre la santé buccodentaire et l'état de santé général. Quelles activités avez-vous en tête pour faire passer le message, dans votre communauté, de l'importance de maintenir une bonne santé buccodentaire?

Notre travail est de rejoindre autant de personnes que possible au sein de la population.

Nous sommes très chanceux de vivre à une époque où la prévention est un thème commun. Historiquement parlant, les maladies dentaires étaient perçues comme quelque chose dont tout le monde pourrait être atteint à un moment ou l'autre de sa vie. Le port de prothèses dentaires et les maux de dents causés par la carie étaient perçus comme inévitables. Avec l'accroissement des recherches et des connaissances, nous sommes maintenant en mesure d'intervenir plus tôt pour protéger les gens contre de telles expériences.

Par contre, puisque nous n'avons pas éliminé les maladies dentaires, notre travail est de rejoindre autant de personnes que possible au sein de la population. L'éducation et la sensibilisation sont les clés de la prévention. Éduquer les nouveaux parents sur les risques de la carie de la petite enfance et sur les autres habitudes buccodentaires qui favorisent la carie est un exemple de prévention hâtive. Les enfants d'âge scolaire peuvent tirer avantage d'entendre parler de l'importance d'adopter des habitudes saines comme un régime alimentaire sain et de bons soins buccodentaires.

Qu'est-ce que le mois de la santé buccodentaire signifie pour vous? *…suite page 83*

* Wener ME, Yakiwchuk C-A. Healthy mouth ~ healthy body. Probe. 2003;37(1):15-23.

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by Susan Ziebarth, BSc, MHA, CHE

To keep a lamp burning we have to keep putting oil in it.
– Mother Teresa

FOR A PROFESSION TO BE A PROFESSION, A DEFINED BODY of knowledge must form the foundation of the activities of those who practise the profession. And as time moves forward, that body of knowledge has to be continuously renewed and transferred it to the practitioners. As your professional association, CDHA must provide the oil to keep your professional lamp burning. We do this in a number of ways: through this peer-reviewed journal; the Members Only website with its many tools and resources, including a growing catalogue of continuing education opportunities; and our bi-monthly e-mail broadcasts.

One of our first projects is to examine the various educational standards.

In Toronto this past January, we held our first-ever Student Summit. Preliminary feedback from the 300 students who attended the event suggests that they definitely found it valuable and definitely something CDHA should repeat. We were thrilled to see that schools from across the country sponsored students to attend.

Within the past year, Dental Hygiene Educators Canada (DHEC) has asked CDHA to become more involved in the policy area of dental hygiene education. As part of this mandate, CDHA is acting as the secretariat for an unprecedented collaboration among all national dental hygiene organizations and many provincial organizations. A Project Planning Committee has been established to design and seek funding for the project. The members of this committee include representatives from the following interest groups (listed in alphabetical order):

- Canadian Dental Hygienists Association (CDHA),
- Commission on Dental Accreditation of Canada (CDAC),
- Dental Hygiene Educators Canada (DHEC),
- Federation of Dental Hygiene Regulatory Authorities (FDHRA), and
- National Dental Hygiene Certification Board (NDHCB)

Entry-to-Practice and Educational Standards
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Les normes d'éducation et de début en exercice

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

Pour qu'une lampe continue à éclairer, nous devons l'alimenter en huile. [Traduction]
– Mère Teresa

POUR QU'UNE PROFESSION SOIT UNE PROFESSION, UN corpus de connaissances bien défini doit constituer le fondement des activités de ceux et celles qui pratiquent la profession. Et, lorsque le temps poursuit son œuvre, ce corpus de connaissances doit être continuellement renouvelé et transmis aux praticiens et praticiennes. Comme association professionnelle, l'ACHD se doit de vous fournir de l'huile pour permettre à votre lampe professionnelle de continuer à éclairer. Nous le faisons de différentes façons : par ce journal approuvé par les pairs; par le site Web réservé aux membres seulement qui offre de nombreux outils et de nombreuses ressources, incluant un répertoire, de plus en plus élaboré, de possibilités de formation continue; et par nos diffusions générales bi-mensuelles par courriel.

L'un de nos premiers projets est d'examiner les différentes normes éducatives.

En janvier dernier, se tenait à Toronto notre tout premier Sommet étudiant. La réaction préliminaire des 300 étudiantes et étudiants qui ont assisté à l'événement suggère que tous ont trouvé l'expérience enrichissante et que c'est définitivement quelque chose que l'ACHD devrait répéter. Nous avons été agréablement surpris de voir que des collèges, de partout au pays, ont commandité des étudiantes et étudiants pour qu'elles ou ils puissent y participer.

Au cours de la dernière année, les Éducateurs en hygiène dentaire du Canada (EHDC) ont demandé à l'ACHD de s'impliquer davantage en ce qui concerne les politiques de l'éducation en hygiène dentaire. Pour réaliser ce mandat, l'ACDH fera office de secrétariat pour assurer une collaboration sans précédent entre tous les organismes nationaux en hygiène dentaire et plusieurs organismes provinciaux. Un comité de planification de projets a été mis sur pied pour la conception de projets et la recherche

Les normes d'éducation et de début en exercice
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This article has been peer reviewed.

Bipolar Affective Disorder and the Dental Hygienist

by Lori Rosmus, RDH, BSc, and Sandra J. Cobban, RDH, MDE***

ABSTRACT

Bipolar affective disorder (BD) is a chronic and often debilitating condition affecting 1% to 2% of the general population. Although BD affects a small population, it is likely that a dental hygienist will encounter individuals suffering from BD sometime during his or her practice. This article describes BD, the drugs used to treat it, dental hygiene implications for the client with BD, and discusses treatment of the client with bipolar disorder within the Oral Health-Related Quality of Life framework. The major features of BD consist of mood disturbances: depression, hypomania, and mania. The precise etiology of BD is unknown. Pharmacotherapy forms the foundation for management of BD and involves administration of mood stabilizers, antidepressants, sedatives, antiepileptics, and antipsychotics. A dental hygienist may expect a client with BD to present with several oral health conditions: xerostomia induced by medication, abrasion of teeth from excessive brushing during mania, gingival injury due to excessive/overeager flossing during mania, inadequate nutrition, or poor oral hygiene due to neglect during depression. The client may be concerned with the daily living aspects associated with bipolar disorder, may not feel that oral health needs are a priority, or may not have the resources to fill those needs. It is important for dental hygienists to acknowledge this difference in perspective in viewing the importance of oral health care. The Oral Health-Related Quality of Life model (OHRQL) provides a framework for aiding the dental hygienist in determining the optimum therapeutic regimen for oral health care for the BD client.

Keywords: bipolar disorder; dental hygienists; oral health; oral hygiene; Oral Health-Related Quality of Life model

BIPOLAR AFFECTIVE DISORDER AND THE DENTAL HYGIENIST

BIPOLAR AFFECTIVE DISORDER (BD) IS A CYCLIC MENTAL illness and includes a spectrum of disorders. BD was previously referred to as bipolar disorder and as manic-depressive insanity, manic-depressive disorder, and manic depression. BD is a chronic and often debilitating condition affecting 1% to 2% of the general population.[1] The onset of BD generally occurs in the late teens or early twenties.

The societal cost of BD is high: absences from work cost employers 50% to 150% more than health-related absences for individuals without BD;[2] health care costs have been estimated to range from $25 billion to $45.2 billion annually.[3] Sufferers are twice as likely to be incarcerated[4] and are at a 15 to 20 times greater risk for suicide than the general population.[5] Individuals with BD are also more likely than the general population or those with unipolar depression to experience substance abuse. Studies have found that 43.7% of sufferers of BD exhibit some form of alcohol dependence or abuse compared with 16.6% of those with unipolar depression, and 14% of the general population. The high incidence of co-morbid BD and substance abuse poses a challenge for treatment and management for each separate condition. For instance, concomitant alcohol dependence or abuse results in increased hospitalizations, more mixed mania, earlier age of onset, and an increase in suicidal ideation.[6]

Although BD affects a relatively small population, it is likely that a dental hygienist will encounter individuals suffering from BD sometime during his or her practice. Few reviews or studies have been conducted on the topic of BD and oral health, and the purpose of this article is to inform dental hygienists about BD and its oral effects. This article describes BD, the drugs used to treat BD, dental hygiene implications for the client with BD, and discusses treatment of the client with bipolar disorder within the Oral Health-Related Quality of Life framework.

It is likely that a dental hygienist will encounter individuals suffering from BD sometime during his or her practice.

FEATURES OF BIPOLAR DISORDER

The major features of BD consist of mood disturbances: depression, hypomania, and mania. Depressive episodes occur three times more often than manic episodes, lead to eight times more hospitalizations,[3] and include at least three of the following: intense, pervasive feelings of sadness for most of the day; an inability to concentrate; a decrease in interest or pleasure in activities previously found interesting; marked gain or loss in weight; sleep dis-

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RÉSUMÉ

Le trouble affectif bipolaire est un trouble chronique et souvent débilitant qui affecte un à deux pourcent de la population en général. Bien que le trouble bipolaire n'affecte qu'une petite partie de la population, une hygiéniste dentaire rencontrera probablement quelques fois des personnes souffrant de trouble bipolaire au cours de ses années d'exercice. Cet article décrit le trouble bipolaire, les médicaments utilisés pour le traiter, les répercussions sur l'hygiène dentaire d'un client atteint de trouble bipolaire et ouvre la discussion concernant le traitement d'un client atteint de trouble bipolaire dans le cadre de la qualité de vie liée à la santé buccodentaire. Les principales caractéristiques du trouble bipolaire sont des troubles de l'humeur : dépression, hypomanie et manie. L'étiologie précise du trouble bipolaire est inconnue. La pharmacothérapie est la base de la gestion du trouble bipolaire et elle inclut l'administration de stabilisateurs de l'humeur, antidépresseurs, sédatifs, antiépileptiques et antipsychotiques. Une hygiéniste dentaire peut s'attendre à ce qu'un client atteint de trouble bipolaire présente plusieurs affections buccodentaires : xérostomie causée par les médicaments, abrasion des dents causée par le brossage excessif en phase maniaque, blessures gingivales dues à une utilisation excessive de la soie dentaire en phase maniaque, ou mauvaise hygiène dentaire due à la négligence en phase dépressive. Le client peut être préoccupé par les aspects de la vie quotidienne associés au trouble bipolaire et peut ne pas avoir le sentiment que les besoins en matière de santé buccodentaire sont une priorité ou peut ne pas avoir les ressources pour répondre à ces besoins. Il est important que les hygiénistes dentaires reconnaissent cette différence de perspective sur l'importance des soins de santé buccodentaire. Le modèle de qualité de vie liée à la santé buccodentaire (OHRQL) offre un cadre pour aider l'hygiéniste dentaire à déterminer le plan thérapeutique optimal pour les soins de santé buccodentaire d'un client atteint de trouble bipolaire.

turbances; persistent thoughts of death; suicidal ideation with or without a specific plan, or suicide attempt; psychomotor agitation or retardation; feelings of worthlessness or inappropriate guilt; and fatigue.[3-9] Major depressive episodes can last from two weeks to nine months.[1,3,8,9] Mania consists of three of the following: feelings of elevated; expansive mood; irritability; loss of self control and judgment; psychotic thinking and behaviour; grandiosity; increased sexuality; appetite disturbance; racing thoughts; creative or bizarre thinking; risk taking; decreased need for sleep; pressured speech; and increased or delusional religious thoughts or experiences.[1,4-9] Excessive goal-striving behaviours or intense mood reactivity to success and reward have also been noted as risky attitudes for bipolar disorder mania.[10-12] Sometimes individuals with BD find themselves in a state of euthymia that represents premorbid levels of mood.[13]

Hypomania is a condition composed of increased productivity and a decreased need for sleep. Hypomania is often not seen as pathologic by the sufferer because it is a condition marked by high functionality. However, it is dangerous as it is accompanied by a high risk for suicidal behaviour and social impairment and can be followed by manic episodes.[1,4-9] Mixed episodes consist of a combination of concurrent depressive and manic symptoms.[1,4-9] There are five different disorders included in the spectrum of bipolar affective disorders: Bipolar I, Bipolar II, dysthmia, cyclothmia, and Bipolar disorder NOS.[1-9] The most recent *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) indicates a diagnosis of Bipolar I is possible with the occurrence of one or more manic or mixed episodes; and Bipolar II with the occurrence of one or more major depressive episodes, accompanied by at least one hypomanic episode.[5] Dysthmia is a milder, chronic form of depression, which can last for two years and occurs in 6% to 8% of the adult population.[1,5,8,9] Dysthmia symptoms have also been referred to as subsyndromal bipolar disorder.[5,12,13] Cyclothymic disorder consists of recurrent brief episodes of hypomania and mild depression. Individuals suffering from cyclothmia are often called "rapid-cyclers" because their symptoms vary from depression to mania much more rapidly than other BD sufferers, with cycles as short as two months.[1,4,5] Bipolar disorder NOS consists of partial syndromes, such as recurrent hypomania without depression.[1,4,5]

Bipolar affective disorder can occur simultaneously with substance abuse, anxiety, and personality disorders.

Bipolar affective disorder can occur simultaneously with substance abuse, anxiety, and personality disorders. Evidence exists for a link between BD and eating disorders, particularly between Bipolar II and bulimia nervosa.[14] BD can also be induced or mimicked by substance abuse, medications, or other psychiatric illnesses involving psychosis.[4,12,13] It has been noted that in some cases substance abuse problems can mask underlying mood disturbances, and that treatment of the latent BD can improve recovery from substance abuse.[15] Genotypes have been discovered that may indicate an overlap between bipolar disorder with persecutory delusions and schizophrenia.[16] It is because of these associations, and the fact that individuals do not generally see hypomania as pathologic,[4,10,13] that BD is often initially misdiagnosed as major depressive disorder or one of the above conditions. Some studies approximate the average latency of bipolar disorder before diagnosis as 8.3 years.[13] This delay in diagnosis can lead to a poorer prognosis, increased complications (such as substance abuse), increased risk of suicide, and impaired quality of life.

The precise etiology of BD is unknown; however, several theories exist. Studies have shown abnormalities in the prefrontal cortex, limbic, striatum, ventricular volume, and in the serotonin, hypothalamic-pituitary-thyroid, and adrenal systems.[12,13] Family studies indicate a strong genetic component to the disorder.[4,7-10,12,15] Some evidence suggests that abnormalities of chromosome 22 may predispose an individual to bipolar disorder.[15] Some theorists view bipolar disorder in an evolutionary framework, as some of the features may attend for propagation of the species, i.e., depression may make individuals less sensitive to the suffering of others, and an anxious temperament may help to ensure the survival of self and kin.[17]

The four general approaches for treatment include pharmacotherapy, psychotherapy, peer support/life skills education, and electro-convulsive therapy (electroshock therapy, or ECT). It is advocated to include all of the above treatments, with the exception of ECT, in effective BD treatment.[1,5,8] While pharmacotherapy is the major form of intervention, stressors and major life events have been shown to exacerbate BD or cause relapse in cases of remission and therefore peer support and life skills management to foster coping skills are important parts of therapy.[4,18,19] The addition of psychotherapy to pharmacotherapy has shown to improve prognosis and increase length of remission in bipolar disorder patients.[4,7,9,11,18-21] Patients being mindful of their illness, having a stay-well plan, and including intervention strategies and coping skills for episodes of illness can improve the course of treatment.[22] ECT is recommended only in refractory situations not improved by pharmacotherapy and psychotherapy.[1,5,8]

PHARMACOTHERAPY

Pharmacotherapy forms the foundation for management of BD and involves administration of mood stabilizers, antidepressants, sedatives, antiepileptics, and/or antipsychotics to help alleviate the effects of depression, hypomania, and mania and to prevent mood disturbances in stages of remission. There are some discrepancies among the appropriate first-line drugs used to treat BD. According to the Canadian Network for Mood and Anxiety Treatments (CANMAT), the first line of treatment for acute mania includes administration of the mood stabilizers lithium and valproate and atypical antipsychotics.[5] The first line of treatment for depression is lithium, lamotrigine, and various combinations of antidepressants and mood stabilizers. For bipolar depression, the American Psychiatric Association guidelines indicate lithium or lamotrigine as the first line for treatment.[23] The World Federation of Societies for Biological Psychiatry advocates the administration of an antidepressant and mood stabilizer as the first line treatment for bipolar depression.[21] For maintenance, use of lithium, lamotrigine, valproate and olanzapine is advocated.[5] There are varying side effects for the various drugs used to treat BD; however, weight gain is seen with all drugs except lamotrigine and carbamazepine.[1,4,18] The next section of this paper will review some of the more common drugs considered by CANMAT to be first-line treatments for BD.

Mood Stabilizers

Lithium. Lithium is a mood stabilizer generally given in the form of a chloride salt. The mechanism of the antimanic and antidepressant action in the central nervous system (CNS) is unknown; however, it may interfere with the synthesis, storage, and release of monoamine neurotransmitters norepinephrine and dopamine.[24-26] Lithium enhances the uptake of tryptophan, increases the synthesis of serotonin, and may enhance the release of serotonin in the CNS. The lithium ion competes at intracellular binding sites, protein surfaces, and transport sites with sodium, potassium, calcium, and magnesium ions.[24] Lithium exerts neurotrophic effects on the brain and has been found to enhance dendritic branching, the development of new synapses, and neurogenesis.[26] Compared with other mood stabilizers, lithium has shown the greatest efficacy in the prevention of suicide.

When taken with erythromyocin, NSAIDs, diuretics, ACE inhibitors, and calcium channel blockers, there is an increase in serum lithium levels that can lead to toxicity. Major side effects of lithium use include weight gain, lethargy, fatigue, impaired glomeruluar or tubular functioning, tremor, cognitive impairment, hypothyroidism, nausea, vomiting, diarrhea, dry mouth, benign leukocytosis, acne, psoriasis, and electrocardiogram changes.[1,24] After 10 years of therapy with lithium, 10% to 20% of patients display kidney changes such as interstitial fibrosis, tubular atrophy, and glomerular sclerosis. Because of the side effects of lithium, adherence to lithium therapy is poor and many patients discontinue lithium treatment. Therefore, several therapies may be tried in order to find the right treatment for the right individual that may or may not include lithium pharmacotherapy.

Because of the side effects of lithium, adherence to lithium therapy is poor and many patients discontinue lithium treatment.

Atypical Antipsychotics

Quetiapine. Quetiapine is administered in monotherapy or in combination with lithium or valproate. When administered alone, quetiapine has been shown to be effective in reducing depressive as well as manic symptoms.[5,7,27] Quetiapine is a dibenzothiazepine derivative, an antagonist at Serotonin 5-HT_{1A} and 5-$HT_{2A,}$ Dopamine D_1 and $D_{2,}$ histamine $H_{1,}$ and Adrenergic α_1 and α_2 receptors.[7] The mechanism for action of quetiapine in bipolar disorder is unknown.

