

**Strategies to Enhance the Oral Health  
of British Columbians, specifically  
Aboriginal Peoples,  
Tobacco-Users,  
and those of  
Low Socioeconomic Background**

**A Report Prepared by:**

**Michael MacEntee  
Rosamund Harrison  
Chris Wyatt**

**Faculty of Dentistry  
University of British Columbia**

**for the:**

**Tobacco Reduction and Control Branch  
Preventive and Health Promotion Division  
Ministry of Health  
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### PREFACE

Bruce Wallace begins his report “*Brushed Aside: Poverty and Dental Care in Victoria*” with the quandary “The cost of a dental visit is the same as a month’s worth of groceries. What would you pick?”<sup>1</sup> While most of the population have the financial and social resources to resolve this quandary, a worrisome number of British Columbians find, at best, that it is a very difficult challenge, and that food must come before

comfort and dental treatment. Even for those with adequate financial resources, access to oral health-care can pose significant challenges. There are no dentists practising in many remote communities of First Nations, so, even with the resources of Health Canada, residents must make long and expensive journeys for dental treatment. There are many long-term care facilities in the province where daily oral hygiene is virtually non-existent for the elderly residents and oral diseases are rampant. Yet, it is among children, the old, and those with disabilities where the impact of oral disease is potentially most distressing and damaging to health in general. For example, dental surgery and restorative treatments are the most common procedures involving general anaesthesia in hospital for children. At the other end of our life span, assistance with daily oral hygiene is almost non-existent for disabled residents of long-term care facilities.

The World Health Organization in 1981 set “*Global Oral Health Goals for the Year 2000*” as part of the “*Health for All*” campaign.<sup>2</sup> At the time, the goals did not seem overly ambitious with the hope of seeing half the five and six year-olds free of dental cavities, and all of the 12 year-olds with no more than three decayed, filled or missing permanent teeth. Improved standards of living in Canada and the widespread availability of fluoride had reduced or limited the initiation of caries generally. Consequently, strategic goals throughout Canada, as in most other industrial countries, were set to detect and eliminate oral diseases. Public oral health programmes moved from filling dental cavities in school children to preventing caries with water fluoridation, health promotion campaigns, and screening children to monitor their dental health. The dental professions based primarily in private practises expanded their services over the past 30 years to focus on periodontal disease and dysfunctional disorders of the jaws, and, of course, to restore the extensive residual damage from caries.

Unfortunately, all did not go exactly as expected. The public in B.C. grew suspicious of water fluoridation, resisted its adoption, and in some communities had it removed from the water supply.<sup>3</sup> New immigrants from less affluent countries arrived without the childhood benefits of fluoride and comprehensive oral care, or the resources to access private dental services. The distribution of wealth changed over the last three decades in Canada,<sup>4</sup> so the proportion of low-income families without private dental insurance increased. Moreover, a strong sense of cultural identity and control evolved from the First Nations with recognition that the oral health of band members is substantially poorer than that of other British Columbians. And, finally, there is now a general recognition of the detrimental effects of tobacco, and of the need for a multisectorial approach to discourage its use, especially among those who are more vulnerable to disease.

The strategies we propose here (see a summary list in Appendix 3) for enhancing the oral health of peoples from low socioeconomic backgrounds, Aboriginal peoples, and tobacco-users are based on primary, secondary and tertiary public health methods. In developing the strategies, we surveyed the literature and attempted to consult widely (Appendix 1) and to remain as neutral as possible to produce a balanced perspective when we encountered conflicting views and interests. It is important to note that this province has many innovative and apparently very effective public health programs in place. Therefore, our approach has been to build on these initiatives. In addition, we acknowledge that the health goals of lay people frequently differ from the goals of health-care professionals. Consequently, we preface our propositions with a strong recommendation for widespread and sensitive consultations among those who are the focus of the strategies.<sup>5</sup> Our perspective, despite the attempts we made to gather opinions from many sources, is of the dominant culture in B.C., so our recommendations on the needs of other cultures warrants careful scrutiny for relevance, and wide consultation for approval before implementation.

Firstly, we recommend several general steps to address the problems facing all three target groups: 1) expand existing programs already operating effectively in the province; 2) develop new programs where needs are not being met; 3) evaluation of all programs; and 4) encourage a more active and sensitive role for the dental professions in caring for the less well-off segments of the province. Our strategies specifically for Aboriginal communities acknowledge the uniqueness and strengths of traditional cultures

and the need to explore their inherent potential for enhancing oral health. We recommend that the Federal Government improve access to dental care for First Nations, and that prevention of oral diseases be featured as an integral theme for all new health and social programs administered by the First Nations. Similarly, access to dental care and services for low-income groups must be simplified and sensitised to the needs of people of all ages who are severely stressed and vulnerable. The role of dental professionals requires attention to ensure that the provision of services is appropriate to the needs of the recipients and to the educational background of the providers, so that preventive programs can be offered widely, efficiently and cost effectively around the province. Finally, we note that the strategies currently in B.C. to discourage tobacco-use are progressive and innovative, however, they would benefit considerably from greater attention to oral health-related issues and to the utilization of dental professionals as active and frontline participants.

The dental profession and related government agencies are wrestling with the challenge of providing equitable access to oral health care, yet there is little reference in the dental literature to the broader concepts of equity and distributive justice that have influenced other disciplines with similar challenges. Distributive justice rests on the ethical principles of an equitable allocation of resources, a fair compensation to providers, and a reasonable range of services. Efforts to capture the essence of how health care can contribute to a decent quality of life conclude that everyone should have equal opportunity for care, and that social inequalities are managed justly when maximum benefit is provided to the least advantaged in society. The apparent “bottom-less” pit of public demand in the face of widespread fiscal retrenchments confronts health services everywhere. However, ultimately the principle of allocating oral health-care to benefit to the least advantaged in society will benefit all, and does not necessarily need large financial resources.

*Whereas it has long been known and declared that the poor have no right to the property of the rich,  
I wish it also to be known and declared that the rich have no right to the property of the poor.*

John Ruskin (1819-1900)

## ACKNOWLEDGEMENTS

We are very grateful for the concern and effort made by many thoughtful and concerned individuals who helped us in so many ways to produce this report. As a group of three academic dentists accused occasionally of living in the isolation of our “ivory tower”, we sought the guidance of an advisory group consisting of Sharon Melanson, Maureen Smith, and Sherry Saunderson who are all very experienced clinicians in the ways of the real world. They offered us a wealth of human and professional experience grounded in everyday clinical public health around the province. Terri Buller-Taylor kept us on track during the collection of information from a multitude of sources. Her organizational skills brought calm and focus to potential chaos on several occasions. The technical skills and perseverance of Rita Zamluk and Tony Hole within the electronic web allowed us to access information with speed and accuracy, while Tony’s interviewing skills enriched our jurisdictional exploration with the personal insights of many experts around the country. George Beagrie, as an author of several influential reports on dentistry, provided constructive criticism to the report as it took shape. Jenny Cleathero from the United Way Research Services provided direction towards an understanding of the extent of poverty in the province, whereas the administrative talents of Judy Laird and Karen Manary, with assistance from Phil Feeley, ensured that the research team was managed well.

We are indebted, of course, to the vision of those individuals in the Ministry of Health who saw the need for this report and who made available the financial support for our research group. Don Davis, Regional Dental Officer, First Nations and Inuit Health Branch, gave to us his wealth of experience and sensitive insights to the needs of the Aboriginal population. In particular, we wish to acknowledge the advice provided by Malcolm Williamson, not only because he gave his time generously to us as we explored the frontiers of public health dentistry in BC, but also because he has been responsible, as the Senior Dental Health Consultant in the province for many years, for constructing a public dental health service that is remarkably good. Indeed, many of our strategic proposals should be feasible because of the foundation that he has laid.

Finally, we wish to extend a widespread thank you to everyone who responded so willingly and openly to our search for information. Our task was made so much easier by the enthusiasm we encountered among the professional organizations representing dentists, dental hygienists, denturists and certified dental assistants provincially and nationally, and by the willingness of representatives from Aboriginal and low-income communities, and from advocates for tobacco cessation, to offer constructive advice. We are encouraged by what we have heard and read over the last few months, and we hope that we have done justice to the efforts of everyone who helped us.

Sincerely,

Michael MacEntee, Rosamund Harrison, Chris Wyatt

May 2001

## LITERATURE REVIEW

*A Case Report*<sup>6</sup> - Recently, a young single mother attended a dental practice regularly for dental hygiene until her dentist would no longer accept payment for her care from the Ministry of Social Development and Economic Security. She was controlling periodontal disease by self-care, supplemented by regular periodic curettage from a dental hygienist as directed by her dentist. Due to her low income, she received financial assistance from the Ministry to receive basic dental care. Her dentist asked her to pay directly for the curettage because he felt that the Ministry reimbursed his practice inadequately for this service. Unfortunately, this young woman felt that she could not afford the dental fee, and so she joined the ranks of others, who believe that dentistry is a health service accessible only to advantaged members of society.<sup>7,8</sup>

Tooth-loss has long been considered an inevitable part of ageing, caries (dental decay) the most prevalent chronic disease in childhood, and oral cancers a significant threat to all. Recent advances in the prevention and management of caries and periodontitis (gum disease) - the two principal causes of tooth-loss in all age groups - have reversed dramatically this inevitability. Today most children can look forward with reasonable confidence to a natural dentition for life. Nonetheless, factors predisposing to oral infections and cancers are influenced strongly by the social, economic and cultural contexts in which people live, and it has become abundantly clear that people from low socio-economic backgrounds and Aboriginal peoples are very prone to caries, whereas people who use tobacco products are more likely than others lose their teeth because of periodontitis or to get cancer. Fortunately, these diseases are, for the most part, preventable.

### LOW INCOME

Most British Columbians are neither wealthy nor poor. In fact, between the early 1950s and the late 1970s, the province experienced an unprecedented period of economic prosperity. Nonetheless, the economy and the purchasing power of most families since about 1980 in Canada have been stagnant. Only the top quintile\* has increased its share to about 41% of the national income, the lowest quintile has remained constant at about 6%, and the three middle quintiles have lost ground.<sup>9,10</sup> Health-care and education are not usually included as part of “income” statistics, although they have a profound impact on our sense of well-being. Therefore, despite attempts at distributing wealth equitably, there remains a very substantial disparity between high and low incomes in Canada.

### Poverty and Low-income

There is no general agreement on what constitutes a low-income or on how the poverty line should be drawn. However, one perspective defines poverty as a lack of resources “for achieving self-respect, taking part in the life of the community, (and) appearing in public without shame”.<sup>11</sup>

The B.C. income-assistance rates in 1996 were \$6,420 for a single person, and \$14,568 for a family of four. The National Council of Welfare uses the *Low Income Cut-Offs* (LICOs) based on the assumption that the average Canadian family spends about 36% of its gross income before tax on food, shelter and clothing. Consequently, Statistics Canada considers arbitrarily that a low-income family spends 20 percentage points or more (*i.e.* 56%) above this average. In 1995, this amounted to about

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\* Each quintile equals one-fifth of the total population.

**\$30,000 annually for a family of four living in a large city, and \$21,000 in rural Canada**, while the cut-off for a single person was assumed to be about half of this income.<sup>12</sup> The *Market Basket Measure* (MBM) developed by the Federal/Provincial/Territorial Working Group on Social Development Research and Information is an alternative measure of poverty that placed the poverty threshold in 1996 for a family of four at \$25,196 in Vancouver, \$22,712 in Prince George, and \$20,516 in rural B.C.<sup>13</sup> Statistics Canada does not calculate poverty rates specifically for FN reserves. There is much controversy around assumptions on income needs and they are subject to widespread political influence and interpretation.

In 1995, five million people in Canada - 17% of the total population; 36% of unattached persons; and 14% of families - had incomes that were below the poverty line.<sup>4</sup> The equivalent 1996 poverty rate in B.C. was 38% for single persons and 14% for families.<sup>13</sup> Census data from B.C. in 1996 show that that 382,100 (21%) women, 326,100 (18%) men, and 184,700 (22%) children were supported by incomes below the poverty line.<sup>14</sup> In all, about *one-in-five or close to three-quarters of a million persons live below the poverty-line in B.C.* with a concentration among recent immigrants, single-parent families, and Aboriginal peoples (Table 1). The poverty rate (17%) among elders in BC almost halved over the last two decades,<sup>15</sup> and in 1990 most (84%) older adults in Canada believe that their income is adequate.<sup>16</sup>

The implications of socioeconomic status for oral health, of course, is that people who struggle constantly to make ends meet have little money or time to spend on dental treatment. Their priorities must focus on food, shelter and clothing for themselves and their families, so prevention of disease assumes an even greater priority when resources are stretched.

**Table 1. Distribution of population groups (x 100) with incomes below the poverty line\* in 1996.**<sup>14</sup>

Population Groups	British Columbia		Greater Vancouver		Vancouver City	
	Number	%	Number	%	Number	%
Everyone	7082	20	419.2	23	156.8	31
Women	3821	21	223.3	24	80.3	31
Men	3261	18	195.9	22	76.5	31
Children <18yrs	1847	22	101.2	26	29.8	35
Recent immigrants	1062	49	98.6	52	35.7	53
Lone-parent family	467	52	21.1	54	6.4	60
Unattached elderly women	434	45	24.5	54	8.7	56
Aboriginal peoples	385	42	13.4	49	6.8	66

\* Low Income Cut-Off (LICO)

## ABORIGINAL PEOPLE IN B.C.

The 1982 Constitution of Canada recognized the term “Aboriginal” in reference to First Nations, Metis and Inuit peoples. Although not a legal identity, *First Nations* has replaced the term “Indian” to identify descendants of the first inhabitants of Canada. Status Indians are either Treaty Indians or Non-treaty Indians depending on whether they or their descendants signed a treaty with the Government of Canada. Most of the First Nations in B.C. did not sign treaties – presently a focus of much attention with potentially profound implications for health care in the province when native groups are no longer wards of the state. The *Inuit* are identified as a distinct Aboriginal people who live mostly in Northern Canada, whereas the *Metis* are of mixed First Nations and European ancestry dating back to the 17<sup>th</sup> century.

