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## Oral cancer and cultural factors in Asia
## Inequity and disparity in oral health–Part I

*Mentha*, 318

THE OFFICIAL JOURNAL OF THE CANADIAN DENTAL HYGIENISTS ASSOCIATION

# Our choices

*Life can provide us with many opportunities, and how we accept these is our choice.*

Wanda Fedora, RDH

I am honoured to have the opportunity to serve as the national president of the Canadian Dental Hygienists Association from October 2008 to October 2009. As I prepare for my term I am reminded of the lyrics in "A little less than the Angels", a song written by Bob Williston of Saskatoon, husband of dental hygienist Joan Williston. The closing line to the chorus had a profound effect on my personal life. I return to this song time and time again for inspiration. Bob ends the chorus with, "Be the person that God knows you are". A challenge to say the least, but knowing that you have that something special within you makes it easier to draw it out.

"Be the dental hygienist you know you are"—I paraphrase this wish for each of you. The sense of satisfaction and fulfillment that comes from achieving our best is the ultimate reward. The benefits are not limited to ourselves; our clients receive the best of care and caring, our colleagues will be inspired to be their best, and our profession will shine. Our profession is affected by our accomplishments, and we are affected by being dedicated members of our profession.

Whether we excel at touching others lives, reaching out, or teaching others, our quest for knowledge may lead to improved care for Canadians. Our ability to develop legislation and work with government could open doors of access to care. It is in the sharing of our abilities that we receive the benefits—as with any other gift.

We have a profession that allows us the luxury to be proud members, a legacy of our predecessors. Our continued growth as dental hygienists is the contribution we make to that profession. We are the profession; its future and reputation rest in our hands. How we go about being the dental hygienist we know we are defines our professional legacies to our successors.

My hope is that I can be the president I know I can be. The support of an incredible national Board of Directors, a dedicated staff led by an outstanding Executive Director, and the knowledge that I am one of you, a Canadian dental hygienist, give me the inspiration to do just that.

I look forward to opportunities to meet as many members as possible, and to work together to benefit the oral health of Canadians, as we strive to be the profession we know we are!

Wanda Fedora RDH.

CDHA welcomes your feedback: president@cdha.ca

# Nos choix

*La vie nous offre beaucoup de possibilités. À nous de faire notre choix.*

*Cette occasion que vous me donnez de servir à la présidence nationale de l'Association canadienne des hygiénistes dentaires du mois d'octobre 2008 au mois d'octobre 2009 est pour moi un honneur. En me préparant pour ce mandat, je me suis souvenue des paroles de* A little less than the Angels, *chanson de Bob Williston, de Saskatoon, époux de l'hygiéniste dentaire Joan Williston. La dernière ligne du refrain m'a profondément touchée et j'y reviens souvent pour m'en inspirer. Bob termine le refrain ainsi : «* Be the person that God knows you are *» (Sois la personne que Dieu sait que tu es). Un défi, c'est le moins qu'on puisse dire! Mais, savoir que l'on a ce quelque chose de particulier en soi en facilite l'expression.*

*« Sois l'hygiéniste dentaire que tu sais être »—C'est le souhait que je paraphrase pour chacune d'entre vous : le sentiment de satisfaction et d'accomplissement que nous éprouvons après avoir fourni le meilleur de nous-même. Nous ne sommes pas les seules à en bénéficier; nos clients reçoivent les soins les meilleurs et l'attention la plus grande, nos collègues s'en inspireront pour faire de leur mieux et notre profession rayonnera. Nos réalisations influent sur notre profession, et notre dévouement envers notre profession nous influence.*

*Que nous excellions à marquer la vie des autres, à les atteindre ou à leur enseigner, notre quête du savoir peut nous mener à améliorer nos soins à la population canadienne. Notre capacité d'élaborer de mesures législatives et de travailler avec le gouvernement pourrait ouvrir de nouvelles voies d'accès aux soins. C'est en les partageant que nous tirons avantage de nos capacités comme de tout autre don.*

*L'appartenance à notre profession est une source de fierté que nous avons héritée de nos prédécesseures. La poursuite de notre croissance en tant qu'hygiénistes dentaires est notre contribution à la profession. Et la profession, c'est nous; son avenir et sa réputation sont entre nos mains. Notre façon d'être l'hygiéniste dentaire que nous savons être définit l'héritage professionnel que nous laisserons à nos successeures.*

*J'espère être la présidente que je sais pouvoir être. Le soutien d'un fantastique conseil national d'administration, d'un personnel dévoué sous la direction d'une remarquable directrice générale, ainsi que l'assurance d'être l'une d'entre vous, une hygiéniste dentaire canadienne, m'inspirent d'être simplement cela.*

*Il me tarde de rencontrer le plus de membres possible et de travailler ensemble dans l'intérêt de la santé buccale de la population canadienne, unissant nos efforts pour former la profession que nous savons être.*

*L'ACHD accueille vos commentaires : president@cdha.ca*

## MASTHEAD




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Canada


# CONTENTS

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

## EVIDENCE FOR PRACTICE



## DEPARTMENTS



## INFORMATION

# If everyone thought the same, nothing would ever change

Susan Ziebarth,
BSC, MHA, CHE

The source of inspiration for my message this issue is a rather unusual one—it is an advertising campaign of HSBC,[1] displayed in our airports. Apart from featuring beautiful photography, the messages on the posters provide substantial food for thought for travellers. The campaign's theme, "Your point of view", is the perspective that my message is framed within. The campaign features sets of four posters, each set interchanging two images and two words. The set that caught my attention interplayed concepts of leader and follower with a tagline that forms the title of this message.[2] The advertisements explore the concepts of privacy and invasion, perfection and imperfection, work and play, art and science, chaos and order, to name just a few.

Okay, so what about this advertising has me taking your valuable time? Because the advertisements are relevant to what is transpiring in the dental hygiene world. In the past few years we have witnessed a number of substantial challenges to the profession across the country—regulatory changes including the expansion of self regulation, increased scopes of practice, and the ability to practice without supervision. The number of dental hygiene schools has increased as has the type of school as well as the duration of education. Now we are experiencing growth in the number of graduates, and a significant increase in the number of dental hygienists and in a number of alternative practice settings.

Can you visualize posters featuring a spa dental hygiene practice and a traditional office setting with various words under them? How about the plans for fifty dental hygiene clinics owned by dentists as noted in the *JCDA*[3]? Can you picture this type of dental hygiene clinic contrasted with a mobile dental hygiene practice? Were some of these forms of dental hygiene practices visualized by the majority of dental hygienists? Possibly not. How will some people view these changes? Negatively? Possibly. Positively? Possibly. Perhaps the key to adapting to the changes we are seeing is to consider that everyone has a unique point of view, and that you have the right to your point of view in the same way others have.

Adopting a perspective of respect for others points of view may become more even important for the profession in these exciting and creative times. One of the most exciting experiences I am able to participate in as the Executive Director is the stimulating debate and diverse points of view that CDHA members express. The CDHA Board honours these perspectives in setting the vision for and speaking on behalf of our over 14,000-strong membership. As the calendar year draws to a close and you begin to reflect on

…continued on page 312

CDHA welcomes your feedback: info@cdha.ca

# Si nous pensions toutes la même chose, jamais rien ne changerait

*Le présent message s'inspire d'une source plutôt inusitée—une campagne publicitaire de la banque HSBC dans nos aéroports.[1] Outre la magnifique photographie, les messages des affiches prêtent substantiellement matière à réflexion pour les gens qui voyagent. Le thème de la campagne, « Votre point de vue », chapeaute bien mon message. L'affiche comporte quatre illustrations où s'alternent deux images et deux mots. L'ensemble, qui a retenu mon attention, fait interagir un chef et un disciple et porte une inscription qui fait le titre du présent message.[2] La publicité explore les notions de vie privée et invasion, perfection et imperfection, travail et jeu, art et science, chaos et ordre, pour n'en mentionner que quelques-uns seulement.*

*D'accord, qu'en est-il de cette publicité qui m'incite à prendre de votre précieux temps ? Ces messages sont pertinents en regard de ce qui se passe dans le monde de l'hygiène dentaire. Nous avons en effet observé que la profession avait un certain nombre de défis importants à relever à travers le pays : nouvelles réglementations, notamment expansion de l'autorégulation, élargissement du cadre de pratique et capacité d'exercer sans supervision. Le nombre des écoles d'hygiène dentaire a augmenté tout comme les types d'école et la durée de la formation. Nous voyons maintenant s'accroître le nombre des nouvelles diplômées et augmenter considérablement le nombre des hygiénistes dentaires et celui des nouveaux types d'environnement professionnel.*

*Sauriez-vous visualiser des affiches présentant un service d'hygiène dentaire dans un spa et un aménagement traditionnel du milieu de travail avec divers mots en dessous ? Qu'en est-il des cinquante projets de cliniques dentaires possédées par des dentistes comme le note le* JADC *?[3] Pouvez-vous imaginer ce type de clinique d'hygiène dentaire en regard d'une clinique d'hygiène dentaire mobile ? Les hygiénistes dentaires ont-elles en majorité envisagé certaines de ces formes d'exercice de la profession ? Possiblement pas. Comment certaines voient-elles ces changements ? Négativement ? Possible. Positivement ? Possible. Il se peut aussi que, pour nous adapter aux changements envisagés, il nous faille d'abord penser que chacune a son propre point de vue et que vous avez personnellement le droit d'exprimer le vôtre comme toutes vos collègues.*

*Songer à respecter le point de vue des autres peut aussi devenir encore plus important pour la profession en ces palpitants moments de création. L'une des expériences les plus excitantes à laquelle je participe actuellement comme directrice générale, c'est le débat en cours et l'expression d'une variété des points de vue par les membres de l'ACHD. Le conseil d'administration respecte ces perspectives en énonçant la vision des 14 000 membres de l'ACHD et en parlant en leur nom. À l'approche de la fin de l'année du calendrier, au moment de réfléchir sur ce qu'aura été celle-ci, songez à ce que pourrait signifier pour vous*

*…suite page 312*

*L'ACHD accueille vos commentaires : info@cdha.ca*

# Oral cancer and cultural factors in Asia

Sherry L Priebe[*], DIPDH, BDSC(DH), RDH; Jolanta Aleksejūnienė[§], MSC, PHD, DDS; Shafik Dharamsi[‡], MSC, PHD, RDH; Christopher Zed[◊], BSC, MBA, DDS, GPR

## ABSTRACT

Oral cancer is on the rise worldwide, with over 200,000 cases diagnosed yearly. The predisposing social and cultural habits related to this disease acquired in resource-poor countries in Southeast Asia remain prevalent among its users following migration to other and better resourced countries. As a result, countries that once rarely experienced high levels of oral cancer will likely see an increased incidence of this disease. Therefore, oral health professionals need to be aware of the cultural risk factors and the resulting oral health effects in order to respond effectively to the increasing incidence of oral cancer. The objective of this overview is to inform what is known about populations from resource-poor countries in Asia in regards to oral cancer and its related cultural factors.

## RÉSUMÉ

Le cancer buccal prend de l'ampleur partout dans le monde; 200 000 cas y sont diagnostiqués annuellement. Les habitudes sociales et culturelles prédisposant à cette maladie acquise dans les pays du Sud-est asiatique qui n'ont pas les ressources suffisantes demeurent toujours prévalentes chez les personnes qui émigrent dans des pays qui ont plus de ressources. Il en résulte que les pays qui n'avaient pas auparavant de hauts taux de cancers buccaux verront probablement s'accroître l'incidence de la maladie. Afin de prévenir l'incidence croissante de la maladie, les professionnelles de la santé buccale doivent donc connaître ces facteurs de risque culturels qui contribuent à compromettre la santé buccale. Elles doivent aussi en connaître les effets sur la santé buccale afin de réagir efficacement à la hausse du taux des cancers buccaux. Cet article présente donc une vue d'ensemble de ce que l'on sait des populations des pays asiatiques qui n'ont pas les ressources suffisantes en ce qui concerne le cancer buccal et les facteurs culturels afférents.

**Key words:** oral cancer, cultural risk factors, resource-poor countries, tobacco, alcohol, betel quid

## INTRODUCTION

The social and cultural habits that may predispose people to oral cancer are common in resource-poor countries in Southeast Asia, and remain prevalent among its users following migration to other and better resourced countries. As a result, countries that once rarely experienced high levels of oral cancer will likely see a considerable increase of this disease. It has been suggested that following migration from these countries to North America, the habit has remained prevalent among this ethnic group.[1] Increasing the level of awareness among oral health professionals about oral cancer and its related cultural risk factors, as well as developing better early diagnosis are of key importance in addressing morbidity rates.[2]

Recognizing the need for increased oral health service, oral health prevention and rehabilitative treatment strategies, the faculty of dentistry at the University of British Columbia General Practice Residency program has established a collaborative international rotation in Vietnam. This international experience has been designed to broaden the scope of learning for dental postgraduate students to include an understanding of regional patterns of disease process, treatment modalities and cultural competency. The objective of the present overview is to describe the cultural risk factors associated with oral cancer in immigrant populations from resource-poor Southeast Asian countries with a particular focus on Vietnam.