The side effects of quetiapine are as follows: somnolence, dry mouth, dizziness, weight gain, constipation, and sedation. In combination with lithium or valproate, somnolence, dry mouth, asthenia, and postural hypotension occurred more often than for placebo plus lithium or valproate. For adolescents in combination therapy, sedation was the only side effect seen more often with quetiapine.[27]

Resperidone. Resperidone is an atypical antipsychotic that has been shown to be effective in the treatment of bipolar mania.[1,5,18,25] Resperidone is a benzisoxazole derivative and antagonizes serotonin and dopamine.[27] Resperidone has a high affinity for serotonin 5-$HT_{2A,}$ dopamine $D_{2,}$ and adrenergic α_1 and α_2 receptors. The precise mechanism of resperidone is unknown. Resperidone is given in monotherapy or in combination therapy with mood stabilizers.

Side effects of resperidone include weight gain, extrapyramidal symptoms, somnolence, hyperkinesias, headache, dizziness, dyspepsia, nausea, and constipation. Increased prolactin levels, and hyperprolactinemia can also result from resperidone use.[12,18] In children and adolescents, sialorrhea has also been noted as a side effect with the use of resperidone.[27]

Olanzapine. Olanzapine is a thienobenzodiazepine neuroleptic. The mechanism of action for olanzapine is unknown. However, it is thought to work by antagonizing dopamine and serotonin activities and selectively antagonizing monoamines with high affinity binding to serotonin 5-HT_{2A} and 5-$HT_{2C,}$ dopamine $D_{1\text{-}4,}$ muscarinic $M_{1\text{-}5,}$ histamine H_1 and α_1 adrenergic receptor sites.[12] Olanzapine has been shown effective for the treatment of bipolar mania and for maintenance therapy when taken in monotherapy or combination with fluoxetine.[5,23]

Side effects of olanzapine include headache, somnolence, insomnia, agitation, nervousness, hostility, dizziness, dystonic reactions, parkinsonian events, xerostomia, constipation, premenstrual syndrome, rhinitis, cough, and weight gain.[18,28]

Antiepileptic Drugs

Lamotrigine. Lamotrigine is a second-generation antiepileptic phenyltriazine derivative. Lamotrigine is one of the most studied of the antiepileptic drugs for treatment of BD,[1,4,9,18,20-23,25,28,29] particularly for maintenance therapy, cyclothymia (rapid cycling), and bipolar depression.[14,29,30,31] The precise mechanism of antiepileptic drugs in the treatment of bipolar disorder is unknown; however, the primary action of lamotrigine and other antiepileptics used to treat mood disorders appears to be blockage of gated sodium channels.[26,29-33] This action may inhibit GABA firing. Lamotrigine also modulates serotonergic transmission and affects potassium channels.

Lamotrigine may reduce the efficacy of oral contraceptives, and concurrent use of valproate may inhibit the efficacy of lamotrigine. Side effects of lamotrigine include headache, dizziness, ataxia, somnolence, nausea, diplopia, blurred vision, dermatologic rash, altered taste sensation, and rhinitis.[28-33]

Carbamazepine. Carbamazepine is an anticonvulsant chemically related to tricyclic antidepressants that limits influx of sodium ions across cell membranes. It has anticholinergic, antineuralgic, antidiuretic, muscle relaxant, antiarrhythmic, and anticonvulsant effects.[28] Carbamazepine has been used since the 1980s and has shown to be particularly effective when used in combination with lithium to treat bipolar disorder.[17,19,24,32] Carbamazepine is also prescribed as an alternative to lithium for those who do not respond to lithium, for whom the side effects of lithium are too debilitating, or in the case of mood-incongruent delusions.[28] Side effects of carbamazepine are the same as the side effects of lamotrigine. Erythromyocin, ketoconazole, and clarithromycin may increase serum levels of carbamazepine and lead to toxicity. Phenobarbital, phenytoin, rifampine, and theophylline may decrease serum levels and lead to symptoms of mania.[5]

A dental hygienist may expect a client with BD to present with several oral health conditions.

Valproate. Valproate is also known as valproic acid, or divalproex. Valproate increases availability of GABA at postsynaptic receptor sites, thereby increasing inhibitory effects. Valproate is used particularly to treat bipolar mania in combination with atypical antipsychotics or antiepileptics.[5,18,19,22,25,28] Valproate is prescribed as an alternative to lithium and has been shown to be as effective in treatment of bipolar disorder as lithium or carbamazepine.[5,11]

Side effects reported include somnolence, dizziness, nervousness, insomnia, alopecia, nausea, diarrhea, vomiting, abdominal pain, dyspepsia, thrombocytopenia, tremor, weakness, and respiratory tract infection.[26,32] Otitis media has also been noted as an adverse effect of valproate.[8]

Antidepressants

Fluoxetine. Fluoxetine, also known as Prozac, is a selective serotonin re-uptake inhibitor (SSRI) that prevents presynaptic neurons from re-uptaking released serotonin from the synapse. This action effectively increases the serotonin available to the postsynaptic neuron. Side effects of SSRI use include SSRI-induced bruxism, xerostomia, headache, anxiety, nervousness, somnolence, nausea, weakness, tremors, diarrhea, rash, pruritus, and pharyngitis.[27] Fluoxetine in combination with olanzapine has shown to be effective in the treatment of bipolar depression and for maintenance therapy.[26,31]

IMPLICATIONS FOR THE DENTAL HYGIENIST

Bipolar disorder is a cyclic illness that has oral effects. A dental hygienist may expect a client with BD to present with several oral health conditions: xerostomia induced by medication, abrasion of teeth from excessive brushing during mania, gingival injury due to excessive or overeager flossing during mania, poor oral hygiene due to neglect during depression.[1,8,34] Inadequate nutrition intake due to a client's inability to maintain sufficient nutrient intake during manic or depressive episodes, as well as the prevalence of cigarette smoking and alcoholism can have oral effects.[35,36,37] The client in a depressive or manic state may be unable to shop or purchase groceries, or prepare nutri-

tious meals. Poor/inadequate nutrition due to co-morbid alcoholism could lead to a deficiency in vitamins. Alcoholism predisposes an individual to deficiencies in the B vitamins, zinc, magnesium, and copper, leaving the oral cavity more susceptible to infection and tissue breakdown. Cigarette smoking can lead to deficiencies in vitamin C, a key vitamin in the regeneration of gingival tissue and in the immune response to bacterial challenge.[35] The dental hygienist can advise clients as to an adequate intake of fruits and vegetables or advise them to use a multivitamin supplement if they are unable to follow Canada' Guidelines for Healthy Eating for a period of time. Consultation with the client's physician or a dietician may be indicated for certain clients with BD, depending on their capacity to maintain adequate nutrient intake and confounding factors such as co-morbid alcoholism or cigarette smoking.

Alcohol and tobacco use, both separately but particularly contemporaneously, increases a client's risk for developing head and neck cancer.

Alcohol and tobacco use, both separately but particularly contemporaneously, increases a client's risk for developing head and neck cancer.[36] Because clients with bipolar disorder are more likely to have alcohol use disorders and use tobacco,[6,37] it is likely that a client presenting with BD will be in this high-risk group. In order to facilitate early intervention, the dental hygienist should perform thorough head and neck examinations at each appointment and monitor any changes in tissue, referring clients with signs suspicious of oral cancer to a specialist. A study indicates that alcohol-addicted persons, with or without concurrent smoking, have a high risk for periodontal breakdown and tooth loss, and frequent vomiting associated with alcoholism is associated with erosion of the tooth structure.[38]

Oral health education about the risks of over-brushing and over-flossing should be implemented in order to prevent further damage. During episodes of depression, oral hygiene neglect is common, as is decreased salivary gland output, a preference for carbohydrates, and a high *Lactobacillus* count.[1,39-41] These factors place individuals suffering with bipolar depression at a very high risk for rampant decay, and intervention with fluoride application in-office and a fluoride rinse for at-home use is recommended.

Extrapyramidal effects resulting from atypical antipsychotics, particularly resperidone, often have an orofacial component: acute dystonia creating mastication muscle spasms, pseudoparkinsonianism resulting in a mask-like face and drooling, and tardive dyskinesia manifesting as lip smacking and tongue protrusion.[8,31] Use of a bite-block and low-volume suction during treatment may be necessary in these cases. Oral health aids, such as thick-handled toothbrushes and two-headed toothbrushes, to help a client with symptoms of tremor may be necessary. SSRI-induced bruxism should be noted and watched for.

As most of the medications for the treatment of BD list xerostomia as an adverse effect, signs of dryness in the oral cavity—decay, plaque accumulation, gingivitis, and diminished taste acuity[28]—should be noted and evaluated. Recommendations for management of xerostomia include drinking water or letting ice melt in the mouth; restricting caffeine intake; saliva substitutes; saliva stimulation through chewing sugarless gum or candies; pilocarpine solution; cevimiline, or bethanechol tablets. In-office fluoride administration as well as at-home rinses are also advocated.[1,9,34]

Due to interactions between local anesthetic and the various medications used to treat BD, administration of local anesthetics should be limited.[1,9,34] The practitioner should use, when necessary, 1:100,000 epinephrine and limit administration to two cartridges.[1,9,34]

During periods of depression or institutionalization, oral health is often severely neglected.[37] Oral health promotion does not seem to be a priority even in institutions with a health care team that includes a dentist available within the hospital, and despite the presence of numerous predisposing factors for oral disease such as medications with oral side effects, smoking, and high intake of sugar among patients.[37] Even for those clients with bipolar disorder who are not institutionalized, oral health may not be a major concern within the scope of the clients' overall health problems.[37] Dental hygiene management for the client with BD has been summarized in table 1.

In order to find an answer as to why this situation may exist, it is necessary to explore where oral health fits into the framework of human needs and Maslow's Hierarchy of Needs (figure 1). The basic concept of the pyramid is that the higher needs on the pyramid come into focus only when the lower needs have been met, that is, once the physiological needs are met, then safety needs can be met, and so forth. The bottom four needs, physiological, safety, love/belonging, and esteem, are termed deficiency needs because they indicate deficiencies that must be met before one can achieve self-actualization.[41]

For example, a dental hygienist, because of her knowledge and experience of oral disease and the link between dental and overall health, may place dental health needs near the bottom of the pyramid, at the physiological hierarchy (the need for a sound dentition for physiological function) or at the safety hierarchy (the need for safety from oral disease). However, a person with BD may place oral health needs higher on the pyramid, that is, oral health may be linked to quality of life as opposed to a function for healthy living. This frame of reference would place oral health at the level for esteem (for the cosmetic attributes of a healthy dentition) or self-actualization (as something linked to a higher quality of life), not a resource for health. The individual's health concerns may include maintaining mental wellness, grappling with depression, and freedom from psychosis and suicidal ideation. In the face of these major issues, oral hygiene may be seen as unimportant or superfluous.[37]

Manage oral side effects of medication	**1. Make adjustments in treatment for parkinsonian muscle symptoms, drooling** - Bite block - Use of low-volume suction during treatment **2. Look for signs of damage: gingival trauma, toothbrush abrasion, bruxism** - Oral health education - Soft toothbrush - Referral to DDS for mouthguard fabrication **3. Look for signs of xerostomia** - Oral dryness - Decay - Heavy plaque accumulation **Management of xerostomia** - Drink water, let ice melt - Restrict caffeine intake - Chew sugarless gum/candies - Pilocarpine, cevimiline, bethanecol to stimulate saliva - Saliva substitutes **4. Look for signs of poor/inadequate nutrition** - Gingival inflammation - Breakdown of mucosal tissue - Periodontal destruction - Underweight/unhealthy appearance **Management of poor/inadequate nutrition** - Advise on adequate nutrient intake - Consult with physician or dietician **5. Look for signs of alcohol/illegal drug abuse** - Erosion of tooth structure - Missing teeth - Periodontal disease - Suspicious lesions - Rapid decay **Management of alcohol/illegal drug abuse** - Refer to counseling/physician/dietician as appropriate - Educate patient on oral effects of alcohol/ illegal drug abuse
Prevent decay	Oral health education, nutrition In-office fluoride treatment – gel or varnish; depending on capacities of client, at-home fluoride rinse
Limit administration of local anesthetics	
Be realistic	Assess the client's motivation for oral health maintenance
Be a resource for the client coping with BD	Refer client to groups such as the Organization for Bipolar Affective Disorders Encourage client to communicate with physician about the client's concerns over treatment If the client consents, discuss the client's status with his/her physician Maintain that, with proper treatment, there is hope for the client, that treatments are individual, and it may take some time before the client finds the right treatment for them
Refer severely depressed clients	Ask about suicidal thoughts Ask about relationship with physician Encourage client to access help

Table 1. Dental hygiene management for the patient with bipolar disorder

The Human Needs Conceptual Model of Dental Hygiene practice is another framework that has been used to view clients and the value they place on dental hygiene care for improving quality of life.[42] Closely linked to the Maslow's hierarchy of needs, the major premise of the model is that human activity is dominated by behaviours aimed at need fulfillment and that when a human need is unmet, an internal drive exists in all human beings to satisfy that need.[42] The human needs defined by the model include the need for a wholesome facial image, protection from health risks, biologically sound and functional dentition, skin and mucous membrane integrity of the head and neck, freedom from head and neck pain, freedom from anxiety and stress, responsibility for oral health, and conceptualization and understanding. To the dental

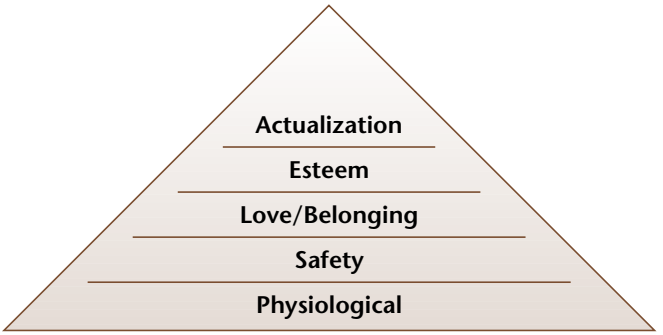

Figure 1. Maslow's hierarchy of needs[41]

hygienist, dental hygiene diagnosis for a client with BD may include deficits in all of these areas. The client, however, may not see these deficits as deficiencies that need to be filled. The client may be concerned with the daily living aspects associated with bipolar disorder; depression, mania, psychotic delusions, suicidal ideation. He or she may not feel that those needs are a priority or may not have the resources to fill those needs perceived by the dental hygienist. Certainly, if the client does not believe that oral health needs are important, the oral health of the client will suffer and the efficacy of the dental hygienist is severely limited.

It is critically important for dental hygienists to acknowledge this difference in perspective for viewing the importance of oral health care, because it is the client who needs to maintain his/her own oral health between dental hygiene visits. It is important to have realistic expectations for clients with BD. If oral health is seen as a quality of life as opposed to a functional health issue by the client, then the client may feel that it is either unimportant or unattainable. Evidence indicates that, even in a subsyndromal state, individuals with BD have a lower quality of life than those of the general population.[43] This discrepancy in quality of life means that individuals with BD may have different needs and priorities as far as overall health (and this includes oral health) is concerned.

THE ORAL HEALTH-RELATED QUALITY OF LIFE MODEL

The Oral Health-Related Quality of Life model (OHRQL) posits that a satisfactory level of oral health, comfort, and function as defined by the individual or population is an integral component of general health.[44] This model measures health and disease along a dynamic continuum that includes health and pre-clinical disease, biological/physiological variables, symptom status, functional status, general and/oral health, and overall quality of life. The model also includes social, cultural, and economic characteristics that influence the other domains listed. Within this framework, we can view the client with bipolar disorder's oral health quality of life.

Under the health and pre-clinical disease domain, an individual with bipolar disorder, as previously discussed, is predisposed to oral disease and may exhibit undetectable changes in the oral cavity that could lead to disease. At this stage, prevention and oral health education are key interventions. The biological and physiological domain includes clinically evident disease as well as clinically evident factors that lead to disease such as xerostomia. The impact of bipolar disorder on oral hygiene habits is important in this domain. The dental hygienist should attempt to assess how well the client is managing his/her illness and the impact of the illness on the oral condition. Management of xerostomia and interventions to restore integrity to the oral cavity are important at this stage. The symptom status domain includes the individual's feelings and perception of the disease. This is where the discrepancy between the dental hygienist's priorities and those of the client may lie. The dental hygienist must work within the client's framework for understanding the symptom status in the larger context of the client's overall health. How does the client perceive his oral health, and what is his/her motivation to improve oral health? These are questions the dental hygienist needs to answer in order to better serve the client. The functional status of the client's oral cavity may be limited by the oral effects of bipolar disorder, and chewing, eating, or speaking may be affected. The relationship between symptom status, functional status, and health perceptions domain is important, and oral health education is an important intervention for the dental hygienist to link the impaired functional status with oral health behaviours in order to facilitate change. The dental hygienist should always be mindful of the client's symptom status and health perceptions, however, and be realistic about the client's capacity for much change. As previously mentioned, individuals with bipolar disorder have a generally lower quality of life than the general population. The situation may not be ideal, but if clients are contributing as much as they can to their oral health according to their capacities and motivation, then it is the best that can be done for the clients at that given time.

Management of xerostomia and interventions to restore integrity to the oral cavity are important at this stage.

Under the OHRQL framework, psychosocial functions for the individual with bipolar disorder should facilitate dental hygiene actions such as taking the initiative to contact social workers and the client's physician, and speaking with caregivers in order to provide the most comprehensive care to the client. The client should be encouraged to follow up on psychosocial interventions for management of bipolar disorder as this has been shown to improve prognosis.[4,7,9,11,18-20,23,32] It is under this domain that maintaining a positive relationship with the client is key because clients are more likely to succeed in treatment if they have a positive relationship with the care providers.[45]

Maintaining a positive relationship with the client, based on the client's context and current capacities, and encouraging the client to maintain a positive relationship with his/her physician is of paramount importance. Evidence indicates that an individual's success in treatment is likely positively correlated to the individual's attitude about the treatment and hope in the success of the treatment.[45] The dental hygienist should be a resource for the client to decrease hopelessness whenever possible, and maintaining a positive attitude may enhance the process. Regardless of how deteriorated the oral health, the dental hygienist should point out the areas of the mouth that are healthy, and not just areas that are unhealthy, to provide the client with some positive feedback. The possibility for change in the future must be upheld to support a positive viewpoint for the client. It has been seen that individuals who have shown success in treatment of bipolar disorder have had a sense of control over their illness,[30,45] and the

importance of this sense of control should be extrapolated to the effects of bipolar disorder on oral health as well. It is critical that the dental hygienist focus on what the client *can* control and do about their oral condition.

CONCLUSION

Bipolar disorder is a complex, chronic, and cyclic mental illness that affects all aspects of an individual's life, including oral health. Clients with bipolar disorder have special needs, motivation issues, and differing priorities than the general population. These clients may require more aggressive prevention of dental disease and more comprehensive oral health education. The dental hygienist must keep these needs and client priorities in mind when planning treatment for the client with bipolar disorder.