During the 1996 census of B.C., Aboriginal persons\* accounted for 4% of the total population.<sup>17</sup> Currently, there are 198 First Nation bands in the province, while one resident in 30 is recognized as a “Status Indian” with a mean age of 28 years compared to 37 years for the rest of the population. Consequently, one-third of the band members are younger than 18 years of age or younger. Seniors, on the other hand, represent less than five percent of the bands, but over 10% of total population.<sup>18</sup> It is important to acknowledge the significant *cultural diversity* between the nations, and even between bands, in the province. Hence, one oral health strategy will not suit all, as reflected in the fact that there are approximately 80 health and social service organizations to address Aboriginal needs.<sup>19</sup> Nearly half (~44%) of the First Nation people live on reserves in B.C.,<sup>20</sup> but between one-third to one-half of them move on and off the reserves frequently. A culturally diverse group of about 28,000 mostly (80%) Status Indians live in Vancouver (*i.e.* about 7% of the city’s population).<sup>21</sup> Compared to the non-Aboriginal population, they are more likely to live in poverty with less than high school education and without steady employment, especially if they live on-reserve.

Access to care is the dominant oral health problem among Aboriginal peoples both on and off reserves. Frequently, access is restricted by the remoteness of the First Nations’ communities, but differences between First Nations cultures and the dominant Western culture can also present even more threatening barriers to care.

## TOBACCO-USERS†

The World Health Organization is focusing international resources and action on the global tobacco pandemic that kills four million people a year, with estimates that it will probably kill 10 million people a year by 2030.<sup>22</sup> This is more than the combined death toll from malaria, tuberculosis, and major childhood diseases. One-quarter or so of the British Columbians smoke tobacco, more so if young or of Aboriginal heritage (Table 2).<sup>23,24,25,26</sup> In addition, 12% of Aboriginal boys and 7% of Aboriginal girls chew tobacco<sup>27</sup> In all, tobacco-use in Aboriginal populations causes more deaths (~6000) *per* year in B.C. than murder, suicide, motor vehicle accidents, other drugs and alcohol, and AIDS combined. It is a major threat also to oral health, not only as an associate of cancer, but also because of the detrimental affect it has on the soft tissues surrounding the teeth and lining the mouth, and because it retards the natural healing process.

	Age (Yrs)				
	12-18	19-24	25-44	45+	65+
Aboriginal	41%	61%	49%	29%	21%
General Population	16%	31%	27%	21%	11%

## HEALTH

### Concepts of Health and Health-care

The system of health-care in BC has evolved over the last 50 years from a relatively simple biomedical perspective focused narrowly on psychophysical disorders to a broad, interactive and holistic mix of

\* 113,315 First Nations; 26,750 Metis; 815 Inuit

† Tobacco misuse is defined as non-traditional use of commercial tobacco, including cigarettes, cigar/cigarillos, pipes and smokeless tobacco (snuff and chewing tobacco).



economic, social and environmental determinants.<sup>28</sup> The seminal concept of health advanced by the World Health Organization in 1948 recognized the physical, mental and social well-being of individuals as integral to their health. Although it is not a particularly useful guide to public health policy,<sup>29</sup> it spawned a series of governmental actions that has shaped our current perspectives on health. In Canada, it took shape within the “Lalonde Report”,<sup>30</sup> was refined a little later,<sup>31</sup> and was adopted by the WHO as a “process of enabling people to increase control over, and to improve, their health”.<sup>32</sup> This concept of health promotion identified a wide range of issues that influence health. More significantly, it moved the focus from the individual to the society where individual participation and the supportive environment were major considerations in the development and implementation of an effective health services. Further conceptual contributions moved the interest from *health promotion* that focused on individual or community control<sup>33</sup> to *population health* that has influential political roots. In summary, health has evolved over the years into a personal and social phenomenon determined by the “air we breathe, the food we eat, how we work, what we earn and how we feel about its fairness, the housing in which we live, the nurturing we receive as youngsters, and the transportation we take as adults”.<sup>29</sup>

## **Distributive Justice in Health Care**

Typical problems with oral health, for example, result from poor nutrition and hygiene. Potential demands for dental treatment in most societies are enormous, especially where curative or treatment techniques prevail over an emphasis on the prevention of disorder.<sup>34</sup> Moreover, when government supports payment for oral health-care, there are frequent disagreements between the government agencies, the providers of care (dentists, dental hygienists and denturists), and the recipients of the care about the scope of reasonable care and the just or fair allocation of public resources. The disagreements are certainly not unique to oral health-care, as debate continues worldwide in search of the most effective method of health-care delivery. There is, however, sensitivity within health-care generally that the least advantaged in society warrants special attention. Currently, a central belief from an ethical and philosophical base is that the greatest rewards for society will come from an egalitarian perspective on prevention, supplemented by a social contract for treatment, so that maximum benefit accrues to the least advantaged.<sup>35,36</sup>

## **Concepts of Health Among Aboriginal Peoples**

Aboriginal peoples impart a spiritual dimension to health and disease, in which transgressions between humans or between humans and spirits cause serious illness. Therefore, health is dependent on both social and moral order. Treatment for sickness frequently involves a public recognition of the transgression, a confession within the community, and a holistic view of healing.<sup>37</sup> The "Native Strengths Project" among Aboriginal residents of Vancouver's Downside Eastside identified eight common themes on health: 1) a sense of community; 2) personal identity; 3) drawing strength from cultural traditions; 4) contributing strength to promote wellness in the community; 5) spirituality; 6) good living; 7) evolving from hardship; and 8) illness that detracts from wellness.<sup>38</sup>

The spiritual concept of health in most native communities does not always provide an adequate awareness of current health problems. For example, in Alberta, Aboriginal youth seemed ill-informed about nutrition, communicable diseases, personal health, and the relationship between smoking and cancer,<sup>39</sup> whereas native children of all ages in the Northwest Territories seemed unaware of dietary and other measures recommended for preventing caries.<sup>40</sup>

## **Health of Aboriginal Peoples in BC**

The *Royal Commission on Aboriginal Peoples* in 1996 identified powerlessness resulting from colonialism, racism, and loss of cultural identity as important influences that affected the health of Aboriginal people.<sup>41</sup> Consequently, the life expectancy of 63 years for Status Indians in 1997 was 16 years

lower than the rest of the population. In Vancouver it was six years less than for other Status Indians in B.C. The prevalence of self-reported chronic diseases in native groups is higher than in the general population, particularly diabetes, heart disease, circulatory disorders, arthritis, pneumonia/influenza and cancer.<sup>42</sup>

Health status varies substantially among Aboriginal communities, therefore, national health indicators may not be meaningful or useful to Aboriginal communities in B.C. Nonetheless, Aboriginal people in general are, by any measure, less healthy physically than the rest of the population.<sup>43</sup> Death rates of Status Indian are almost twice the provincial average, while Sudden Infant Death Syndrome, accidental injuries, and chronic liver disease are three to eight times higher than the general population. Nonetheless, the horrifying gap between Status Indians and the rest of the population is narrowing, as noted in the decreasing infant mortality rates over the last half century.<sup>44</sup>

Reasons for the poor health of this population are varied, but the lack of Aboriginal-staffed and friendly health-care services sensitive to the cultures, traditional beliefs and healing practices probably play some role. Western medicine usually has little interest in the traditional herbs and plants that special “healers” in the community use to address the spiritual aspect of sickness.<sup>45</sup> Certainly, the infant mortality rate of Status Indians living in the North West of B.C. is lower than in the South Mainland or on Vancouver Island, and probably because of the ***Provincial Aboriginal Health Services Strategy*** encouraged the participation of First Nations in the design, delivery and governance of culturally appropriate health services. Currently, about two-thirds of the bands in B.C. are responsible for their own community health services on-reserve, or they have planning to do so.

**STRATEGY**  
**integrate oral health into all programs for improving the health of Aboriginal peoples**

## ORAL HEALTH AND DISEASE

### Caries

Caries is the most prevalent chronic disease threatening children in B.C. It is the largest unmet health-care need in the USA<sup>46</sup> and is a very frequent reason for missing school.<sup>47</sup> Caries is five times more common than asthma,<sup>48</sup> and is surpassed in frequency only by the common cold.<sup>49</sup> It is initiated and sustained by a combination of bacterial virulence in the mouth; acidity of the diet; and resistance of the teeth to demineralisation.<sup>50,51</sup> Bacteria, notably *Streptococcus mutans* and *Lactobacilli*, produce acids when they metabolise carbohydrates and sugars on the surface of teeth. The *S. mutans* adhere to and acidify the smooth surface of the teeth allowing calcium and phosphate ions to leave the organic matrix. Subsequently, the surface pores enlarge so the less adhesive *Lactobacilli* can invade. Finally a cavity opens when the organic matrix collapses, and an abscess develops in the jawbone around a tooth when bacteria invade the root canal.

The term ***early childhood caries (ECC)***\* refers to a severe form of caries in the primary teeth of young children.<sup>52</sup> The prevalence of tooth decay in children and adults has decreased significantly in the past 30 years, although the decrease has been much less pronounced in primary (baby) teeth relative to permanent teeth.<sup>53,54</sup> Awareness of the burden of dental disease on children and their families has increased, so that oral health surveys have begun to focus on children five years of age and younger. The 1988-91 National Health and Nutrition Examination survey in the USA, for example, found that 0.8-

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\* ECC has also been called “nursing caries”, “baby bottle tooth decay”, “nursing bottle syndrome”, or “milk bottle syndrome”, however, the link between caries and the use of a baby-bottle is not always absolute. Therefore, the more general term - early childhood caries - is more appropriate without linking the disease to a specific cause.

1.7% of infants (<5yrs) had ECC.<sup>55</sup> More recently, a large British survey found that 43% of 5-year olds had experienced caries,<sup>56</sup> and a survey of 5-year olds in Ontario with similar findings added that caries seems to be increasing among the youngest schoolchildren.<sup>57</sup> Nevertheless, it is difficult to present the actual prevalence of this disease in the population because there have been relatively few large surveys of dental health in preschool children.<sup>58</sup> It has been studied in specific groups of preschoolers, but the prevalence ranges from 19-63% in clinical studies, and from 0.8-64% in population-based studies.<sup>59,60</sup>

### ***Risk Factors***

Maturity of teeth, transmission of bacteria, food selection, patterns of eating, and oral hygiene, along with many other psychosocial variables, modify the risk of caries.<sup>50</sup>

### ***Socio-economic Status***

It is difficult to separate socio-economic status from variables, such as the age and education of the mother, or the use of tobacco by either parent, yet polarization of the disease to a minority of high-risk children is evident by the fact that **one-quarter of children account for more than 50% of the caries** in western societies.<sup>61</sup> Reports from the USA indicate that children from low-income families have substantially more decayed teeth and more untreated oral disease generally than other more affluent children,<sup>48,62,63</sup> Similarly, the most important social factor explaining differences in caries among European children is the social class of the family.<sup>64,65</sup> A recent National Diet and Nutrition Survey in the UK of children aged 1.5-4.5yrs, demonstrated that the association between social class and caries is much stronger than the association between toothbrushing and caries, or between sugar consumption and caries,<sup>66</sup> which supports an earlier British observation that the parents occupation had a particularly strong impact on the dental health of a child.<sup>67</sup> Other associated factors, such as young mothers<sup>68</sup> or mothers who use tobacco,<sup>69</sup> are also associated with ECC. Indeed, low socio-economic status has a negative impact on dental health even in communities with fluoridated water,<sup>70,71</sup> although impoverished compared to affluent children benefit more from water fluoridation.<sup>72,73</sup> Certainly, socio-economic influences are not simply related to poor diets or infrequent toothbrushing.<sup>74,75</sup> Families living in deprived circumstances are more prone to disease generally, possibly because of low interest or trust in health promotion,<sup>76</sup> limited awareness of available health services, and a fatalistic attitude to life. High transportation costs and the refusal of some dentists to treat recipients of social benefits also are major impediments to care when financial resources are scarce.

### ***Ethnic background***

ECC among preschool children in many non-industrialized countries is increasing.<sup>53</sup> Children of recent immigrants to industrialized countries also demonstrate a high prevalence of ECC. For example, the decline in caries noted generally over the past 30 years in Scandinavia is not as pronounced among preschool children with immigrant backgrounds despite the fact that all preschool children are offered comprehensive oral health-care.<sup>77,78</sup> Also, in the UK, where immigration patterns are similar to those here, caries among children of South-Asian heritage is much more prevalent than among children of English heritage, irrespective of economic status.<sup>79,80,81</sup> And, in Vancouver, nearly two-thirds (64%) of a small sample of children of Vietnamese background had ECC - a significantly higher percentage than similarly aged U.S. children.<sup>82</sup>

### ***Fluorides***

Water fluoridation is beneficial to all.<sup>83,84</sup> **Children from deprived communities benefit more from water fluoridation than children in affluent communities.**<sup>72</sup> In fact, community water fluoridation\* is the most effective and socially equitable strategy for preventing caries in all age groups.<sup>85</sup>

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\* The Ontario Ministry of the Environment in September 2000 lowered the level of fluoride in the drinking water to 0.5-0.8mg/L from the previous standard of 1.0-1.2mg/L and lower than the 0.8-1.0mg/L recommended by the federal-provincial

### *Acquisition of caries-causing bacteria*

The bacteria that initiate and sustain caries can transmit from mother to child through kissing and by sharing food or eating utensils. Mother and child usually have similar numbers and genotypes of *mutans streptococci*, which suggests strongly that ***cariogenic bacteria are transmitted from mother to child***.<sup>86,87</sup>

#### **STRATEGY**

**encourage mothers to eliminate caries from their teeth to reduce the risk of transmitting cariogenic bacteria to their children**

### *Diet and other factors*

There is very aggressive and very effective marketing through ***television commercials*** directed at children to promote foods and snacks with a high content of sugar and fermentable carbohydrates.<sup>88,89,90</sup> The media has a profound influence also on the food choices of many indigenous peoples worldwide.<sup>91</sup> Analysis of the nutritional quality of food in television advertisements targeted at children in New Zealand reported that they rarely promoted nutritious low-cost foods or healthy foods consumed by Aboriginal peoples.<sup>92</sup> Consequently, these marketing strategies are likely to increase obesity in childhood, cardiovascular disease, diabetes and cancers in adults, and dental caries in all.