## FACTS ABOUT ORAL CANCER

Oral cancer is a serious public health problem with over 200,000 new cases reported annually worldwide.[3] The overall mortality rate for oral cancer remains high at approximately 50 per cent and even with modern medical services is probably due to the diagnosis only at the advanced stage of this disease.[4] Oral cancer is responsible for more deaths than melanoma, Hodgkin's disease, or cervical cancer.[5] In most regions of the world, about 40 per cent of head and neck cancers are known to be oral squamous cell carcinoma originating in the oral cavity.[6] In South-Central Asia, 80 per cent of head and neck cancers are found in the oral cavity and oropharynx.[3] Oral squamous cell carcinoma comprises over 90 per cent of the malignancies beginning as inflammatory lesions such as leukoplakia, erythroplasia, and erythroleukoplakia.[7,8]

In 2002, two–thirds of the new cases and deaths occurring in the world due to oral cancer were observed in resource-poor countries.[9] Annual incidence rates for oral and pharyngeal cancer are estimated at 25 cases per 100,000 in resource-poor countries.[10] In Canada, oral cancer represents approximately 2.6 per cent of all cancers in males and 1.4 per cent in females.[11] In 2008, these cases are estimated as approximately 3,400 new cases and 1,150 deaths.[11] In the United States, the annual incidence rates for oral cancer are estimated at 10 cases per 100,000.[5] Approximately 60 per cent of people diagnosed with oral cancer will survive only up to five years.[5] It is important to emphasize that oral cancer is one of the few cancers whose survival rate has not improved over 30 years.[12] Moreover, in the past three decades there has been a 60 per cent in-

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crease in oral cancer in adults under the age of 40.[13] The diagnosis of oral cancer may be delayed because a clinician did not suspect the malignant nature of the lesion due in part to the limitations of visual and manual examination of the oral cavity, head and neck.[12,14,15] Studies that previously only involved the Southeast Asian traditional cultural and carcinogenic habit of betel quid chewing now reveal a worldwide phenomenon that is increasing at a disturbing rate.[8,16]

The recognized etiological agents and risk factors for oral cancer include tobacco use, frequent alcohol consumption, a compromised immune system, the use of areca nut, history of cancer, dietary habits and such less well-established factors as infection with certain types of human papilloma viruses.[17-21] Alarmingly, 25 per cent of newly diagnosed cases of oral cancer do not fit the high-risk profile.[22,23] It has been reported that rapid urbanization leading to an unhealthy lifestyle, such as increased access to and utilization of tobacco in its various forms as well as abuse of alcohol, leads to an increase in the incidence of oral precancer and cancer.[10]

Tobacco use in all its forms is first on the list of risk factors of oral cancer with at least 75 per cent of those diagnosed with oral cancer being tobacco users.[6,10,11,24-27] When tobacco use is combined with frequent alcohol consumption, the risk increases substantially as these two risk factors act synergistically exacerbating each other's harmful effects.[6,10,25-27]

Oral cancers are more common in parts of the world where areca nut with or without tobacco is chewed. The International Agency for Research on Cancer has classified betel quid without tobacco as a human carcinogen.[6] Consequently, the use of areca nut in any form is not safe for oral health. The commercially manufactured forms of areca nut with additives such as sugar have even more oral health related risks.

### Oral cancer in Asia

Oral cancer accounts for up to 40 per cent of all malignancies in Southeast Asia.[28] In Vietnam, 19.80 per cent of all malignant neoplasms are diagnosed as oral cancer.[18] In India, the incidence of oral cancer in women is 3-7 times higher than in resource-rich countries, and smoking and chewing of tobacco betel quid are identified as risk factors.[29] In most regions of India, oral cancer is the most common cancer in men and the third most common cancer in women.[30] Information emerging from Taiwan and China indicates that the incidence of oral cancer in men has tripled since the 1980s due to the chewing of betel quid.[10] Tobacco generally is not added to betel quid in these regions.

### Oral cancer in Vietnam

Vietnam is a resource-poor country with numerous challenges. Oral health care in Vietnam is aggravated by poverty, lack of health education, and lack of government funding and policies to provide a sufficient number of oral health care workers.[31] The practice of seeing the dentist for a regular dental examination is traditionally not a major priority for many Vietnamese. It is no surprise that oral cancer ranks seventh of all cancers in Vietnam—the ratio of males to females was 1:1.5 in 1993 compared with a ratio of 1.3:1 in 2001.[18]

Oral malignancies are often not being detected until individuals experience debilitating circumstances to normal oral function. The need for assessment of the imminent oral health problems and their contributing factors in Ho Chi Minh City has been realized. As many as 26 cases in 1000 patients admitted daily to the HCMC Oncology Hospital are diagnosed with advanced oral cancer due to tobacco use and inadequate diet. Consequently, these patients become immuno-compromised with considerably increased secondary risk of oral diseases and oral infections. Moreover, oral cancer is a possible result of cultural, socio-economic and behavioural factors such as limited access to oral health care leading to a diagnosis only at the advanced stages of a disease, inadequate information about oral health and proper nutrition, and the lack of funds and awareness about risk factors such as tobacco use, frequent alcohol use, and the use of betel quid.

In 2000, 4.1 per cent of Vietnamese women chewed areca nut or betel quid.[18] The largest proportions of areca nut chewers are found in the two age groups of 55-64 years (19.70%), and of 65-75 years (8.39%).[18] Precancerous and cancerous lesions found in females comprise 3.51 per cent of 11.49 per cent of oral mucosal lesions in South Vietnam including submucosal fibrosis, pink and white lesions, and oral mucosal lesions of betel quid use.[18] Submucosal fibrosis in betel quid chewers was found to be 124 times higher compared with non betel quid chewers.[18]

## BEHAVIOURAL AND CULTURAL HABITS RELATED TO THE RISK OF ORAL CANCER

### Tobacco use worldwide

The association between smoking and oral carcinoma has been firmly established from epidemiologic studies, revealing more than twice as many smokers among oral cancer patients as among non smokers.[15] Worldwide, four million people die each year from tobacco related diseases and that number is expected to rise to 8.5 million a year by 2020.[9] Smokers are six times more likely to develop oral cancer than those who do not smoke.[32] Approximately 80 per cent of the world's smokers live in resource-poor countries such as Vietnam where smoking rates have risen dramatically in the past few decades.[9]

### Tobacco use in Vietnam

Worldwide, Vietnam has the highest rate of smoking among males (63.4%). The prevalence of this unhealthy lifestyle is reported to a lesser extent among women (20%).[18] However, smoking rates in Vietnamese women may be underestimated because it is not culturally acceptable for women to smoke. Smoking by youth and women is on the rise.[33] Vietnamese who are both smokers and drinkers, or who are both smokers and betel quid chewers, have 2-3 times higher risk of contracting oral precancerous and cancerous lesions compared with those who only smoke.[18]

### Alcohol use worldwide

Alcohol abuse, defined as more than twenty-one standard drinks in one week, ranks second in risk factors for

the development of oral cancer.[34-36] Canadian recommendations are not to exceed more than two standard drinks per day, one standard drink being 13.6 grams of alcohol. Further recommendations are not to exceed more than nine drinks per week for women and not to exceed more than fourteen drinks for men.[34-36] Excessive alcohol consumption is related to oral cancer which is six times more common in drinkers than in non drinkers.[32]

Alcohol's effect on the mouth may be the key to understanding how it works with tobacco to increase the risk of developing cancer. The dehydrating effect of alcohol on cell walls enhances the ability of tobacco carcinogens to permeate mouth tissues.[37] Another hazardous influence of alcohol is that its excessive consumption leads to nutritional deficiencies which in turn can lower the body's natural ability to use antioxidants to prevent the formation of cancers.[36,38] Tobacco use has been proven to increase the risk of oral cancer, consequently people who use both alcohol and tobacco are at an especially high risk of contracting the disease. The combined effects of tobacco and alcohol are illustrated in a study of over 350 individuals who had oral cancer and their mortality rate was 31 per cent in 5 years.[39]

**Alcohol use in Vietnam**

In December 2006, Vietnamese Deputy Minister of Health Le Ngoc Trong expressed that excessive alcohol consumption had reached alarming proportions with serious consequences for the health and safety of the public.[40] Vietnamese males commonly consume 0.5-1.5 litres of alcohol daily. Apart from individual suffering, alcohol abuse hampers national development and economic growth. According to the Vietnamese Health Strategy and Policy Institute, the cost of dealing with the consequences of excessive consumption of alcohol typically accounts for 2%-8% of national gross domestic product.[40]

Research suggests that Vietnamese youth (15-20 years old) are consuming more alcohol, and at younger ages. Of 480 surveyed youth, 30 per cent had consumed alcohol and approximately 20 per cent of young men, and to a lesser extent young women, reported intoxication in a six-month period.[41] As oral cancer is being seen in younger populations in both resource-rich and resource-poor countries, more awareness and better communication with the public as well as with oral health and medical professionals about the detrimental effects of alcohol use in younger populations and the associated oral health risk is necessary.[36]

**Areca nut and betel quid use worldwide**

The areca nut is used as a chewing substance by approximately 600 million people worldwide.[42] Betel quid is a mixture of areca nut (from the areca tree) and slaked lime (calcium hydroxide) wrapped within a betel leaf (from the Piper betel vine) although this mix varies in individuals and communities to include tobacco, various spices, sugar and chemicals.[16] Betel quid is placed in the cheek of the mouth where it is chewed slowly. An estimation of 10%-20% of the world's population chew areca nut in some form, often mixed in betel quid with or without tobacco.[43] Betel quid chewing is a social and cultural practice for its stimulant effects, and it is thought to diminish hunger and to sweeten the breath. The usage of areca nut is indigenous to India, Sri Lanka, Maldives, Bangladesh, Myanmar, Taiwan and numerous islands in the South Pacific.[43] The habit is popular in parts of Thailand, Indonesia, Malaysia, Cambodia, Vietnam, Philippines, Laos, China and in migrant communities from these countries.[43] The chewing practice of betel quid dates back thousands of years and is deeply entrenched in the culture of the population in several parts of Southeast Asia.[43] Both men and women of all ages in many countries, including children, chew areca nut.[43]

In communities throughout Southeast Asia, oral cancer including oral squamous cell carcinoma has been predominantly related to traditional areca nut use.[16] In Southeast Asian countries, and specifically in the countries of Taiwan, India and China, a steep rise in oropharyngeal cancers has been observed since the early 1970s.[16] Betel quid chewing worldwide is a known risk factor for oral leukoplakia, oral submucous fibrosis, and oral squamous cell carcinoma.[1,16,26,44,45] The World Health Organization (WHO) has reported the use of betel quid as a widespread global risk habit that has spread due to increased migration of Asian communities to all continents resulting in an increase in oral cancers around the globe.[16] A review of the approximately 1.5 million cancer deaths in England and Wales from the years 1973-1985 shows that Indian-born men had over two times, and Indian-born women over five times, greater risks of oral cancer mortality than native English and Welsh individuals.[46] Consequently, public health concern of a worldwide epidemic of oral cancer relates to the use of betel quid and its substitutes by an increasing number of young adolescents.[46]

**Areca nut and betel quid use in Vietnam**

Evidently, betel quid chewing has cultural and traditional social significance particularly among elderly Vietnamese women. There is a common saying in Vietnamese social circles "the betel begins the conversation".[47] The traditional wedding gift from a groom to the bride's mother is an assortment of areca nut, betel leaf, slaked lime, tobacco, and additives such as the bark of the areca nut tree, peel of the areca nut, and the pomello fruit peel, even if betel quid chewing is not practised. Based on a folk tale, the betel leaf and areca nut are important symbols of love and marriage and the phrase "matters of betel and areca" (*chuyện trầu cau*) is synonymous with marriage.[47]

In Vietnam, only the women are known to chew betel quid; although in a recent research study[48] one man was identified as chewing betel quid for thirty-five years. Chewing areca nut is believed by Vietnamese to strengthen the teeth and keep the gums healthy. The teeth become heavily stained from this nut as well as from the practice of "tobacco rubbing" and "tobacco sticking". Tobacco rubbing and sticking is accomplished by rubbing a small ball of raw dried tobacco over the gingiva on the anterior teeth and buccal mucosa and then sticking the tobacco ball in the cheek vestibule with the areca nut. When chewed, the areca nut creates a red juice that dyes the lips and stains the teeth dark brown. The red dye that leaks on the lips of women is traditionally considered to be attractive to men. Today in Vietnam, there is an increasing social stigma as-

sociated with this habit among younger women who refer to this habit as being for elderly women only.