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Qu'est-ce que le mois de la santé buccodentaire signifie pour vous? *(suite de la page 67)*

Durant ce mois de la santé buccodentaire, de nombreuses activités peuvent être réalisées pour passer le message de l'importance de la prévention auprès des Canadiens et des Canadiennes. Voici quelques idées : créez un dépliant d'information qui pourrait être distribué dans les cliniques de votre communauté; dirigez vos clients vers des ressources disponibles pour favoriser leur apprentissage et accroître leurs connaissances sur la corrélation entre la santé buccodentaire et leur état de santé général. Visitez une classe ou une garderie pour faire une activité de « brossage » qui pourrait intéresser les enfants et les inciter à adopter un modèle d'hygiène buccodentaire personnelle pour le reste de leur vie. Quelques fois de toutes petites interventions ont des effets de longue portée. Prenez un moment pour visiter le site Web de l'ACHD (section « Oral Care Centre ») et participez aux activités qui y sont présentées. Je crois fermement que nous sommes chanceux et chanceuses d'avoir accès à cette ressource et je vous encourage à profiter de cette ressource « unique » qui vous appartient.

Bien que la majorité des Canadiens et Canadiennes jouissent d'une bonne santé buccodentaire, il y en a encore plusieurs qui n'ont pas accès à des soins buccaux. Ces personnes pourraient être le public cible pour nos activités du mois de la santé buccodentaire. Contribuez à à votre banque alimentaire locale en lui fournissant des brosses à dents et des dentifrices fluorés. Préparez une présentation sur le lien qui existe entre la santé buccodentaire et l'état de santé général pour les soignants professionnels dans les centres de soins de longue durée ou les résidences pour personnes âgées. Écrivez à votre membre de l'assemblée législative ou à votre député pour promouvoir une législation qui augmenterait l'accès aux soins pour tous les Canadiens et toutes les Canadiennes.

Vous vous rappelez peut-être avoir lu dans le *Probe* (ancien nom du journal) de janvier 2003 un article sur un projet dans le Deer Lodge Centre de Winnipeg, au Manitoba, où deux hygiénistes dentaires et un dentiste ont fait une différence dans un centre de soins de longue durée de 500 lits.* Ils avaient développé un programme de formation en soins buccaux pour les soignants professionnels. Ce programme a eu un succès énorme et, par la suite, les soignants, les résidents et leurs familles ont pu recevoir des informations sur les soins buccaux.

Comme hygiéniste dentaire communautaire, j'ai vécu des expériences enrichissantes en visitant des écoles primaires et en offrant de l'éducation de santé buccodentaire dans ce milieu. Plusieurs années après, j'ai rencontré quelques jeunes adultes qui avaient bénéficié de notre programme de « brossage » et qui m'ont dit que cela avait eu un effet positif sur leur santé buccodentaire. En certains moments, lorsque nous faisons face à une surcharge d'information, un contact personnel, c'est si rafraîchissant. Rien n'a aussi grande importance qu'une personne qui prend réellement le temps de vous enseigner quelque chose de nouveau.

Allez au-delà des limites de votre pratique et rejoignez le plus grand nombre de personnes de votre communauté que vous le pouvez. C'est ainsi que nous pourrons apporter des changements dans la santé buccodentaire des Canadiens et des Canadiennes. Au cours du mois d'avril, apportez votre contribution personnelle toute spéciale pour éduquer les membres de votre communauté. Vous êtes l'expert ou l'experte en prévention de la santé buccodentaire et vous pouvez faire la différence.

La seule façon de découvrir les limites du possible est d'aller au-delà jusqu'à l'impossible. [Traduction]
– Arthur C. Clarke

Vous pouvez rejoindre la présidente à <president@cdha.ca>.

Les normes d'éducation et de début en exercice
(suite de la page 71)

de financement pour ces projets. Les membres de ce comité incluent des représentantes et représentants des groupes d'intérêt suivants (par ordre alphabétique) :

- L'Association canadienne des hygiénistes dentaires (ACHD)
- Le Bureau national de la certification en hygiène dentaire (BNCHD)
- La Commission de l'agrément dentaire du Canada (CADC)
- Les Éducateurs en hygiène dentaire du Canada (EHDC)
- La Fédération des organismes de réglementation en hygiène dentaire (FORHD)

L'un de nos premiers projets est d'examiner les différentes normes éducatives établies par les différents organismes nationaux pour les aider dans leur travail. Ces normes se présentent sous différents formats : exigences pour l'agrément, énoncés de compétences pour l'examen national, cadre éducatif articulé par l'association professionnelle, normes nationales de pratique et résultats d'apprentissage élaborés par l'organisme des éducateurs. Le concept d'entrée en exercice est exprimé différemment dans ces documents parce qu'en ce moment l'hygiène dentaire n'a pas de norme nationale commune associée à l'entrée en exercice pour la profession.

La médecine dentaire a développé une norme nationale pour l'entrée en exercice des praticiennes et praticiens généraux. Leur norme nationale constitue les fondements de l'agrément, de l'éducation et de l'examen ainsi que de la réglementation provinciale. Compte tenu de la diversité des normes d'éducation et de réglementation en hygiène dentaire, une norme similaire pour notre profession est essentielle pour permettre aux organismes nationaux et provinciaux en hygiène dentaire de travailler efficacement en ces temps où les changements sont rapides.

Le besoin d'une telle norme nationale commune est devenue beaucoup plus important avec la divergence des modèles éducatifs pour l'entrée en exercice au Canada, avec les programmes qui sont mis en place dans de nouvelles juridictions (Nouveau-Brunswick) et les multiples établissements post-secondaires qui envahissent le secteur de l'éducation. Les établissements post-secondaires incluent maintenant des établissements privés et publiques ainsi que des collèges, des collèges-universités et des universités.

Il est prévu que le projet de collaboration en hygiène dentaire, coordonné par la D^re^ Susanne Sunell, sera complété d'ici deux ans. Il a débuté, tôt en février, par un atelier animé par Dianne Landry auquel ont participé plus de 20 hygiénistes dentaires ayant des compétences dans la profession en général, en promotion de la santé, en éducation, en pratique clinique, en agence de changement, en recherche et en administration. Le projet comprendra également un sondage en ligne et des groupes de discussion.

Les connaissances, les aptitudes, les attitudes et le jugement requis pour débuter en exercice comme hygiénistes dentaires ont besoin d'être articulés. L'approche « habiletés » est un des moyens par lequel la norme d'entrée en exercice peut être présentée. Cette norme pourra ensuite être utilisée pour développer les programmes scolaires et les programmes d'évaluation, évaluer les gradués et graduées, et élaborer des normes de réglementation provinciales ainsi que des programmes de compétence continue.

Continuez à compter sur votre association professionnelle nationale pour alimenter votre lampe de connaissance.

What Does Oral Health Month Mean to You?
(continued from page 67)

that are available there. I firmly believe we are so fortunate to have access to this resource and I encourage you to take advantage of this "Owner" resource.

While the majority of Canadians enjoy good oral health, many still are unable to access oral care. These people could be the target audience for our April oral health month activities. Help stock your local food bank with toothbrushes and fluoridated toothpaste. Prepare a presentation on the connection of oral health to overall health for caregivers in a residential care facility. Write to your MLA or MP to advocate for legislation that would increase access to care for all Canadians.

You might recall reading in the January 2003 *Probe* [former name of the journal] about a project in the Deer Lodge Centre in Winnipeg, Manitoba, where two dental hygienists and a dentist made a difference in this 500-bed long-term care facility.* They developed a mouth care training program for caregivers. It was a great success and subsequently many caregivers, residents, and families have received mouth care information.

As a community dental hygienist, I have had the rewarding experience of visiting elementary schools and providing oral health education in this setting. Many years later, I met some young adults who had experienced our "brush-ins" in Grade 3. They remembered these "brush-ins" and said that they had a positive impact on their own oral health. In a time when we are dealing with information overload, a personal contact is so refreshing. Nothing has a greater impact than an individual who actually takes the time to teach you something new.

Go beyond the boundaries of your practice and reach out to a broader community to make a difference in the oral health of Canadians. Make April special by your personal contribution to educating your community. You are the Prevention Expert in oral heath and you can make a difference.

The only way of finding the limits of the possible
is by going beyond them into the impossible.
– Arthur C. Clarke

You can contact the president at <president@cdha.ca>.

Increasing Competition in Oral Health Services.

A Brief Submitted to the House of Commons Standing Committee on Finance, September 5, 2006

by the Canadian Dental Hygienists Association

EXECUTIVE SUMMARY

Dentists hold a monopoly on oral health services, a situation that creates a lack of competition. The Canadian Public Service Dental Service Plan and the Veterans Affairs Canada (VAC) Dental Plan perpetuate and support this monopoly by not allowing dental hygienists to receive payment for oral health services, even though dental hygienists have private businesses. The federal government can increase competition in oral health services by following the lead of two other government dental plans: the Canadian Public Service Pensioners' Dental Service Plan and the Ontario Children in Need of Treatment program (CINOT) both pay dental hygienists directly for their services.

Several international reports and letters support payments to dental hygienists in private businesses as a way of increasing competition. A letter from the Canadian Competition Bureau overwhelmingly supports the ability of dental hygienists to initiate practice with no restrictions from dentists. Recently, the U.S. Department of Justice and the Federal Trade Commission published a report on competition in health services, which documents how dentists' control over dental hygienists reduces competition in oral health services. In addition, the Organization for Economic Co-operation and Development (OECD) recently published a report on competition that highlights the negative impact of dentists' attempts to prevent independent dental hygiene practices. The Competition Authority in Ireland also criticizes dentists' efforts to forestall independent dental hygiene practices.

A healthy workforce leads to increased productivity, which in turn improves competition. One aspect of a healthy workforce is good oral health. Canada has the second lowest per capita *public* oral health expenditures of all OECD countries. CDHA maintains that the federal government must be a world leader, assisting Canadians to achieve excellent oral health. This will create a healthy workforce that will stimulate business investment. The federal government can make a financial commitment to oral health, namely 36% of total oral health spending, for categorical national oral health programs for low-income Canadians, including those receiving social assistance and those working; children; persons with disabilities; and seniors.

Competition in Canada can also be strengthened by a government that invests in lifelong learning. Health professionals today are required to keep current with constantly changing research, education, and technology that directly affect their daily work. They do so through continuing education opportunities such as on-line courses and professional conferences. In the *Income Tax Act,* the definition of "designated educational institution" should be expanded to include groups such as professional associations that deliver educational programming through conferences and courses (including on-line courses).

INTRODUCTION

THE CANADIAN DENTAL HYGIENISTS ASSOCIATION (CDHA), a national professional organization since 1964, represents the voice of Canada's 14,000 dental hygienists. CDHA's position is that oral health—a significant component of overall health—is the right of all Canadians. Lack of access to oral health care is a critical issue and dental hygienists are vital in solving this problem. The CDHA promotes access to oral health by working in cooperation with government, health agencies, public interest groups, and other health professions. The association serves the public by developing national positions and standards related to dental hygiene practice, education, research, and regulation. The CDHA also provides services to its members, including continuing education, professional development, and representation on various external agencies. Through this work, the association is able to better prepare its members to provide the Canadian public with high-quality, accessible oral health care.

There are a number of benefits to allowing dental hygienists to bill directly for their services.

CDHA believes there are two significant public policy opportunities in the area of oral health and human resources in which the federal government must invest. The dividends will be improved productivity in Canada. First, the federal government can invest in Canada's standard of living through improved oral health of Canadians. Second, the government can make an investment in human capital through lifelong learning and continuing education.

Accroître la concurrence dans les services de santé buccodentaire

RÉSUMÉ

Les dentistes détiennent un monopole sur les services de santé buccodentaire, une situation qui crée un manque de concurrence. Le régime de soins dentaires de la fonction publique et le régime de soins dentaires du ministère des anciens combattants du Canada perpétuent et appuient ce monopole en ne permettant pas que les hygiénistes dentaires reçoivent directement le paiement pour leurs services de santé buccodentaire, même si les hygiénistes dentaires ont une entreprise privée. Le gouvernement fédéral peut augmenter la concurrence dans les services de santé buccodentaire en suivant l'exemple de deux autres régimes de soins dentaires gouvernementaux, le régime de soins dentaires pour les retraités de la fonction publique canadienne et le Programme pour les enfants ayant besoin de soins dentaires de l'Ontario qui, tous les deux, paient directement les hygiénistes dentaires pour leurs services.

Plusieurs lettres et rapports internationaux soutiennent que les paiements aux hygiénistes dentaires en entreprise privée sont une façon d'accroître la concurrence. Une lettre du Bureau de la concurrence du Canada confirme que les hygiénistes dentaires ont la capacité d'offrir des services de santé buccodentaire sans qu'il y ait de restrictions établies par les dentistes. Récemment, le Department of Justine et le Federal Trade Commission des États-Unis ont publié un rapport sur la concurrence dans les services de santé qui indiquent comment le contrôle des dentistes sur les hygiénistes dentaires réduit la concurrence dans les services de santé buccodentaire. De plus, l'Organisation de coopération et de développement économiques (OCDE) a récemment publié un rapport sur la concurrence qui souligne l'importance de l'impact négatif des tentatives faites par les dentistes pour empêcher l'exercice indépendant en hygiène dentaire. Le Competition Authority, en Irlande, critique également les efforts déployés par les dentistes pour prévenir l'exercice indépendant en hygiène dentaire.

Une population active en santé amène une augmentation de la productivité ce qui, en retour, accroît la concurrence. L'une des caractéristiques d'une population active en santé est une bonne santé buccodentaire. Parmi tous les pays de l'OCDE, le Canada affiche le deuxième plus bas niveau de dépenses par habitant en santé buccodentaire. L'ACHD maintient que le gouvernement fédéral doit être un chef de file mondial en aidant les Canadiens et les Canadiennes à atteindre un excellent état de santé buccodentaire. Ceci permettra d'avoir une population active en santé qui stimulera l'investissement commercial. Le gouvernement fédéral peut prendre des engagements financiers pour la santé buccodentaire, à savoir 36 % des dépenses totales en santé buccodentaire, avec des programmes nationaux spécifiques de santé buccodentaire pour les Canadiens et les Canadiennes à faible revenu, incluant ceux et celles qui reçoivent de l'aide sociale et ceux et celles qui travaillent; les enfants; les personnes ayant des handicaps; et les personnes âgées.

La concurrence au Canada peut également être renforcée par un gouvernement qui investit dans l'éducation permanente. Aujourd'hui, les professionnels et professionnelles de la santé doivent se tenir à jour sur les recherches, l'éducation et les technologies en changement constant qui touchent directement leur travail quotidien. Ils et elles le font en utilisant différentes possibilités de formation continue, comme les cours en ligne et les conférences professionnelles. Dans la *Loi de l'impôt*, la définition de « établissement d'enseignement agréé » devrait être élargie pour inclure des groupes comme les associations professionnelles qui offrent une programmation éducative avec des conférences et des cours (incluant les cours en ligne).

L'ACHD recommande que le gouvernement fédéral

- *modifie le régime de soins dentaires de la fonction publique et le régime de soins dentaires du ministère des anciens combattants du Canada pour permettre le paiement direct aux hygiénistes dentaires autorisées;*
- *collabore avec les provinces et les territoires pour offrir du leadership et du financement* (36 % des dépenses totales en santé buccodentaire ou 2 972 millions de dollars) *pour des programmes nationaux spécifiques de santé buccodentaire pour les Canadiens et les Canadiennes à faible revenu, incluant ceux et celles qui reçoivent de l'aide sociale et ceux et celles qui travaillent; les enfants; les personnes ayant des handicaps; et les personnes âgée;*
- *demande aux gouvernements provinciaux et territoriaux d'affecter des fonds pour des activités publiques de santé buccodentaire, incluant des programmes de scellement, de fluorure et de dépistage précoce;*
- *annule les dispositions de récupération planifiées de 43,9 M$ en 2006/7 et de 68,4 M$ en en 2007/8 applicables à la Direction générale de la santé des Premières Nations et des Inuits;*
- *accorde une augmentation annuelle des fonds de 10,9 % pour le Programme des services de santé non assurés;*
- *amende les articles suivants de la* Loi de l'impôt :
  - *À l'article 118.6 (1a), la définition de « établissement d'enseignement agrée » devrait être élargie pour inclure des groupes comme les associations professionnelles qui offrent une programmation éducative avec des conférences et des cours (incluant les cours en ligne).*

- *Les critères d'agrément d'un établissement par le ministère du développement des ressources humaines devraient être élargis pour inclure les associations professionnelles qui offrent des conférences et des cours (incluant les cours en ligne).*
- *À l'article 118.6(1c), la définition de « programme de formation admissible » devrait être élargie pour inclure des programmes qui ont une durée inférieure à 3 semaines consécutives, incluant les conférences de 2 jours ou plus et les cours en ligne comportant 15 heures ou plus d'étude.*

- *Accorde des subventions aux étudiants à faible revenu non seulement pour la première année d'étude, comme c'est le cas actuellement, mais également pour toutes les autres années et instaure une échelle mobile basée sur les revenus des étudiants et de leurs familles. En outre, il doit y avoir des fonds supplémentaires accessibles pour les groupes sous-représentés comme les autochtones et ceux ou celles qui sont les premiers de leur famille à s'inscrire dans un collège ou une université.*

INCREASING COMPETITION IN ORAL HEALTH SERVICES

Dentists in Canada hold a monopoly on oral health services, a situation that creates a lack of competition. The Canadian Public Service Dental Service Plan and the Veterans Affairs Canada (VAC) Dental Plan perpetuate and support this monopoly. Neither of these plans accepts invoices from licensed dental hygienists for their dental hygiene services. This forces dental hygienists to work for a dentist who then submits the invoices for the dental hygiene service. We argue that this restricts competition in oral health services and restricts access to dental hygiene services for Public Service Plan members and Veterans Affairs clients. This restricted competition for oral health services results in dental plans that lack efficiency, effectiveness, and accessibility for clients.

There are a number of benefits to allowing dental hygienists to bill directly for their services. It will result in improvements in the oral health of plan members. It will allow dental hygienists to provide services to veterans in their own home or in a long-term care facility, where dentists are not currently providing services. It may also lead to a decrease in costs for the Public Service Dental Service Plan, since the overhead of dental hygienists is much lower than that of dentists and a middle-person (the dentist) is no longer paid for the dental hygiene services.

To improve the Canadian Public Service Dental Service Plan and the VAC Dental Plan, the federal government must follow the lead of two other government dental plans that allow dental hygienists to bill directly to the dental plan: the Canadian Public Service Pensioners' Dental Service Plan,[1] and the Ontario Children in Need of Treatment program (CINOT).[2] These two plans pay dental hygienists directly for their services.

A number of national and international government organizations support this call for increased competition. Early in 2006, the Canadian Competition Bureau overwhelmingly supported dental hygiene self-regulation and the ability to self-initiate practice with no restrictions from dentists. Documented support from the Competition Bureau is in letters to the Nova Scotia Department of Health, to Health and Wellness New Brunswick, and to the Alberta Department of Health and Wellness.[3] These letters argue that self-regulation of dental hygienists will lead to increased competition of dental hygiene services and will promote efficient, low-cost, quality, and innovative services. Furthermore, the Bureau called for dental hygiene legislation that is free from restrictions such as the 365-day rule in British Columbia and the order rule in Ontario, as it may harm consumer welfare.

In July 2004, the U.S. Department of Justice and the Federal Trade Commission published *Improving Health Care: A Dose of Competition*.[4] This report indicates that dentistry prevented dental hygienists from obtaining direct payment for their services. The report also discussed how dentistry's control over dental hygienists limits consumers' access to dental hygiene services.