#### **STRATEGIES**

**develop consumer educational programs that equip individuals of all ages and cultures to assess the validity of nutritional information in advertisements of foods, snacks and beverages**

**encourage advertisements for healthy foods**

**tax specific confectionary goods and beverages to support programs directed at the adverse impact of excessive sugar consumption on health**

**require manufacturers of confectionary, soft drinks and other snacks to label their products with health warnings**

The food we eat plays a key role in our risk to caries. The weight of evidence suggests that it is ***frequency of sugar and fermentable carbohydrate intake*** rather than total sugar consumption that heightens the risk of caries.<sup>93</sup> A sweet liquid in a baby-bottle is a particularly hazardous beverage when used by a child for comfort or when sleeping.<sup>94,95</sup> There have been suggestions that bovine milk is cariogenic,<sup>54</sup> but this may only be so if ingested constantly from a bottle,<sup>96</sup> or if the milk has added sweeteners, such as honey or chocolate syrup.<sup>97</sup> Fruit juices or other drinks that acidify the mouth<sup>98</sup> are also hazardous.<sup>99</sup> The habitual use of a bottle during the day predisposes a child to habitual ***snacking***, which can lead in due course to rampant caries.<sup>100,101</sup>

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subcommittee on drinking water in 1996. The standards have been adjusted to compensate for other sources of fluoride (e.g. toothpaste) and to reduce dental fluorosis.

The relationship between caries and consumption of sugar or fermentable carbohydrate is complicated. Industrialized countries consume large quantities of sugar, yet caries overall has been on the decline, probably because of exposure to fluorides.<sup>102</sup> Even in non-industrialized countries where fluoride is not so readily available but sugar consumption is less than 15 kg/person/year, the association between caries and sugar consumption is weaker than expected.<sup>103</sup> This observation has led to a suggestion that caries might be controlled strategically by limiting sugar consumption to less than 15 kg/person/year.<sup>104</sup> However, despite the apparent simplicity of this strategy, it is probably impractical because of the central role that sugar plays in our celebrations.<sup>102</sup> Certainly, sugars and refined carbohydrates in soft drinks, confectionary and sweet snacks are major threats to health generally, and even more so among some new immigrant groups who previously have not had such ready access to these products.

Grocery spending patterns have changed remarkably in Canada between 1982-96 with a 90% increase in purchases of non-alcoholic beverages (including carbonated and non-carbonated drinks, but excluding juices, coffee and tea). The urban consumer spending on non-alcoholic beverages went from \$34 to \$71, and on confectionery and snacks from \$32 to \$75, *per-capita* during this period.<sup>105</sup> At the same time, there was a 44% increase in spending on groceries. Americans consumed 27 pounds of candy and gum in 1998 at a cost of \$US56.4 each,<sup>106</sup> and the total apparent consumption (= shipments + imports – exports) for all “candy” in the USA amounted to about \$US15 billion (wholesale) and \$US23 billion retail annually, or about \$CAN128 per person.<sup>107</sup> Assuming that the sales are similar in this province, the expenditure on confectionary or sweets in B.C. is approximately \$511 million annually. The 7% ***provincial sales tax on confectionaries should generate about \$36 million for managing sugar-related illnesses***, such as caries. Currently, confections are subject only to federal G.S.T. but not P.S.T.

### *Oral hygiene*

The relationship between oral hygiene and caries is confusing because it is almost impossible to evaluate how well teeth are cleaned, and because reports of tooth brushing usually come from parents or others who are prone to a “recall” or “social desirability response” bias.<sup>50</sup> Nonetheless, ***visible plaque on the labial surfaces of maxillary primary incisors does predict future caries in young children***.<sup>108,109</sup> In the British National Diet and Nutrition Survey,<sup>66</sup> consumption of sweet food was not associated with caries when children brushed their teeth at least twice daily. Nonetheless, it is very likely that caries is prevented more by the fluoridated toothpaste than by the toothbrush, especially in preschool children where spaces between teeth allow the fluoride in toothpaste to remineralise all dental surfaces.<sup>110</sup>

## **Developmental Disorders and Trauma**

Cleft lips, cleft palates and other birth defects, along with severe developmental malocclusion cause substantial distress on individual families. Expensive and repeated surgery, accompanied by orthodontic treatment is usually required to repair the defects and align the teeth and supporting structures.

Accidental or non-accidental injuries to the teeth or supporting structures also have significant consequences. Fortunately, preventive devices and educational strategies do substantially reduce the risk of damage to the mouth and jaws.

## STRATEGY

**expand awareness of mouth-guards, helmets, car seats and other protective devices to reduce the incidence and severity of orofacial trauma**

### Tobacco And Oral Health

Tobacco-use has been linked to periodontal diseases, mucosal disorders, cancer, and birth defects,<sup>111</sup> while cigarettes and smokeless tobacco specifically increase the severity of gingivitis, periodontitis, caries and mucosal diseases.<sup>112,113,114,115,116</sup> In all, the link between smoking and periodontal disease is strong, although the causal relationship is unproven. Smokers tend to have more bacterial plaque on their teeth,<sup>117,118,119</sup> and nicotine weakens the body's protective responses to bacterial plaque.<sup>120,121</sup> The result, paradoxically, usually leads to less, rather than more, gingival bleeding, as destruction of the periodontium continues.<sup>122</sup>

The quantity of tobacco, usually cigarettes, smoked has a direct relationship to the prevalence and severity of **periodontal disease**,<sup>123,124</sup> and is responsible for most of the periodontitis occurring in young adults.<sup>112,125,126</sup> The risk of periodontitis in the population generally is tripled in smokers compared to non-smokers,<sup>127</sup> doubled in light smokers and former smokers, but elevated between four- and seven-fold in heavy smokers.<sup>128,129</sup> Consequently, elimination of tobacco smoking could reduce the prevalence of severe periodontal disease by 1-2% in the adult population.<sup>130</sup> Smokers who quit tobacco can reduce the loss of periodontal bone,<sup>123,123,131</sup> but if they continue, they will inhibit healing and risk reactivation of the disease following periodontal treatment.<sup>132,133</sup>

American<sup>134</sup> and Swedish<sup>135</sup> studies suggest that the risk of **cleft lips and palates** in newborns is elevated when mothers smoke during pregnancy, although the extent of the risk is unclear.<sup>136</sup>

Tobacco-use also has an adverse affect on the oral mucosa,<sup>137</sup> on the prevalence of **caries** in adults<sup>138,139</sup> in children of parents who smoke,<sup>69</sup> and on the integration of oral **implants**.<sup>140</sup> **Oral cancers** represent approximately 3% of all cancers,<sup>141</sup> with about 3,000 new cases diagnosed annually in Canada.<sup>142</sup> The link between smoking and changes to the oral mucosa leading to cancer is well established,<sup>111</sup> and is exacerbated by alcohol abuse.<sup>143</sup> And, of course, the risk increases almost five-fold for those who have smoked heavily (>40 cigarettes/day) for a long time. Therefore, avoiding tobacco and alcohol abuse reduces the risk of cancers in and around the mouth,<sup>144</sup> and early detection of cancerous lesions in the mouth improves the prognosis significantly.<sup>141</sup> There is a substantial risk to oral health also from **smokeless tobacco** despite claims that it is an attractive and safe alternative to smoking. It too is addictive, carcinogenic<sup>145,146</sup> and a risk to periodontal disease.<sup>147</sup> Furthermore, the high sugar content of chewing tobacco contributes also to the risk of caries.<sup>148</sup>

### Oral Health of Aboriginal Peoples

At the turn of the last century, most native bands had good dental health, probably because sugar and refined carbohydrates were not a usual part of the native diet.<sup>149</sup> European colonial policies imposed major changes to the Aboriginal lands, resources, and social structures. New illnesses accompanied the colonizers with horrific long-term consequences to the indigenous population. Consequently, even today and by every measure, Aboriginal peoples have significantly poorer health, including oral health, than the majority of the population. In Ontario, for example, almost all native children by age 12 years have had caries,<sup>150</sup> and tooth-loss is endemic amongst Inuit adults.<sup>151</sup> In 1997, almost half of the Aboriginal adults

who responded to surveys conducted among the First Nations of Canada\* said that they needed some dental care.<sup>152</sup> Younger adults were more likely than older people to report a need for treatment, either because Elders had a more traditional diet, or they have dentures. About one adult in four reported having a dental problem or pain within the previous month. Investigators in the USA reported that the distribution of edentulism in their native population approximates the edentulism seen in the “white” population during the 1950s.<sup>153</sup> In Australia, the native population fares no better.<sup>154</sup> However, information on the oral health of native populations generally has been conducted mostly on reserves among children and elders, with little attention to youth and younger adults who live off the reserves. Also, there are few longitudinal surveys† to determine change in health status, or the impact of health interventions.

**Strategy**

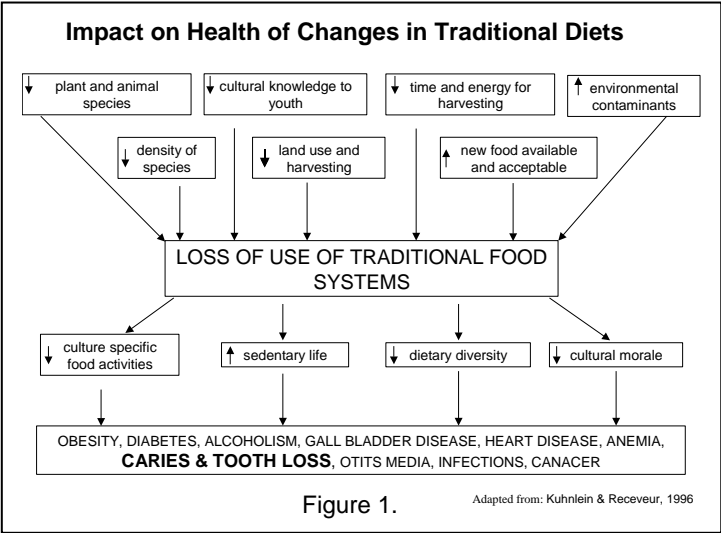
**encourage First Nations to explore and readopt traditional parenting practices**

**explore appropriate diets and oral hygiene practices with respect to the “cultural revitalization” of First Nations people**

**Indigenous Food and Oral Health**

The diverse range of Aboriginal cultures within B.C. in the three different horticultural zones (Northwest Coast, Plateau and Sub-Arctic) provides a wide assortment of traditional fish, meat and plants. Traditionally, the diet of the First Nations in B.C. was higher in protein and fat than in fructose, glucose, starch or other carbohydrates. Carbohydrates from roots and berries probably contributed no more than one-fifth of the total diet of native communities.<sup>149</sup> Sweet substances are rare in the traditional diet. Douglas fir trees yield crystalline sugar, licorice fern rhizomes and some roots - such as camas, nodding onions and balsam roots - contain inulin that converts to fructose during storage and cooking. However, neither the quantity nor the frequency of these carbohydrates posed a significant threat to teeth. Sugar, refined grain-flour bread, sweetened tea and alcohol accompanied the Europeans with very damaging consequences to health and to the appreciation of traditional foods.<sup>91</sup>

Although fish remains a staple of most coastal bands in B.C., there has been a gradual decline in the consumption of other traditional foods over the last century due to the influence of schools and public health programs promoting the food of the dominant culture.<sup>155</sup> Promotion of infant formula and milk in a baby-bottle, for example, introduced



\* The First Nations and Inuit Regional Health Surveys in 1997 covered people across Canada living on-reserve.

† In B.C., from 1972 to 1988, First Nations communities took part in province-wide surveys of oral health status, but the clinical observations were limited in age-range, and to children on reserves.

Early Childhood Caries through misuse of the bottle to deliver sweet drinks as a constant day-time and nap-time soother. The variety of traditional harvests was replaced by a limited market-based supply of food, and a resulting risk of malnutrition.<sup>91</sup> The impact of these changes have not been investigated to any large extent, but there is no doubt that the rising incidence of diabetes, cardiovascular diseases, caries, tooth-loss, and obesity are associated strongly with diets high in sugars, refined foods, saturated fats and low fibre (Fig 1).<sup>156</sup>

## ORAL HEALTH OF BRITISH COLUMBIANS

### GENERAL POPULATION

There is little information on the oral health of British Columbians based on a representative sample of all age groups. The College of Dental Surgeons of B.C., and recently the Association of Dental Surgeons of B.C., between 1986 and 1996 surveyed the oral health of patients attending dentists in the province. On three occasions - 1986, 1991 and 1996 – a questionnaire was sent to the dentists requesting a dental “picture” of the adult population in their care on a particular day. Response from about one-third of the 2083 practising dentists in the province revealed that 87% of their patients on that day in 1996 had been examined also within the previous year, which is a substantial increase from the 64% of patients in 1986 who had attended the dentist seen within the previous year, especially since the proportion (~ two-thirds) of patients with dental insurance changed little between 1991-96.<sup>157</sup> Most patients had evidence of caries, even among 16-25 yr-olds of whom about one in five had lost a tooth. Nonetheless, there was an overall decrease in the prevalence of caries (96% in 1986; 88% in 1996) in this age group during the same period.<sup>158</sup>

**Cancer** of the mouth, lip, tongue and pharynx in 1997 was diagnosed in 725 and fatal in 253 British Columbians (Table 3).<sup>159</sup>

**Table 3.** Incidence and death rates (per 100,000) of oral cancers in B.C. during 1997.<sup>159</sup>

Lesion	Incidence	Mortality
Lip	0.2	1.7
Tongue	1.4	3.7
Mouth	1.8	6.2
Pharynx	3.0	6.7
Total	6.4	18.3

### Aboriginal Peoples

The Provincial Health Officer’s Annual Report in 1997 reported that the age-standardized hospitalisation rate for dental procedures was 6.7 *per* 1000 children, but for Aboriginal children under 14 years the rate as high as 68 *per* 1000 Aboriginal children.<sup>160</sup> Recent surveys demonstrate that caries in permanent teeth has been decreasing, yet, caries in primary teeth remains high and quite extensive among Aboriginal children compared to the general population.<sup>161</sup> Similar observations of extensive **caries** in primary teeth have been reported from the Cariboo region of the province.<sup>162</sup> This early destruction of primary teeth explains in part the increased prevalence of severe **malocclusion** in Aboriginal children compared to the rest of the population,<sup>163</sup> whereas an increase in claims for orthodontic treatment suggests a recent awareness of dental health and facial appearance.<sup>164</sup>

Caries among First Nations and Inuit children is less prevalent in B.C. than in other parts of the country, nonetheless, 12 year-olds on average have had about four teeth decayed, filled or extracted, and caries-rates in six- and 12 year-olds dropped very little during the last decade.<sup>165</sup> There is almost no information available on the oral health of Aboriginal adults on or off reserve in this province.