## LACK OF ORAL HEALTH AWARENESS IN RESOURCE-POOR COUNTRIES

Awareness is virtually non-existent in resource-poor countries particularly about oral health risk factors such as sugar consumption, tobacco use, frequent alcohol consumption, betel quid chewing, stress, and inadequate information about health and diet. The trend of the increasing flow of rural to urban migration compounds the problems of the urban poor population including increased oral health treatment needs. This pattern has evolved over the past twenty years, and it is likely to become more the norm than the exception.[49]

The changing socio-economic situation in some countries may have a strong negative association with oral health.[50] For example, a report in the Vietnamese S*unday Morning Post* by the Columbia University's Earth Institute states, "Cheap food, cigarettes and city life are causing millions of early deaths in the developing world… as populations increase in cities. The tobacco scourge, now at epidemic levels in less developed countries, exacts its tolls in many ways… ."[51] The increased incidence of oral cancer is associated with rising affluence which relates to the potential increase in exposure to additional amounts of tobacco and alcohol.[50] As a possible result, rising oral cancer statistics worldwide appear to be a reflection of the currently increasing urbanization and increasing affluence.[50,51]

### Oral health awareness in Vietnam

Medical surgeons and oncologists in southern Vietnam are concerned about oral health education for patients as well as for doctors. The low level of health literacy of oral cancer patients has been related to extreme patient load, lack of time for health care professionals and lack of human resources. People are frightened and confused about their disease perceiving oral cancer as a contagious disease. Therefore, a multidisciplinary approach to oral health care of cancer patients is required.[52,53] Access to public oral health care education is part of that approach. Many concepts of this education have unclear boundaries between access and demand, between health status and health care and between perceived individual need and social responsibility.[54] Vietnam has a Cancer Prevention Program as well as a National Oral Health Promotion Program, yet there is a lack of patients' knowledge of their oral disease. The WHO Basic Package of Oral Care (BPOC) is an example of proven effectiveness and is acceptable, feasible and affordable for most disadvantaged communities to improve their oral health care.[55] The three components of BPOC are oral urgent treatment, affordable fluoride toothpaste, and atraumatic restorative treatment (ART).[55]

## WORLDWIDE ORAL CANCER EDUCATION

An awareness of creating a healthy lifestyle and behaviour to prevent oral cancer is dependent on changes in both lifestyle and cultural values. This change can be accomplished through a well planned preventive oral health education based on in-depth understanding of community needs and their specific characteristics, people's habits and self perceived oral health problems and needs as well as good use of the existing infrastructures.[55] Various non government organizations have contributed to the oral health education of resource-poor countries worldwide. For example, Path Canada is a non profit organization that has greatly advanced the education of the Vietnamese authorities and public in general about the hazardous effects of tobacco use. It is also important to consider that tobacco use and frequent alcohol consumption thrives and competes against basic human needs.[56] Through this project, a unique opportunity exists in Vietnam to study the association of intra-household tobacco use expenditures and their impact on child health and poverty.[56] Furthermore, the association of betel quid use with the increase of precancerous conditions and oral cancerous lesions highlights the importance of education not only on tobacco cessation and less alcohol consumption but also on betel quid cessation.

It can be concluded that an active preventive educational approach is required to curb the rising increase in oral cancer due to culturally related risk habits especially in Asia and within Asian immigrant populations around the world.

## REFERENCES


1. Avon SL. Oral mucosal lesions associated with use of quid. *J Can Dent Assoc*. 2004;70(4):244-48.
2. DiMatteo AM. Cancer: Your responsibility. *Inside Dentistry*. 2007;3(1):47-61.
3. Parkin DM, Pisani P, Ferlay J. Estimates of the worldwide incidence of 25 major cancers in 1990. *Int J Cancer*. 1999;80(6):827-41.
4. Pisani P, Parkin DM, Bray F, Ferlay J. Estimates of the worldwide mortality from 25 cancers in 1990. *Int J Cancer*. 1999;83(1):18-29.
5. Jemal A, Tiwari RC, Murray T, Ghafoor A, Samuels A, Ward E, et al. Cancer statistics, 2004. *CA Cancer J Clin*. 2004;54(1):8-29.
6. International Agency for Research on Cancer (IARC). *Tobacco Habits Other Than Smoking: Betel-Quid and Areca-Nut Chewing and Some Related Nitrosamines*. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. [37].1985. Lyon, France, IARC.
7. Silverman S Jr, Gorsky M, Lozada F. Oral leukoplakia and malignant transformation. A follow-up study of 257 patients. *Cancer*. 1984;53(3):563-68.
8. Silverman S Jr. Demographics and occurrence of oral and pharyngeal cancers. The outcomes, the trends, the challenge. *J Am Dent Assoc*. 2001;132 Suppl:7S-11S.
9. Parkin DM, Bray F, Ferlay J, Pisani P. Global cancer statistics, 2002. *CA Cancer J Clin*. 2005;55(2):74-108.
10. World Health Organization. *Oral Health*. WHO 2001 July 18 [cited 2008 Jun 27]. Available from: http://www.afro.who.int/oralhealth/epidemiology.html
11. Canadian Cancer Society/National Cancer Institute of Canada. *Canadian Cancer Statistics 2008*. [cited 2008 Jul 3]. Available from: http://www.cancer.ca/vgn/images/portal/cit_86751114/10/34/614137951cw_library_WYNTK_Bladder_Punjabi2005.pdf
12. Lane PM, Gilhuly T, Whitehead P, Zeng H, Poh CF, Ng S, et al. Simple device for the direct visualization of oral-cavity tissue fluorescence. *J Biomed Opt*. 2006;11(2):024006.
13. Myers JN, Elkins T, Roberts D, Byers RM. Squamous cell carcinoma of the tongue in young adults: increasing incidence and factors that predict treatment outcomes. *Otolaryngol Head Neck Surg*. 2000;122(1):44-51.
14. Evans CA, Kleinman DV. The Surgeon General's report on America's oral health: opportunities for the dental profession.

*J Am Dent Assoc*. 2000;131(12):1721-728.
15. Silverman S Jr. *Oral Cancer*. 5th edition. Hamilton, BC Decker Inc. 2003;1-128.
16. *Betel-Quid and Areca-Chewing Carcinogenic to Humans*. WHO/IARC Monographs. WHO Media News Release 2003 July 8 [cited 2004 Nov 7]. Available from: http://www.who.int/mediacentre/news/releases/2003/priarc/en
17. Edwards BK, Howe HL, Ries LA, Thun MJ, Rosenberg HM, Yancik R, et al. Annual report to the nation on the status of cancer, 1973-1999, featuring implications of age and aging on U.S. cancer burden. *Cancer.* 2002;94(10):2766-792.
18. Khanh N. *Oral Lesions in Vietnam*. Unpublished report: Thesis. Ho Chi Minh City, Vietnam: 2000.
19. Miller CS, Johnstone BM. Human papillomavirus as a risk factor for oral squamous cell carcinoma: a meta-analysis, 1982-1997. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2001;91(6):622-35.
20. Shillitoe EJ, Greenspan D, Greenspan JS, Silverman S Jr. Five-year survival of patients with oral cancer and its association with antibody to herpes simplex virus. *Cancer*. 1986;58(10):2256-259.
21. Shillitoe EJ, Gilchrist E, Pellenz C, Murrah V. Effects of herpes simplex virus on human oral cancer cells, and potential use of mutant viruses in therapy of oral cancer. *Oral Oncol*. 1999;35(3):326-32.
22. Lingen M, Sturgis EM, Kies MS. Squamous cell carcinoma of the head and neck in nonsmokers: clinical and biologic characteristics and implications for management. *Curr Opin Oncol*. 2001;13(3):176-82.
23. Schantz SP, Yu GP. Head and neck cancer incidence trends in young Americans, 1973-1997, with a special analysis for tongue cancer. *Arch Otolaryngol Head Neck Surg*. 2002;128(3):268-74.
24. Forastiere A, Koch W, Trotti A, Sidransky D. Head and neck cancer. *N Engl J Med*. 2001;345(26):1890-900.
25. Koch WM, Lango M, Sewell D, Zahurak M, Sidransky D. Head and neck cancer in nonsmokers: a distinct clinical and molecular entity. *Laryngoscope*. 1999;109(10):1544-551.
26. Lee CH, Ko YC, Huang HL, Chao YY, Tsai CC, Shieh TY, et al. The precancer risk of betel quid chewing, tobacco use and alcohol consumption in oral leukoplakia and oral submucous fibrosis in southern Taiwan. *Br J Cancer*. 2003;88(3):366-72.
27. Walker DM, Boey G, McDonald LA. The pathology of oral cancer. *Pathology*. 2003;35(5):376-83.
28. Cox S. Oral cancer in Australia--risk factors and disease distribution. *Ann R Australas Coll Dent Surg*. 2000;15:261-63.
29. Stanley K, Stjernsward J, Koroltchouk V. Women and cancer. *World Health Stat Q*. 1987;40(3):267-78.
30. Sturgis EM. A review of social and behavioral efforts at oral cancer preventions in India. *Head Neck*. 2004;26(11):937-44.
31. Pack AR. Dental services and needs in developing countries. *Int Dent J*. 1998;48(Suppl 1):239-47.
32. Znaor A, Brennan P, Gajalakshmi V, Mathew A, Shanta V, Varghese C, et al. Independent and combined effects of tobacco smoking, chewing and alcohol drinking on the risk of oral, pharyngeal and esophageal cancers in Indian men. *Int J Cancer*. 2003;105(5):681-86.
33. Jenkins CN, Dai PX, Ngoc DH, Kinh HV, Hoang TT, Bales S, et al. Tobacco use in Vietnam. Prevalence, predictors, and the role of the transnational tobacco corporations. *JAMA*. 1997;277(21):1726-731.
34. Centre for Addiction and Mental Health. *Low-Risk Drinking Guidelines*. 2008 March 13 [cited 2008 Jul 3]. Available from: http://www.camh.net/About_Addiction_Mental_Health/Drug_and_Addiction_Information/low_risk_drinking_guidelines.html
35. University of Toronto and the Centre for Addiction and Mental Health. *Maximize Life, Minimize Risk. LRDG/The Guidelines*. 2008 Jun 9 [cited 2008 Jul 3]. Available from: http://www.lrdg.net/guidelines.html
36. Oral Cancer Foundation. *Oral Cancer Facts*. 2006 Nov 13 [cited 2008 Feb 7]. Available from: www.oralcancerfoundation.org/facts/index.htm
37. Garro AJ, Lieber CS. Alcohol and cancer. *Annu Rev Pharmacol Toxicol*. 1990;30:219-49.
38. Lewis S, Campbell S, Proudfoot E. *Alcohol as a Cause of Cancer*. May 2008. Cancer Institute NSW Monograph [cited 2008 Jul 3]. Available from: http://www.cancerinstitute.org.au/cancer_inst/publications/pdfs/pm-2008-03_alcohol-as-a-cause-of-cancer.pdf
39. Mashberg A, Garfinkel L, Harris S. Alcohol as a primary risk factor in oral squamous carcinoma. *CA Cancer J Clin*. 1981;31(3):146-55.
40. VietnamNet Bridge. *Experts discuss curbing alcohol abuse*. 2006 Dec 13 [cited 2007 Feb 2]. Available from: http://english.vietnamnet.vn/social/2006/12/643633/
41. Kaljee LM, Genberg BL, Minh TT, Tho LH, Thoa LT, Stanton B. Alcohol use and HIV risk behaviors among rural adolescents in Khanh Hoa Province Viet Nam. *Health Educ Res*. 2005;20(1):71-80.
42. Nelson BS, Heischober B. Betel nut: a common drug used by naturalized citizens from India, Far East Asia, and the South Pacific Islands. *Ann Emerg Med*. 1999;34(2):238-43.
43. Gupta PC, Warnakulasuriya S. Global epidemiology of areca nut usage. *Addict Biol*. 2002;7(1):77-83.
44. Nair U, Bartsch H, Nair J. Alert for an epidemic of oral cancer due to use of the betel quid substitutes gutkha and pan masala: a review of agents and causative mechanisms. *Mutagenesis*. 2004;19(4):251-62.
45. Yoganathan P. Betel chewing creeps into the New World. *N Z Dent J*. 2002;98(432):40-5.
46. Swerdlow AJ, Marmot MG, Grulich AE, Head J. Cancer mortality in Indian and British ethnic immigrants from the Indian subcontinent to England and Wales. *Br J Cancer*. 1995;72(5):1312-319.
47. Betel. In *Encyclopædia Britannica* Online. [cited 2008 Aug 13] . Available from: www.britannica.com/EBchecked/topic/63367/betel
48. Trân T K Cuc, Nguyên T B Ngoc, Nguyên T Hong, Priebe S. *Betel chewing and oral mucosal lesions in Vietnamese population sample*. Proceedings, Oral Cancer in the Asia Pacific – A Regional Update and Networking. Kuala Lampur: Faculty of Dentistry, University of Malaysia, 17-19 February 2006: 71.
49. Maupome G. An introspective qualitative report on dietary patterns and elevated levels of dental decay in a deprived urban population in northern Mexico *ASDC J Dent Child*. 1998 Jul-Aug;65(4):276-85. Erratum in: *ASDC J Dent Child* 1998 Nov-Dec;65(6):437.
50. Hobdell MH. Economic globalization and oral health. *Oral Dis*. 2001;7(3):137-43.
51. Columbia University's Earth Institute. *Heart Disease Now Major Global Threat*. 24 April 2004 [cited 2008 Jun 2]. Available from: http://preventdisease.com/news/articles/heart_disease_major_global_threat.shtml
52. Bruce SD. Radiation-induced xerostomia: how dry is your patient? *Clin J Oncol Nurs*. 2004;8(1):61-7.
53. Huang HY, Wilkie DJ, Schubert MM, Ting LL. Symptom Profile of Nasopharyngeal Cancer Patients during Radiation Therapy. *Cancer Practice*. 2000;8(6):274-81.
54. Maupome G, Hann HJ, Ray JM. Is there a sound basis for deciding how many dentists should be trained to meet the dental needs of the Canadian population? Systematic review of literature (1968-1999). *J Can Dent Assoc*. 2001 Feb;67(2):87-91.
55. Frencken JE, Holgrem CJ, van Palenstein WH. *Basic Package of Oral Care*. 2002. Nijmegen, WHO Collaborating Centre. [Cited 2008 Jul 7]. Available from: www.whocc-nijmegem.com
56. The International Development Research Centre. *The Economics of Tobaccco Use in Vietnam: Tobacco Expenditures and Their Opportunity Cost*. 1 May 2004 [cited 2008 Feb 2]. Available from: http://archive.idrc.ca/ritc/path-canada.html