In fact, Canada has the second lowest per capita* public *oral health expenditures of all OECD countries.

In December 2005, the Organization for Economic Co-operation and Development (OECD) published proceedings of a roundtable on *Competition in the Health Sector: Enhancing Beneficial Competition in the Health Professions*.[5] This document supports independent dental hygiene practice. It argues that dentistry's attempts to prevent independent practice of dental hygienists in Ireland, the United States, and Finland restrict competition for oral health services. The report notes that when independent practice is limited, the prices are 5% to 11% higher.

In December 2005, the Competition Authority in Ireland published *Competition in Professional Services*.[6] This report criticizes dentists in Ireland who are preventing independent dental hygiene practices and calls for regulations that will allow dental hygienists to operate independently of dentists. This will increase competition in oral health services and benefit the public by increasing access to oral health services.

The CDHA recommends that the federal government
- *change the Public Service Dental Service Plan and the Veterans Affairs Canada Dental Plan to allow direct payment to licensed dental hygienists.*

INVESTING IN CANADA'S STANDARD OF LIVING THROUGH IMPROVED ORAL HEALTH

We believe that a healthy workforce results in increased productivity. The CDHA recognizes that an investment in improved oral health status and in access to oral health services—two measures of standard of living and quality of life—will improve productivity.

It is time to broaden the debate about access to health services. While access to surgery and wait times is important, the debate must include a range of essential health services. Oral health services are one of the essential health services that should be available to Canadians through categorical coverage.

Who pays for what?

Public health sector spending in Canada, 70% of total health spending, is similar to the spending in Germany (78%) and France (76%). However, an analysis of spending on oral public health results in a very different picture: Canada places far below Germany and France (Canada 4.6%, Germany 68%, and France 36%).[7] In fact, Canada has the second lowest per capita *public* oral health expenditures of all OECD countries.[8] Furthermore, of the 4.6% we do spend on oral public health, the majority is provincial (61%), not federal (39%). And most of federal spending is for First Nations and Inuit oral health services. Australia, New Zealand, Denmark, and the United Kingdom all have universal, national, publicly funded programs for children's oral health care.[9-11] Denmark, in addition, has a National Health System (the government funded system of national health care) where all citizens are entitled to prophylactics and basic treatment. This National Health System is subsidized with the government paying 20% and citizens 80%. Canada, however, lags behind these leaders, with no national program and provincial/territorial programs that vary in level of coverage. Two provinces, Manitoba and New Brunswick, have no programs at all.[12] Some programs provide emergency services only, others require a co-payment, and the primary focus is not on prevention. In addition, only three areas in Canada—Alberta, Prince Edward Island, and the Northwest Territories—have seniors' programs.

Private health insurance and the private sector carry the majority of the burden for oral health. Private health insurance companies spent $4,441.3 million in 2002. However, in that same year, only 58% of Canadian employees had access to dental benefits through their employers. This leaves almost half of Canadians without access to oral health care insurance coverage. Studies show that individuals with oral health insurance are more likely to consult an oral health professional than those without.

The private sector carries the remainder of the burden of oral health costs. In 2002, private sector spending accounted for $3,389.2 million,[13] which represented 95% of the spending on oral health care in 2004, an increase from 89% in 1984.[14] In 2004, 26% of Canadian adults reported that they did not seek needed dental care because of cost.[15] Another study reports similar findings: between 20% and 51% of citizens with incomes below the national median said they needed oral health care but did not get it because of cost.[16] Over the past 12 months, more than

70% of those who do have dental insurance visited the dentist; this compares with 47% of those without insurance.[17] Those without private oral health care insurance and those with low incomes have little access to services.

This creates a significant disparity in oral health status between high- and low-income Canadians. Numerous studies have shown that individuals in lower socio-economic groups have inferior oral health compared with those in wealthier groups.[18-20] Oral health care is an example of the inverse-care law: individuals with the greatest need for services tend to be those with the least ability to pay for services and therefore with the lowest level of access to services. For lower socio-economic individuals and families, the limited finances must first be spent on food, shelter, and clothing. As a result, prevention and treatment of oral disease takes a back seat.

Consequences for the economy and productivity

For the 26% of Canadians who report that they cannot afford oral health care, daily functioning and quality of life can be profoundly affected by oral pain, abscesses, infections, and missing teeth. Oral disease contributes to poor overall health and affects the most basic human needs: the ability to eat, drink, swallow, maintain proper nutrition, and communicate. Many individuals avoid certain foods, which can lead to wider health problems. There are also social and economic consequences, such as loss of self-esteem, impaired speech, restricted social and community participation. Overall, there is a significant negative impact on a person's health status and quality of life.

Oral diseases directly affect important aspects of life, including attendance and performance at work, and contribute to a lack of productivity in the Canadian economy. Loss of productivity from oral diseases and dental visits in the United States accounts for more than 164 million work hours per year.[21] This is a sizable loss of productivity for the population as a whole.

Oral pain, cancer, tooth decay, and periodontal disease—all preventable health problems—have a significant impact on general health and direct consequences for the nation's productivity. About 10% of the adult population suffers facial pain, symptom of an untreated oral problem.[22] Facial pain can result from periodontal diseases, tooth decay, or other musculoskeletal conditions. It can disrupt vital functions such as chewing, swallowing, and sleep, and interfere with work activities. Chronic pain can affect resistance to other diseases, significantly decrease quality of life and productivity, and result in high economic costs.[23] Chronic pain was estimated to cost $79 billion (U.S. estimate) a decade ago. Given the prevalence of chronic oral-facial pain, the estimated overall cost associated with this pain is billions of dollars each year (U.S. estimate).[24]

Oral and pharyngeal cancer is the sixth most common cancer in the developed world.[25] In Canada, the incidence of oral cancer is 16 times greater than that of cervical cancer (0.132% and 0.08%, respectively), and oral cancer's mortality rate is 56 times greater than that of cervical cancer (0.112% and 0.002%, respectively).[26] Oral cancer has a survival rate of approximately 50% and the reconstruction and management of the survivor carry a high price economically and socially.[27] This high mortality rate can be prevented and oral cancers successfully treated when diagnosed at an early stage—a fortunate situation. Dental hygienists are actively involved in screening for and preventing oral cancer by obtaining health history information, which may reveal possible risk factors for oral cancers; conducting oral cancer examinations; and tobacco cessation counselling.

Children with low socio-economic status suffer twice as many dental caries as their more affluent peers.

Tooth decay has not been eradicated. Tooth decay in primary teeth predicts future tooth decay in permanent teeth—children with tooth decay will grow up to be adults with tooth decay. A new 2005 report indicates that there has been a 15.2% increase in tooth decay among the nation's (U.S.) youngest children aged 2 to 5.[28] In addition, more than 80% of the adolescent population is affected by tooth decay, and recurrent tooth decay and root caries are prevalent among adults.[29]

Children with low socio-economic status suffer twice as many dental caries as their more affluent peers.[30-34] In 2003, dental decay rates for Aboriginal children in Ontario were two to five times higher than rates for non-Aboriginal children.[35] In 2004 in Nunavut, about half the infants suffered from a chronic epidemic of baby bottle tooth decay and a quarter needed dental surgery with general anesthetic to have rotting teeth removed.[36] Childhood caries does not get the attention it warrants.

Children with low socio-economic status and Aboriginal children are not just more susceptible to poor oral health; their general health is also compromised. Healthy teeth contribute to a child's health, growth, and development in a number of ways. Children's teeth are involved in nutritional intake, development of proper speech, and normal jaw development. They also guide the permanent teeth into proper position and contribute to a child's appearance and healthy self-esteem. In addition, severe dental decay undermines the quality of life of young children through pain and problems in sleeping, eating, and behaviour, and can be a contributing factor in "failure to thrive."[37]

Periodontal disease is a serious gum infection that destroys attachment fibres and the supporting bone that hold teeth in the mouth. Severe periodontal disease affects 14% of adults ages 45 to 54 and 23% of 65-to-74-year-olds.[38] Periodontal disease, historically considered a localized infection, is now considered a potential risk factor for a number of serious health problems such as cardiovascular disease, respiratory disease, and pre-term low birth weight babies.[39-41] In addition, there is a two-way relationship with diabetes: if you have periodontal disease, then your level of blood sugar may be more difficult to control.

If you have diabetes, you may have an increased chance of developing periodontal disease. New research shows that bacteria caused by an infection in the mouth can be inhaled into the lungs or carried through the bloodstream to the rest of the body. This research provides a persuasive argument for discarding the notion that oral health is a separate entity from general health.

Seniors' oral infections can contribute to worsened chronic or systemic diseases against which they may have less immunity, compromising their overall health and well-being. Seniors' important contribution to the economy through their volunteer work may be compromised by their limited access to oral health services, with only 46% of seniors accessing oral health services.[42]

quality of life,[43] and increasing productivity. "Preventive health activities are estimated to be 6 to 45 times more effective than dealing with health problems after the fact."[44]

The following studies and reports provide graphic examples of how oral health promotion and disease prevention activities, such as early preventive care, fluoridation, and sealants, are cost-effective in reducing disease and health costs, and improve quality of life and productivity.[45,46]

There is mounting evidence that workplace health promotion, when included in a broader, more integrated approach to employee health, can result in cost savings, higher levels of productivity, and enhanced worker

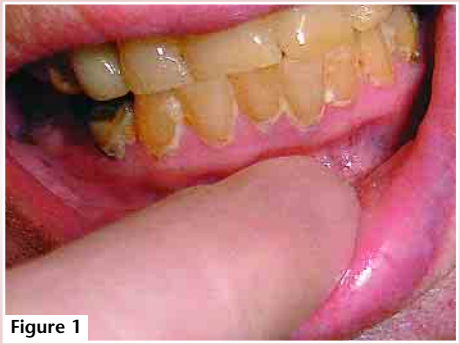
Figure 1


Figure 2

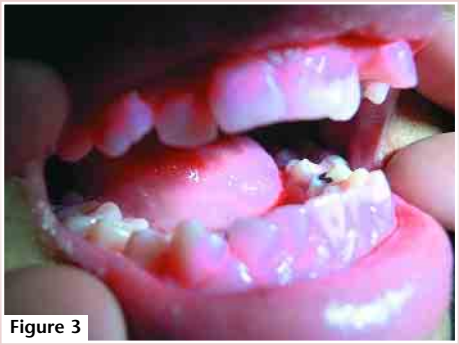
Figure 3

Figure 1. Resident in a long-term care facility with no oral health services. **Figure 2.** A 20-year-old man with a broken tooth and caries. **Figure 3.** A 15-year-old has used disclosing solution after brushing the teeth to highlight (in pink) the areas that are missed. This shows the need for increased oral health education to teach better tooth-brushing techniques.

Figure 1 shows a woman in northern Ontario who is living in a long-term care facility with no oral health services. Her blackened tooth shows pronounced infection.

There is mounting evidence that workplace health promotion, can result in cost savings, higher levels of productivity, and enhanced worker engagement and retention.

What are the solutions?

An ounce of prevention equals a pound of cure. This old adage is still applicable today, particularly since oral diseases are for the most part preventable. Money spent on oral health promotion and disease prevention programs will help produce a better return on the health care dollar, a competitive workforce, and a robust economy for a number of reasons. An investment in prevention is less expensive than treating oral disease after it occurs. It also helps to lower productivity losses by preventing ill health before it arises.

Health policy experts declare that health promotion and disease prevention can generate substantial long-term benefits by reducing oral health care costs, improving

engagement and retention. The cost savings for workplace health promotion programs shows that for every US$1 spent on workplace health promotion programs, organizations saved US$1.50 to US$2.50 on health care costs and absenteeism.[47]

In 1997, the British Columbia Provincial Health Officer's *Annual Report* concluded that dental procedures are the most common surgical procedures that children receive in hospitals.[48] In-hospital dental procedures—usually as day surgery—include tooth extractions, fillings, and other restorative dental work. All of these are carried out under general anesthesia. Many of these surgeries could be prevented if more children received oral health instruction and preventive services from dental hygienists. The overall financial savings due to reduced surgical costs for nurses, anesthetists, and dentists illustrate the cost-effectiveness of the care provided by dental hygienists.

To better prepare children to contribute as future productive citizens, we must pay greater attention to their needs now. We must provide prevention programs including early and routine preventive care, fluoridation, fluoride varnish, fissure sealants, and perinatal parental education. We must shift the focus from invasive tooth surgery to preventive public oral health programs for children.

Fissure sealants have been tested since 1979.[49] High-quality, randomized controlled trial research[50] consistently

shows this preventive measure is highly effective in preventing pit and fissure decay. Economic benefits also result from fissure sealants, as shown by nine studies: one from Canada; five from Australia, New Zealand, and Europe; and three from the United States.[51] This research has for the most part been overlooked; as a result, fissure sealants are greatly underused in the public health system. When sealants are used, they can prevent tooth decay and infections in the root of the tooth, which require expensive root canal treatment. The $15 cost of a sealant is minimal compared with the cost of treating a root canal for approximately $1,000. We call on the federal government to implement a national public oral health sealant program that targets high-risk individuals.

ship and funding for national oral health programs for low-income Canadians, seniors, and persons with disabilities.

Solutions for improved oral health for Aboriginal Peoples in Canada must come from increased spending in the Non-Insured Health Benefits Program. At present, Aboriginal oral health needs are far from being adequately met and with a growing population, the situation will only worsen over time. In April 2005, the Assembly of First Nations developed an action plan for non-insured health benefits. This action plan recommends that the NIHB program receive a 10.9% annual increase in program funding.[54] This recommendation was based on First Nations' population growth and aging projections; inflation trends


Figure 4

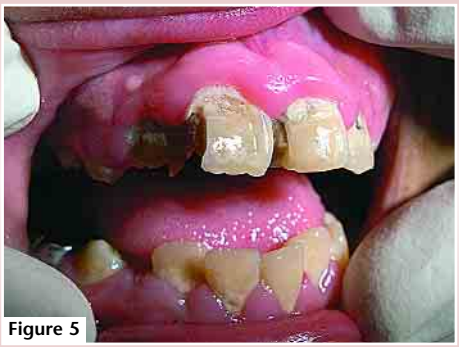
Figure 5

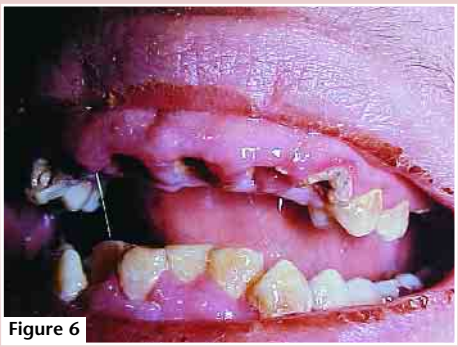
Figure 6

Figure 4. A man in his mid-30s with severe decay and periodontal disease. He must have a high pain threshold to be enduring the dental pain from this infection. **Figure 5.** A middle-aged man with a fistula on his gum resulting from severe decay. **Figure 6.** A 24-year-old man with teeth that have rotted away, leaving the root tips showing in the gum.

The majority of public health prevention measures lack economic evaluations. However, water fluoridation has strong evidence to support its use. A May 2004 report describes the economic benefits of community water fluoridation.[52] Eight studies mentioned in this report indicated significant cost-saving results from community water fluoridation. Although water fluoridation has high initial costs and delayed benefits, the net benefits for the payer were as high as $5.3 million. Since Health Canada reports that only 40%[53] of Canadians have access to fluoridated water, there is a strong role for public health to play in this area.

CDHA believes the federal government must be a world leader, assisting Canadians to achieve excellent oral health. This can be done by making a financial commitment, similar to France's, of 36% of total oral health spending. Total health spending in Canada is $8,254.5 million, so the federal contribution to oral health in Canada should be $2,972 million. We are not suggesting the creation of an "oral sick care" system, which treats disease after it develops, but an oral health promotion and disease prevention system. However, the development of oral health programs is at the discretion of the provinces/territories. Given their track record to date, it is now time for the federal government to step in and work together with the provinces/territories to provide leader-

over the past four years; and an annual escalator attributable to utilization, new treatments, changes in the delivery of health services, and other costs factors. CDHA supports this modest annual increase.

Figures 2 to 6 above portray some of the oral health issues facing Aboriginal peoples in Canada today. Although the photos depict First Nations people from Duncan and the Cowichan Valley, British Columbia, similar oral health issues are seen in other provinces/territories and also in Inuit communities.

CDHA believes the federal government must be a world leader, assisting Canadians to achieve excellent oral health.

If the economic arguments in this brief have not convinced you of the need for an increase in oral health spending within FNIHB, then hopefully these photos have. Our request for a modest annual increase in the FNIHB budget should be one of your top priorities for the new budget.

The time to act is NOW.

The CDHA recommends that the federal government

- *work together with the provinces/territories to provide leadership and funding* (36% of total oral health spending, or $2,972 million) *for categorical national oral health programs for low-income Canadians, including those receiving social assistance and those working; children; persons with disabilities; and seniors;*
- *call on the provincial/territorial governments to earmark funding for public oral health activities, including sealant, fluoride, and early screening programs;*
- *cancel the planned claw-backs to Health Canada's First Nations and Inuit Health Branch of $43.9 million in 2006/7 and $68.4 million in 2007/08 that were announced in the 2005 Federal Budget.*
- *provide an annual increase of 10.9% for the Non-Insured Health Benefits Program funding.*

ENHANCING PRODUCTIVITY THROUGH AN INVESTMENT IN LIFELONG LEARNING

Lifelong learning and continuing education are important investments in human capital, which can lead to enhanced productivity. CDHA, like numerous other professional organizations, supports lifelong learning by offering our members continuing education opportunities through conferences and on-line programs. These activities develop and improve specific skills for health professionals. Unfortunately, due to the length of these continuing education programs (between two days to three weeks), they do not meet the requirements for a "qualifying educational program" nor does CDHA meet the Human Resources and Skills Development Canada requirements for a certified educational institution.

In order to encourage, support, and enhance lifelong learning activities, some of the definitions in the *Income Tax Act* should be extended, including "designated educational institution," "certified educational institution," and "qualifying education program." This would allow individuals to claim expenses related to continuing education events such as conferences and short-term on-line courses. The following are a number of important issues that support these changes.