## Low-Income Groups

Oral health in all age groups is associated directly with socio-economic status, and limited access to nutritious foods often leads to a more cariogenic diet.<sup>166,167,168,169</sup> For example, low-income groups compared to their wealthier neighbours have a higher rate of caries,<sup>81,170,171</sup> usually because they consume more sugar, use less fluoridated toothpaste,<sup>172,173,174,175</sup> and visit dentists less frequently.<sup>176,177</sup> The anxiety of a mother relating to her own oral health, along with other stressful events, can and frequently does influence the oral health-related behaviour of her children for a lifetime.<sup>178,179,180</sup> Children in the USA who are in the “Head Start” program have extensive financial support for dental treatment through government aid, yet, they too, when compared to children who are not in the program, have high rates of caries and dental pain, and they visit dentists irregularly.<sup>181</sup> Utilization rates of government sponsored health services to young and old adults in the USA<sup>182</sup> and in Finland<sup>183</sup> have also been low. Many **dentists consider the remuneration inadequate** for treating recipients of social benefits, and so are reluctant to provide treatment.<sup>184</sup> The poor participation by dentists in the Medicaid program in Washington State was attributed also to inadequate fees, slow payment for services, missed or cancelled appointments, racial discrimination, low satisfaction in working with patients who have extensive treatment needs and little compliance with therapeutic recommendations.<sup>185</sup>

Dental staff, originally from the Ministry of Health and now from the Regional Health Boards, conduct visual examinations of all kindergarten children annually using the Williamson Index developed by the Ministry of Health as a screen for caries among kindergarten children.<sup>186</sup> This screening protocol was expanded to produce an index of Nursing Bottle Tooth Decay (NBTD) also used by the Ministry of Health.<sup>187</sup> The results of the screenings in recent years indicate on average that 11% of kindergarten children in the province have ECC (Table 4), which may indeed underestimate the problem because only visual methods are used to examine the teeth.<sup>188</sup>

**Table 4.** The Nursing Bottle Tooth Decay (NBTD) Index for 5 year-olds in the health regions of B.C., 1998/99.<sup>187</sup>

	Thompson/ Okanagan/ Kootenay	South Fraser	Simon Fraser/ Fraser Valley	Vancouver Island/ Coast Garibaldi	North	Burnaby	Capital Health Region	Vancouver/ Richmond Health Board	Total
Total screened	7007	7833	6904	4605	4658	1004	1481	3877	37369
Severe	344	269	221	318	238	76	108	1574	3148
NBTD	(5%)	(3%)	(3%)	(7%)	(5%)	(8%)	(7%)	0%	*4%
<b>Total</b>	<b>645</b>	<b>617</b>	<b>566</b>	<b>546</b>	<b>441</b>	<b>175</b>	<b>177</b>	<b>1061</b>	<b>*4228</b>
<b>NBTD</b>	<b>(9%)</b>	<b>(8%)</b>	<b>(8%)</b>	<b>(12%)</b>	<b>(10%)</b>	<b>(17%)</b>	<b>(12%)</b>	<b>(27%)</b>	<b>(11%)</b>

\*This index is not employed by the V/RHB

Another perspective on the extent of ECC comes from the Provincial Health Officer in 1997 reporting that **dental treatments were the most common hospital-based surgical procedures for children under 14 years of age in B.C.**<sup>160</sup> at an estimated cost of about **\$2.9 million for hospitalisation**, excluding the cost of dental treatment.<sup>184</sup> In the South Fraser Health Region during 1998/99, one-quarter of all children's day-care surgery was for dental procedures, and about one-fifth (18%) of all children's surgery was for dental problems.<sup>189</sup> A Task Force of the Association of Dental Surgeons of B.C. reported that about 1% of the children aged under 4yrs in the province during a one-year period required a general anaesthetic (GA) for dental surgery in hospital - a number not including the large number of children treated under GA in private out-patient ambulatory clinics.<sup>184</sup> The cost in 1997 was about **\$700,000 for the outpatient GA services.**<sup>184</sup> Each paediatric dentist reporting to the Task Force had, on average, eight children under 4yrs.of age waiting about 14 weeks for urgent treatment in hospital.

## Homeless Populations

There is little information available on the oral health of homeless people, even though most of them have access to basic oral health-care through social assistance.<sup>1</sup> However, what information there is from

the USA<sup>190</sup> and Britain<sup>191</sup> suggests that caries is very prevalent, but awareness of this disease or concern for other problems in or about the mouth is low. Indeed, it is highly likely that most of the homeless population do not avail themselves of their dental benefits through social assistance because of a general discomfort with the bureaucratic system.<sup>192</sup>

## Low-Income Seniors

About fifty years ago, the majority of the elderly population of British background wore complete dentures replacing all of their natural teeth. Today, it is more common for everyone to retain at least some natural teeth for life. Nonetheless, over two-thirds of the elderly population (>65yrs.) in the USA<sup>193</sup> and Britain<sup>194</sup> have fewer than 18 natural teeth (Table 5), and most of them use a complete denture in their upper jaw.<sup>195</sup> **Tooth-loss** is more likely among the less (51%), rather than more (29%), well educated,<sup>196</sup> and with rural (~70%) rather than urban (~50%) dwellers.<sup>197</sup> Usually it is managed satisfactorily with complete dentures, although, there are many edentulous individuals who cannot wear dentures and who are distressed deeply by this handicap. Indeed intolerance to dentures can lead to serious psychological illness, to say nothing of the risk to malnutrition, particularly when they are living in the social context of a nursing home.<sup>198</sup>

**Table 5.** Percentage of the population aged 65+yrs with teeth missing (excl. 3<sup>rd</sup> molars).<sup>193,194</sup>

	Number of Teeth Missing		
	6+	8+	12+
USA	82	76	67
UK	74	92	69

Currently, about one-in-five elderly resident of Vancouver's nursing homes, and more than one-in-ten of the Seniors who live independently are missing some front teeth without replacement. Apparently, tooth-loss continues as a common feature of old age, and it can be a major social disability when the loss involves front teeth.

With the success of preventive strategies in early life and the increasing number of individuals retaining their natural teeth for life, there is an alarming increase in **rampant caries among elders**. Conservative estimates suggest that approximately one individual in four over 65yrs with natural teeth is infected with caries.<sup>199,200,201</sup> In another study of elderly residents of long-term facilities in Vancouver, over half (61%) of the residents with natural teeth had evidence of carious lesions.<sup>209</sup> Most (46%) of them had shallow lesions, one-third had lesions that were threatening the survival of a tooth, and about one-in-ten had deep lesions infecting multiple teeth. This same sample of elders in residential care had widespread **gingivitis** (bleeding gums) – indicating poor oral hygiene – but no more than one resident in five had serious **periodontitis** or loose teeth. There have been a few prospective (longitudinal) studies on the incidence of caries among older adults in the USA,<sup>202,203,204</sup> and one in Vancouver,<sup>205</sup> all of them concluding that Seniors with natural teeth get, on average, about one new lesion *per person per year*. However, this figure is misleading because the disease is concentrated heavily within about one-third of elderly population with natural teeth – an observation made also in children.<sup>206</sup> Analyses of the Vancouver data to identify those who are most at risk to the disease identified five characteristics: 1) previous infection; 2) residence in a long-term care facility; 3) high numbers of cariogenic bacteria in the mouth; 4) poor oral hygiene; and 5) frequent sugar consumption.<sup>205</sup> In summary, caries is a serious disease in old age, and it will increase in prevalence as more people live longer with their natural teeth, whereas periodontal disease is much less prevalent.

Oral health influences psychological well-being and satisfaction in old age no less than at any other time of life.<sup>198</sup> Yet, a short time ago, less than half of the residents in Vancouver's **long-term care facilities** had seen a dentist in the previous year despite complaints of oral problems and requests for treatment.<sup>207,208,209</sup> Older adults generally are uneasy about travelling to see a dentist when they are disabled, even though the dental treatment available to them within a long-term care facility is limited to emergency care.<sup>210</sup> Basically, elders in residential care have minimal access to dental care – a problem

documented also in other provinces<sup>211,212,213</sup> and in other countries<sup>214,215</sup> - because dentists and dental hygienists are unaccustomed to providing comprehensive care away from their usual dental practice.<sup>210,216</sup>

The consequences of this neglect are that most of the elderly population in residential care need treatment, with conservative estimates of about **90 minutes of dental treatment for each resident** allowing for the possibility that about one-third of the elders do not have the desire or propensity for any dental treatment.<sup>209</sup> About 6% of British Columbians over 65yrs are in residential care, so this estimate translates into a substantial quantity of needed treatment to restore oral health.

## RELATIONSHIPS BETWEEN ORAL HEALTH AND GENERAL HEALTH

Dental caries is found in a significant number of preschool children in the province, and the impact on the quality of life of the children and of their families can be very disturbing. A recent study at the Montreal Children's Hospital revealed that young children with caries had to wait about 6-8 months before they received the general anaesthesia needed to facilitate treatment of the problem.<sup>217</sup> During this period, many of the children were in pain (48%), had difficulty eating (43%) and sleeping (35%). In B.C., the hospital waiting period for children less than 4 years of age is on average about 4 months, but often much longer.<sup>184</sup> Caries also affects a young child's growth and ability to thrive, an observation that was made convincingly by studies in Israel<sup>218</sup> and in New York.<sup>219</sup> In addition to the acute effect of ECC on a child's life, and effects on physical growth and development, extensive decay and early loss of primary teeth has well-known effects on the development of the secondary teeth and the dental arches.

There is a renewed awareness that the consequences of neglected oral hygiene are not confined to the mouth. Microbes found frequently in the mouth have been associated with **pulmonary infections** of elderly people, and several investigators suggest a causal relationship between poor oral hygiene and bronchopulmonary infections - the leading cause of death in this population.<sup>220,221,222,223,224</sup> There is also a strong association between xerostomia (dry-mouth usually from the use of medications) and bronchopneumonia,<sup>225</sup> and empirical evidence that dental plaque harbours large quantities of respiratory pathogens among patients receiving intensive care.<sup>226</sup> More recently, evidence has emerged to support associations between poor oral hygiene, advanced periodontal disease and **coronary heart disease**,<sup>227,228,229,230</sup> although it is important to note that a causal relationship has not been established.<sup>231</sup> Indeed, a recent report contradicts the idea that periodontal disease increases the risk of cardiovascular disease and death, at least in older men.<sup>232</sup> This latest challenge to the significance of periodontal disease as an independent predictor of cardiovascular disease is based on a study of 22,000 middle-aged male physicians in the USA, although the investigators did note a significant (39%) reduction of cardiovascular death for physicians who reported tooth-loss. In conclusion, the relationship between oral infection, most specifically periodontal disease, and cardiovascular disease remains a concern, and there is little doubt that oral diseases can have a very significant impact on general health and quality of life in all age groups.

## PREVENTING ORAL DISEASES AND DISORDERS

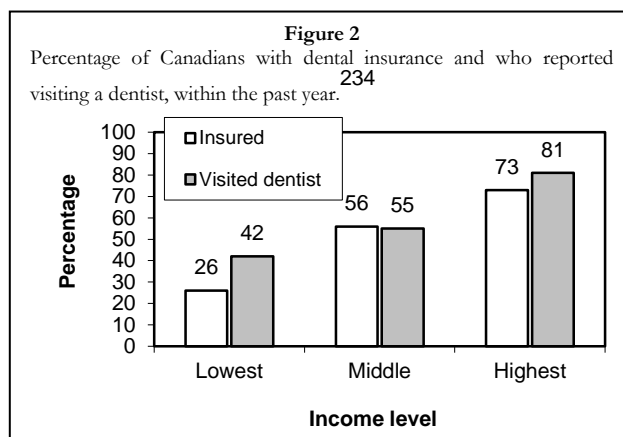
Prevention of disease or disorder can be considered in three phases: 1) the **primary** phase *protects* the mouth from damage before the disease or disorder occurs; 2) the **secondary** phase *detects* to reverse the problem before it causes irreparable harm; and 3) the **tertiary** phase *intervenes* to restores function and appearance after damage has occurred.

## Oral health promotion

The residents of B.C. compared to Canada as a whole are more likely to have **dental insurance** and to have visited a dentist in the last year (Table 6).<sup>233</sup> The majority (64% women; 60% men) of the population in Canada reported a dental visit during 1996–97.<sup>234</sup> Accessibility to dental care is influenced strongly by income level and dental insurance, and individuals with lower-incomes are less likely to have dental insurance (25%) or to have visited a dentist during 1996-97 (45%). Most high-income earners, by contrast, were insured (73%) and reported visiting a dentist (81%) during the previous year (Fig. 2). Seniors, on the other hand, were irregular attendees, with less than half of them visiting a dentist in the preceding three years.