# Inequity and disparity in oral health–Part I: A review of oral health status measures

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## ABSTRACT

While overall, the oral health of Canadians has improved according to several outcome measures, on closer inspection a widening gap exists between those with the highest oral health status and those who are the least healthy orally. This is largely due to the socio-economically advantaged having substantial improvements in their oral health status while the less advantaged are not realizing similar gains. The resulting disparities are not unique to oral health, and are also evident in general health. The reasons for the polarization in oral health status are complex and require sophisticated, multidimensional strategies to mitigate them.

This paper provides an overview summarizing the literature about various oral health status measures and will begin to illustrate the oral health disparities that exist in several sub population groups of Canadians. Both traditional clinical oral health measures, and the more subjective psychosocial measures are included in the review. The former measures include dental care utilization rates, caries experience, periodontal measures, tooth loss and oral lesions, while the latter measures include quality of life and oral satisfaction measures.

While this review focuses on the various measures used to assess oral health, it will introduce such population groups as First Nations, new Canadians, seniors, socio-economically disadvantaged, remotely located and institutionalized that collectively demonstrate lower oral health status than less marginalized Canadians. The status quo in oral health care delivery has benefited many Canadians, but it has left a significant proportion without comprehensive care, and subsequent poorer oral health.

Part II of this paper, to be published later, will describe the various exposure variables operating as contributing factors and causal forces for the outcome measures described here. This subsequent review will also provide an exploration into potential impact the dental hygiene profession could make in assuaging these disparities.

## RÉSUMÉ

Alors que, dans l'ensemble, la santé buccale de la population canadienne s'est améliorée selon plusieurs mesures des résultats, si l'on y regarde de plus près, l'écart s'accroît entre les gens qui ont la meilleure santé buccale et ceux dont la santé buccale est la plus faible. Cela est en partie attribuable au fait que les mieux nantis socialement et économiquement améliorent substantiellement leur santé buccale alors que les moins nantis sont loin d'en faire autant. La disparité qui s'ensuit ne touche pas uniquement la santé buccale mais aussi la santé en général. Les raisons de cette polarisation sont complexes et cela demande des stratégies sophistiquées et multidimensionnelles pour les réduire.

Le présent article dresse donc un aperçu de la littérature sur les diverses mesures de l'état de santé buccale et aborde une illustration des disparités entre plusieurs sous-groupes de la population canadienne. La revue comprend les mesures traditionnelles et cliniques de l'état de santé buccale et les mesures psychosociales qui sont plus subjectives. Les premières comprennent les taux d'application des soins dentaires, l'expérience de la carie, la santé parodontale, la perte des dents et les lésions buccales, alors que les secondes portent sur la qualité de vie et la satisfaction de l'état de santé buccale.

Alors que la revue se concentre sur les diverses mesures d'évaluation, l'article présente des groupes de population comme les Premières Nations, les néo-canadiens, les personnes âgées, les personnes défavorisées socialement et économiquement, les gens qui vivent en régions éloignées ou en institution, lesquels démontrent une moins bonne santé buccale que les plus favorisés. Beaucoup de Canadiens et de Canadiennes ont bénéficié de la prestation soutenue des soins buccaux, mais une importante partie de la population demeure sans soins complets et a en conséquence une moins bonne santé buccale.

La deuxième partie de l'article, à venir, traitera des variables des risques auxquels nous sommes exposés et qui agissent comme facteurs et forces causales de la mesure des résultats décrits ici. Elle examinera subséquemment l'impact que pourrait exercer la profession d'hygiéniste dentaire sur la réduction de ces disparités.


**Key words:** oral health, inequities, disparities, dental hygiene, care

## INTRODUCTION

The oral health status of Canadians varies across the population with less advantaged population groups displaying lower oral health status than others.[1,2] This variation among groups is a result of numerous forces including inequities in oral health care delivery. This phenomenon is not new, but disparities in oral health status have become increasingly glaring.[3]

The philosophy of Canada's health care system denounces inequities in health care, and yet inequities persist in oral health care, which has largely embraced a free market economical structure in its delivery. Because of the lack of structures that support access to care, the current system of oral health care delivery virtually ensures a marked polarization in oral health status between the most advantaged and most disadvantaged population groups. For those that believe oral health is part of overall health, the dichotomy between the two population groups creates a tension.

In response to this discord, many oral health researchers and professional groups have suggested a reorientation of oral health care delivery. Dental hygiene through its national professional organization, Canadian Dental Hygienists Association (CDHA), has publicly identified its view of the failure of the oral health system and has positioned itself against the inequitable distribution of oral health care.[4] Further to CDHA's critical stance has been its assertion that the dental hygjene profession has great potential to make an impact on oral health inequities

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but has largely been prevented due to structural factors primarily surrounding restrictive legislation and funding mechanisms.[4] These factors, which will be discussed in Part II of this paper, prevent the public from directly accessing dental hygiene care and perpetuate a reliance on the traditional model of oral health care delivery. Removal of such restrictions would allow dental hygiene practitioners to provide primary care in alternative settings, thus promoting access and attenuating the widening disparities in the oral health status of Canadians.[4,5]

The aim of Part I of this paper is to provide a summary of the literature about various oral health status measures. Through this orientation to oral health measures, the reader will be introduced to oral health disparities existing in Canadian sub-population groups.

**Materials and Methods**

A literature search was conducted of the MedLine data base from 1963 to September 2008, and Google Scholar using the following key words and their combinations: oral health, status, inequities, disparities, dental hygiene, care, Canadian. Of the articles generated by the initial search, based on titles and abstracts, sixty-five were retrieved in full text. Additional papers were located utilizing these references and also searching key authors in this field of inquiry. This search is not to be considered exhaustive.

**Results**

*Background*

Universal health care has not lost its relevance to global society as it is still high on the policy agenda for many developed nations.[6] In Canada, support for universality and the provision of equitable and accessible basic health care services continues to be favoured.[3] Where the discourse gets confusing is in what is considered "basic", and whether oral health care falls within this realm.[6] As researchers continue to uncover more of the web of factors that contribute to morbidity and mortality, expectations surrounding quality of life and broader conceptualizations of health develop further. Recent perceptions on health care have become more comprehensive,[6] and support for the inclusion of previously excluded services, including oral health care have increased.

The dental profession has been described as being at a crossroads, determining what theoretical underpinning will guide its practice in the next decades.[6] While it appears that dental care in Canada and the US is increasingly based on a neo-liberalist standpoint with the free market economy guiding practice, in an alternate view such as that of the Canadian health care system, dentistry and oral health care are founded on "contractarianism"[6] where inevitable social inequalities are managed fairly with basic needs more equitably distributed across the population. Dharamsi[6] describes this latter scenario being closely related to "distributive justice" where, on moral grounds, the allocation of resources is socially justified while ensuring that providers are fairly compensated and that the population receives a "reasonable" share of services.

The philosophical perspective that grounds professional practice is important because it influences the stance it takes with government and others in helping shape public policy. Dentistry may appear to display some philosophical confusion between its moral values to society on the one hand and its commercial values of practice on the other.[6] CDHA has made its ideology clear in stating on its web site, "The CDHA is dedicated to the principle that all Canadians should have access to quality preventive oral health services provided by dental hygienists. The CDHA seeks input from and dialogue with government and consumers to enable it to serve more effectively both its members and the Canadian public."[7]

Given organized dental hygiene's philosophical position, it is essential to clarify the status of Canadians' oral health and what (if any) inequities have contributed to it. While the literature about inequalities in health care distribution and outcomes is not extensive, it does provide compelling evidence that less advantaged groups have poorer oral health outcomes.[1-3] While no agency in Canada is obligated to report oral health inequities,[3] it is becoming apparent that oral health disparities are becoming increasingly pronounced, meaning that the gap between the oral health of the most and least advantaged Canadians is widening.[3,8] This is disappointing, and possibly surprising, to many Canadians who enjoy at least satisfactory oral health, and are unaware of the many sub-population groups that have been unable to access care and have been left vulnerable to unmet needs and subsequent poor oral health.[8-10]

While determining a clear picture of the current burden of oral illness is essential,[11] Leake[3] reports that the Canadian public health system has not adequately measured the population's oral health, and that there is lack of adequate surveillance systems consistent with international standards.[3] The need to collect data on the oral health of Canadians has been raised by such groups as CDHA[7] and the Federal/Provincial/Territorial Dental Working Group (FPTDWG).[12] The last national survey was conducted in the early 1970s; thus, current information regarding Canada's oral health status and trends are lacking.[13] The development of a Canadian Health Measures Survey sampling 5000 Canadian children and adults addresses this lack. The survey is targetted for implementation in 2010 and includes several oral health measures.[14]

## ORAL HEALTH STATUS MEASURES

While traditional methods of measuring oral health status have relied on clinical or biophysical measures such as caries measures, and tend to be more unidimensional, recent emphasis has focused on psychosocial models, such as oral health satisfaction.[10,11,15] These more recent measures are in alignment with contemporary ideas about health and are typically used to supplement clinical outcome measures.[10,11,15]

Interestingly, only some associations were found between clinical indicators and more subjective oral health scales.[11] Locker explains the lack of agreement in that psychosocial measures are influenced by individual experience and functional variables.[11] Based on the World Health Organization's (WHO) generic model, Locker developed a conceptual framework of oral health that utilizes not only biophysical impacts and social concerns, but also such intermediate influences as functional limitations, pain or disability.[11] Clearly, contemporary ideas for describing oral

health status require a balance of both objective, clinical, and subjective psychosocial measures.

**Objective oral health status measures**

Objective oral health clinical measures for instance, caries, periodontitis, edentulousness, and prosthetics, have been measured the most extensively, and these will each be discussed in turn. Utilization rates or dental visits, as an oral health status measure, have also been used in that they are seen to relate directly to access. However this relationship requires the assumption that greater utilization is equivalent to oral health improvements. Thus, care is commensurate with need.[9,16] However, in fee-for-service environments, considerable variance occurs as a result of various influences including inappropriate provision of care (over-use), and these implications must be considered when examining utilization rates.