- Quality health services are a top priority for Canadians. When Canadians were asked to rank five different aspects of health care that included quality, costs, publicly funded system, integrated community, and hospital services, quality care rated as the most important feature of health care.[55] There is a strong link between quality health services and on-going education. The Canadian Council for Health Services Accreditation has developed an accreditation process that focuses on improvements to quality of care. Quality of care is measured through a number of standards, including a human resources standard, that measure the ability of an organization to respond to the on-going education needs of its employees.[56] CDHA believes that this link between quality care and continuing education is relevant to all health professionals, including oral health professionals. Continuing education allows professionals to maintain their commitment to quality assurance and standards, standards that so many Canadians have come to depend on.
- The Advisory Council on Online Learning emphasized the need to enhance access to e-learning.[57] Professional associations are addressing this issue by delivering tailored continuing education programs on-line and through conferences. These programs have highly accessible since they are geared toward efficient use of time, important for busy professionals.
- Many professionals must meet continuing education requirements of their regulatory bodies to maintain their licence to practise. Approximately 70% of dental hygienists across Canada are required by their provincial regulatory body to develop and maintain their professional knowledge and skills through continuing education. This allows dental hygienists to keep abreast of new developments in their field and use new research to inform evidence-based practice. It is important for ensuring quality programs and services, excellence within the profession, accountability to the public, and increased productivity.
- Today's workplace requires higher levels of education and skills.[58] The economy of the 21st century needs lifelong learners who can respond and adapt to change. Professionals are required to keep current with constantly changing research, education, and technology that directly affects their daily work. They do so through a variety of professional development activities, including conferences and on-line courses.
- Income tax deductions for an expanded number of continuing education activities would provide an additional incentive to Canadians to increase their knowledge and skills in their particular field of study. It would result in an investment in lifelong learning and increased productivity through tax incentives.
- As identified in Canada's *Innovation Strategy: Knowledge Matters*, there are gaps in the infrastructure for continuing education.[59] On-line continuing education is one way of addressing this gap. Such programs allow health professionals to pursue education while maintaining their full-time employment. This is one of the benefits of electronic technology; it allows individuals who are balancing work and home responsibilities to advance their knowledge in the comfort of their own home.

The CDHA also calls on the federal government to improve student loans. Dental hygienists are educated during two to four years of study at a college or university. Many students are battling the high costs of this education, which can cost up to $40,000. Statistics Canada reports that students returning to university this year will face tuition costs 2.3% greater than last year. This is almost twice the rate of growth in the previous academic year. In addition, between 1990 and 2005, the increase in tuition was almost four times the rate of inflation.[60] The elimina-

tion of grant programs in most provinces puts a further strain on students. The federal government must extend the first-year grants for low-income students to all other years, a position supported by the Canadian Federation of Students.[61] In addition, the 50% or $3,000 cap on these grants should be replaced with a sliding scale based on an assessment of students'/families' income and the number of family members. Furthermore, there must be additional accessibility funding for under-represented groups such as Aboriginal peoples, and those who would be the first in their family to attend college or university.

The CDHA recommends the following:

- *The federal government should amend the following sections of the* Income Tax Act:
  - *In Section 118.6 (1a), the definition of "designated educational institution" should be expanded to include groups such as professional associations that deliver educational programming through conferences and courses (including on-line courses).*
  - *The criteria for certification by the Minister of Human Resources Development for an educational institution should be expanded to include professional associations offering conferences and courses (including on-line courses).*
  - *In Section 118.6(1c), the definition of "qualifying education program" should be expanded to include programs that are shorter in duration than three consecutive weeks, including conferences of two or more days, and on-line courses consisting of 15 or more hours of study.*
- *The federal government must extend the first-year grants for low-income students to all other years and institute a sliding scale based upon the students'/families' income. Furthermore, there must be additional accessible funding for under-represented groups such as Aboriginal peoples and those who would be the first in their family to attend college or university.*

IN CLOSING…

CDHA believes that it has offered the Minister of Finance several targeted policy measures that are consistent with the federal government's mandate. If Canada is to increase productivity, we require a healthy and well-educated workforce. Fortunately, the morbidity, mortality, and loss of productivity associated with oral diseases can be addressed and reduced with oral disease prevention programs. Investing in prevention up-front is the most cost-effective means of making oral care available.

If Canada wants to improve productivity, it must make the right investment in its workforce—an investment in knowledge and skills development through continuing education. Providing a tax deduction for a larger number of continuing education activities is an investment in the nation's productivity performance.

We would like to thank the Minister of Finance for the opportunity to contribute this brief to the discussion of the federal budget. We look forward to working collaboratively in constructive partnership with governments at all levels, with the public, and with other stakeholders to ensure effective, long-term change that will lead to positive oral health outcomes for all Canadians.

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Recognizing Excellence

CDHA Honours Leadership and Dedication to the Dental Hygiene Profession

EACH YEAR, THE CANADIAN DENTAL HYGIENISTS Association (CDHA) recognizes distinctive efforts by dental hygienists that advance the dental hygiene profession. Congratulations to all of this year's winners and participants.

TD Meloche Monnex/CDHA Visionary Prize

This honour and accompanying $2,000 prize are awarded to a student in a masters or doctoral program in dental hygiene for advancing the dental hygiene profession by submitting a discussion paper, essay, or thesis with a vision for the profession, including future initiatives, strategies and goals.

Congratulations to this year's winner, **Joanna Asadoorian.**

While the overall oral health of Canadians has improved over the years, studies show that socio-economic status is behind a widening gap in oral health between advantaged and disadvantaged population groups. People who can afford private dental insurance or who have dental benefits at work show significantly better oral health than those who do not have access to these resources.

Joanna Asadoorian believes that as long as comprehensive oral health care is not a reality for everyone, the dental hygiene profession is well-placed to play a role in reducing access barriers by (1) clearly establishing the extent of disparities among the population, (2) determining opportunities for progressive dental hygiene interventions, and (3) developing and implementing appropriate oral health programs. By addressing inequities in oral health care, Asadoorian is convinced that dental hygiene will not only make an important contribution to the health care of all Canadians, but also gain recognition as an important aspect of the Canadian health care system.

Johnson & Johnson/CDHA Community Health Prize

The honour and accompanying $3,000 prize are awarded to a student or group of students enrolled in the final year of a dental hygiene program for improving oral health through an innovative community oral health project.

Congratulations to this year's winning group of students, **Charlotte Williamson, Deborah Sparaga, and Stephanie Hind.**

In their last semester at the Canadian College of Dental Health, Charlotte Williamson, Deborah Sparaga and Stephanie Hind distinguished themselves in practising their commitment to education and prevention as the cornerstone of a successful dental hygienist. As part of their community health project, they selected school children in grades 1 and 8 as primary recipients of oral hygiene awareness because these children, being at a milestone in their lives, might be more open to information. Using plenty of visual aids and having one of them dressed up as Tootsie in a life-sized tooth costume, the three students were able to connect with the six-year-olds, who had just started elementary school, to demonstrate the effect of sugar on teeth and proper brushing techniques.

The teenagers, who were about to start high school, were given the facts about the effect of smoking and oral piercing on oral health in a presentation that used modern technology as much as entertainment and shock value to get the point across. In this project, all three students showed their ingenuity and passion in community oral health as a way to make a difference in people's lives.

Dentsply/CDHA Leadership Prize

The honour and accompanying $2,500 prize are given to a student currently enrolled in a dental hygiene program for showing leadership and making a difference in his or her local, academic or professional community.

Congratulations to this year's winner, **Christine Ta**.

A third-year dental-hygiene student in the Department of Dentistry at the University of Alberta, Christine Ta combines academic excellence with community involvement. Last fall, she organized Operation Christmas Child in cooperation with Samaritan's Purse. Together with her student colleagues, Ta collected enough donations to fill 48 shoeboxes, which were distributed to children all over the world. The year before, again with Ta in the lead, the students raised $2,000 for the Canadian Red Cross and its Christmas 2004 tsunami victims program.

When she is not holding fundraisers—or studying—Ta volunteers her time as a member of the board of directors of the Dental Student's Association where she applies her considerable energy to enhancing the inter-professional relationship between dental and dental hygiene students, believing that teamwork will only benefit her future clients. Meanwhile, she still draws her colleagues into local charity work, such as food-bank drives and other activities.

Ta believes that the knowledge, leadership and communication skills she gains from her extracurricular activities will make her a better, well-rounded dental hygienist.

Crest Oral-B Oral Health Promotion Awards

These awards are presented to (1) a dental hygiene school, (2) a team, and (3) an individual for the creative promotion of dental hygiene, including education, community impact, and innovative partnerships. The school and team prizes are $2,000 each and the individual prize is $1,000. All prize money is shared equally with the winners and the local dental hygiene chapters.

(1) In the **Dental Hygiene School** category, congratulations to this year's winners, **the dental hygiene class at Camosun College in Victoria, B.C.** The winning submission was assembled by Jodi Sperber.

Using a popular Halloween event at a local recreational centre as an opportunity to inform parents and their kids about Early Childhood Caries (ECC), the dental hygiene class at Camosun College developed a table clinic. Recognizing that children up to the age of six are at the highest risk of developing EEC, the class undertook its own study and confirmed that some 40 per cent of children in greater Victoria have the condition by the time they start kindergarten.

More than 250 children visited the table clinic that was complete with dental supplies donated by the college, a local dental office, a dental supply company, and two local pediatric dentists, as well as information material from the CDHA and Crest websites. Answering questions from parents and entertaining children with prize draws to win stickers, toothpaste, and sugar-free gum, the clinic was deemed so successful that the recreation centre has asked the college to invite next year's dental hygiene class to continue the tradition of oral health promotion as an innovative Halloween treat.

(2) In the **Clinic Team** category, congratulations to this year's winners, **Mickey Wener, Mary Bertone, and Carol-Ann Yakiwchuk**.

Some years ago, the Health Promotion Unit (HPU) of the Centre for Community Oral Health at the University of Manitoba began offering mouth-care training for non-dental health professionals at Deer Lodge Centre, a local long-term care facility. Interestingly, it was the speech language pathologists who became the most ardent supporters of effective daily mouth care to help prevent serious health problems such as aspiration pneumonia.

That successful partnering among health care professionals today has grown into training sessions for trainers. One such session was provided last fall by HPU dental hygienists Mickey Wener, Mary Bertone and Carol-Ann Yakiwchuk. The team gave four hands-on *Connecting through Oral Health* workshops to trainers representing more than 50 personal-care homes in the Winnipeg Regional Health Authority. To provide mouth-care training in their own facilities, workshop participants received tailored information and specialized products. At the same time, the workshop team coached dental hygiene students interested in providing mouth-care training. The collaboration among dental hygienists and other health care professionals greatly enhances overall health and wellness for many Winnipeg seniors who rely on caregivers for daily mouth care.

(3) In the **Individual** category, congratulations to this year's winner, **Leah Salagubas.**

Leah Salagubas is the lone dental hygienist in her small, island community off the northeastern tip of Vancouver Island. The majority of the 1,300 residents are First Nations' members. Working at the Namgis Dental Clinic, which serves Alert Bay and surrounding islands, Salagubas had to overcome a lot of mistrust in her profession brought about by years of stories passed on from older generations.

Realizing that few clients would show up for appointments if she did not gain and keep their trust, Salagubas began mailing out flyers with dental information such as how smoking affects oral health. The community responded by asking for more information. Slowly broadening awareness, Salagubas branched out offering information sessions alongside the community health nurse visiting pregnant women and mothers with young children, as well as presentations in kindergarten class and at the Women's Wellness Fair.

Handing out booklets geared to specific age groups and prizes for correctly answering dental questions, along with toothbrushes and floss, this enterprising dental hygienist has seen a significant drop in early childhood caries and enthusiastic participation in the No Cavity Club. With small, steady steps, Salagubas has made a big difference in this remote community.

Crest Oral-B/CDHA Dental Hygiene Undergraduate Baccalaureate Student Prize

This honour and a $1,500 prize are awarded to an undergraduate dental hygiene student for contributing to the advancement of dental hygiene in the context of their educational and volunteer activities.

Congratulations to this year's winner, **Wendy Lai**.

Throughout her education, Wendy Lai has volunteered her time on various school committees and in numerous community initiatives. While attending the dental hygiene program at Camosun College, she helped organize a Christmas hamper for a local family in collaboration

with the Victoria Regional Dental Hygiene Society. The gesture demonstrated that a dental hygienist's involvement in the community extends beyond oral care. At the same time, Lai was actively involved in improving the college's program by organizing regular student feedback. Having discovered a passion for talking to children about oral health, she has taken time during her holidays to make presentations inspiring kids to develop good oral health habits from an early age. By integrating her academic and community experiences, Lai believes she will be both a better dental hygienist and an advocate for the profession.

Crest Oral-B/CDHA Dental Hygiene Diploma Student Prize

This honour and the accompanying $1,000 prize are awarded to a dental hygiene student in a diploma program for contributing to the advancement of the dental hygiene profession within the context of their educational and volunteer activities.

Congratulations to this year's winner, **Jayanne Kirkpatrick.**

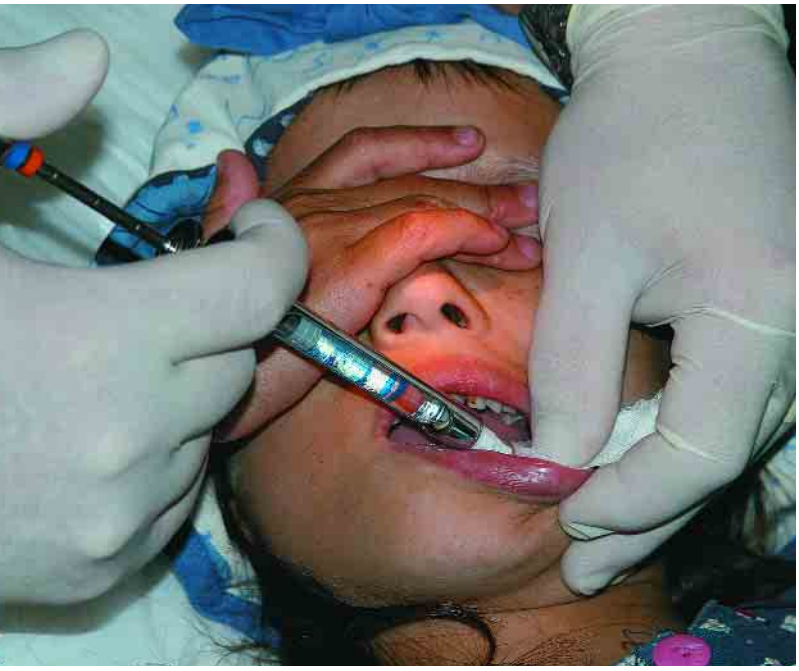
Now in her final semester, Jayanne Kirkpatrick enrolled in Algonquin College's Dental Hygiene Program after being in the workforce—and out of school—for almost 20 years. Despite feeling daunted by the challenges of her new direction, Kirkpatrick quickly became a staunch advocate of the program and the profession by volunteering as the liaison to the Student Association and faculty where she raised and addressed issues aimed at enhancing the program. Promoting dental hygiene in the community, she has participated in public awareness campaigns where she wore a molar costume, and the college's television program and annual Open House. In the workplace, Kirkpatrick had observed dental hygienists, dental assistants and dentists and had asked clients for feedback. The insights she gained inspired her to become a dental hygienist. While setting the bar high for herself, she keeps reaching higher by inspiring others to pursue what she passionately feels is a rewarding and esteemed profession.

CDHA received many submissions for these awards and appreciates the effort and inventiveness of all those who worked to better the profession of dental hygiene and awareness of the importance of dental hygiene to one's general health. While not every submission could win these prizes, the community has gained tremendously from all these initiatives. Thank you.

For further information on the CDHA Dental Hygiene Recognition Program, please visit CDHA's Members' Only section of the website (www.cdha.ca/members/index.asp) and click on "Networking & Recognition."

Do We Make a Difference?

by Donna Kittle, RDH



A young patient from an early trip to Honduras

THE TIKAL AREA OF NORTHERN GUATEMALA HAS GONE Hollywood. The TV reality show *Survivor* has changed some of the last untouched villages of the world by bursting in and introducing Western values and lifestyles to the indigenous inhabitants. Native life will never be the same.

Education after grade six is free, but it costs $300 per student for bus, books, uniforms, and extras.

In February and March 2006, I found myself in El Quiche, northern Guatemala on my ninth or tenth Kindness In Action (KIA) dental mission. Our group consisted of 28 dentists, dental assistants, dental hygienists, translators, and "go-fers." Working out of a newly constructed concrete one-room medical centre, the week consisted of helping long lineups of people in dental pain. Basic-needs treatment consisted of extractions, simple restorations, and gross scaling dental cleanings using a portable ultrasonic scaler and hand instruments. With the help of four other volunteers and one giant green dinosaur hand-puppet named "Dino," we spent a day and a half at the largest school, implementing basic tooth brushing and dental health education to over 320 kids (K-Grade 7). Trying to find the right local volunteers to teach tooth brushing and to set up a fluoride varnish program for children was a little harder for me this year—especially after discovering I had only two tubes of Duraflor! (I do need to find out just how Jesus fed thousands with only five loaves of bread and two fishes.)

Sometime during the week of kids crying, extracted teeth flying, and souvenir buying, I began wondering about the impact KIA has had over the last 13 years. Has KIA done the same damage as *Survivor*? Honduras, Guatemala, Nicaragua, Belize, Peru, Venezuela, Mexico, India, Thailand, and the Philippines have all been touched by KIA. We have provided instant pain relief, passed out a few shoes and clean clothes to those in need, and taught a few kids how to brush their teeth. Has it just been a nice thing to do? Or has there perhaps been either damage or real benefit from our helping?

Statistically, there cannot be much of an impact on the people when you have helped only 500 out of a population of 2 million. On the other hand, specific individuals receive pain relief through dental extractions, restorations, and dental hygiene cleaning. As well, the volunteer gets to experience warm feelings from giving to another human being.

In 1993, the very first Kindness In Action dental mission was born when Dr. Amil Shapka and three other Canadian dental volunteers joined an American contingent in Honduras. "Bright eyed and bushy tailed" best describes our early years of KIA. "No game plan, no portable equipment or supplies, and minimal dental tools," said Amil Shapka, head of KIA. "Horrible, horrible, working conditions from sun-up until sundown and a never-ending lineup of people in pain. Now we have lots of dental personnel and volunteers, a dynamic evolving organization, lots of supplies and instruments, new portable dental units for restorations, and preventive community programs in place. We had a huge learning curve."

I sat and reflected on my first dental mission in 1998. Memories included fighting my way out of mosquito-netted dormitory bunk bed and hand scaling what felt like ancient two-foot-thick calculus on a grandmother with only two teeth left (she wanted one on the top and one on the bottom to chew her corn tortillas). On my most recent mission, I used a portable ultrasonic scaler with a separate water supply and gave dental health education to 320 kids in school. Times have changed!

But what stays the same is a location that is usually very remote and difficult to get to, incredibly long lineups, and superb views. KIA, like its many dedicated volunteers, is growing up and maturing as an organization. The original mandate of "putting fires out" (immediate pain relief) has now progressed to include pain prevention. Kim Penner, RDH, is responsible for formalizing and developing a community-based preventive program and a basic oral health program for grades K-6.

As I talked to Amil on the telephone, he repeated the word "spin-off." Wikipedia defines this as a new entity formed by a split from a larger organization. "Okay," I said. "What spin-offs have come from our KIA dental missions that have had a lasting impact on the regions we have touched?" Here are some examples….