Place	Number (× 1,000)	Percentage			
		Insured	Visited Dentist		
			<1 year	1-3 years	3+ years
Canada	23,884	55	62	20	19
B.C.	3,152	59	64	22	14

There is general agreement that the underlying causes of oral diseases, and health inequalities will be reduced only through health promotion.<sup>175</sup> One extensive review of caries prevention reported that fluoride was effective, but school-based educational programs and mass media campaigns had little success.<sup>235,236</sup> Others suggest that comprehensive strategies using programs tailored to community needs and involving professional personnel from several sectors should have a greater and more sustained benefit.<sup>96,237,238,239,240</sup>



## Preventing Early Childhood Caries

### Health Promotion

Healthy behaviours are established in early childhood; therefore, programs to promote oral health and to prevent ECC should focus on the early post-natal period or sooner.<sup>29,86</sup> An effective educational program on oral health developed in **Sweden** for parents of children 6-18 months was equally effective for immigrant families when presented in their own languages.<sup>53</sup> Home visits to new and expectant mothers by health visitors in **Britain** have been effective also in preventing ECC, and in improving knowledge and behaviour relating to this disease.<sup>241,242</sup>

The bacteria, *mutans streptococci*, are transmitted from mother to child.<sup>87</sup> Strong correlations between salivary *mutans streptococci* counts in mothers and their children have been reported, and the genotypes of the infant's bacteria are usually similar to that of the mother.<sup>87</sup> An extensive and long-term preventive program targeting mothers with high levels of *mutans streptococci* is a consideration in preventing "infection" of their children with cavity-causing bacteria.<sup>86</sup> Reducing the **numbers of caries-causing bacteria** - *mutans streptococci* - in a mother's saliva will delay colonization of the bacteria in her child,<sup>243,244</sup> which is likely to have a long-term benefit for the child, especially if the reduction occurs as the child's primary teeth erupt.<sup>245</sup>

**Fluoride in communal water supply** offers a very cost effective way for lowering the risk of caries in low-income and deprived communities.<sup>72,246</sup> In fact, it has decreased the caries-rate by half in the primary

dentition of many communities.<sup>247</sup> Unfortunately, there seems to be a general concern in B.C. about the addition of any “chemicals” to communal water supplies. There is evidence that the benefits of fluoride can be obtained in other ways,<sup>248</sup> however, in general, the long-term compliance by families with recommendations for using **fluoride supplements** is poor.<sup>249,250</sup> Application of a **fluoride varnish** directly to the surfaces of teeth shows promise as a caries-preventive agent in preschool children.<sup>251,252</sup> Evidence from several clinical trials have demonstrated that the varnishes are as efficacious as other preventive agents,<sup>253</sup> and the progression-rate of caries on the interproximal surfaces of primary teeth has been diminished substantially by a semi-annual application.<sup>254</sup> They are non-toxic and can be applied quite easily to the teeth of preschoolers attending day-care centres, well-baby clinics, and “Moms ‘n Tots” groups, when the risk of caries is high.<sup>255,256</sup> However, most importantly, the exposure to fluoride at home through twice-daily toothbrushing with a fluoridated toothpaste should be a key component of any preventive program against ECC.<sup>86</sup>

**Multisectorial involvement** of community and professional personnel can help to prevent ECC. Physicians and public health nurses, for example, can be alerted to detect ECC when immunizing or attending to infants,<sup>257,258</sup> while dentists can offer oral assessments and preventive advice to families with children younger than they are usually accustomed to examining today.<sup>259</sup>

### **Ministry of Health Programs in B.C.**

Dental staff initially with the Ministry of Health and now with the Regional Health Boards in the **North** and in the **Okanogan** initiated programs to identify children at risk for ECC.<sup>187</sup> Questionnaires are used to identify risky behaviours in children attending for 12-month immunizations, and the dental staff contact parents to help reduce the risk. Currently, 15 of the 20 health regions use the questionnaires at 90 sites within the province to assess the risk of caries, and in 1999 they revealed that at about one-fifth of the toddlers were in families where the risk was high.<sup>187</sup> The success of the program is dependent on the cooperation and assistance of other health-unit staff, such as health-unit aides, public health nurses, clerical staff, and volunteers. There is much variation of personnel who provide 12-month immunizations around the province. For example, public health nurses provide 70% of the immunizations in the Capital Health Region, so families there can complete the questionnaire at Child Health Clinics. However, 80% of infants attend physicians’ offices for immunizations in the North Delta and South Fraser regions. A comparison in the Capital Health Region between families who were contacted following the questionnaire and families who had no follow-up concluded that the contact from dental staff had a positive impact on changing “dentally-unhealthy” behaviours. However, parents generally, were more likely to use a toothbrush with fluoridated toothpaste than they were to change their child’s feeding habits.<sup>187</sup>

#### **STRATEGY**

**enhance the awareness and availability of resources about oral health promotion to all health-care workers, social workers and teachers**

Dental staff have introduced other ECC-related projects in health regions throughout the province that reflect B.C.’s cultural and socio-economic diversity. The following are selected examples:

- A poster and brochure project for physician’s offices was developed in the **South Fraser Health Region** where 80% of families see their family physician for immunizations. Focus groups informed the design and size of the poster which has been translated into Punjabi to attract the attention of the large number of South Asian families in the region. The materials have been distributed also to every pharmacist in the province.<sup>260</sup>

- A program supplementing the kindergarten screenings is underway also in the **South Fraser Health Region** to identify families with other children who are at high-risk to ECC, based on the knowledge that all children in the same family are at similar risk.
- Focus group meetings with parents of young children in the **Simon Fraser Health Region** is exploring where and when parents would benefit most from information about ECC, and identifying barriers to “dentally-healthy” behaviours.<sup>261</sup>
- The **North Interior Health Region** is planning a fluoride varnish program for high-risk preschool children.<sup>262</sup>

These innovative programs should be supported and extended by the provision of additional resources that will allow timely outcome and impact evaluation.

### **STRATEGIES**

**continue to support, and expand, oral health-related preventive programs for parents and infants in the early post-natal period**

**enhance the current initiatives in the Health Regions that identify and follow-up infants and young children at high risk to ECC**

#### ***Other Programs in B.C.***

A program for the Vietnamese community in Vancouver’s eastside over the last five years provides counselling on the prevention of ECC to mothers of young children at routine immunization visits.<sup>96</sup> It provides information on oral health within the context of a child’s general health. A community dental health worker (CDHW), who is a Vietnamese mother of two young children, offers information and behavioural incentives to the mothers in their own language at bi-monthly immunization clinics (Fig. 3). She also makes follow-up telephone calls to provide additional advice and support directly to the mothers, and to gain insight on how they accept her recommendations.. An outcome evaluation of the program was conducted three years after the program began by comparing the participants with other Vietnamese families who did not participate. This evaluation revealed significant improvements towards “dentally-healthy” feeding practices along with measurable benefits to the dental health of the children (Table 7). Recently, the program expanded to include Chinese families in Vancouver, and, as of January 2001, at least 96 Chinese families and 128 Vietnamese families have had at least one counselling session.

#### **Caries Preventive Programs for School-age Children**

### **STRATEGIES**

**promote fluoride as a caries preventive strategy in community water supplies, school-based mouth rinse programs, varnishes and toothpastes**

**implement school-based pilot projects to assess the benefits of agents - such as fluoride rinses, fissure sealants, and xylitol chewing gum - for controlling caries in elementary and high schools where the risk of caries is high**

The risk of caries among children and adolescents from low-income families is high.<sup>263</sup> Consequently, preventive programs will be most effective if they focus on schools where family incomes are low. For example, use of *Xylitol* chewing gum will diminish the numbers of cavity-causing bacteria in the mouth,<sup>264,265</sup> and reduce the cariogenic potential of the bacteria.<sup>266</sup> Acceptance of a chewing gum program by teachers can be troublesome, but the children respond well to it.<sup>267</sup> Fluoride mouth rinses increase resistance to caries,<sup>268</sup> although management of the program requires a significant amount of time from the teachers or volunteers to administer daily or weekly at school. Alternatively, fluoride-tablets are also effective, and they are much easier to administer.<sup>269, 270</sup> Caries in older children occurs at the outset usually on the biting surfaces of molar teeth where there are numerous natural pits and grooves. Consequently, a plastic material bonded to the biting surface to seal the natural irregularities can inhibit the disease.<sup>271</sup> Indeed, sealants, oral health education, and a fluoride mouth-rinse program can be a successful combination in adolescents who live in non-fluoridated communities.<sup>272</sup>

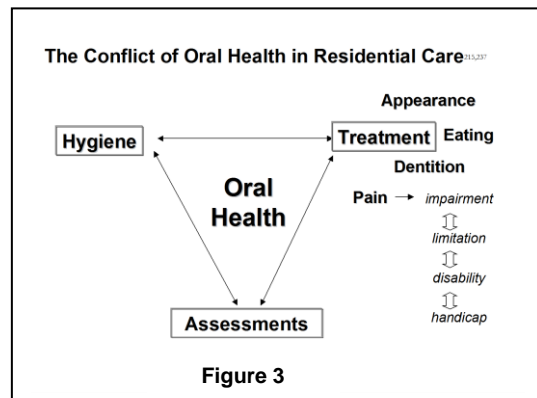
## Preventing Oral Diseases in Adults

Caries is also a concern for adults, and particularly in old age among the increasing number of elders who retain their natural teeth. Adults are often affected by periodontal disease and rarely but more seriously by oral cancer. Fortunately, oral hygiene strategies directed at caries also inhibit gingivitis and periodontitis whereas the risk of oropharyngeal cancer is reduced substantially by quitting smoking.<sup>273</sup> Strategies to prevent caries in older age-groups are best directed towards those who are at particular risk to the infection, such as those who need help with oral hygiene, institutionalized and homebound individuals with limited access to dentistry, or individuals with reduced salivary function.<sup>209,274,275</sup>

Two medicaments, fluoride and chlorhexidine, have featured prominently in the management of this infection among children, so it is reasonable to expect similar successes in older populations. To date, comparisons between the effectiveness of chlorhexidine and fluoride have not been tested in a controlled manner for elderly populations, although studies are underway at U.B.C.

## Residential Care

There are three principal concerns about oral care for residents of long-term care facilities: diagnostic examinations; follow-up treatment; and daily oral hygiene (Fig. 3). Emergency *dental treatment* is readily available, but regular periodic *examinations* and follow-up treatments are more difficult to organize, possibly because dentists, dental hygienists and denturists in general prefer to work within the familiar surroundings of a conventional practice,<sup>210,216</sup> despite the difficulty it imposes on everyone involved.



## STRATEGY

**Integrate oral health-related educational programs with other preventive or health promotional activities at Child Health Clinics, school nursing programs, community centres, regional health clinics, Seniors' centres, long-term care facilities and traditional community gatherings**

There is no practical remedy as yet to the regular *oral hygiene* needs of individuals who are physically or cognitively disabled. And, yet, the management of oral hygiene poses a very significant and

acknowledged frustration to the staff and to dental personnel involved in long-term care.<sup>237,276,277</sup> Nurses and care-aides feel uninformed about dental matters and burdened by other responsibilities. Moreover, residents do not always report their difficulties with hygiene, and frequently feel uneasy about asking for assistance from the staff.<sup>215</sup> The frequent turnover of care-aids in many facilities detracts from the endeavours by some dental hygienists to educate the staff. In summary, effective oral hygiene is not an integral part of the daily care rendered in most long-term care facilities, and, as a consequence, the oral health of the residents is poor.

## TOBACCO INTERVENTION AND DENTAL CLINICS

Dentists play a key role in early diagnosis and management of oral cancer,<sup>278</sup> yet, despite the effectiveness of smoking cessation programs in other settings,<sup>142</sup> the dental practice has not been used widely in this regard.<sup>279</sup> Dentists in general believe that this is not a part of their professional responsibility, nor has it been a significant part of their education,<sup>280,281</sup> even though many patients feel that dentists should offer such services.<sup>282</sup> Apparently, this belief is changing with the central role that dental professionals play in detecting the effects of tobacco use (leukoplakia, stained teeth, bad breathe, and oral cancers),<sup>111,112,142,283,284</sup> along with the availability of educational models, such as the *National Cancer Institute Smoking, Tobacco, and Cancer Program*.<sup>285,286</sup> Experience in Britain indicates that 4-6 minutes of advice about the effects of smoking on periodontal health can produce a 50% reduction in cigarette-use.<sup>287</sup> There is evidence also that counselling in dental practices is particularly effective in reducing the use of smokeless tobacco.<sup>288</sup>

Tobacco dependence or addiction usually requires repeated interventions well suited to brief counselling sessions.<sup>289</sup> Over half of the population of B.C. have a dental examination annually,<sup>290</sup> and most (71%) of the smokers who are examined want to stop smoking; yet many dentists feel that they might alienate patients by broaching the subject of smoking cessation.<sup>282</sup> The *Smoking Cessation Clinical Practice Guideline* in the USA includes a system for health professionals to identify smokers and to offer motivational interventions with nicotine substitutes and follow-up.<sup>291</sup> As yet, there are no provisions for the cost of counselling or medications as benefits of the Medical Services Plan or of dental insurance plans, such as the Non-Insured Health Benefits Program for Aboriginal people.

Smoking is a highly social practice in all cultures, but it seems to be more socially acceptable in Aboriginal cultures.<sup>292,293</sup> The majority of smokers in the population generally start before the age of 18yrs, but Aboriginal children start at around 9yrs.<sup>294</sup> Effective efforts at reducing tobacco-use among Aboriginal youth rely on the cooperation of the native community and families.

Very recently, several national organizations\* produced “*Tobacco: the Role of Health Professionals Joint Statement*” highlighting the following strategies:

- Educate members on their valuable role in tobacco control;
- Promote the inclusion of smoking cessation training in the required academic curricula of all health professionals and in continuing-education programs;
- Communicate research evidence about effective smoking cessation and tobacco reduction strategies to members;
- Provide members with tools that will motivate and assist them in their roles as counselors and referral agents;

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\* Canadian Association of Occupational Therapists, Canadian Association of Social Workers, Canadian Dental Association, Canadian Medical Association, Canadian Nurses Association, Canadian Pharmacists Association, Canadian Physiotherapy Association, Canadian Psychological Association, and Canadian Society of Respiratory Therapists. Issued January 17<sup>th</sup>, 2001.



- Identify our individual strengths and complementary areas, and collaborating to create a “synergy”;
- Increase public awareness that support and resources to help people stop smoking are available from their health care providers;
- Advocate to governments regarding the health professional’s role as an effective agent in tobacco control.

### **STRATEGY**

**expand the oral health content of the “Honouring our Health: Aboriginal Tobacco Strategy for British Columbia”**

## **RESEARCH**

There has been recently a renewed emphasis on health-related research from both the federal and provincial governments. The federal government provided the Canadian Institutes of Health Research with a budget of \$477 million in 2001-2002 to develop a comprehensive and interactive approach to health research across the country,<sup>295</sup> while the BC government committed \$110 million in March 2001 to the Michael Smith Foundation for Health Research for building and sustaining a strong health research community in this province.<sup>296</sup>

### **STRATEGY**

- encourage research granting agencies to support studies involving:**
- **epidemiological data on oral health throughout the province;**
  - **outcome and impact evaluation of innovative oral health services;**
  - **strategies relating to the oral health of people who are at particular risk to oral diseases;**
  - **the role of traditional diets in promoting oral health among First Nations and other minority groups;**
  - **smokeless tobacco-use throughout the province.**

## **JURISDICTIONAL REVIEW**

The prime concern underlying this report is the perception that oral health-care and preventive practices and services are lacking among individuals with relatively low incomes, among the provinces Aboriginal peoples, and among users of tobacco products. Oral health-care is accessible predominantly to the more affluent countries,<sup>297,298</sup> yet, tooth-loss and other oral health problems are more prevalent, and the consequences more serious, among lower income groups.<sup>299,300</sup> Discussions about equity, accessibility and justice in health-care generally are changing the delivery of health services, including dental services, in Canada,<sup>31</sup> the USA<sup>301,302,303</sup> and in Europe.<sup>304,305</sup> In Canada, we attempt to support a comprehensive health service to all,<sup>306</sup> although, in reality, there is little consensus on what is meant by comprehensive or basic care. Inequities in oral health abound for many reasons, but largely because of social and economic factors.