In the least advantaged groups there does appear to be value to measuring utilization rates. Leake[3] reports that socio-economic status effects dental visiting, and those needing care the most are least likely to receive it. This phenomenon, termed the "inverse care law",[3] has been demonstrated with the elderly and other such disadvantaged groups as the poor, medically compromised, less educated, institutionalized and ethnic minorities.[17,18] Lower rates of utilization have been associated with high caries rates in elderly populations.[9] Conversely, long term care residents who regularly use oral health services have been shown to have superior oral health than their contemporaries who do not use similar services.[19] The type of utilization is also important; for example, accessing care only when in pain versus care for prevention or maintenance is associated with higher levels of disease, and more specifically, with tooth loss.[20] In the US, about 25 per cent of the population seeks out dental care only in emergency situations.[6]

One of the most prevalent outcome measures of oral health status is caries rates. Bacterial plaque accumulation has been shown to be a significant factor in explaining caries, and plaque indices are associated with socio-economic status.[21] By adulthood, almost everyone has experienced tooth decay, but caries rates are considerably and unequally distributed across the population with lower socio-economic groups demonstrating a disproportionately greater experience.[8] While caries is nearly ubiquitous, most incidence occurs in childhood, adolescent, and senior years. Caries rates have continued to decline in the last fifty years, but certain sub-populations have considerably higher levels of disease prevalence and severity including First Nations and Inuit children, children born outside of Canada, and seniors.[3,22]

Early childhood caries is an aggressive form of caries marked by early disease experience (one or more primary teeth affected in infants less than 72 months old) and multiple contributing factors.[23] Severe forms require treatment by pediatric dental specialists in hospital settings under general anesthesia,[23] often incurring substantial travel and treatment costs. Full mouth extractions can be the outcome of severe early childhood caries leaving very young children physically and emotionally debilitated. Recently, it has been shown that socio-economic status is one of the most important associations with early childhood caries while poor oral hygiene and sugar consumption also present increased risk.[23] Additionally, limited access to professional oral health care, feeding practices and other factors may be involved.[23]

First Nations populations have consistently demonstrated an extremely high prevalence of early childhood caries; Manitoba, Ontario and British Columbia demonstrated proportions of 50%–100% compared to 5 per cent seen in general populations.[22,23] While caries rates in First Nations' child populations have shown recent decline, improvements have only been evident in permanent teeth, and caries rates remain higher than in other children of the same age and region.[22] Harrison and Davis[22] explained that the lack of improvement in primary teeth was due to a lack of exposure to school based preventive programs until after caries had been initiated.

While in other populations less is known about the prevalence of early childhood caries, in a recent Manitoban pilot study[23] using an agricultural, rural three-year old Caucasian population exposed to fluoridated water, early childhood caries was demonstrated in 44 per cent of the children with 21 per cent demonstrating severe early childhood caries. In this study, caries experience was inversely associated with maternal education levels.[23] While family size was also a factor, its influence was not attributed to reduced financial resources but rather more likely to time constraints, as plaque and oral debris levels were also found to be high.[23] Almost half of the study subjects had not yet visited a dentist, and the authors concluded that earlier attendance had been warranted.[23]

While caries experience typically tapers off considerably once reaching adulthood, a re-emergence of the disease occurs in late adulthood often in the form of root caries. More older adults are retaining their teeth longer, and as a result, it is expected that root decay will be an increasingly significant problem.[18,24] Studies have demonstrated root caries prevalence of up to 90 per cent of elderly people,[9,18,24] and a shift has shown that the ratio of decayed to filled teeth has increased in favour of decay.[9]

Along with caries, periodontal disease contributes substantially to oral tissue destruction and eventual tooth loss. Recognizing that epidemiological studies are believed to underestimate periodontal disease experience because they include healthier individuals with somewhat intact dentitions and utilize more conservative diagnostic criteria, severe periodontal disease is believed to be less prevalent than once thought.[25,26] However, there are some population groups that are disproportionately affected,[25,26] and the prevalence and severity in these groups may be increasing.[27] Utilizing multivariate analysis, periodontal disease has been shown to be associated with social and behavioural factors.[26] More specifically, variables such as older subjects, smokers, those with fewer teeth, those with less education, and those who do not make regular dental visits were all found to be important with the first three variables having the most consistent associations with periodontal disease.[26]

Edentulousness (toothlessness) represents the ultimate poor oral health outcome, and is a commonly used indicator of dental health status particularly in older popu-

lations.[20,27] While in the last national study more than half of Canadians over sixty years of age were found to be edentulous.[13] North Americans have demonstrated significant declines in edentulousness in older groups, albeit with disease shifting to increases in caries and periodontitis.[27] Clovis[8] reported in the 1990s that approximately one third of all Canadians over 65 years have lost all of their teeth. In more recent provincial studies, edentulousness rates have varied from 51%-81% in those over 65,[13] with independent seniors having lower rates than the institutionalized elderly.[18,28]

Tooth loss, especially complete tooth loss, is extremely significant to health and well being. Leake[13] states that the presence of one's natural teeth is the single strongest predictor of maximal oral function. Edentulous individuals report gastrointestinal problems often requiring medication when dentures cannot be adequately fitted.[8] While little documented data exists on the psychological and social impacts of tooth loss, Miller[20] asserts that in comparison to other life events, edentulousness must be considered to require considerable adjustment with substantial functional, social and psychological problems. Tooth loss and edentulousness are positively related to disadvantaged population groups and are associated with all classic socio-economic status measures and minority status.[9,10]

In an attempt to diminish the affects of the loss of some or all teeth, oral prosthetics are often fabricated but are often a less than ideal replacement of the natural dentition. In a review that included Canadian data, it was reported that 6 per cent of the residents in a long term care institution wore their dental prosthesis only for meals or when receiving visitors, and 20 per cent reported dissatisfaction with their dentures.[18] Increasing prosthetic needs are associated with the elderly as they experience more tooth loss.[27]

Soft tissue lesions and cancer are other outcome measures that have been used to assess oral health status. Some studies indicate that 30 per cent of seniors will experience non cancerous soft tissue lesions with a greater prevalence in those residing in long term care institutions.[18,29] These lesions may vary from asymptomatic to painful and potentially serious, and many relate to ill-fitting dentures. Oral cancer can be painful, disfiguring and often deadly. Clovis[8] reported that one in fifty cancer deaths in Canada and the US were attributed to oral cancer. Oral cancer is often overlooked until it has reached more advanced and less treatable stages.[8] Older adults are disproportionately affected with almost linear associations between lip, tongue and intra-oral cancers and increasing age, albeit a slower progression with the last two.[8] Smoking and alcohol consumption, particularly when in combination, are both well known risk factors.[17]

### Subjective oral health status measures

Subjective oral health status measures are increasingly recognized as important indicators of oral health and wellness. Examples of these measures include self perceived oral health, and oral health related quality of life.[10,30,31] These measures have been described as complex and multidimensional constructs, and are considered subjective in that they are based on the individual's perceptions of oral wellness.[31] Criticisms have sometimes centred on the lack of agreement between subjective measures and more traditional, objective measures. However, more recent studies have shown strong associations between subjective and objective measures improving the validity of such measures.[31]

The measurement of one's quality of life is a relatively recent outcome measure pertaining to oral health status and can include a number of other more subjective, psychosocial measures. Locker identified problems surrounding quality of life measures including their lack of use and that, when used, studies inherently report the experience of "healthy survivors".[30] However, inroads have been made in developing and validating quality of life composite scales and measures. Through these measures, it is possible to determine if and to what extent oral disease impacts function and psychosocial well-being and how these are influenced by socio-economic status.[30] Because oral disorders are disproportionately concentrated in disadvantaged population groups, it has been shown that this group's quality of life is also more compromised.[30,31]

Locker and co-workers[30] found a high level of older adults who were orally compromised, and this was significantly associated with diminished psychological well being and overall life satisfaction. Poor self rated oral health corresponded with decreases in morale and life satisfaction and increases in life stress even after controlling for other potential influences such as socio-economic status and general health.[10,30] Tooth retention has also been associated with enhanced self esteem and greater quality of life outcomes.[17] While Locker and colleagues recognized that reverse causation is a potential in some study designs, meaning a better quality of life influenced improved tooth retention, they cautiously concluded that oral health appeared to be an important contributor to the overall well-being of elderly Canadians, particularly in the more financially disadvantaged groups.[30]

## DISCUSSION

Assertions about the existence of oral health disparities are compelling but will need require further quantification if they are to be meaningfully addressed. Accurate assessment through measurement is the first step in mitigating oral health disparities in order to:

1. determine the underlying causal mechanisms of disparities,
2. target appropriate interventions, and
3. measure improvements subsequent to intervening.

Various measures of oral health status are available and questions surround which measures, or combinations, are best used.

Recognizing the broadening conceptualization of oral health, oral health status measures need to be reflective of this and become more comprehensive and include both traditional, more objective, measures along with contemporary, more subjective measures.

When comparing these measures, traditional measures tend to be more quantifiable and demonstrate high reliability and validity. They allow for statistical analysis and are well suited for targeted specific interventions. These are important measures that contribute to the concept of oral

health. Some of these traditional measures, such as tooth loss, are linked to functional variables like chewing ability, whereas others are potentially life threatening as in oral malignancies. In addition, objective measures are associated in some socio-economic status, such as periodontal disease, with overall systemic health. Traditional oral health measures are often clinically based, making them more expensive and challenging to measure, and do not include how such manifestations impact the individual.

Contemporary measures tend to be more subjective relying on individual perceptions and tend to be more complex in their multidimensionality. While contemporary measures have been shown to correlate with traditional objective measures, subjective measures are important regardless of the association as we appreciate oral health to be a more all encompassing construct. They also have the advantage that they can be collected via non-clinical methods allowing for large samples to be surveyed typically at a fraction of the cost of clinical measures.

## CONCLUSION

There is evidence that disadvantaged groups have poorer oral health status using both traditional and contemporary measures. It is concluded here that a combination of both objective and subjective measures will be required to accurately assess the oral health status of Canadians and determine the extent of oral health disparity occurring between disadvantaged sub-population groups and the majority of Canadians. Only then will a more organized agenda for addressing this oral health issue be developed on a comprehensive national level.

## REFERENCES


1. Locker D. Measuring social inequality in dental health services research: individual, household and area-based measures. *Community Dent Health*. 1993;10(2):139-50.
2. Sanders AE, Slade GD, Turrell G, Spencer A, Marcenes W. The shape of the socio-economic oral health gradient: implications for theoretical explanations. *Community Dent Oral Epidemiol*. 2006;34(4):310-19.
3. Leake JL. Why Do We Need an Oral Health Care Policy in Canada? *J Can Dent Assoc*. 2006;72(4):317.
4. Lux J. Access Angst: CDHA Position Statements on Access to Oral Health Services. *Probe Scientific*. 2003;37(6):261-274.
5. Manga P. *The Political Economy of Dental Hygiene in Canada*. Ottawa, ON: CDHA, 2002.
6. Dharamsi S, MacEntee MI. Dentistry and distributive justice. *Soc Sci Med*. 2002;55(2):323-9.
7. Canadian Dental Hygiene Association. [Accessed 2006 Dec]. Available from: www.cdha.ca/
8. Clovis J. The Impact of demographic, economic and social trends on oral health care. *Probe*. 1994;28(3):93-8.
9. Dolan TA, Atchison KA. Implications of Access, Utilization and Need for Oral Health Care by the Non-Institutionalized and Institutionalized Elderly on the Dental Delivery System. *J Dent Educ*. 1993;57(12):876-87.
10. Locker D. Self-Esteem and Socioeconomic Disparities in Self-Perceived Oral Health. *J Pub Health Dent*. 2008; Early view, August 2008.
11. Locker D. The burden of oral disorders in a population of older adults. *Community Dent Health*. 1992;9(2):109-24.
12. Federal, Provincial and Territorial Dental Working Group. Accessed 2008 Sep. Available from: www.fptdwg.ca
13. Leake JL. A Review of Regional Studies on the Dental Health of Older Canadians. *Gerodontology*. 1988;7(1):11-19.
14. Tremblay M, Wolfson M, Gorber SC. Canadian Health Measures Survey: rationale, background and overview. *Health Rep*. 2007;18:Suppl:7-20.
15. Locker D. Disparities in oral health-related quality of life in a population of Canadian children. *Community Dent Oral Epidemiol*. 2007;34:348-56.
16. Locker D, Leake JL. Inequities in Health: Dental Insurance Coverage and Use of Dental Services Among Older Ontario Adults. *Can J Public Health*. 1993;84(2):139-40.
17. Meyerowitz C. Geriatric Dentistry and Prevention: Research and Public Policy (Reaction Paper). *Adv Dent Res*. 1991;5:74-77.
18. Berkey DB, Berg RG, Ettinger RL, Meskin LH. Research review of oral health status and service use among institutionalized older adults in the United States and Canada. *Spec Care Dentist*. 1991;11(4):131-6.
19. Vigild M. Evaluation of an oral health service for nursing home residents. *Acta Odontol Scand*. 1990;48(2):99-105.
20. Miller Y, Locker D. Correlates of Tooth Loss in A Canadian Adult Population. *J Can Dent Assoc*. 1994;60(6):549-55.
21. Lachapelle-Harvey D, Sévigny J. Multiple regression analysis of dental status and related food behaviour of French Canadian adolescents. *Community Dent Oral Epidemiol*. 1985;13(4):226-9.
22. Harrison RL, Davis DW. Caries experience of Native children of British Columbia, Canada, 1980-1988. *Community Dent Oral Epidemiol*. 1993;21(2):102-7.
23. Schroth R, Moffatt M. Determinants of Early Childhood Caries (ECC) in a Rural Manitoba Community: A Pilot Study. *Pediatr Dent*. 2005;27(2):114-20.
24. Locker D, Slade GD, Leake JL. Prevalence of and Factors Associated with Root Decay in Older Adults in Canada. *J Dent Res*. 1989;68(5):768-72.
25. Locker D, Leake JL. Periodontal Attachment Loss in Independently Living Older Adults in Ontario, Canada. *J Public Health Dent*. 1993;53(1):6-11.
26. Locker D, Leake JL. Risk Indicators and Risk Markers for Periodontal Disease Experience in Older Adults Living Independently in Ontario, Canada. *J Dent Res*. 1993;72(1):9-17.
27. Kuc IM, Hargreaves JA, Thompson GW, Donald EA, Basu T, Overton TR, Chao ES, Peterson RD. Dental health status and treatment needs of elderly residents of Edmonton, Alberta. *J Can Dent Assoc*. 1990;56(6):521-5.
28. Galan D, Odlum O, Brecx M. Oral health status of a group of elderly Canadian Inuit (Eskimo). *Community Dent Oral Epidemiol*. 1993;21(1):53-6.
29. Leake JL. Planning for the Future. *Ont Dent*. 1988;65(2):27-32.
30. Locker D, Clarke M, Payne B. Self-perceived Oral Health Status, Psychological Well-being, and Life Satisfaction in an Older Adult Population. *J Dent Res*. 2000;79(4):970-5.
31. Lawrence HP, Thomson WM, Broadbent JM Poulton R. Oral health-related quality of life in a birth cohort of 32-year olds. *Community Dent Oral Epidemiol*. 2008;36:305-316.