Dr. Brian Palmer's KIA group wanted to make a bigger contribution in northern Honduras. They decided on a five-year project, thus providing both consistency and time to establish the project. The first objective was to establish a fully equipped, permanent dental clinic in Santa Cruz and to pay a local dentist to work part-time and deal with emergencies. "Dental emergencies from the surrounding mountain villages are shipped down to the clinic," said Brian. The second objective was to establish and support a toothbrush program in four schools in the villages of Balin, Buenos Aires, Cipres, and Las Flores. Now 1500 kids brush twice daily at school. Yesica, a local volunteer, was originally taught how to teach the kids to brush; she now is in charge of the school program. In each classroom, toothbrushes are stored in a pop bottle with each child's name on it. Teachers instruct the students to brush twice a day. "Don't you remember? You were the first volunteer to start dental health education and fluoride varnishes in these Guatemala schools in February 2003," said Brian. I had forgotten. The final goal was to support 10 youngsters from local villages to go to technical school where they can become marketable as nurses or electricians. Education after grade six is free, but it costs

A young boy awaits our arrival

$300 per student for bus, books, uniforms, and extras. "One fellow literally begged us to send his kids to tech school," said Brian, "because otherwise the kids go directly to work in the local rum factories at 12 years of age." This team funds these three programs from monies raised at their annual golf tournament in Sundre, Alberta. In February, when Brian's team goes to Honduras, they keep the excitement up by working in the clinic and travelling to the mountain villages about two hours from Santa Cruz.

Dr. Gordon Huff was another name mentioned. "We left behind knowledge by teaching the government-funded nurses how to do simple extractions, surgery instruments, and a school," said Gordon. "We brought dental care to a very isolated group of tribal people who have never had any type of dental care... For three dental missions, we would travel two days (in 45-foot dugout canoes) up the Rio Coco (river) heading to our final destination and headquarters of San Andres in the Bosawas Biosphere Reserve (northeast side of Nicaragua). Thirty-five hundred indigeneous people from the Miskito and Miagma tribes live around the river.

In the beginning, everyone was curious and they would come running down to the river and stare as our two large canoes went by. Our MASH unit only did emergency dentistry. Multiple perio extractions were easy—the teeth were loose and falling out. Over the years, the dental IQ has changed. Now, healthy dentitions make the extractions more difficult! The nature of procedures has changed, with requests for fillings, orthodontic, and other elective dentistry. In our first year, the old generator gave us only three hours of light a night. Last year, it seemed strange to find people watching *Rambo*. In just three short years, solar panels have allowed satellite television into the solitude of the jungle.

Last year, Dr. Jim Guild in Urubamba, Peru, left behind a portable compressor and equipment to entice local dentists to volunteer dental services to the area. Jim, as well as many other KIA volunteers, has sponsored youngsters to go on to higher education in Guatemala. Roger and Bonita Marchand raised funds at home to sponsor a teacher for the new school in XIX (pronounced *sheesh*) in Guatemala.

Shooting the rapids

Waving goodbye

Dr. Bob Dickson, MD, largely funded by KIA, built the medical clinic where I worked in El Quiche, Guatemala. This went along with a medical lab, computer centre, and playground for kids. The list goes on and on…all spin-offs.

I began to see that KIA dentistry is just a foot in the door for helping others. We plant the seeds of self-sufficiency and leave behind a great deal of knowledge and material things such as schools and medical centres that were not there before our arrival. The impact on the recipients is huge. But the impact on the volunteer is like no other experience you have ever had. Leaving the comfort zone of our North American cocoons to work from the heart is foremost a transforming experience and arguably the most important thing we do. As Gordon Huff said, "You are the only ones...no one else can help. You know why you are here!" Now my head is spinning. What kind of an impact can I make this year on my trip to Venezuela? The fluoride varnish will help many children and I want to train a local volunteer to repeat this procedure at least twice more this year.

For further information, visit our website at www.kindnessinaction.ca or contact Dr. Amil Shapka at docdoc1@hotmail .com.

Entry-to-Practice and Educational Standards *(continued from page 71)*

One of our first projects is to examine the various educational standards established by different national organizations to support their work. These standards come in various formats: requirements for accreditation, competency statements for the national examination, a framework for education that is articulated by the professional association, national practice standards, and learning outcomes developed by the educators' organization. The concept of entry-to-practice is expressed differently in these documents because at present, dental hygiene does not have a common national standard associated with entry-to-practice for the profession.

Dentistry has developed a national standard regarding entry-to-practice for general practitioners that is used by dentistry's national organizations. Their national standard provides a foundation for national accreditation, education, and examination as well as provincial regulation. Given the diversity of dental hygiene education and regulation, a similar standard for our profession is essential for the work of dental hygiene national and provincial organizations in these times of rapid change.

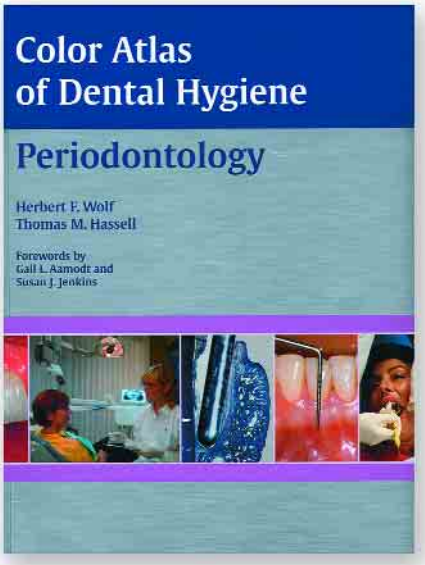
The need for such a common national standard is becoming increasingly important with the divergence of entry-to-practice educational models across Canada, programs being implemented in new jurisdictions (New Brunswick), and multiple post-secondary organizations entering the educational sector. Post-secondary organizations now include private and public organizations as well as colleges, university-colleges, and universities.

The dental hygiene collaborative project, coordinated by Dr. Susanne Sunell, is expected to conclude within two years. It began with a workshop in early February, facilitated by Dianne Landry, with over 20 dental hygienists with abilities related to the general profession, health promotion, education, clinical therapy, change agency, research, and administration. The project will also involve a web-based survey and focus groups.

The knowledge, skills, attitude, and judgment required for entry-to-practice as dental hygienists have to be articulated. The "abilities" approach is a way in which the entry-to-practice standard can be expressed. This standard can then be used to develop curricula, assess programs, examine graduates, and develop provincial regulatory standards as well as continuing competency programs.

Keep looking to your national professional association to provide the oil for your lamp of knowledge.

Color Atlas of Dental Hygiene: Periodontology



by Herbert F. Wolf and Thomas M. Hassell. New York: Thieme; 2006.
351 pages, 1174 illustrations. ISBN 9781588904409 / 9783131417619
US$69.95

TO MY KNOWLEDGE, THIS IS THE FIRST-EVER COLOUR atlas of dental hygiene and periodontology. It contains 1174 colour illustrations that have been graciously approved by the authors and the publisher for reproduction for educational purposes. The superb quality of these illustrations makes this opportunity a definite asset. The section on the structural biology (i.e., histology) of the periodontium is very well illustrated. However, the descriptions of the epithelium and lamina propria, in terms of cellular components, lack depth. The atlas contains an excellent description of plaque biofilm formation including simplified illustrations that are easily understood. The classification of periodontal microbiology is very thoroughly discussed yet in a manner that is also readily understandable. The section on immunology provides excellent point-form explanations accompanied by colourful illustrations that enhance comprehension. Periodontal indices are well covered; the epidemiology section, however, is not as thorough as it could be. A discussion of basic epidemiological terminology along with definitions that could assist in the interpretation of data would have added strength to this section. The text is strengthened by the numerous photographs of the entire periodontal classification of diseases and has a particularly excellent explanation of aggressive periodontitis, including a comparison of the old and the new classifications. The authors do a nice job of emphasizing the importance of periodontal maintenance therapy; as well, they include comprehensive sections on periodontal surgery and implants. However, they did not include a discussion of either professional care or home care of implants, which is a definite deficiency.

The preface at the front of the book highlights the inclusion of the periodontal systemic linkage as a major strength. However, disappointingly, there is only one page on the topic. Another major flaw is the use of non-evidence-based information in several sections of the text. Examples include the misplacement of diabetes in the periodontal disease classification; advocating aggressive root planing until root surfaces have a glassy smooth surface, citing old references from the 1980s; advocating performing two phases of initial periodontal therapy with the inclusion of the removal of supragingival deposits only in the first phase of treatment and then subsequent subgingival deposit removal and root planing in the second phase of initial therapy. This practice is contrary to the periodontal and dental hygiene literature and has not been considered the standard of care for over a decade. However, interestingly enough, the authors discuss the use of full-mouth disinfection, which includes the complete debridement of the entire dentition within a 48-hour time period, a recent concept cited and well substantiated in current literature.

I cannot recommend this text for use by dental hygiene students as the text is not congruent with the dental hygiene process of care. The use of terminology such as "data collection" rather than the assessment phase and the lack of emphasis on evaluation or outcomes of care are just two examples. That, together with the emphasis on the rubber cup polishing and fluoridation of every client, the two phases of initial therapy as previously discussed, the practice of gingival curettage despite the position of the American Academy of Periodontology to the contrary, form the basis of my recommendation. Additionally, the lack of incorporation of current literature in the recommendation of both professional and home care products, such as power brushes and other oral hygiene aids, is a major shortcoming. Given the emphasis on evidence-based decision-making and incorporation of current research findings into practice decisions, this book is definitely lacking in this area.

The major strengths of this book are its wonderful illustrations and in-depth discussions and explanations of periodontal microbiology and immunology, instrumentation and hypersensitivity. I would recommend the purchase of this text by practising dental hygienists and educators who wish to have access to excellent pictures and diagrams for presentation purposes but would caution against incorporating several techniques described that lack the scientific evidence to support their use in practice.

– Salme E Lavigne, DipDH, BA, MS(DH)
Professor and Director,
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University of Manitoba

The 2007 Canada's Food Guide: What Does It Mean for Your Practice?

by Health Canada, Office of Nutrition Policy and Promotion

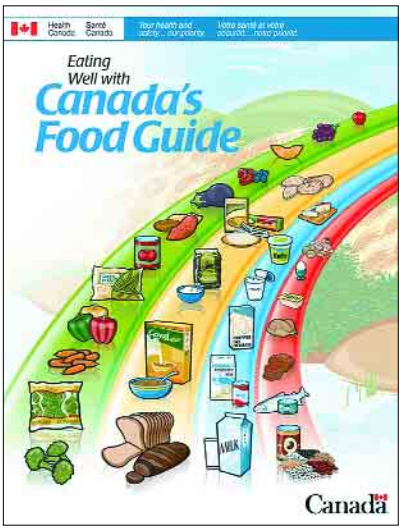

Fig 1. Cover of new *Canada Food Guide*

Fig 2. Food guide on-line

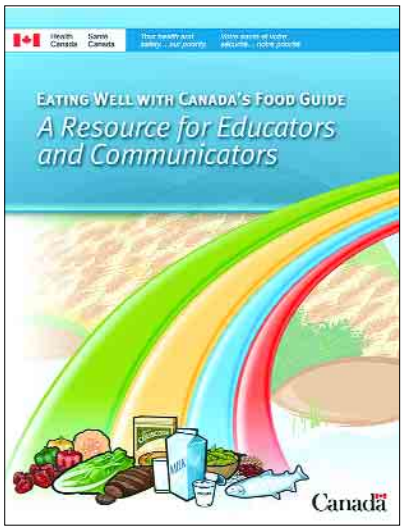

Fig 3. Cover of educators' resource

NUTRITION HAS A PROFOUND EFFECT ON OUR HEALTH, including our oral and dental health. The 2007 edition of *Canada's Food Guide*, released on February 5 of this year, translates the latest science on nutrition and health into a practical pattern of eating. Following the Food Guide will help Canadians get the nutrients they need and reduce their risk of chronic disease. For dental hygienists, the release of this Food Guide offers an opportunity to renew interest in healthy eating among your clients. This article will give you an overview of the Food Guide's features, why and how it was revised, and some ideas for using this tool in your practice.

> As dental hygienists we appreciate the link between oral health and total wellness. Consumers today are more proactive and want to be involved in decisions around their health. The 2007 Food Guide is an evidence-based tool that we can use in our day-to-day practice to help our clients make effective food and lifestyle choices.
>
> – Laura Myers, Director of Education, and Acquisitions Editor for the *Canadian Journal of Dental Hygiene*

WHAT TOOLS ARE AVAILABLE?

Eating well with *Canada's Food Guide*

Canada's Food Guide describes the amount and type of food recommended for Canadians aged two years and older (figure 1). It replaces the 1992 tearsheet and "Using the Food Guide" booklet where the familiar rainbow concept first appeared. For the first time, Health Canada also is developing a specially tailored national Food Guide for First Nations, Inuit, and Métis people. This guide, which is complementary to *Canada's Food Guide*, will be released in 2007.

Canada's Food Guide On-Line

(www.healthcanada.gc.ca/foodguide)

This new website (figure 2) expands on the information and tips in *Canada's Food Guide*. It features interactive tools, such as "My Food Guide" where people can create their own food guide based on their personal food and activity choices. More details about the website are given later in this article.

A Resource for Educators and Communicators

The companion resource for educators and communicators (figure 3) supports your role by providing background information and tips to complement the advice in *Canada's Food Guide*. It provides practical "Tips for Consumers" and features "Put it into Practice" notes, with ideas on how to enhance your teaching by sharing your own experiences. Six sample one-day menu plans are included for different ages and stages; for example, for a 3-year-old, the sample menu plan shows how the recommended Food Guide Servings can be divided up into smaller amounts of food served throughout the day.

WHY AND HOW WAS THE FOOD GUIDE REVISED?

The Food Guide was revised to ensure it reflects updated nutrient standards, changes in the food supply, and changes in Canadians' patterns of food use. It also attempts to address the challenges that Canadians were facing in understanding and using the information in the 1992 Food Guide. The best evidence available on nutrition and health along with a range of expert opinions have helped to shape the revised Food Guide.

The food intake pattern (amounts and types of food recommended) in the revised Food Guide was developed through a process called modelling. Different combinations and amounts of food were tested until a pattern was found that is nutritionally adequate (that is, it meets Dietary Reference Intakes) and is consistent with evidence linking food and risk of chronic diseases.

Throughout the revision, Health Canada consulted extensively with a variety of stakeholders, including dietitians, scientists, physicians, public health experts with an interest in health and chronic disease prevention, consumers, and industry. Ongoing advice and guidance came from three expert committees: an external Food Guide Advisory Committee, an Interdepartmental Working Group, and the Expert Advisory Committee on Dietary Reference Intakes. The Food Guide also underwent two rounds of focus testing. The resource for educators and communicators and the web-based resources also were tested with end users.

EATING WELL WITH *CANADA'S FOOD GUIDE*

Canadians will be able to find detailed information in *Canada's Food Guide* on the amount of food they need, based on their age and gender. The introduction of age and gender categories and the removal of ranges within the Food Guide Serving sizes are just two of the key improvements over the 1992 Food Guide. The Food Guide also provides more specific guidance on the types of food to choose within each food group and for the first time, gives guidance on including a small quantity of added oils and fats. In addition, this Food Guide features more specific tips and messages on healthy eating and daily physical activity.

Canada's Food Guide offers advice for using the nutrition information on food labels to make informed food choices. It encourages consumers to compare information in the Nutrition Facts table (figure 4) on food labels to choose products that contain less fat, saturated fat, trans fat, sugar, and sodium.

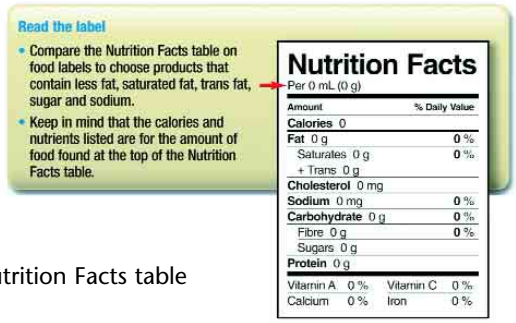

Figure 4. Nutrition Facts table

The "% Daily Value" is an especially useful benchmark when comparing two products as it puts the nutrients on the same scale (0% to 100% Daily Value). The "% Daily Value" can also be used to target those nutrients you want to eat more of—for example, fibre, vitamin A, vitamin C, calcium and iron—by checking if they have high percentages in a food product. Consumers should be reminded that the calories and nutrients listed on the label are for the specific amount of food found at the top of the Nutrition Facts table.

In recognition of the multicultural nature of our country, the Food Guide's resources include a range of foods from a variety of ethnic cuisines. Health Canada will work with community groups to determine the best way to make multilingual copies of the Food Guide available to Canadians. By spring 2007, Health Canada will make the "My Food Guide" web tool available in different languages.

For the first time, Canadians over the age of 50 are advised to have a daily vitamin D supplement. The Food Guide also now explicitly recommends physical activity, in accordance with Canada's Physical Activity Guide. It details the benefits of eating well and being active and offers specific suggestions for both. Water now receives special prominence as the Food Guide emphasizes drinking water as a means to satisfy thirst. In addition, guidance to limit fruit-flavoured drinks, soft drinks, sports and energy drinks, and sweetened hot or cold drinks is included in the Food Guide.

The *Canada Food Guide* encourages Canadians to

- emphasize vegetables, fruit and whole grains, and include milk and meat as well as their alternatives, along with a small amount of unsaturated fat;
- limit foods and beverages high in calories, fat, trans fat, sugar, and salt;
- compare the Nutrition Facts table on labels to make wise choices;
- combine regular physical activity with healthy eating; and
- drink water to satisfy thirst.

MAKING EACH FOOD GUIDE SERVING COUNT

Because the type of food people choose is just as important as the amount, directional statements on the quality of food choices are critical to consumers' use and understanding of the Food Guide. The guidance about which foods to choose within each food group is now more specific and action-oriented, making it easier for people to "make each Food Guide Serving count."

Vegetables and fruit

This section is now the most prominent arc of the rainbow, to emphasize the importance of these foods for overall health. The directional messages are to

- Eat at least one dark green and one orange vegetable each day.
  - Go for dark green vegetables such as broccoli, romaine lettuce, and spinach.

  - Go for orange vegetables such as carrots, sweet potatoes, and winter squash.
- Enjoy vegetables and fruit prepared with little or no added fat, sugar, or salt.
  - Have vegetables steamed, baked, or stir-fried instead of deep fried.
- Have vegetables and fruit more often than juice.

Grain products

For grain products, the advice is to

- Make at least half of your grain products whole grain each day.
  - Eat a variety of whole grains such as barley, brown rice, oats, quinoa, and wild rice.
  - Enjoy whole grain breads, oatmeal, or whole wheat pasta.
- Choose grain products that are low in fat, sugar, or salt.
  - Compare the Nutrition Facts table on labels to make wise choices.
  - Enjoy the true taste of grain products. When adding sauces or spreads, use small amounts.

Milk and alternatives

This group has a new name, "Milk and Alternatives," to reflect the inclusion of newer non-milk-based products in this group. The advice for this food group is to

- Drink skim, 1%, or 2% milk each day.
  - Have 500 mL (2 cups) of milk every day for adequate vitamin D.
  - Drink fortified soy beverages if you do not drink milk.
- Select lower fat milk alternatives.
  - Compare the Nutrition Facts table on yogurts or cheeses to make wise choices.