## LOW-INCOME GROUPS

Dental services in B.C., as in the rest of Canada, are not part of the provincial health care service, so they are not subject to the same legislative requirements of universality, comprehensiveness, public administration, portability and accessibility that regulate most other health services. About a quarter of the population in Canada, usually those with low-incomes, go to dentists for little more than emergency care.<sup>299</sup> Although not due solely to low income,<sup>216</sup> this behaviour does raise concerns about access to dental services generally. Moreover, concerns about the level of public expenditure on health-care are likely to reduce rather than enhance the scope of health services. In the USA, public expenditures on dental services through Medicaid, unlike other health services, have been reduced over the last quarter-century by about one-third.<sup>307</sup>

### STRATEGIES

**amend the “*Adult Care Regulations, B.C. 1997*” to specify that a resident of a long-term facility must be examined by a dentist within six months prior to, or within three months after, entering the facility and at least once a year thereafter**

**explore with the Ministry of Advanced Education, Training and Technology, the College of Dental Surgeons of B.C. and the Association of Certified Dental Assistants in B.C. the possibility of expanding the educational base of certified dental assistants in preparation for a coordinating role in preventing oral health-related problems within long-term care facilities**

**promote the use of fair methods of remunerating dentists, dental hygienists, denturists and certified dental assistants within long-term care facilities**

**encourage the College of Dental Surgeons and the Association of Certified Dental Assistants in B.C. to develop a coordinating role for certified dental assistants in preventing oral health-related problems within long-term care facilities without the direct supervision of a dentist**

**encourage the Ministry of Social Development and Economic Security to permit direct billings of their dental plan from dental hygienists for services they provide directly to persons in residential care.**

Canadian provinces deliver health care through regional health units. Each region has some autonomy in determining what health-care is funded. Most provinces screen children in schools for those at high risk to caries, and families with low incomes are offered treatment through provincial aid or insurance programs. Large cities provide some health-care to the poor and the homeless through community-based non-profit organizations, although usually they exclude or severely limit dentistry to emergency treatment.

### *Long-Term Care*

Several regulatory bodies in Canada<sup>308</sup> and in the USA<sup>309</sup> have established minimal standards of oral health in LTC facilities.<sup>310</sup> For example, the “*Adult Care Regulations, B.C. 1997*” specify that “dental health care professional” should examine all new residents soon after admission.<sup>311</sup> The regulations do not specify that a dentist must perform the examination, although there is general agreement among most professional regulatory bodies in the province that dentists are alone among dental professionals

who can diagnose oral health-related disorders and diseases. Currently, dentists, dental hygienists and denturists, but not certified dental assistants (CDAs), are identified as professionals who can examine residents. As yet, nobody seems to have addressed specifically the concerns of dentist about dental hygienists and denturists offering diagnoses and comprehensive treatment plans for elders with serious disabilities.<sup>237</sup>

Attempts here and in other countries to regulate the responsibilities of the nursing staff in LTC facilities towards oral care have been disappointing, probably because of the demanding and conflicting priorities of residential care compounded by a high turnover of staff. Educational efforts have been made to institute daily mouth care as a specific service of nurses and care-aides,<sup>312,313</sup> but they have not been very effective.<sup>276,277</sup> Four professional groups – dentists, dental hygienists, denturists and certified dental assistants (CDA) – offer dental services to adults in residential care. Until recently, there was little interest in this need,<sup>210,216</sup> but now there are several dentists and dental hygienists with mobile practices limited to institutionalised and housebound persons throughout the province.

**Dentists** and **denturists** work independently within their separate scopes of practice. **Dental hygienists** works under the direction of dentists unless they have a special qualification to practice independently in “residential care”; denturist can make removable partial dentures on prescription of a dentists, while **CDAs** work only under the direct personal supervision or direction of dentists. Typically, a dental hygienist completes one pre-requisite year at a university followed by two ten-month years in an accredited\* dental hygiene program at a community college. A CDA usually has a high school diploma and completes one ten-month accredited dental assisting program, also at a community college. The College of Dental Surgeons of BC accepts the role of dental hygienists working independently in LTC facilities or group homes remote from dentists, but the College would prefer that the dental hygienists practise only if a dentist has prescribed treatment.<sup>314</sup> The College of Dental Hygienists, in contrast, allows registrants with additional qualifications and a “residential care registration certificate “ to practise independently in facilities with the requirement only that they advise residents to be examined annually by a dentist, and that they advise the College of Dental Surgeons of residents who cannot have dental services arranged in a facility.<sup>315</sup> Dental hygienists may “assess”† the status of teeth and adjacent tissues to formulate a dental hygiene diagnosis and provide preventive and therapeutic dental hygiene when approved by a dentist. Clearly, dental hygienists prefer to work in facilities without depending on the prescription of a dentist, while dentists claim that only they are equipped to diagnose the full range of oral health problems encountered in a disabled population, and to prescribe treatment.

The College of Dental Surgeons of B.C. permits certified dental assistants to work in **public health programmes** throughout the province without the direct supervision of a dentist, where health promotion including oral health instruction but not dental treatment is carried out, providing the program is directed, albeit at a distance, by a dentist. A CDA supervised by a dentist in private practice may, among other duties, clean teeth, apply topical anti-caries agents and fissure-sealants to teeth, evaluate dietary habits, provide nutritional counselling relevant to oral health, and provide instruction on the use of dentures. Currently, most of the dental hygienists and CDAs employed by the Regional Health Boards manage health promotional programs in facilities and community centres, although some CDAs have been educated by the Ministry of Health to screen for caries in children.

A few dental hygienists working in residential care have become an integral part of the staff and contribute regularly to the general appraisal of each resident’s progress. Unfortunately, this is not their

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\* Accredited by the Commission on Dental Accreditation of Canada or the American Dental Association Commission on Dental Accreditation

† A dental hygienist may assess, rather than diagnose the need for treatment.

role in most facilities where dental professionals are seen as “outsiders” remote from the daily operational care of the other staff.<sup>237</sup> Another beneficial program involving care-aides with special training to teach oral hygiene techniques to other staff members operates in one Vancouver facility, but it is threatened financially by other priorities.<sup>237</sup>

### ***Community Dental Programs in B. C.***

The **Vancouver/Richmond Health Board** (V/RHB) offers oral health promotion and clinical services by certified dental assistants, dental hygienists, dentists, and Community Health Nurses who address primarily the needs of school-age children and older adults in Vancouver. The children’s program offers information to expectant and new parents, screens kindergarten and Grade 2 children and arranges for follow-up treatment with dentists. The dental hygienists also provide oral health education to staff and residents of group homes for young and old adults with developmental and long-term disabilities. Clinical services are delivered from two locations to elementary school children. The **Downtown Community Health Clinic**, run by the V/RHB, offers emergency treatment to adults who live in the vicinity emergency treatment for a fee based on a sliding scale according to ability to pay. All of the staff, including the dentist, is on salary, and the Health Board heavily subsidizes the clinic. Most of the area residents who attend the Clinic have some coverage from welfare or through refugee status.<sup>316</sup>

The **REACH Community Health Centre** in Vancouver offers primary public health care including a dental clinic with three full-time dentists and one dental hygienist on salary.<sup>317</sup> The clinic offers “basic” dental care and is funded through pay-per-service fees, insured fees, and money taken from the health centre's general operating budget. No government money is given specifically for dental services, so the dental clinic operates at a financial loss. The service is focussed primarily on low-income people from diverse ethnic backgrounds. Many of the people attending the clinic are “working poor” who cannot afford dental services, whereas about one-third of the attendees have dental insurance. There is a waiting period of 4-6 weeks for treatment. A sliding fee- scale is used, with fully insured individuals paying full fees, Aboriginal peoples pay a little less, individuals on social assistance pay 60-70% of the full fee, and those with no health benefits pay 20% less than the full fee. Dental students, accompanied by a supervisor, offer their services one evening each week when patients are charged \$7 *per* visit.

The **Mid-Main Community Health Centre** in Vancouver is a non-profit organization offering medical, dental, and associated services.<sup>318</sup> Young families and poor people who are employed with at minimum wage jobs use the Centre. The dental services, with six dentists on staff - three of them full-time - operate six days *per* week without government support. Treatment is rendered as a fee-for-service paid to the Centre and apportioned to the dentists. Preventive efforts focus on the importance of oral health promotion and are aimed at health care workers in pre-natal clinics, service providers at B.C. Housing, and day-care workers with low-income groups.

The **Seymour-Strathcona Children's Dental Committee**, also in Vancouver, is working to improve the dental health of children in the Downtown Eastside of Vancouver.<sup>319</sup> The Committee consists of community school coordinators, dentists, parents, two principals, health committee workers, community health workers, Vancouver/Richmond Health Board dental staff, the provincial dental consultant, and an advisor from the Faculty of Dentistry. The main aim of the Committee is to improve access to existing dental services and to develop a fully functioning dental clinic in Strathcona School. It serves low-income families, 80% of whom do not speak or read English fluently. A large Aboriginal population and several cultural minority groups live in the area. The Committee has investigated the barriers to oral health-care, and has received financial support from local government and other agencies for several projects, most notably for: 1) a school fluoride-rinse program; 2) improving accessibility to the "Healthy Kids" program with the help of facilitators who are familiar with the community; and 3) a study on the unmet needs of children who do not have access to preventive strategies. The Committee emphasises the involvement of the families they serve in finding and implementing solutions to oral health problems.

Comprehensive dentistry is available for everyone from dental students at the **Faculty of Dentistry, UBC** and at affiliated outreach programs, and a grant from the Ministry of Children and Families allows school-age children who do not qualify for other dental benefits to attend this clinic. Specialized preventive and treatment services are available from dental hygiene, dental assistant, and denturist students at the **Vancouver Community College**. Other community college programs throughout the province provide a similar service.

### **STRATEGY**

**promote undergraduate and graduate educational programs for dental personnel that focus on the oral health needs of Aboriginal peoples, tobacco-users, and low-income groups of all ages**

**Regional Health Boards** throughout the province employ dental hygienists and certified dental assistance under the professional direction of a public health dentist with the Ministry of Health to offer a wide variety of preventive and community programs, depending on the needs of each region. Programs include prevention of early childhood caries; oral care training for teenage parents, day-care instructors and care-aids in long-term care facilities; and tobacco cessation guidance for secondary school students. The dental staff also devote a significant amount of time helping families to get follow-up dental treatment for problem identified during the periodic screening examinations. It is noteworthy, nonetheless, that all of the treatment centres for low-income and homeless individuals are located in the Lower Mainland. In view of the population expansions in other urban centres in the northern and interior regions of the province, it seems reasonable to expect that similar services will be needed elsewhere.

#### ***Community Dental Programs in the rest of Canada***

In 1995, the **Government of Alberta** changed the structure of health care from individual hospitals and community health boards delivering services (with strong oral health components) to a regional organization, and, in the process, cutbacks in oral health-care occurred.<sup>320</sup> For example, before regionalization, children aged 0-8 were examined every 6 months by a dental hygienist, whereas now only kindergarten children, 3 yr-olds and children in grades 3 and 6 are examined regularly.<sup>321</sup> In addition, dental hygienists working for **Regional Health Authorities** supervise fluoride rinses and apply fissure-sealants among preschool and school children. The parents of children who are deemed to be high risk to caries are advised to bring their children to see dentists in private practice, or, if they live in Calgary, to a dentists employed by the Calgary Health Authority. Dental health education is given in some schools. Alberta Health and Wellness presently has no one working in oral health, but there is a group of hygienists and dental assistants from the regional health authorities attempting to standardize the oral health programs in the various regions.

The **Calgary Urban Project Society (CUPS)** is an example of an urban program that caters to the homeless and to persons at risk of becoming homeless.<sup>322</sup> Although there are several dentists and dental assistants who volunteer their services to the Society, the services are restricted to people who require emergency dental care.

The **Capital Health Authority in Edmonton** has a dental prevention program focused on preschool children (15 – 42 months), school-aged children and Seniors. Their “**Early Childhood Oral Health Services**” screens for high-risk children and offers counselling and fluoride varnish and dental sealants as needed. Low cost treatment for adults is available at the University of Alberta School of Dentistry, and the *Boyle-McCauley Cooperative*, a low cost dental clinic funded privately through the Capital Health Authority in an inner city neighbourhood.<sup>323</sup>

The *Alberta Child Health Benefit (ACHB)* is a premium-free benefit that provides annual oral examinations, tooth-cleanings, diagnostic radiographs, fillings and extractions, and, if needed, endodontic treatment for front teeth. Eligibility is based on family size and the previous year's net family income (<\$27,214 for a family of four). However, it is not available to children who already receive health coverage through another welfare plan. Furthermore, employed individuals with low-incomes frequently have no dental insurance. Alberta has no legislation relating to oral health promotion among low-income groups or Aboriginal peoples, but the regional health authorities do run oral health-related programs.<sup>324</sup>

The “*Extended Health Benefits Program*” for Seniors in Alberta pays a portion of the cost of eyeglasses and dental services received by residents 65 yrs. of age and over, their spouses and eligible

## STRATEGIES

**encourage Health Regions to support in each region the infrastructure and staff for at least one public dental clinic suitable for low-income groups, and ask local professional associations to seek volunteers willing to provide treatment at reduced fees**

**enhance the work of Health Region staff and other pilot projects that facilitate access to dental services for low income families and individuals**

**improve information for the public on accessing dental benefits through the Ministry of Social Development and Economic Security**

**improve communications between the Ministry of Social Development and Economic Security and dental personnel to enhance emergency and basic care for low-income groups**

**resume negotiations between the Ministry of Social Development and Economic Security and the dentists, dental hygienists and denturists in the province to establish fair reimbursement for treatment provided to recipients of dental benefits**

dependants, and recipients of the Alberta Widows Pension. It pays a portion of examinations, radiographs, dental restoration, extractions, endodontic treatment, periodontal preventative treatment, removable partial dentures, and complete dentures. For example, a complete oral examination by a dentist typically cost \$55.56, whereas the “Program” pays dentists \$20.84 for this service.<sup>325</sup>

Saskatchewan has 32 health districts and one northern health authority responsible for assessing health generally and delivering health services. **Saskatchewan Health** offers advice to the health districts and the health authority on promoting oral health among children, elders and others with special needs. **Saskatoon District Health** runs a dental health program in the city to improve the oral health of children who are at high risk to disease.<sup>326</sup> The dental clinics are located in 5 schools, and they provide free preventive and treatment services to high-risk children aged 4-13 years. A dental therapist, dental assistant, community dental health coordinator, dentist and secretary work as a team to provide the treatment. There are dental health promotion programs operating also throughout the district to promote the availability of fluoride and to educate non-dental professionals. Yet, caries continues as a major threat to the oral health of some children in **Saskatchewan** despite the availability of effective preventions. Saskatchewan health authorities adopted the oral health goals of the WHO for the Year 2000, by which half of all five and six year-olds would be free of dental cavities, and all 12 year-olds would have no more than three decayed, filled or missing permanent teeth.<sup>327</sup> However, in 1998/99

fewer than half of the health districts had met the goals for five year-olds; less than a quarter met the goals for six year-olds; and none of the districts met the goals for 12 year-olds

## STRATEGY

**legislate preventive health practices to insure that prevention of disease is an integral part of oral health-care in the province**

The provincial government in **Manitoba** is rewriting all of its dental legislation, and recently it terminated a dental program in schools in favour of referring low-income families to dental clinics that offer services at reduced rates. However, the **City of Winnipeg** continues to run a school dental program. The Environmental Health Unit - Dental/Oral Health Unit promotes policies and community-based programs directed at the mental and oral health for all Manitobans, and it encourages adoption of oral health-related behaviours.<sup>328</sup> The unit has a mandate to: improve, maintain and protect the oral health of Manitobans; provide advice and input on current and emerging oral health issues to the Ministry of Health; develop an evolving role to best serve the public, stakeholders, and oral health care providers; develop a provincial oral health strategy. The unit works closely with all private dental associations, levels of government, community health groups and educators, as well as other health organizations. In addition, Manitoba Health as part of a public oral health initiative supports the community water fluoridation program to 63 communities representing 95% of the population and about approx. 770,000 residents.