# Highlights of the CDHA Board of Directors meeting, 16–18 October 2008

Board of Directors with facilitator, Dr. Sandy Kolberg (far left, second row from above), and Caroline Oliver, consultant (far left, top row).

CDHA Board of Directors held its biannual meeting at the national headquarters in Ottawa, 16–18 October 2008. The Board reviewed the framework of policy governance and reiterated that its primary interest is to link with the owners (members of CDHA).

Dr.P.Cooney, Chief Dental Officer, Health Canada, was the guest speaker. He provided an overview of the oral health of Canadians that included utilization of dental services in Canada, variations in annual attendance to oral health providers, presence of oral caries, health and life quality, number of dental service providers in Canada, and the Canadian Health Measures Survey (CHMS) currently underway across Canada. The Board members look forward to receiving the results of the CHMS for the latest information on oral health of Canadians.

The Board also talked about an important event in the CDHA calendar in June 2009 entitled *An Orientation to the NIDCR/NIH–Strategic Initiatives: Research Priorities for Advancing Oral Health*. The National Institute of Dental and Craniofacial Research (NIDCR) is holding a conference in Bethesda, Maryland, USA, from 15 to 17 June 2009. This three-day conference will be of interest to dental professionals considering opportunities for advancing dental hygiene research.

The Board was apprised of the current status on labour mobility. As of 1 April 2009, all Canadians will have the opportunity for labour mobility allowing our workforce (including dental hygienists) to change jurisdictions and enhance portability with minimal requirements. Each province will be given an opportunity to voice objections based on the provincial scope of practice for the specific profession.

The Board received provincial reports, and reports from representatives to such organizations as the National Dental Hygiene Certification Board (NDHCB), Dental Hygiene Educators Canada (DHEC), and the Canadian Forces Dental Service (CFDS). CDHA will be meeting with the Education Advisory Committee to discuss the movement of DHEC to CDHA in December 2008.

Membership to CDHA continues to grow, and a working group has been struck to explore the culture of our dental hygiene profession. In addition, CDHA continues to forge linkages with various organizations of interest to the dental hygiene profession.

## CDHA Board of Directors: October 2008 to October 2009

Wanda Fedora, President; Nova Scotia

Carol-Ann Yakiwchuk, Past President; Manitoba

Anna Maria Cuzzolini, President-Elect; Quebec

Arlynn Brodie; British Columbia

Bonnie Blank; British Columbia

Evie Jesin; Ontario

France Bourque; New Brunswick

Jacki Blatz; Alberta

Julie Linzel; Prince Edward Island

Maureen Bowerman; Saskatchewan

Palmer Nelson; Newfoundland and Labrador

**Observers**

Marina Roberge
Canadian Forces Dental Service

Doris Lavoie
National Dental Hygiene Certification Board

# News excerpts of overall health studies

(The Fraser Institute is an independent research and educational organization with offices in Canada and the US, and partners in more than 70 countries. Its mission is to measure, study, and communicate the impact of competitive markets and government intervention on the welfare of individuals. To protect the Institute's independence, it does not accept grants from governments or contracts for research. Visit www.fraserinstitute.org)

## OCTOBER 20 RELEASE

*Paying More, Getting Less: 2008 Report*

The peer-reviewed study, *Paying More, Getting Less: 2008 Report*, uses Statistics Canada data from the past ten years to project growth trends in government spending on health care versus total revenue. Provincial spending on health care is growing faster than revenues with six of ten provinces projected to be spending more than 50 per cent of all available revenue on health care by 2036. "Alberta is the only province where energy-driven revenue increases have managed to keep pace with health care expenditures. All other provinces have seen health care expenditures climb at a faster rate than revenue."

## SEPTEMBER 30 RELEASE

The peer-reviewed study, *The hidden costs of single payer health insurance: a comparison of the United States and Canada*, compares some of the key aspects of health care systems in Canada and the US. The study also includes supply of medical resources, access to technology and effective health insurance coverage.

The study shows that health care in Canada appears to cost less because Canadian health insurance does not cover many advanced medical treatments and technologies, common medical resources are in short supply, and access to health care is often severely delayed.

Canada falls behind the US on many key indicators of available health care resources including:

| Health care resources | Canada | US |
|---|---|---|
| Number of MRI units per million population in 2006 | 6.2 | 26.5 |
| Number of MRI exams per million population in 2004-05 | 25,500 | 83,200 |
| Number of CT scanners per million population in 2006 | 12 | 33.9 |
| Number of CT exams per million population in 2005-05 | 87,300 | 172,500 |
| Number of in-patient surgical procedures per million population in 2004 | 44,700 | 89,900 |

The study concludes that both Canada and the US should look at health care models in countries such as Switzerland and the Netherlands. Even on health care insurance coverage, the Canadian system does not perform much better than the US, when it comes to actually delivering insured access. Brett Skinner, author of this study, says, "Access to a wait list is not the same thing as access to health care."

## SEPTEMBER 15 RELEASE

*Canada's central planning approach to regulating prescription drug prices provides no cost savings.*

Research on the cost burden of prescription drug spending in Canada and the US examines per capita spending on prescription drugs. The results confirm that such expenditures make up roughly the same percentage of income in both countries, and are explained by the inflated process of generic drugs in Canada.

Research from another study by the same author, Brett Skinner, confirms that Canadian prices for generic prescription drugs were on average 112 per cent higher than US prices for identical drugs in 2007. At the same time, Canadian prices for brand name prescription drugs in 2007 were on average 53 per cent lower than American prices. "Canadians pay more than Americans for generic drugs because Canadian government policies shield generic drug companies and pharmacy retailers from competitive free market that would put downward pressure on prices for generic drugs", says Skinner.

For further information on the three news releases, please contact: Brett Skinner, Director, Health, Pharmaceutical and Insurance Policy Research brett.skinner@fraserinstitute.org

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

# Opportunities for Advancing Dental Hygiene Research

CDHA, the National Center for Dental Hygiene Research (NCDHR) in the US, and the American Dental Hygienists' Association (ADHA) are pleased to announce the upcoming conference **Opportunities for Advancing Dental Hygiene Research**. The conference will take place 15–17 June 2009 in Washington, DC, and will bring together dental hygiene researchers, students, educators, and academics. Topics addressed at the conference include strategic planning for future research, translating research into practice, cultural considerations for practice, linking dental hygiene and systemic health, assessing the efficacy of alternative dental hygiene models of care delivery in meeting community needs, preparing quality/competitive grants, grant programs and training opportunities. Stay tuned to http://www.cdha.ca/members/content/events&conferences/events&conferences.asp for more information.

# Look before you leap

CDHA's Independent Practice Advisor, Ann E. Wright

Every day I receive e-mails and telephone calls from members asking me about independent practice. Often the question starts with, "Tell me what I need to know." My response is, "Tell me about yourself. Why does independent practice interest you, and what will your independent practice will look like?"

As a guide, ask yourself the following questions:

1. **Why do I want to change my present employment status?**

Sometimes members tell me that they can't find a job in their community, so they think they might as well go ahead and open their own practice. While I admire their chutzpah, lack of employment opportunities is a poor reason for opening your own practice.

2. **Why does the concept of independent practice intrigue me?**

Dental hygienists who are considering an independent practice are motivated by the possibility of providing the highest standards of dental hygiene care in an environment that they have designed. This includes scheduling appointments at a reasonable pace and taking the time to get to know their clients. Financial success is not usually a driving force.

3. **What will my independent practice look like?**

There are many possibilities here. Some dental hygienists start slowly, out of their home with evening and weekend appointments. Others decide to limit their services to providing sports mouth guards and tooth whitening. Still others contemplate working with the institutionalized or homebound and will purchase mobile equipment. Start-up for a mobile practice involves tremendous time and effort spent visiting the residential care centres, meeting with the directors and explaining the dental hygiene services. Then there is the task of getting the proper approvals and medical information in place … before you even see a client! The majority of dental hygienists envision a stand-alone practice. These practices typically involve partnerships between one or more dental hygienists, or with other health or lifestyle providers; physiotherapists, chiropractors, nurse practitioners, denturists, estheticians and massage therapists.

4. **Is this practice in keeping with my lifestyle, work schedule etc.?**

Can I devote more hours than I work now to my independent practice? Too often dental hygienists have not considered the social and lifestyle factors that impact this decision. The workload in a private practice does not end when the last client leaves. As a business owner, keep in mind that you are the bookkeeper, handyperson, marketing manager, employer, and cleaner.

5. **How much money do I currently earn? Do I need that much to live on, or can I make do with less?**

This takes some time to calculate. Can I subsist on less money than I earn now, and if so, how much less? It will take time to build up a clientele and get the practice going. Remember, you are establishing a brand new practice. A conservative projection for a stand-alone practice is to cover your costs or "break even" in the first year. Many dental hygienists choose to keep their current jobs for a time as they build up their private practice to offset the practice expenses.

6. **What aspects of my community make independent practice attractive?**

This step is a significant part of planning. Who are the major employers in my community and have they dental insurance plans? Are other businesses and services established, and will they work with me as referral sources? Is this a growing community with young families or is this a mature community with seniors on fixed incomes? Are there private schools that may be interested in dental hygiene services or are there senior centres that I can approach?

7. **What aspects of my community make independent practice unattractive?**

What is the total population, and what is the oral healthcare provider to population ratio? Is my community under serviced or are there many practitioners? Are people losing their jobs? Are businesses and malls closing around me?

8. **What do I think this will cost me?**

Here is where the homework comes in. Conduct your own research on the web or call dental suppliers and find out what equipment and construction will cost. There are a vast number of equipment options. The Internet offers portable dental hygiene equipment for under $2000. Will this equipment stand up to wear and tear and can the supplier provide a reference? More importantly, does it pass Canadian standards? At the other extreme of investment, I have reviewed dental hygiene business plans with financial costs of over a million dollars!

Independent dental hygiene practice is an exciting opportunity. Dental hygienists who have recently opened their practices are thrilled about practising the way they want to, and providing quality dental hygiene services to clients who appreciate the difference.

Friends and acquaintances, outside of dental hygiene often approach me with the same question. Why would someone go to a dental hygiene practice, rather than a traditional dental office where they can receive all the oral care services? Well, the simple answer is that dental hygiene practices are different. Dental hygiene private practitioners unanimously report that the public responds enthusiastically to their services. While clients appreciate the fact that they are not urged to commit to more complex dental procedures, the most important key to success is the competent, caring treatment provided in a relaxed, welcoming atmosphere. Isn't this what independent practice is all about?

CDHA welcomes your feedback: aew@cdha.ca

# Dental hygiene and continuing competence

CDHA staff

All professional quality assurance (QA) and continuing competence (CC) programs aim to ensure acceptable levels of health care provider competence.[1] Continuing education encourages dental hygienists to renew their skills and knowledge so as to provide the most efficient and effective care to clients. In the same way that dental hygienists formulate a care plan for client therapy, learning activities–based on a career portfolio or personal development plan that includes predetermined goals–seem most likely to lead to improved delivery of care. Have a plan and process in place to diagnose individual learning needs, design learning activities, locate resources and evaluate outcomes define self-directed learning.[2] Input from colleagues and co-workers can also be helpful in deciding on a focus for study. The key for the learner is to choose learning opportunities that match the selected area of development or need for competence.[3]

Self assessment and critical reflection are vital elements for acquiring and processing information that will most encourage excellence in a practitioner's dental hygiene practice, and provide the opportunity to grow as a professional.