Meat and alternatives

For "Meat and Alternatives," alternatives such as beans, lentils, and tofu are highlighted. The nutritional messages are to

- Have meat alternatives such as beans, lentils, and tofu often.
- Eat at least two Food Guide Servings of fish each week. *(The Food Guide advises consumers to check the latest Health Canada advice for limiting exposure to mercury.)*
  - Choose fish such as char, herring, mackerel, salmon, sardines, and trout.
- Select lean meat and alternatives prepared with little or no added fat or salt.
  - Trim the visible fat from meats. Remove the skin from poultry.
  - Use cooking methods such as roasting, baking, or poaching that require little or no added fat.
  - If you eat luncheon meats, sausages, or prepackaged meats, choose those lower in salt (sodium) and fat.

Features of the Food Guide website

The Food Guide website expands on the information in the print resource and provides interactive tools to help consumers learn, retain, and implement the Food Guide messages. On the website, you can access *Canada's Food Guide* and *A Resource for Educators and Communicators*.

Key website features for consumers

- Food Guide Basics: Provides the same information as the print resource in a web-friendly format.
- Choosing Foods: Expands on the messages in the Food Guide and offers practical tips.
- Using the Food Guide: Helps consumers apply the Food Guide advice by expanding on topics such as meal planning and food shopping.
- Maintaining Healthy Habits: Provides actionable tips on eating well and being active.
- Take the Guided Tour: Takes users on a tour of the Food Guide's main features.
- My Food Guide: An interactive tool that enables users to personalize the Food Guide based on their age, gender, food preferences, and activity choices.
- Link to Canada's physical activity guide.

Website information for health professionals

- *A Resource for Educators and Communicators* is accessible online.
- Background on the Food Guide that includes more information on the revision process, the evidence base behind the revisions, and the history of Food Guides in Canada.
- Frequently Asked Questions section will be helpful in answering common questions.

Key role for dental hygienists

Dental hygienists in every type of practice setting can play an important role in promoting healthy eating to Canadians. The Food Guide and its supporting materials can help you make nutrition messages meaningful to your audiences. Here are just a few examples:

- Let your clients know where they can get a copy of *Canada's Food Guide* (information is on the back of the Food Guide).
- Improve your own understanding by reviewing *A Resource for Educators and Communicators* and the additional background information available on the website.
- Have copies of the Food Guide available in the waiting room and treatment room at the office where you work.
- Use the Food Guide to talk about healthy eating when you're in schools doing screening.

For 65 years Canadians have trusted *Canada's Food Guide* to provide guidance on healthy eating. The revised Food Guide is based on a comprehensive review of the science linking nutrition to health and incorporates input from many stakeholders. The release of this latest version provides a prime opportunity to revitalize your focus on nutrition and health, including oral health.

Related links

- Health Canada Food Guide website—**www.healthcanada.gc.ca/foodguide**
- Health Canada Nutrition Labelling website—**www.healthcanada.gc.ca/nutritionlabelling**

84th General Session & Exhibition of the IADR

1st Meeting of the Pan-Asian-Pacific Federation (Australian/New Zealand, Chinese, Korean, Japanese, and Southeast Asian Divisions of the IADR) June 28-July 1, 2006, Brisbane, Australia

These abstracts were a few of the many presented at the 84th General Session of the International Association for Dental Research and 1st Meeting of the Pan-Asian-Pacific Federation (Australian/New Zealand, Chinese, Korean, Japanese, and Southeast Asian Divisions of the IADR). Meetings were held June 28–July 1, 2006, in Brisbane, Australia. The IADR has given us permission to publish a selection of abstracts that were presented at that meeting.

LATE-BREAKING NEWS

ANTIPLAQUE/ANTIGINGIVITIS EFFICACY OF ESSENTIAL-OIL-FLUORIDE MOUTHRINSE & AMINEFLUORIDE/ STANNOUSFLUORIDE MOUTHRINSE

S. SANTOS[1], N. SHARMA[2], **M.W.B. ARAUJO**[1], J.F. COELHO[1], M. LYNCH[1], and J.T. MCGUIRE[1], [1]Pfizer Consumer Healthcare, Pfizer Inc, Morris Plains, NJ, USA, [2]Biosci Research Canada, Ltd, Mississauga, Canada

INTRODUCTION: This six-month, randomized, examiner-blind, parallel group, controlled clinical trial, conducted in accordance with ADA Guidelines, investigated the comparative antiplaque/antigingivitis efficacy of an essential oil/sodium fluoride-containing (EOF) mouthrinse and a mouthrinse containing amine fluoride/stannous fluoride (AmF/SnF). METHOD: Following a supragingival dental prophylaxis, 376 subjects with mild to moderate gingivitis and dental plaque were randomized to one of 3 treatment groups. Subjects brushed with regular fluoride toothpaste and rinsed, unsupervised, for 6 months following labeled directions with either the 1) EOF or 2) AmF/SnF or 3) 5% Hydroalcohol control rinse. Randomized subjects received oral and written home care instructions. Compliance was monitored monthly through the use of a diary and measurement of volumes of returned bottles. Examinations were performed at baseline, three and six-months. The primary efficacy variables were the mean Modified Gingival Index (MGI) and mean Plaque Index (PI) scores at six months post-treatment analyzed using ANCOVA. RESULTS: At 6 months, subjects on the EOF rinse exhibited 15.7% and 40.3% reductions versus the 5% Hydroalcohol control rinse in mean MGI and PI scores ($p<0.001$), respectively. Subjects in the AmF/SnF group demonstrated 9.9% and 19.4% reductions versus the 5% Hydroalcohol control rinse in mean MGI and PI ($p<0.001$), respectively. The EOF rinse provided significantly greater reductions in MGI (6.5%) and PI scores (26.0%), respectively, compared with the AmF/SnF ($p<0.001$). CONCLUSIONS: In this six-month definitive study, the addition of EOF rinse to brushing regimen was found to be more effective than an AmF/SnF rinse at improving plaque control and gingival health in an established long term, daily use design. This study confirms data from previously reported in-vitro and short-term studies.

RANDOMIZED CLINICAL TRIAL OF SAFETY OF DENTAL AMALGAM IN CHILDREN

D. BELLINGER[1], F. TRACHTENBERG[2], L. BARREGARD[3], M. TAVARES[4], E. CERNICHIARI[5], D. DANIEL[6], and **S. MCKINLAY**[2], [1]Havard Medical School, Harvard School of Public Health, Boston, MA, USA, [2]New England Research Institutes, Inc, Watertown, MA, USA, [3]Sahlgrenska Universitetssjukhuset, Göteborg, Sweden, [4]Forsyth Institute, Boston, MA, USA, [5]University of Rochester School of Medicine, NY, USA, [6]University of Maine at Farmington, USA

Objective: To assess the safety of dental amalgam restorations with respect to neuropsychological and renal function in children. **Methods:** The New England Children's Amalgam Trial was a 2-group randomized safety trial involving 5 community health dental clinics in Boston, Massachusetts, and 1 in Farmington, Maine, between September 1997 and March 2005. 534 children aged 6 to 10 years at baseline with no prior amalgam restorations and 2 or more posterior teeth with caries were randomly assigned to restoration of baseline and incident caries during a 5-year follow-up period using amalgam (n=267) or resin composites (n =267). The primary neuropsychological outcome was 5-year change in full-scale IQ scores. Secondary outcomes included tests of memory and visuomotor ability, as well as creatinine-adjusted urinary albumin. **Results:** Children had a mean of 15 tooth surfaces (median, 14) restored during the 5-year period (range, 0-55). Assignment to the amalgam group was associated with a significantly higher mean urinary mercury level (0.9 vs 0.6 µg/g of creatinine at year 5, $P<.001$). After adjusting for randomization stratum and other covariates, no statistically significant differences were found between the groups in 5-year change in full-scale IQ score (3.1 vs 2.1, $P = .21$). The difference in change scores was 1.0 (95% confidence interval, –0.6 to 2.5) full-scale IQ score point. Four-year change in the general memory index (8.1 vs 7.2, $P = .34$), 4-year change in visuomotor composite (3.8 vs 3.7, $P = .93$), and year 5 urinary albumin (median, 7.5 vs 7.4 mg/g of creatinine, $P = .61$) were all statistically not significant. **Conclusions:** This study, provides definitive evidence of the safety of amalgam in children and suggest that the health effects of amalgam restorations in children need not be the basis of treatment decisions when choosing restorative dental materials.

BEHAVIOURAL STUDIES

0144 CARIES PREVALENCE FOUR YEARS AFTER THE CESSATION OF AN RCT

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Objectives: The aim of this study was to measure the development of dental caries after the cessation of a clinical trial of supervised toothbrushing with a 1,000 ppm fluoride toothpaste. **Methods:** 461 children (mean age 5.5 years) in 12 schools in Tayside, Scotland completed a randomised controlled trial (Curnow et. al., 2002). The intervention group comprised classes of children brushing once a day at school under supervision and receiving a home support package designed to encourage twice daily toothbrushing, and the non-intervention group comprised the parallel classes of children who had no toothbrushing at school. A brushing supervisor dispensed the toothpaste to the test group and recorded its use daily. The intervention period was 30 months. Children were examined every six months during the intervention, and additionally, 6, 18, 30, and 54 months after the completion of the intervention, by the same examiner. **Results:** Significantly less dental caries developed in the new first permanent molars of the children after 24 months of receiving the intervention (Curnow et. al., 2002). 71% (n=329) of the children were re-examined 54 months after the intervention ended (mean age 12 years). Children who had been in the test group had a D3¬FS increment of 1.62 (s.d. 2.51), significantly lower than the control children, with a D3FS increment of 2.65 (s.d. 3.62) ($p=0.002$). **Conclusions:** Prolonged dental health benefits have been found for children who were part of a school-based toothbrushing programme. A longer period of follow-up will help to determine whether the programme has resulted in a long-term behavioural change with more children brushing twice daily or whether the

improved dental health is principally a prolonged biological effect for the first molars. The findings from this study have been influential in developing government policy about national caries preventive programmes within Scotland.

PREVENTION, SCHOOL-BASED PROGRAMS, ORAL HEALTH PROMOTION

0159 INTERGENERATIONAL ORAL HEALTH PROMOTION: IMPACT ON CHILDREN'S KNOWLEDGE & BEHAVIOR

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Introduction: The purpose of this research was to test the effectiveness of using older adults as educators of 4th and 5th grade children about oral health and nutrition. **Methods:** Older adults of Caucasian, Asian, and Hispanic ethnicity completed a 4-week oral health promotion training. Of the 57 participants, 18 volunteered to teach small groups in classrooms. Fourth and fifth grade classes in three rural Washington schools agreed to participate; three classes made up the experimental group (n=53 children) and two were control group classes (n=38). Following a baseline clinical dental exam and interviews re: knowledge and behavior related to oral health, the experimental group was taught in small classes (6 sessions) by the previously trained elders. Children in the control group were not given any intervention. Follow-up assessments were conducted immediately after classes were completed (experimental group only), and after 6 months (both groups). **Results:** Of the 91 children who participated, 62.6% were female. The sample was primarily Hispanic (63%). Most (85%) were U.S. born. At 6 months, 79% of the experimental group and 87% of controls remained. Both at the immediate and 6 month follow-up, experimental children knew more about fluoride's effect ($p<.02$), plaque ($p<.05$), and removal of plaque ($p<.0001$) than before. Control group children showed no significant changes. The former could list more healthy snacks ($p<.0001$) and unhealthy snacks ($p<.001$) 6 months later, and reported increased flossing frequency (65% vs. 44%). They were also more likely to report better eating habits immediately after and 6 months later. **Conclusion:** Older adults can be effective promoters of oral health for children. An intergenerational program can successfully improve children's oral health knowledge and behavior. Supported by CDC Grant # U48 CCU009654

ORAL HEALTH RESEARCH

0580 ORAL CANCER SCREENING IN HIGH-RISK COMMUNITY USING FLUORESCENCE VISUALIZATION

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With the advent of new technology and a better understanding of the natural history of oral cancer, there is increasing pressure to develop screening strategies for its prevention and early detection. This need is even more imperative among marginalized high-risk communities. **Objectives:** The objective of this study is to introduce this new user-friendly tool to a high-risk community dental clinic in Vancouver Downtown Eastside as an easy adjunct screening tool to the conventional head and neck examination for early detection of oral cancer and precancers. **Methods:** Demographics, risk factors and medical history were collected by personal interview from patients seen at the Portland Community Dental Clinic located in the Vancouver DTES. Patients received a full head and neck examination including the use of novel visualization aids (fluorescence visualization and toluidine blue stain). **Results:** Of 133 patients examined, the majority were at high-risk: ever smokers (86%) and regular consumers of alcohol (83%). On clinical examination, 26 had clinical leukoplakia. All 26 showed clinically significant alteration in fluorescence at the lesion site, with 31% also showing retention of toluidine blue. To date, 6 have been biopsied, showing 1 case with oral cancer and 4 with oral premalignant dysplasia. **Conclusion:** We were able to recruit patients from Vancouver DTES, a poor, medically underserved population, and were able to identify cases with significant disease that required further triage for treatment. In addition, we describe the common normal variations of the oral tissue with alterations of fluorescence visualization and some of the common confounders that should be recognized in the daily practice.

1297 CLINICAL EVALUATION OF THE PLAQUE REMOVAL EFFICACY OF THREE TOOTHBRUSHES

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Variation in the design of manual toothbrushes may lead to differences in their ability to remove plaque. This study compared a recently introduced manual brush to a currently marketed leader and flat trim control manual toothbrush. **Objective:** This randomized, single-blind, crossover study compared the safety and plaque removing efficacy of the Oral-B Advantage Plus (ADV), Oral-B Indicator (IND) and the Colgate 360 (COL) toothbrushes. **Method:** Qualified subjects with a mean whole mouth pre-brushing Rustogi Modified Navy Plaque Index score of °Y0.6 were randomly assigned to treatment sequence. After 1 min brushing, oral tissues were re-examined and plaque was reassessed. One examiner (NCS) evaluated all subjects at all time points. Changes in plaque scores from pre-treatment means within each treatment at each visit were analyzed using a paired t-test and between treatments using an analysis of variance. **Results:** All brushes significantly reduced mean plaque from pre to post brushing in all areas ($p<0.001$). ADV and IND removed significantly more plaque than COL whole mouth (0.552 ± 0.04, 0.527 ± 0.06 vs 0.456 ± 0.06, $p=0.0001$), marginal (0.745 ± 0.12, 0.683 ± 0.12 vs 0.547 ± 0.14, $p=0.0001$) and approximal areas (0.939 ± 0.07, 0.908 ± 0.09 vs 0.810 ± 0.13, $p=0.0001$). ADV and IND removed 21.9% and 15.6% more whole mouth plaque, 36.20% and 24.8% more marginal plaque, and 15.93% and 12.1% more approximal plaque respectively than Colgate 360.

ADV also removed significantly more plaque than IND whole mouth, margin and approximal surfaces, p=0.0001. No evidence of oral hard and soft tissue trauma was found with any toothbrush. **Conclusion:** The results demonstrate that both Oral-B Advantage Plus and Oral-B Indicator were superior to Colgate 360 removing significantly more plaque from all areas. This study was sponsored by The Procter & Gamble Company, Mason, OH, USA.

CARIOLOGY RESEARCH

0190 REMINERALIZATION BY CHEWING GUM CONTAINING CPP-ACP AND CITRIC ACID

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Objectives: Casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) have been shown to remineralize enamel subsurface lesions in situ. The aim of this study was to investigate the effects of CPP-ACP in a fruit-flavoured sugar-free chewing gum containing citric acid on enamel remineralization, and the acid resistance of the remineralized enamel, using an in situ remineralization model. **Method:** The study utilized a double blind, randomized, crossover design with three treatments: (i) sugar-free gum (2 pellets) containing 18.8 mg CPP-ACP and 20 mg citric acid, (ii) sugar-free gum containing 20 mg citric acid alone, and (iii) sugar-free gum not containing CPP-ACP or citric acid. Ten subjects were instructed to wear removable palatal appliances, with 4 half-slab insets of human enamel containing demineralized subsurface lesions, and to chew gum (2 pellets) for 20 min (4times/d, 14d). At the completion of each treatment the enamel half-slabs were removed and half of the remineralized lesion treated with carbopol/lactic acid for 16hr. The enamel slabs (remineralized, acid challenged and control) were then embedded, sectioned and subjected to microradiography to determine the level of remineralization. **Results:** Chewing with the gum containing CPP-ACP and citric acid resulted in significantly higher remineralization (13.1% ± 2.2%) than chewing with either the gum containing no CPP-ACP or citric acid (9.3% ± 1.2%) or the gum containing citric acid alone (2.6% ± 1.3%) ($p<0.01$). The 16hr acid challenge of the remineralized lesions showed that the level of mineral after acid challenge was significantly greater for the gum containing CPP-ACP and citric acid when compared with the other two gums ($p<0.01$). **Conclusion:** Sugar-free chewing gum containing CPP-ACP and citric acid significantly promoted remineralization of enamel subsurface lesions in situ.

1253 FLUORIDE CONTENT OF BOTTLED WATER

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An increase in fluorosis prevalence has been reported in studies from both fluoridated and non-fluoridated areas. An important factor to consider when estimating fluoride intake, is the array of products consumed. Significant amounts of fluoride can be found not only in food, water and water-based beverages, but also in non-dietary sources such as fluoride supplements, dentifrices, rinses and gels. In addition, new products are continuously being introduced into the market. Of these products, bottled water has become an increasingly popular beverage choice. Many of these waters have little or no fluoride, while a few are either naturally fluoridated or have had fluoride added. However, their fluoride levels generally are not listed on the products. **Objectives:** To determine the fluoride levels of bottled waters. **Methods:** This study analyzed fluoride levels of 110 bottled waters collected in 2004-2005 from Iowa, Minnesota, and from a national sampling collection study. The fluoride was measured using a direct read method with a fluoride ion specific electrode. Each sample was mixed with a buffer solution and the results reported in parts-per-million fluoride(ppmF). Quality control measures were included with each analysis. **Results:** The majority of bottled waters (88%) had low concentrations of fluoride

(0.02–0.24 ppm). 5% ranged from 0.31 to 0.47 ppmF, and 6% from 0.61 to 1.55 ppmF. The mean of the 110 samples was 0.15 ppmF(S.D 0.24), with a median of 0.07 ppmF. **Conclusion:** The decision to prescribe dietary fluoride supplements to pre-school children to help in the prevention of caries and fluorosis should be done cautiously. Dental professionals need to be aware of households using bottled waters for drinking and meal preparation and the importance of testing these waters for fluoride. This emphasizes the need to consider total fluoride intake before prescribing dietary fluoride supplements. Supported by #RO1-DE09551 and USDA Grant #58-1235-1-045.

1257 ENAMEL FLUORIDE RETENTION AFTER FLUORIDE GEL APPLICATION

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Objective: To determine the enamel fluoride retention after application with fluoride gel. **Methods:** Fourteen subjects, aged between 20-22years old, were included. The buccal Enamel biopsies were conducted on the middle buccal surfaces of the upper premolar before and at 30minutes, 2, 4 and 8weeks after 1.23% acidulated phosphate fluoride application. Fluoride concentration of the etching solution was determined using a fluoride electrode. Calcium concentration was evaluated by an atomic absorption spectrophotometer. The data were analyzed by Wilcoxon Signed Rank test and Friedman test at significant level .05. **Results:** The baseline value of enamel fluoride content was 2,107±498ppm. After the application with fluoride gel at 30 minutes, 2, 4 and 8 weeks the fluoride content were 6,525±699, 4,751±966, 2,906±663 and 1,792±466ppm, respectively. Statistical analysis revealed a significant increase in the enamel fluoride content at 30 minutes, 2 and 4 weeks when compared to the baseline value ($p < .01$). No significant difference between the 8 weeks value and the baseline was observed. **Conclusion:** The enamel fluoride retention after topical application with acidulated phosphate fluoride gel lasts for more than 4 weeks but no longer than 8 weeks.