**Ontario** explicitly legislates preventive oral-health practices based on a train-the-teacher approach that involves the provision of oral health educational resources to schoolteachers and health workers that can be passed on to students and patients.<sup>329</sup> Mothers in families at high risk to ECC are encouraged to breast-feed their children and to discourage cariogenic behaviours. Specific schools with many children at high risk to caries receive an annual dental education day along with fluoride applications and a “fissure sealant” program for the students. These educational and disease preventive activities are supplemented by community-wide campaigns, a telephone information line, group parenting sessions, and training of “peer educators”.

**Regent Park Community Health Centre** in **Toronto** is an example of an urban program with a broader service to low income-people.<sup>330</sup> For the last 15 years, two part-time dentists and a dental assistant/receptionist have provided a full range of dental care, including endodontic treatment, dentures, and preventive counselling. The **Queen West Community Health Centre** is located in a part of central Toronto inhabited largely by homeless individuals and low-income workers.<sup>331</sup> The Centre has a dental department with three full-time dentists who are reimbursed on a dental fee-for-service partly (about 40% of dentists fees) by the provincial Ministry of Health and partly by direct payments from patients or third-party insurers. Besides clinical treatment, the staff attempt to overcome barriers to care, and to educate dental students. The dentists also bring their services out of the Centre to homeless individuals, and the staff are involved in highlighting the plight of low-income populations. The **SHOUT Clinic** in central Toronto also includes a dental clinic with two dental chairs open 3 days per week with a particular focus on street youth.<sup>332</sup> The dental service is funded entirely through fundraising efforts, and the dental staff consist of volunteer dentists and dental hygienists who volunteer a half a day per month, one part-time dental assistant on salary, a fundraiser and a coordinator of volunteers. A broad range of services is offered without appointment, and occasionally, the dental staff visit shelters to examine the homeless and to inform the youth about the Clinic and other dental-care resources.

The **Hamilton Urban Core Community Health Centre** offers dental services to low income people, including families, newly arrived refugees, homeless or risk of being homeless, Seniors, and youth.<sup>333</sup> A

dentist's salary is paid from the Centre's general operating budget, and preventive educational sessions are delivered at schools, community groups, classes for new immigrants, shelters, and cultural associations.

The city of **Ottawa** operates three public dental clinics for low-income people. They receive about 30,000 visits per year with about 45 staff members, including dentists, on salary. Financial support is shared by the province and the city through social assistance and Children's Aid, while the ***Children In Need of Treatment [CINOT] program***, in which the province and city share expenses for treating low-income children (<15yrs) without other benefits. Low-income adults without coverage get one-time or temporary treatment support from social services. The direct relationship between Children's Aid and the salaried dentists allow the program to operated effectively for low-income groups. The clinics employ two Health Promotion Officers with no background in dentistry in the belief that "dental health is the result of social problems not the cause".<sup>334</sup> Volunteers assist in teaching the children how to brush their teeth, and dental hygienists perform standard screenings and referrals in the schools. High-risk children are referred to one of the clinics where the parents also receive required care, and parents are encouraged to bring other children to the clinic.

Many of the non-government community health organizations with special focus on the homeless and poor do not list oral health treatments as part of their primary health services. The *Peel Regions Outreach Service Plan* in the Toronto area, for example, provides care that includes a wide range of medical services but there is no mention specifically of oral health-care.<sup>335</sup> Similarly, a letter dated June 29, 1999 to Minister Bradshaw - the Federal Minister of Labour, and the Federal Coordinator for Homelessness - from representatives of the *National Roundtable on Homelessness* explains that homelessness touches on health and Aboriginal affairs, but there is no specific mention of oral health.<sup>336</sup> Consequently, it is difficult to measure the level of significance placed on dental care by this organization.

The ***Access to Baby and Child Dentistry (ABCD) Program*** in **Spokane, Washington**, focuses on birth to 6 yr. olds to prevent and control major dental problems by introducing low-income parents to regular dental care and allowing them to assume responsibility for appropriate visits and recall appointments.<sup>185</sup> It encourages also private dental clinics to interact with low-income patients by training local dentists to manage infants. Health district staff promote the program through the media and community agencies, such as food banks and immunization clinics. Medicaid fees plus a supplement to provide payments that are in the 75th percentile of the dentists' usual fees cover the dental services. Dental office staff use electronic claims to minimize delays in payment. The results demonstrated that 37% of participants *vs.* 12% of non-participants used the dental services, and over 80% of the dentists in the district provided their services, in contrast to the 50% or less of dentists in Washington who provide care in the regular Medicaid program. Clearly, **low-income families can be accommodated by private dental clinics** if government-sponsored benefits are reasonable and the staff are prepared appropriately.

## **ABORIGINAL PEOPLES**

### **Canada**

Health services for Aboriginal peoples are the responsibility of provincial, territorial and federal governments. The provinces and territories provide and/or pay for insured physician and hospital services. The federal government provides treatment and public health services in remote areas and public health services in non-isolated First Nation communities through the **First Nations and Inuit Health Branch (FNIHB) of Health Canada**. The FNIHB Directorate is charged with ensuring that First Nations people and Inuit receive dental care benefits similar to other Canadians.<sup>337</sup> Regional dental personnel provide clinical, preventive and administrative services. The staff varies from region to region.



In B.C. they include a Regional Dental Officer, community-based dental therapists, dental assistants and dental clerks. Contract-providers offer community-based care based on a *per diem* or fee-for-service. Dental assistants are often hired locally from within a First Nation, and dentists occasionally fly into remote communities throughout the province, or the residents are transported out to a dentist. Oral health services include health promotion programs, along with treatment services and environmental health surveillance. The ***Non-Insured Health Benefits Program*** pays dentists, denturists and dental specialists a fee-for-service to eligible First Nations peoples living on and off reserve. The FNIHB predetermines and approves funding for care through “First Canadian Health”.

## STRATEGIES

**facilitate access to dental services for all Aboriginal people by encouraging care-providers, consumers, insurance carriers to solve the difficulties Aboriginal people experience when seeking services to which they are entitled**

**encourage partnerships between federal and provincial governmental agencies to insure that preventive oral care is an integral part of all health-care programs administered by the First Nations**

Currently, the control of health programs is in transition to many First Nation organizations. The mandate of the ***National Head Start Program for Aboriginals*** is to improve the health of Aboriginal children by improving the continuum of home and community care, and by coordinating the links between the federal and provincial health systems.

The **National School of Dental Therapy** was established by the Medical Services Board of Health Canada to encourage First Nations people and Inuit to enter the dental profession.<sup>337</sup> The Saskatchewan Indian Federated College in affiliation with the Faculty of Dentistry, University of Saskatchewan, delivers a two-year program in Prince Albert. Here, under contract with Health Canada, students recruited from northern communities are educated for basic dental services, including fillings, extractions, preventive care and dental health promotion. Presently, dental therapists work in the Territories and in all of the provinces apart from Ontario and Quebec. There are seven therapists working now in B.C. They operate on the authority of both the Health Act and the Indian Act, and over the years they have worked in 60 of the 350 more remote First Nations communities in the province, and, more recently, in the less remote Cowichan Valley on Vancouver Island.<sup>338</sup>

The Faculty of Dentistry at the University of Toronto supports two programs, the Moose Factory and Sioux Lookout, to First Nations peoples in **Northern Ontario**.<sup>339</sup> The ***Moose Factory project***, about 20 years old, involves three full-time dentists, an orthodontist, a denturist, dental residents and dental students who work at the Moose Factory Hospital. The dentists and the orthodontist also visit remote Aboriginal communities in an attempt to address the very poor oral health of the children and adults in the area. The ***Sioux Lookout program***, is over 30 years old, with four dentists who work out of the hospital in Sioux Lookout. The dental service is similar to the Moose Factory program, serves about 130 remote First Nations communities, and involves also dental residents.

## Australia

Oral health-care in remote communities is a problem faced by other countries where the indigenous peoples are similar to the First Nations peoples of B.C. **Western Australia**, for example, has a huge land mass with very sparse distributions of people throughout most of the state – only 13% live outside the major urban centres.<sup>340</sup> As in B.C., low-income groups in remote regions have the added expense of

travelling long distances to access care. Most of the dentists in Western Australian are located in the cities and larger towns, so that there are large areas serviced only by itinerant practitioners. In addition, the people in the more remote regions are of Aboriginal descent with distinct cultural and general health needs. Physicians are frequently called to provide emergency dental care, yet the medical curricula in Australia, as in Canada, provides very little didactic or clinical training for this service. Steele *et al.*<sup>340</sup> have proposed several strategies to facilitate the provision of oral health services throughout the state of Western Australia. In particular, they recommend closer links between dental personnel and other medical practitioners beginning in the medical curriculum and continuing into the postgraduate training of physicians for practice in remoter regions. They suggests also that nurses and Aboriginal health workers be trained in oral health-care. Western Australia is implementing a “pregraduation internship” year for new dentists with a suggestion that they spend part of their training in remote localities. Modern communication systems offer the possibility of improved specialty services to remote communities. The visual nature of oral diagnosis combined with intraoral cameras offer the possibility of effective video-conferencing for general dentists or medical personnel to consult with specialists elsewhere, or at least a telephone connection for non-dentists to seek the advice of a dentist. Western Australia has a ***Combined Universities Centre of Rural Health*** to provide a focus for rural health training and support for all health professionals in the areas of population health, preventative health care and practice-related issues.<sup>341</sup> There is also a ***Western Australian Centre for Rural and Remote Medicine*** that addresses medical recruitment and retention problems across Australia through continuing education programs particularly in the area of telemedicine. The Health Department of Western Australia supports it.

## STRATEGY

**provide government funds to assist in the development and maintenance of an “internship” year for new dentists to encourage the expansion of oral health services to remote localities**

## TOBACCO-USERS

Provincial involvement in tobacco reduction exists in the form of alliances with government, non-government, health professional groups, and private agencies. Legislative statements for tobacco reduction attempt to protect non-smokers from second-hand smoke, to encourage youth not to smoke, and to help tobacco-users overcome their addiction. The ***BC Tobacco Strategy*** aims to: “protect young people from tobacco, change the behaviour of the tobacco industry, and hold the tobacco industry accountable for the damage it's done” - an approach that integrates legislation, legal action, and public education with increased funding for programs.<sup>342,343</sup> This wide-ranging strategy involves Regional Health Boards, Regional Tobacco Reduction Coordinators, Regional Tobacco Enforcement Officers and other special interest groups. Focus is placed on school-aged children through programs like “*Heartsmart Kids*”, “*bc.tobaccofacts*”, and “*Kick the Nic 2000*”. The community dental health programs of the health regions direct smoking prevention and cessation for schools. The **South Fraser Health Region**, for example, has a program entitled “Up in Smoke” containing a series of integrated lessons with some oral health content to help students in elementary schools explore their own health attitudes and behaviours towards smoking.<sup>344</sup> This program was developed further in a computerized format by the **Association of Dental Surgeons of B.C.** to bring schools, dental professionals, and the community together to combat tobacco addiction. The provincial government has sponsored the “***Aboriginal Tobacco Strategy***” as an integral part of the overall provincial strategy, to ensure that the ideas and values of the First Nations are addressed.<sup>345</sup>

There are several other anti-tobacco initiatives in B.C. The Heart and Stroke Foundation of BC, the Canadian Cancer Society, and the B.C. Lung Association together produced “*BC – Leading the Pack on Tobacco: A Plan to put BC at the forefront of tobacco control in Canada*”. The Canadian Cancer Society operates a *Teen Cessation Program* and a toll-free “Quit Line”. The Ministry for Children and Families and the Ministry Responsible for Seniors, along with the Ministry of Health, run the “*Prevention Source B.C.*”, a provincial informational centre for regional tobacco reduction coordinators, tobacco enforcement officers and other involved in preventing alcohol, tobacco and other drug misuse.<sup>346</sup> The “*BC Doctors’ Stop Smoking Program*” operates with support from the Ministry of Health to engage physicians in smoking cessation methods.<sup>347</sup> Similarly, the “*Dental Team’s Clinical Approach to Tobacco Use*” was produced in collaboration with the College of Dental Surgeons of B.C. to guide dentists and other dental personnel who wish to include smoking cessation as a part of dental practice.

**STRATEGIES**

**emphasize in the “*Tobacco Reduction Program*” the detrimental impact of smokeless tobacco on health**

**expand the oral health content of “*Honouring our Health: An Aboriginal Tobacco Strategy for British Columbia*”**

The Alberta government contributes \$1 million annually to the *Alberta Tobacco Reduction Alliance*, which reviews tobacco legislation and supports media campaigns, youth workshops, and group or individual counselling.<sup>348</sup> A program entitled “Encouraging patients to quit tobacco: An easy and effective intervention for the dental office” was supported by the National Cancer Institute of Canada to provide pamphlets, booklets, posters, videos and other resources for dental practices illustrating the connection between tobacco and oral health. In 1996, over 3,000 patients in 52 dental offices participated in the program.<sup>349</sup> Similarly, but with much broader financial support\*, the *Habitrol DenTEC Program* operates through dental practices to counsel and prescribe nicotine replacement† treatment for smokers.