Technology has now made it much easier for all practitioners, regardless of where they reside, to access suitable evidence based resources that will meet their professional needs and learning styles. Internet self study courses, research articles, webcasts, and podcasts are widely available, and meet the requirements for continuing competence. More traditional methods of continuing education such as study clubs, lectures by experts in the field, and conferences remain popular choices for participants.

Whatever the format, in the current research and technological environment, most health care practitioners must be extremely efficient in keeping up-to-date.[4] There is a useful self assessment and activity planning tool for professional development available here: http://www.cdho.org/Quality_English_QAPackage.htm [see Section E; Form #6]

CDHA's Information Coordinator can often assist with research activities or educational resources, and can be reached at library@cdha.ca.

**A sampling of web based Continuing Education Resources from CDHA www.cdha.ca**

| Course | Content/Goal | Length |
|---|---|---|
| Work and Personal Life Balance | Designed to help develop coping strategies and a personal plan of action to deal with the stress in your life. | 13 hours |
| Tobacco Cessation | Presents current evidence based facts about tobacco use and tobacco cessation. | 6-10 hours |
| The Professional Role | Provides opportunities for self-reflection and critical thinking that will enhance your professionalism. | 5 hours |
| Independent Dental Hygiene Practice Certificate | Provides the necessary knowledge and tools for dental hygiene entrepreneurs to establish and operate their own practices. | 5 sections.<br>8 hours per section. |
| Difficult Conversations | Designed to help you have the hard but necessary conversations that we all have to face. | 5-8 hours.<br>5 modules - work at own pace |
| Negotiation | Assists in developing or improving an individual's persuasive communication skills. | 5-8 hours |
| DVD Quarterly of Dental Hygiene | Produced by CME network in Partnership with the CDHA.<br>www.dvdquarterly.com | 4-5 hours of content |

Dental Hygiene regulatory authorities, where appropriate, assign credit hours to specific courses. A summary is located on CDHA's Members Only web site: http://www.cdha.ca/members/content/continuing_education/ce_home.asp

**Other self study educational resources** (some are free):

The Ontario Dental Hygienists Association:
www.odha.on.ca
The American Dental Hygienists Association:
www.adha.org
Proctor&Gamble: www.dentalcare.com
Colgate: www.colgateprofessional.com
Dimensions of Dental Hygiene:
www.dimensionsofdentalhygiene.com

CDHA welcomes your feedback: library@cdha.ca

## REFERENCES


1. Asadoorian J, Locker D. The Impact of Quality Assurance programming: A Comparison of Two Canadian Dental Hygienist Programs. *Journal of Dental Education* 2006;70(9):965-71.
2. Jennings S. Personal Development Plans and self-directed learning for Healthcare Professionals: are they evidence based? *Post Graduate Medical Journal* 2007;83(982):518-24.
3. Westphal C. Learning Never Stops-Keys to lifelong Learning. *Access* 2008;22(4):26-32.
4. Asadoorian J, Batty H. An Evidence-Based Model of Effective Self-Assessment for Directing Professional Learning. *International Journal of Dental Education* 2005;69(12):1315-323.

# Continuing Education Opportunities

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Our online CE courses will allow you to expand your knowledge base and stay up-to-date on new developments in the comfort of your own home.

Obtain a certificate of course completion to satisfy provincial dental hygiene regulatory professional development requirements. Remember, it is your professional responsibility to be a life long learner. You can keep track of the continuing education initiatives you have completed or are in the process of completing with the Professional Development Manager at http://www.cdha.ca/members/content/continuing_education/ProfessionalDevelopment.asp

One of our courses is sure to meet your own specific learning needs. A new online course will be available to CDHA members at no cost from December 1, 2008 until September 15, 2009. Visit the CDHA continuing education site at: http://www.cdha.ca/members/content/continuing_education/ce_home.asp

Take the demonstration tour of our most recent course on Difficult Conversations. We believe that you will find the unique format very enjoyable.

## Featured Courses

**Self-Initiation for Dental Hygienists**

The amendment to the Dental Hygiene Act, 1991 was proclaimed in Ontario on September 1, 2007. Registrants approved by the College of Dental Hygienists of Ontario to self-initiate their authorized act of scaling teeth and root planing, including curetting surrounding tissue may now do so in Ontario without an order from a dentist subject to the provisions of Regulation 501/7 Part III. Successful completion of this course will allow dental hygienists from Stream Two to meet the requirement and from Stream Three to meet one of the requirements for eligibility to apply for approval to self-initiate their authorized acts according to the CDHO Standard of Practice for Self-Initiation. Aussi offert en Français

**Certificate Program: Independent Practice for Dental Hygienists**

Legislative changes in some Canadian jurisdictions now allow the establishment of independent dental hygiene practices. The business environment is challenging and requires energy and hard work, and to be successful, dental hygienists must now develop the necessary management skills to complement their role as primary preventive oral care providers.

**Treatment vs. Prevention: New Insights on Common Oral Conditions**
*(Free Membership Renewal Benefit until October 31, 2008)*

There is no "trap door" at the neck that separates oral health from overall health. This is a paradigm shift that has significant implications for the treatment and prevention of oral conditions and for the role of dental hygienists as healthcare professionals.

**Clinical Tobacco Intervention**

This online course has been developed by the BC Cancer Agency to meet the requirements of a variety of health professionals. The course will enable you, the practitioner, to answer patients' questions about tobacco use with evidence-based recommendations.

**Work and Personal Life Balance**

Are you feeling that life is just too hectic and unmanageable? This engaging course explores stress and work and life imbalance, helping you develop coping strategies and a personal plan of action to deal with the stress in your life.

**Negotiation**

As a dental hygienist you negotiate on an ongoing basis in your day-to-day life. When negotiating an issue that is very important to you, do you find yourself at the losing end of the negotiation? You may already be a good communicator, but you may like to improve your negotiation skills to achieve better results and be more effective in all areas of your life. This course will assist you in developing or improving your persuasive communication skills.

**Interpersonal Skills**

As a dental hygienist it is imperative that you develop your interpersonal skills. Interpersonal skills enable you to work with others harmoniously and efficiently. Employers, co-workers and clients appreciate individuals who get along well with people at all levels. This course will assist you with improving your interpersonal skills, including communication, problem solving, and teamwork abilities.

**The Professional Role**

As a dental hygienist, you may ask yourself, "Am I acting like a professional?" This course will enhance your professionalism. How you look, talk, write, and act at work determine how you are perceived as a professional. Theoretical and practical concepts are presented, along with opportunities for self-reflection and critical thinking.

**Help Your Clients to Stop Gambling With Their Health**

As members of the tobacco cessation team, dental hygienists can play a key role in helping their clients to stop using tobacco. This course presents current facts about tobacco use and tobacco cessation. It will help you integrate this knowledge into the DH process of care in order to implement an evidence-based tobacco cessation program for your clients. Aussi offert en Français

**Difficult Conversations**

Do you find it hard to deliver tough messages? Do you get anxious when others get angry at you? Do you avoid conversations that may end in arguments? The Stitt Feld Handy Group Online Difficult Conversations Course is designed to help you have the hard but necessary conversations that we all have to face.

# Maximize benefits from conferences

CDHA staff

Conferences abound–continuing education, keeping pace with technology in your profession, leadership, business management, professional development, building the entrepreneur in you–but only so much time and money to get around. What are the chances of high returns on your investment (ROI) in conferences? Would devising your own game plan on attending the conference of your choice ensure you receive a high ROI? Conferences are not necessarily about the sessions, the talks, or the demos. And does it really matter if you attend the vendors' exhibition? Conferences are also about the breaks, the dinners, the bar at the conference hotel after the day's done. Why? Because the educational aspect of a conference is something you can often receive by simply buying a book or a training DVD. To many, the most important aspect of attending a conference would be the opportunities to meet people that they would not have otherwise ever met, and to profit personally through those chance meetings.

1. http://www.aimclearblog.com/2007/04/09/maximizing-the-business-benefit-of-conferences-and-trade-shows/

This link offers valuable tips on getting the most of any conference or tradeshow that you attend, and helps you organize yourself to draw the greatest personal benefit from your encounters.

2. http://www.businessknowhow.com/growth/conf10.htm

Four pathways to get a good ROI:

i. Select the sessions that will be most likely to improve your skills.
ii. Collaborate with a colleague to share what you learn. Attend different sessions.
iii. Stay for the entire conference. You never know what good information you might miss by arriving late or leaving early.
iv. Stay at the conference's designated hotel. You need to be where you can enlarge your network most effectively.

3. http://elearningtech.blogspot.com/2008/02/making-most-of-attending-conference.html

What do attendees gain from a conference? You could participate in a blog or read what others share on conferences, and their ideas on what makes better conferences.

4. http://www.cmg.org/conference/justify.html

How do you justify attending a conference? Do you create action reports, implement at least one valuable thing you learned to benefit your colleagues and your organization, and train others?

CDHA welcomes your feedback: journal@cdha.ca

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5. http://www.hunter.cuny.edu/genderequity/equityMaterials/attendingConference.pdf

Thoughts on attending conferences include reasons to attend, which conferences to choose, how often you attend, how to meet people, and how to get speaking invitations.

6. http://findarticles.com/p/articles/mi_m0CMN/is_n3_v28/ai_10577497

Why attend conferences when facing tight budgets? What details do you provide your employer to justify your attendance? In rapidly changing technologies, when jobs become fewer, it's the people who keep up with change who offer the greatest value.

7. http://www.intuitive.com/blog/the_critical_business_value_of_attending_conferences.html

This blog talks of the critical business value of attending conferences. If you are tuned in to your industry and market, you need to also attend workshops, seminars and conferences.

8. http://opensourceculture.blogspot.com/2006/11/why-attend-conferences-aka-time-for.html

Conferences are a great way to gather a whole bunch of experts and those wanting to learn more about a topic together in one place to facilitate learning and the sharing of new ideas and thoughts. Conferences have also become a mechanism for corporate PR and product launches—a hybrid approach like the unconferences, but with a little more structure to keep people on track.

9. http://www.lifehack.org/articles/communication/6-ways-to-attend-awesome-conferences-for-free.html

Paying for every conference you want to attend is a quick way to put your finances in the red, even if you manage to grab early bird rates and other discounts. This link suggests a few ways to arrange for free tickets—not for every conference, unfortunately, but for enough to make the effort worthwhile. A judicious choice of methods in your action plan is essential as not every method will work at every event.

10. http://www.digital-web.com/articles/understanding_the_unconference/

Understand the unconference. Unconferences are guided by tenets of the Four Principles of Open Space and the accompanying Law of Two Feet. The creative structure and practice of unconferences may be a challenge to some, and the proponents of this new form of social organization suggest you participate in unconferences to appreciate the improvised nature and value of the event.

*'Letters to the editor' is a forum for expressing individual opinions and experiences of interest that relate to the dental hygiene profession and that would benefit our dental hygiene readership. These letters are not any reflection or endorsement of CDHA or of the journal's policies. Send your letters to: journal@cdha.ca*

Editor:

**A better way to treat periodontal disease**

Non surgical treatment of gum disease has not changed appreciably since I graduated from the University of Toronto Dental School in 1959. It is still basically a "cleaning" service. Using scalers or an ultrasonic cleaner like the Cavitron, the clinician attempts to get and keep the teeth deposit free with regular periodic scaling. The hope is that if the patient keeps the teeth plaque free, one of the following will occur:

(a) if the patient is disease free, the patient will stay healthy,

(b) if disease is present, it will not progress further.

In spite of the efforts of dentists and dental hygienists, a large percentage of these patients develop gum disease which slowly progresses over time to the point where they need surgery. Patients need surgery because debridement becomes progressively more difficult and ineffective as pocket size increases. Surgery eliminates or reduces pocket size making debridement easy, but does not eliminate the cause that led the patient to getting the disease in the first place.

Many patients after surgery and regular periodic scaling develop new pockets in a few years as the disease continues to destroy the structures that support the teeth. Fortunately there is a much better way to treat gum disease. A new approach to treatment and the procedures that make it possible enable clinicians provide the care required.

Clinicians can debride teeth with pockets 8–9 mm deep perfectly, safely, painlessly, and without surgery or anesthetic using an easy-to-learn-and-do procedure.

In addition, clinicians can use methods outlined to achieve the following:

(a) get most pockets up to about 5 mm or 6 mm deep to heal,

(b) often stop the disease from progressing where deep pockets existed initially enabling the patient to keep such teeth,

(c) post treatment root sensitivity is rare, and bleeding gums are no longer a problem.