2444 RANDOMIZED FLUORIDE VARNISH TRIAL FOR PREVENTING ECC IN ABORIGINAL COMMUNITIES

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Early Childhood Caries (ECC) is the most common chronic disease among Canadian Aboriginal children and the number one cause of health inequalities between native and non-native children. Caregiver oral health education alone has not been able to reduce ECC or its treatment costs. Fluoride varnish (FV) is effective in preventing caries in permanent teeth, but there is insufficient evidence of its effectiveness on caries in primary teeth. **Objectives:** To determine the effectiveness of FV (Duraflor, 5% NaF, Pharmascience) plus caregiver counseling in preventing ECC in a 2-yr randomized controlled trial. **Methods:** This trial enrolled 1226 children aged 6 months to 4 years from the Sioux Lookout Zone First Nations reserves and 149 from Thunder Bay (NW Ontario). First Nations communities were randomized to 2 study groups; families in both groups received oral health counseling and restorative dental care provided by Health Canada – one group received no FV (FV0) and the other received FV 2-3×/yr. Subjects were examined for the dmft/s indices by calibrated dental hygienists in 2003, 2004 and 2005. **Results:** 83.5% of 1026 subjects in the FV group received 2-3 FV applications in the first 12-month follow-up; 54.5% of 1081 subjects examined at 12 months experienced a 'net' dmfs >=1. Subjects in the no-FV group had a 34% increased risk for a dmfs increment >=1 (Odds Ratio = 1.34, p=0.026) than those in the FV group, controlling for age, aboriginal status, and dmfs score at baseline through logistic regression. Analysis of Covariance yielded similar findings; FV treatment conferred 26% reduction in the 1-yr mean dmfs increment (FV0 = 6.1 vs. FV = 4.5), adjusting for age, ethnicity and dmfs at baseline. **Conclusion:** Fluoride varnish applied at least 2×/yr in high caries risk children was effective in preventing and reducing ECC after 1-yr of follow-up. IAPH-CIHR MOP-64215 and HSCF XG-03-067.

GERIATRIC ORAL RESEARCH

0548 QUALITY OF LIFE AMONG OLDER ADULTS DECLINING MANDIBULAR IMPLANT OVERDENTURES

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Objective: Disability with traditional complete dentures has been hypothesized to impair quality of life enough to suggest implant overdentures as the minimum standard for managing the edentulous mandible. This study aimed to use the International Classification of Functioning Disability and Health as an approach to explore psychosocial concerns of edentate elders who had declined mandibular implant overdentures. The objective was to develop hypotheses to explain quality of life concerns relevant to the oral health of older adults with complete dentures. **Methods:** Twenty-five edentate adults, 59 to 85 years of age who had declined treatment with mandibular implant overdentures, were interviewed individually by means of open-ended questions on perceptions about quality of life related to their life generally and general and oral health including experiences with natural teeth, tooth loss and denture use. Emerging themes and hypothetical patterns related to psychosocial and quality of life concerns of the participants were identified in verbatim transcripts of the interviews. **Results:** A range of psychosocial responses were revealed including themes of satisfaction and dissatisfaction related to body structure and function, as well as activities and participation related to the participant's life, health and oral health. In keeping with the ICF, there were reports of the influence of personal beliefs, such as philosophies geared to adaptation in the face of adversity, and of environmental factors, such as the degree of financial freedom. Complete dentures were usually considered acceptable substitutes for previous natural teeth. Implant overdentures were not favored typically because they were considered unnecessary to improve function or quality of life, or because potential improvements did not outweigh perceived surgical or maintenance concerns. **Conclusion:** Aging adults may maintain quality of life consistent with their expectations despite general and oral health conditions including tooth loss and complete denture use. (Canadian Institutes of Health Research Grant #14R90998)

PERIODONTAL DIAGNOSIS

0348 VALIDATING SINGLE SITE MEASUREMENTS OF PROBING DEPTH AND ATTACHMENT LOSS

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Objective: The purpose of this study is to examine the relationship between full mouth measurements using all 6 sites per tooth and single site measurements, for probing depth (PD) and attachment loss (AL) and to assess the degree of relative bias that occurs in using each site per tooth. **Methods:** Using a data set of 644 adults screened for a treatment study of Type III or early Type IV chronic periodontitis, 130 adults (76 Male/54 Female), averaging 49.9 ±10.03 years, with no periodontal therapy (in previous 6 months) or prophylaxis (in previous 30 days), constituted the study sample. The NC probe (one mm increments) was used to measure PD, gingival recession (to obtain AL) and bleeding upon probing. Paired t-test and regression analyses were used to compare PD and AL using all 6 sites per tooth to each site. **Results:** Mean differences (paired t-test) showed that two of the sites underestimated the severity of both PD and AL, while the remaining four sites overestimated severity (range: PD: -32.40% to 16.01%; AL: -11.58% to 9.43%). For PD, all of these differences were statistically significant ($p<0.001$), whereas none were statistically significant for AL. Using bivariate linear regression, each of the six sites was a significant predictor ($p < 0.0001$) of the six-site measure for PD and AL. However, the mesial lingual site gave the best fit for PD ($R^2 = 0.88$, $p < 0.0001$) and AL ($R^2 = 0.91$, $p < 0.0001$). For PD severity, the mesial buccal (MB) and distal buccal (DB) sites had the smallest relative biases (both 12.42%); for AL severity, the MB had the smallest relative bias (1.86%). **Conclusions:** In this sample, the MB site showed the most consistent pattern across the various analyses. Supported by HRSA Grant 5 D13 HP30009.

FAQs

by CDHA Staff

THE INFORMATION COORDINATOR IN THE CDHA Library receives many requests for assistance during her day and a good number of these are not related to journals or books or research for papers. So we thought it would be both interesting and useful to look at some of the most common issues and questions broached by CDHA members as well as the public. As the information is sometimes available on our website or other on-line sources, we have included those web addresses.

EMPLOYMENT CONCERNS

1. Employee status

Members often ask about the differences between the status as an employee and that of the self-employed or independent contractor. A Canada Revenue Agency site provides a brief guide to the ins and outs of taxation law as it applies to the working relationship (*www.cra-arc.gc.ca/E/pub/tg/rc4110/rc4110-e.html)*. This will give you a good introduction but it is always preferable to discuss these options with a professional experienced in taxation laws.

2. Alternative practice settings

As the organization of oral health care evolves, opportunities for alternative practice settings are increasing. For those dental hygienists with an interest in this area, we suggest a few basic preparatory actions. Members may obtain a unique ID number for dental insurance carriers, some of whom now accept dental hygienists as providers. This can be done by contacting Shawna at the CDHA office at our toll free number 1-800-267-5235. Participating in workshops on small business management/entrepreneurship skills would help prepare you to become an independent practitioner. CDHA is planning a series of on-line continuing education modules to provide the skills and knowledge to manage a practice of your own.

3. Conflict among office staff

Another issue often encountered by dental hygienists is poor communication and conflict among office personnel. The more complex and technologically advanced dental practices of today bring many new challenges and necessitate a positive work environment. The on-line courses available to members on the CDHA website, "The Professional Role" and "Interpersonal Skills," have proven useful to members. A new course on negotiating skills will soon be offered and should be a great benefit to professionals when dealing with both employers and clients. A new national labour survey was distributed earlier this year and the information gained will enable us to provide statistics on salary levels and other subjects of concern to dental hygienists across the country.

4. Employee rights

When employment problems go beyond communication issues and affect the rights of employees, there are government employment standards or human rights agencies that should be contacted. A government gateway site at *www.hrsdc.gc.ca/asp/gateway.asp?hr=en/lp/lo/lswe/ls/provincial.shtml&hs=lzl* provides links to the provincial and territorial employment standards offices. The Ontario Human Rights Commission links to all other agencies in Canada at *www.ohrc.on.ca/english/commission-links.shtml*.

5. Practising abroad

For dental hygienists who might be interested in practising abroad, the International Federation of Dental Hygiene has a listing of requirements in 17 countries where dental hygiene is recognized. Visit *www.ifdh.org/workabroad/*.

REGULATORY ISSUES

1. General information

With all the acronyms we encounter, it is not surprising that some confusion occurs when members want to clarify the legalities of professional practice. Transitions such as first-time registration, moving from one jurisdiction to another, or adopting new procedures and technology can require explanations of existing regulations and guidelines. So, who do you call? The CDHA, your professional association, can often help by providing policy and position statements and access to statistics and research to support evidence-based practice. We can be contacted at by e-mail at *library@cdha.ca*, or via our toll free number 1-800-267-5235. One example of the type of question that has been of concern recently relates to the issue of coronal polishing. The American Dental Hygienists' Association has an excellent position statement at *www.adha.org/profissues/polishingpaper.htm*.

2. Regulatory bodies

For regulatory issues related to registration or scope of practice, the regulatory bodies for each province must be contacted. A complete list of contact information is available on our website at *www.cdha.ca/content/careers/reg_authorities.asp*.

EDUCATION

You may have family or friends who, inspired by you, wish to pursue a career in dental hygiene. A complete list of dental hygiene programs, both degree and diploma levels, can be found on our website at *www.cdha.ca/content/careers/hygiene_programs.asp*. In order to determine the accreditation status of the various schools, contact the Commission on Dental Accreditation of Canada at *www.cda-adc.ca/en/cda/cdac/search_aep/index.asp*.

We suggest that you keep this contact information on hand for future reference. We always welcome enquiries from members. If we are unable to provide an answer to your question, we will try our best to locate the necessary resources for you.

Nutrition and Oral Health

by CDHA Staff

AS MARCH IS NUTRITION MONTH AND APRIL CONcentrates our attention on oral health, it is appropriate that we combine the two and look at some websites that deal with nutrition and oral health.

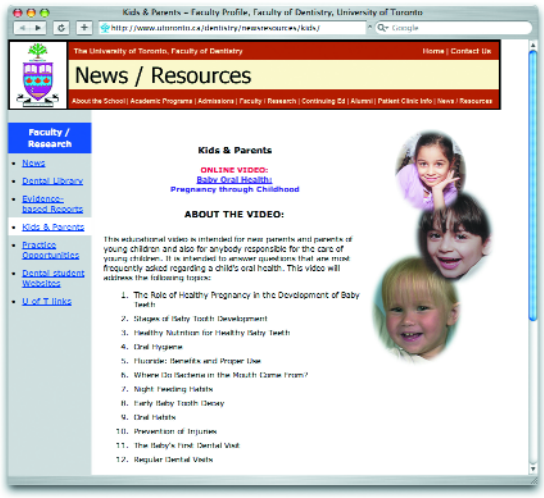
Nourish Your Smile with a Well-Balanced Diet
(American Academy of Periodontology)
www.perio.org/consumer/nutrition-benefits.htm
This site is aimed at consumers and at what they consume. The introduction states that "at this time of year, people are either benefiting from their New Year's resolution to eat correctly or in need of encouragement. Since Nutrition Month Awareness is in March, it's a good time to restart the program. And, eating correctly not only reduces risks of diabetes and heart disease, it benefits oral health as well."

Links from this page to "Low Dietary Vitamin C Can Increase Risk for Periodontal Disease," to information about gum disease, risk for periodontal disease, and treatment options.

Nutrition–Adults. Nutrition–Children
(Academy of General Dentistry)
www.agd.org/consumer/topics/nutrition/
This portal for adult nutrition contains short articles for consumers about nutrition and its effect on oral health. Examples of some of the articles are "Prescription drugs can interact with a variety of foods," "How does what I eat affect my oral health?" "Coffee and doughnuts: disastrous combo for teeth?" "Living in a sugar culture," Shedding summer pounds can harm your teeth." Aimed at the public, these short articles are written for the public so this could be a good site to recommend to your clients.

www.agd.org/consumer/topics/childrensnutrition/
This is a similar portal but the articles are obviously geared toward children's oral health. Examples of articles are "Schools' long-term soda deals kick kids in the teeth," "High-sugar infancy can mean adult sugar dependency," "Developmental chart for feeding infants."

Oral Health Made Simple (Simple Steps to Better Dental Health – Columbia University College of Dental Medicine)
www.simplestepsdental.com/SS/ihtSS/r.WSIHW000/st.31819/t.31819/pr.3.html
This site has consumer information prepared by Columbia University and is divided into three broad categories, "Prevent problems," "Understand conditions," "Explore treatments." The nutrition pages ("Mouth-healthy eating") of the prevention section start with the comment that "learning how food affects your oral health — long-term and short-term — is the first step toward mouth-healthy eating." It looks at the "Immediate effects of food," "Long-term effects," and "What to eat." There is a good set of illustrations to show how a tooth decays and an animated video on brushing and flossing. Another set of pages in the prevention section looks at "What does 'sugarless' really mean?" Other links would be of interest to clients as well, such as "Your mouth and teeth age, too."



The Effects of Oral Health on Oral Health (Health Canada)
www.hc-sc.gc.ca/iyh-vsv/life-vie/dent_e.html
"Good nutrition is important to helping build strong teeth and gums that can resist disease and promote healing." This government site looks at the health risks of poor oral health, ways in which to minimize the risks, the role of Health Canada, and links to other sites with more information about nutrition and oral health.

Child Dental Health (Medline Plus)
www.nlm.nih.gov/medlineplus/childdentalhealth.html
This is a listing of articles relevant to children's health – from latest new, information from the National Institutes of Health, overview articles, those on diagnosis/symptoms, treatment, prevention/screening, pictures/diagrams, nutrition, financial issues, statistics, sites and articles aimed at children rather than their parents or caregivers.

Baby Oral Health: Pregnancy through Childhood
[online video] (University of Toronto, Faculty of Dentistry)
www.utoronto.ca/dentistry/newsresources/kids/
The introduction to this educational video explains it very well. It "is intended for new parents and parents of young children and also for anybody responsible for the care of young children. It is intended to answer questions that are most frequently asked regarding a child's oral health. This video will address the following topics: The Role of Healthy Pregnancy in the Development of Baby Teeth; Stages of Baby Tooth Development; Healthy Nutrition for Healthy Baby Teeth; Oral Hygiene; Fluoride: Benefits and Proper Use; Where Do Bacteria in the Mouth Come From?; Night Feeding Habits; Early Baby Tooth Decay; Oral Habits; Prevention of Injuries; The Baby's First Dental Visit; and Regular Dental Visits.

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BRITISH COLUMBIA

VANCOUVER Part-time dental hygienist required for Vancouver West-Side office. Progressive, friendly office with great patients. Days flexible, and no evenings or weekends! Office has just undergone a complete renovation, and we have panoramic views of the mountains and ocean. Position available immediately. Please fax résumé to **604-734-3720** or call **604-787-9474** or **604-734-2536**. E-mail: **gailchow@telus.net**.

VICTORIA Progressive group practice in Victoria looking for a personable dental hygienist 3-4 days/week. Flexible days and hours. Contact Stacy or Tonya at **250-477-7321** or **gscdental@shaw.ca** or fax résumé to **250-477-3722.**

ALBERTA

BANFF Full-time dental hygienist position. Modern, high-tech office. Great perio program! Signing bonus and assistance with moving expenses. Excellent compensation, benefits, bonuses & flexible vacation time. Direct inquiries to Sheila at **403-609-2113**; fax résumé to **403-678-9737**; or e-mail to **jbagley@shaw.ca**.

STRATHMORE Strathmore Dental Centre is seeking a personable, compassionate, progressive dental hygienist. We are a family-oriented practice with a team offering services in all areas of dentistry including implants, orthodontics, periodontics, prosthodontics and esthetic dentistry. Competitive wages and benefits. If interested in a full- or part-time position, please forward résumé by fax to **403-934-3362**.

STRATHMORE Dental hygienist required for part- or full-time position in an established family practice in Strathmore Alberta, 20 minutes east of Calgary. No evenings or weekends. Flexible hours/days. Qualifications Certified dental hygienist for the province of Alberta. Fax résumé to **403-901-0384** or phone **403-934-9681**.

ONTARIO

TORONTO Instructor in Dental Hygiene: Instructs assigned courses based on competency and quality; develops and utilizes instructional strategies; monitors, evaluates student attendance, progress and competency; submits related reports as required; maintains established office hours; prepares and grades class tests, assignments and examinations; assists with the arrangements for outside practical assignments; other responsibilities will be discussed at the interview. Visit **www.cdha.ca/members/content/career_centre/job_opportunities.asp** for more information. Contact Human Resources, Huron College of Mgmt., Tech. and Health Care , 175 Rexdale Blvd., Toronto ON, M9W 1P7. Fax: **416-913-6444;** e-mail: **apply@huroncollege.ca**

TORONTO Program Director, Dental Hygiene: Develops and utilizes a variety of instructional strategies, techniques and delivery methods designed to meet the individual learning styles of students; effectively handles student and patient issues; acts as liaison between College and all Dental regulatory bodies; other responsibilities will be discussed at the interview. Visit **www.cdha.ca/members/content/career_centre/job_opportunities.asp** for more information. Contact Human Resources, Huron College of Mgmt., Tech. and Health Care, 175 Rexdale Blvd., Toronto ON, M9W 1P7. Fax: **416-913-6444;** e-mail: **apply@huroncollege.ca**

UNIONVILLE Permanent part-time hygienist wanted for busy family and cosmetic dental practice. Please contact Patty: telephone, **905-479-7777**; fax, **905-479-7808;** e-mail, **patty@vitality dentistry.com**.

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COLDBROOK Wanted: dental hygienist with a dynamic personality to work in a team environment in a new modern building. Experience strongly preferrred. In addition to being a part of our great team, we offer: competitive salary, 3-4 day work week, registration fees, expanded duties, fixed working hours, CE allowance. Uniforms supplied. Comprehensive medical benefits. Please contact Caroline Archibald at **contact@parkstreet dental.net** or fax acceptable résumés to **902-678-1058**. No phone calls please. Website www.parkstreetdental.net.

INTERNATIONAL

SWITZERLAND Dental hygienists wanted in Switzerland, the heart of Europe. Wonderful opportunities for travelling, learning a new language, culture, etc. Very interesting salary and working conditions. Includes 4 wks min. paid vacation & 13th salary. Don't pass this up! Visitez notre site internet: **www.kanadent.ch**. E-mail: **kanadent@bluewin.ch**

CONTINUING EDUCATION

University of Manitoba, School of Dental Hygiene will be offering a Local Anesthesia Continuing Education Program for Licensed Dental Hygienists on May 4-6, 2007, at the Faculty of Dentistry. Self-study portion six weeks in advance. Registration deadline is April 2, 2007. 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**.

ISDH, TORONTO Get in on the action! Attend the International Symposium on Dental Hygiene (ISDH 2007), Toronto, Canada, July 19-21, 2007. Register today at **www.cdha.ca**.

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