You can learn about this approach to treatment and the procedures that make it possible through free downloadable information from this link: http://www.pakperiopockets.ca/html/professionals.html As well, I encourage you to explore the other informative pages on my web site http://www.pakperiopockets.ca/

The treatment approach and procedures were developed over a period of about sixty years by dentists, periodontists, and dental hygienists, and have been successfully used. It is currently being used in a small number of offices mainly in the Toronto area. It is my hope that some of you will begin to offer our approach to treatment to your clients or patients.

Dr. John Linghorne
Periodontist (semi-retired)
Islington, Ontario
E-mail: info@pakperiopockets.ca
URL: http://www.pakperiopockets.ca/

**Executive Director's message**, *If everyone thought the same, nothing would ever change …* continued from 287

the year that was, think about what the quote that started this message means to you, "If everyone thought the same, nothing would ever change."

## REFERENCES

1. http://www.yourpointofview.com/hsbcads_airport.aspx [Accessed 2008 Oct 1].
2. http://www.yourpointofview.com/upload/leader_Air.pdf [Accessed 2008 Oct 1].
3. Launch of New Hygiene Centre. News & Updates. *JCDA*. Sep 2008;74(7)582.

**Message de la directrice générale**, *Si nous pensions toutes la même chose, jamais rien ne changerait …* suite 287

*la citation qui nous sert de titre : « Si nous pensions toutes la même chose, jamais rien ne changerait. »*

## RÉFÉRENCES

1. http://www.yourpointofview.com/hsbcads_airport.aspx [Accès. 1er oct. 2008].
2. http://www.yourpointofview.com/upload/leader_Air.pdf [Accès. 1er oct. 2008].
3. *Launch of New Hygiene Centre. News & Updates. JCDA*. Sep 2008;74(7)582.

# Guidelines for authors

The *Canadian Journal of Dental Hygiene* (CJDH) provides a forum for the dissemination of dental hygiene research to enrich the body of knowledge within the profession. Further, the intent is to increase interest in, and awareness of, research within the dental hygiene community.

The *Canadian Journal of Dental Hygiene* is a peer-reviewed journal. It invites manuscripts relevant to dental hygiene practice and policy including theory development and research related to education, health promotion and clinical practice. Manuscripts should deal with current issues, make a significant contribution to the body of knowledge of dental hygiene, and advance the scientific basis of practice. Manuscripts may be submitted in English or French. All accepted submissions will be edited for consistency, style, grammar, redundancies, verbosity, and to facilitate overall organization of the manuscript.

**Criteria for submission**
A manuscript submitted to the *CJDH* for consideration should be an original work of author(s), and should not have been submitted or published elsewhere in any written or electronic form. It should not be currently under review by another body. This does not include abstracts prepared and presented in conjunction with a scientific meeting and subsequently published in the proceedings.

Pre-submission inquires to:
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**Categories of manuscripts accepted for submission:**

1. Studies/Research paper–no longer than 6000 words, and a maximum of 150 references. Abstract within 300 words.
2. Literature review –no longer than 4000 words and as many references as required. Abstract within 250 words.
3. Position paper – no longer than 4000 words and a maximum of 100 references. Abstract within 250 words.
4. Case report – between 1000 and 1200 words, and a maximum of 25 references, and 3 authors. Abstract of 100 words.
5. Editorial – by invitation only, and may be between 1000 and 1500 words, using as many references as required. No Abstract needed.
6. Letter to editor is limited to 500 words, a maximum of 5 references, and 3 authors. No Abstract required.

**Submission checklist** - authors are advised to:

1. Send their submission electronically to the Managing Editor in MS Word either via email (journal@cdha.ca) or in a CD via mail (96 Centrepointe Drive, Ottawa, ON K2G 6B1).
2. Use such standardized fonts as Arial, New Times Roman, Verdana in 10-12 points.
3. Keep the file free of formatting (i.e. no tabs, indents, page breaks, and codes).
4. Double-space body text with margins of 1 inch.
5. Number pages consecutively, starting with title page.
6. Separate tables and figures as individual files and indicate their appropriate placement in the body text of the Word document.
7. Send a cover letter along with their manuscript, stating their position of duality of interest. Competing interests can be financial, professional, or personal.
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**Manuscript components:**

1. **Title page:** The title must provide a clear description of the content of the submission in 12 words. It should be followed by each author's name (first name, middle initial and last name) with respective degrees and any institutional affiliation(s). Corresponding author's name, address and email. All authors should have participated sufficiently in the work to be accountable for its contents.

2. **Abstract:** should not contain references or section headings. Typical formats are outlined below.
    a. **Study and Research paper:** Background (including study question, problem being addressed and why); Methods (how the study was performed); Results (the primary statistical data); Discussion, and Conclusion (what the authors have derived from these results).
    b. **Literature Review:** Objective (including subject or procedure reviewed); Method (strategy for review including databases selected); Results and Discussion (findings from and analysis of the literature), and Conclusion (what the authors have derived from the analysis).
    c. **Position paper:** Same format as Literature Review.
    d. **Case Report:** Introduction (to general condition or program); Description of case (case data) Discussion (of case grounded in literature), and Conclusion.

3. **Key Words:** Provide a maximum of 6 key words or short phrases from the text for indexing purposes. Terms from the Medical Subject Headings (MeSH) list of *Index Medicus* are preferred.

4. **Text**
    a. **Studies and Research papers** consist of original work arising from the exploration of research questions. Presentation of the study will vary based on the type of research being presented. **Introduction:** a concise background and rationale for the study. It should include the purpose of the study and its relevance to practice and the profession. A brief review of key themes from current literature is included to provide the reader a context from which to understand the research question. **Methods:** a clear description of the methodology including materials (stating manufacturer's name and location; city/state/province/ country) if applicable. The study design must be clear and appropriate for the question addressed. **Ethics approval:** All studies using human or animal subjects should include an explicit statement identifying the review and ethics committee approval for each study if applicable, and in accordance with *Tri-Council Policy Statement for Ethical Conduct for Research 1998* (with amendments 2005) or the Declaration of Helsinki. Editors reserve the right to reject papers if there is doubt as to whether appropriate procedures have been used. **Results:** a logical sequence as befits the methods used.

Tabular data should include relevant test statistics based on the statistical tests used. **Discussion:** an interpretation of work in light of the previously published work in the area. It should highlight the contribution of the study to dental hygiene practice as well as its limitations. **Conclusions:** drawn from the body of original work within the context of the literature in the area being studied. Areas of future research to support the further development of knowledge in the area may be highlighted.

b. **Literature Reviews** provide a synthesis of published work in a particular area. They may range from very structured formats such as systematic review to more loosely organized review of the literature. They should be organized in a logical manner. Tables, illustrations, and photographs are encouraged. **Objective:** a concise background and rationale for the inquiry. It should include the purpose of the inquiry and its relevance to practice and the profession. **Method:** a clear description of search strategies used including the databases accessed and the key words used in searches. Inclusion and exclusion criteria are also documented if applicable. **Results and Discussion:** findings from the literature reviewed, its comparison and contrast, and an account for possible differences within the findings. **Conclusion:** implications of the inquiry for practice and the profession. Conclusion must be supported by the literature analyzed.

c. **Position papers:** the organization supporting the position should be highlighted. Open structure with subheadings according to the relevance of the topic discussed.

d. **Case Reports** are designed to shed light on decision-making within the context of practice problems. The case being profiled should differ to some degree from what is considered a common practice problem. For example, it could involve a unique perspective or challenging diagnostic or treatment focus. It could also relate to a unique program or intervention, and its outcomes. Authors must provide signed client consent for both identifying text and any images, along with manuscript at the time of submission, without which the submission will not be considered. **Introduction**: If a clinical case, the presenting problem plus a very brief overview of the disease or condition. If a community, population, health or education-based case, the background of the problem or issue that was studied should be described. How does the case benefit the reader? **Case Description:** should provide demographics of the client(s) or population being studied with intervention(s), clinical or otherwise. If a team is involved in managing the client(s) or situation, the role of each health-care professional in the team should be outlined. Results of actions or interventions should follow. **Discussion:** results or findings of the case with reference to the literature. What would typically be expected in this or similar situations? **Conclusion(s):** implications of the study for clinical practice, community care or educational practice. Conclusion must be supported by the case(s) presented.

e. **Letters to the Editor:** discussion or balanced opinions on current issues in the dental hygiene profession or with a focus on articles in the previous editions of the journal in a 6-month period. The Managing Editor reserves the right to edit letters for clarity, but the letters will not undergo the peer review process.

5. **Acknowledgements:** Acknowledge any assistance or support given by individuals, organizations, institutions, or companies. Those identified here must have provided informed consent for you to cite their names as this may imply endorsement of the data and/or the conclusions.

6. **Artwork** includes any illustrations, figures, photos, graphs, and any other graphics that clearly support and enhance the text in their original file formats (source files).

- Acceptable file formats include .eps, .pdf, .tif, .jpg, .ai, .cdr in high resolution, suited for print reproduction:
  i. minimum of 300 dpi for grayscale or colour halftones,
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7. **Data or Tables** may be submitted in Excel or Word formats. These tables or data may also be included at the end of the Word document.

8. **Abbreviations and Units:** must conform to the Système Internationale d'Unités (SI). SI symbols and symbols of chemical elements may be used without definition in the body of the paper. Abbreviations should be defined in brackets after their first mention in the text, not in a list of abbreviations.

9. **Supplementary information:** Any supplementary information supplied should be in its final format because it is not subedited and will appear online exactly as originally submitted. Please seek advice from the Editorial Office before sending files larger than 1 MB.

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

*Volume with supplement*

Orban B, Manella VB. A macroscopic and microscopic study of instruments designed for root planing. *J Periodontal*. 1956;27 Suppl 7:S6-12.

*Conference proceedings – abstract*

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

air abrasion [abstract]. *J Dent Res*. 2001;80(Special issue):37.

*Organization as author*

Canadian Dental Hygienists Association. Policy framework for dental hygiene education in Canada. *Probe*. 1998;32(3):105-7.

**Books and other monographs**

*Personal authors*

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

*Editors as authors*

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

*No author*

What is your role in the profession [editorial]? *J Dent Topics*. 1999;43:16-7.

*Chapter in book*

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

*Conference paper*

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

*Scientific or technical report*

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

*Personal communication*

These should be cited in parentheses in the body of the text. The author should obtain permission from the source to cite the communication.

**Other publications**

*Newspaper article*

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

*Audiovisual*

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

**Unpublished material**

Smith A, Jones B. The whitening phenomenon. *J Nat Dent*. (Forthcoming 2004)

**Electronic material**

*Monograph on Internet*

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

*Journal on Internet*

Walsh MM. Improving health and saving lives. *Dimensions Dent Hyg* [serial on Internet] 2003 Nov/Dec [cited 2004 Jan 12]:[about 7 p.]. Available from: www.dimensionsofdentalhygiene.com/nov_dec/saving_lives.htm

*Homepage/web site*

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

**(Last updated: May 2008)**

**SUBJECT INDEX**

*Page references are to the issue and first page of the article.*

**AUTHOR INDEX**
*Page references are to the issue and first page of the article.*



**KEY WORD INDEX**
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### Corrigendum

Aquilina-Arnold, Grater-Nakamura. Chemotherapy: Considerations for dental hygienists. *Can J Dent Hygiene*. 2008 Sep-Oct;42(5):241–48.

Page 244, 2nd column, lines 11 and 12 of "Hemorrhage" read: "A platelet count <40,000/mm$^3$–75,000/mm$^3$ may require platelet transfusion, and if >40,000/mm$^3$, it is recommended that dental hygiene and dental care be deferred."

The statement is corrected to: "A platelet count between 40,000/mm$^3$ and 75,000/mm$^3$ may require platelet transfusion, and if the count is less than 40,000/mm$^3$, it is recommended that dental hygiene and dental care be deferred."

### ABOUT THE COVER

People through the ages did spend time trying to take care of their teeth and dental hygiene. The front covers of Volume 42 feature plants used as remedies in dental treatments during the Renaissance period, and this note provides a ***historical*** perspective of their traditional use in oral or dental care, and hygiene.

Volume 42.6, November-December 2008
Cover picture credit: © Arcot C


***Mentha* (garden mint)**
Mint leaves "smootheth the roughness of the tongue if it be rubbed therewith."

William Turner (d. 1568). *The New Herbal Parts II and III*. Cambridge University Press.1995:449. Edited by Chapman GTL, Tweedle MN. Vol.2 reproduces parts II and III, originally published in 1562 and 1568 respectively.

"For the stinking of the mouth and filth of the gums and of the teeth, wash thy mouth and gums with vinegar that mints have been sodden in; after that, rub them with the powder of mints or with dry mints."

The original version was *Bankes' Herbal*. 1525. This reference is available from: http://www.gallowglass.org/jadwiga/herbs/teeth.html [Accessed 2008, Oct 27.]