**STRATEGIES**

**integrate dentists, dental hygienists, denturists, dental therapists and certified dental assistants into the provincial tobacco-cessation/reduction program**

**consult with dentists, dental hygienists, denturists, certified dental assistants and dental therapists to develop a tobacco cessation program with appropriate oral health-related content and based on the Ministry of Health’s “*Tobacco Reduction and Control Branch Program*” and the “*BC Doctors’ Stop Smoking Project*”**

The “*Saskatchewan Coalition for Tobacco Reduction*” is a coalition of representatives from health, educational, and church organizations, government departments, health professional groups, and private

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\* Support provided by: Alberta Dental Association; Alberta Dental Assistants Association; Alberta Dental Hygienists Association; Alberta/NWT Division of the Canadian Cancer Society; and Novartis Consumer Health Canada Inc.

† Habitrol Stop Smoking System. Novartis Inc Summit, NJ. USA.

citizens committed to reduce tobacco-use.<sup>350</sup> The National School of Dental Therapy educates students about smokeless tobacco and tobacco cessation for Aboriginal communities. **Manitoba** is in the process of developing a provincial tobacco reduction strategy, whilst Ontario is attempting to include tobacco reduction awareness as part of the usual routine of all dental practices. In **Ontario**, tobacco education resources are given to dentists and their staff with the aim of involving the entire dental clinic staff in tobacco awareness and counselling of patients.<sup>329</sup> However, third-party insurers of dental services do not reimburse dentists for tobacco counselling, which is a significant barrier to the success of this initiative. The “*Dental Smoking Cessation Project*”<sup>351</sup> helps dental professionals expand their involvement in smoking cessation. It was initiated in three phases: firstly, through journals and conferences to heighten awareness; secondly, through the participation of a small group of dental practices, and thirdly, by expansion to local and provincial dental professionals.<sup>352</sup>

The **Canadian Dental Association** with other health organizations lobbied government through the “*Tobacco or Kids*” campaign to adopt new warning labels on cigarette packages illustrating the effects of smoking. It joined with Health Canada in 1997 to create the “*Quit 4 Life*” campaign - an interactive website offering stories about four teenagers who struggle to overcome the smoking habit. It also lobbies governments to increase taxes on tobacco for money to educate children about the hazards of tobacco, and it is linked to the Canadian Council for Tobacco Control.<sup>353</sup>

In the **USA**, the American Dental Association supports the role of dentists in helping individuals to quit tobacco use.<sup>354</sup> The *ADA Guide to Dental Therapeutics* has a chapter on tobacco-use cessation, and the *Health History* form recommended by the ADA for use by dentists includes questions on tobacco use and interest in quitting. Also in the USA, the National Cancer Institute established the *National Dental Tobacco-Free Steering Committee* to promote interest among dental organizations and to produce an instructional manual entitled: *How to Help Your Patient Stop Using Tobacco: A National Cancer Institute Manual for the Oral Health Team*. The *Campaign for Tobacco-Free Kids* is a very extensive non-governmental initiative with support from over 130 organizations including several dental associations\* in the USA.<sup>355</sup> The *Centers for Disease Control and Prevention*<sup>356</sup> along with the National Institute of Dental Research and the American Dental Association have developed a strategy for preventing and controlling oral and pharyngeal cancer in which they identify a need at all levels of training in dentistry for instruction in preventing and controlling tobacco use. The *Oregon Research Institute* offers training to dental professionals on implementing successful tobacco cessation programs.<sup>357</sup>

There are several national initiatives on other continents to limit the use of tobacco through the intervention of a dental professional,<sup>358,359,360</sup> each reflecting the World Health Organization’s recognition that “brief, opportunistic and consistent advice” from a health professional, including dentists, is an effective strategy to reduce tobacco use.<sup>361</sup>

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\* Academy of General Dentistry, American Association of Dental Schools, American Dental Association, American Dental Hygiene Association, National Institute of Dental and Craniofacial Research

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# APPENDICES

## APPENDIX 1

### Methodology: Jurisdictional Review

The jurisdictional review served two main purposes for the present strategy. The first was to determine current activities in British Columbia (B.C.) concerning oral health-related prevention efforts, which needs are being met and which needs are unmet. The second was to determine what model oral health-related initiatives are in place within B.C., across Canada or internationally that warrant consideration for an Oral Health Strategy for B.C.

### Sample

There were two main criteria for determining which agencies/organizations were included in the jurisdictional review. The first factor was geographical and the second factor was program referral (peer nomination).

The geographical criterion was enlisted to ensure that oral health initiatives from a variety of settings have been investigated, particularly within Canada and with an emphasis on B.C. The United States and Australia were also included in the jurisdictional review because of its similar cultural settings.

A variety of key players were contacted in order to ensure that a broad range of input was received. Key players included those from private dental and medical practices, low-income community health centres, regional health offices, provincial organizations (e.g., BC Doctors Stop Smoking Program, BC Association of Aboriginal Friendship Centres, College of Dental Surgeons), and National organizations (e.g., Canadian Cancer Society, Canadian Prenatal Nutrition Program, and Dentistry Canada Fund).

A total of 97 individuals representing 74 different organizations were contacted either in person or over the telephone and 64 Web Sites were included (Table A1). Note that some agencies may have more than one respondent. The numbers for agencies indicate the number of unique agencies contacted. For example, Friendship Societies in B.C. are considered to be one agency, however, they have nine individual contacts across the province.



**Table A1: Sample for Jurisdictional Review**

Regional Representation	Web Sites	Agencies	Interviews
		n	n
Canada - Federal	19	5	5
B.C. - Provincial	19	9	11
B.C. - Health Regions		8	17
B.C. - First Nations Groups		10	20
B.C. – Professional Organizations, Private Practices, and Others		19	19
Alberta		4	4
Saskatchewan		4	5
Manitoba		2	2
Ontario		6	7
Quebec		1	1
Prince Edward Island		1	1
Newfoundland		1	1
Nova Scotia		2	2
Other Provinces	11		
United States	9	2	2
Other Countries	6		
<b>Totals</b>	<b>64</b>	<b>2</b>	<b>2</b>

## Interviews

Upon successful contact with representatives from each agency/organization, informal interviews were scheduled when convenient for respondent and interviewer. These informal interviews consisted of asking the respondent what they or others were doing in the areas of oral health-related: 1) prevention initiatives; 2) oral health-related initiatives for Aboriginals; 3) oral health-related initiatives for low-income groups; and 4) oral health-related initiatives for tobacco users. Respondents were also asked for recommendations regarding other programs or individuals that should be contacted for the purposes of the present research.

## **Appendix 1A**

### **Sample for Jurisdictional Review**

With the geographical and program referral criterion (see methodology for the jurisdictional review), the following agencies/organizations were selected:

#### **British Columbia - Provincial**

##### **Governmental**

- ◆— Ministry of Health - Malcolm Williamson - Senior Dental Health Consultant
- ◆— Ministry of Health - Lorna Storbakken - A/Director, Prev. and Health Promotion Strategies

##### **Non-governmental**

- ◆— BC Association of Aboriginal Friendship Centers
- ◆— BC Dental Hygienists' Association - Cindy Flecter
- ◆— BC Doctors Stop Smoking Program - Fred Bass
- ◆— Certified Dental Assistance Society of BC - Sherry Sikora
- ◆— College of Dental Hygienists - Yvonne Smith
- ◆— College of Dental Surgeons of BC - Jim Brass
- ◆— College of Denturists - Jim Connelly
- ◆— Denturists Association of BC – Frank Price
- ◆— Lookout Emergency Aids Society - Al Mitchel
- ◆— Prevention Source BC - Jamie Brown
- ◆— Prevention Source BC - Colin Mangham

#### **British Columbia - Regional and Community**

##### **Health Regions:**

##### **Capital**

- ◆— Victoria Office - Shirley Woods - Community Hygienist
- ◆— Victoria - Dr. Richard Stanwick - Medical Health Officer

##### **North Shore**

- ◆— North Shore Health Unit - Joanne Vestvik

##### **Northern**

- ◆— Cariboo Health Unit - Williams Lake - Joan Reiswig
- ◆— Northern Interior Office Sharon Davalovsky
- ◆— Smithers Office - Dental Health Services for Community Living - Mary Lou Burleigh
- ◆— Tobacco Reduction Program - Kerri McCaig (coordinator)

##### **Simon Fraser/Fraser Valley**

- ◆— Simon Fraser Office - Lynn Guest
- ◆— Abbotsford Office - Maxine Borowko

### **South Fraser**

- ◆ North Delta Office - Maureen Smith

### **Thompson/ Okanagan/ Kootenay**

- ◆ Okanagan/Similkameen Region - Kelowna Office - Carol Gulliford
- ◆ Thompson/Okanagan/Kootenay Region - Lesley Dyck

### **Vancouver/Richmond**

- ◆ Evergreen Community Health Centre - Vancouver - Tana Wyman
- ◆ Extended Care Facilities - Beverly Contreras
- ◆ North Community Health Office - Vancouver - Dr. Tracy Wong
- ◆ Regional Tobacco Reduction - Shirley Thompson

### **Vancouver Island/Coast Region**

- ◆ Central Vancouver Island - Anita Vallee

### **First Nations Groups**

- ◆ Community Health Associates - Osoyoos Reserve Health Services - Brenda Baptiste
- ◆ Community Health Associates (LI, FN), Tina-Marie Christian
- ◆ Cowichan Tribes - Tsewultun Health Centre
- ◆ First Nation's Chief's Health committee - Shunee Pointe
- ◆ First Nation's Chief's Health committee - Addie Pryce (former administrator)
- ◆ Friendship Society - Cariboo - Marg Ahdemer
- ◆ Friendship Society - Cariboo - Pregancy Outreach Program - Tracy Higgins
- ◆ Friendship Society - Fort Nelson - Judy
- ◆ Friendship Society - Houston - Penny
- ◆ Friendship Society - Interior - Linda
- ◆ Friendship Society - Lillooet - Leona Joseph's receptionist
- ◆ Friendship Society - Port Alberni - Cindy Stevens
- ◆ Friendship Society - Vancouver - Gloria Cardinal
- ◆ Institute of Aboriginal Health - Vancouver - James Andrew
- ◆ Inter-Tribal Health Authority - Ethel Henderson
- ◆ Mt. Curry Band - Sylvia Passmore
- ◆ Native Health Centre - Kamloops - Charlene Yow
- ◆ Native Health Centre - Lillooet - Rose Marie
- ◆ Tobacco Working Group - Denise Lecoy
- ◆ Vancouver Native Health Society - Gordon
- ◆ White Feather Health Center - 100 Mile House - Gail Orr (Public Health Nurse)

### **Private Practices**

- ◆ Dental Hygienist - Ft. St. John - Suzanne Malanowich
- ◆ Dental Practice - Kelowna - Alan Milnes
- ◆ Dental Practice-Pemberton- Anne Crowley
- ◆ Dental Practice - Vancouver - Wendy Kwong
- ◆ Dental Practice - Vancouver - Gary McDonagh (retired - downtown clinic)

- ◆— Dental Practice - Williams Lake - Gerald Edward Dyck (Children's Dentist)
- ◆— Medical Practice - Queen Charlotte Islands -Dr. Watson
- ◆— Medical Practice - Sayward - Dr. Harvey Henderson
- ◆— Nurse, Street - Kelowna - Lee Fenton

### **Other**

- ◆— BC's Children's Hospital, Dental Dep't- Gary Derkson
- ◆— Bridge Community Health Clinic - Vancouver - Cheryl Anderson
- ◆— Downtown Eastside Youth Activities Society - Vancouver - Vinnie Trigueros
- ◆— Downtown Eastside Women's Centre - Vancouver
- ◆— Kelowna General Hospital - Cancer Agency - Dental Dept - Lynn Van Den Elzen
- ◆— Mid-Main Community Health Centre - Vancouver - Colleen Ming
- ◆— REACH Community Health Clinic - Vancouver - Barbara Bell
- ◆— Seymour-Strathcona children's Dental Committee - Vancouver - Kyle Pearce
- ◆— UBC Health Care and Epidemiology - Chris Lovato
- ◆— UBC Institute of Health Promotion Research - James Frankish
- ◆— Vancouver Island Public Interest Research Group - Bruce Wallace

### **Alberta - Provincial, Regional, Community**

- ◆— Alberta Dental Association - Dr. G.W. Thompson
- ◆— Health Region: Edmonton Capital - Dawn Samis
- ◆— Health Region: Chinook Regional Health Authority
- ◆— Health Region: Keeweenaw Lakes Regional Health Authority

### **Saskatchewan - Provincial, Regional, Community**

- ◆— Saskatchewan District Health - Rural Dev. and Complementary Care - Sheila Achilles
- ◆— Saskatchewan Extended Health Benefits - Jerry Fazakas
- ◆— Saskatchewan Ministry of Health - Health Promotion - Janet Gray
- ◆— Saskatchewan Ministry of Health - Health Promotion - Tanya Mceilree
- ◆— School of Dental Therapy - Connie Duplessis

### **Manitoba - Provincial, Regional, Community**

- ◆— Manitoba Public Health - Bernadette Desmarais
- ◆— University of Manitoba - Community Dentistry - Doug Brothwell

### **Ontario - Provincial, Regional, Community**

- ◆— Central Toronto Community Health Centre - Queen West - Joel Rosenbloom
- ◆— Central Toronto Community Health Centre - SHOUT - Anna Travers
- ◆— Hamilton Urban Core Community Health Centre - Denise Brooks
- ◆— Ontario Dental Services Branch, Ottawa-Carleton, Aaron Burry
- ◆— Ontario Program Training & Consultation Centre - Josie, d'Daveras
- ◆— University of Toronto - Department of Pediatric Dentistry - Keith Titley
- ◆— University of Waterloo Centre for Behavioural Research - Dr. Sharon Campbell

### **Quebec - Provincial, Regional, Community**

- ◆— McGill University, Faculty of Dentistry - Dr. Michael Wiseman

### **Prince Edward Island - Provincial, Regional, Community**

- ◆— PEI Dental Public Health

## **Newfoundland - Provincial, Regional, Community**

- ◆— Newfoundland Medical Care Plan - Dental Affairs - Brenda Butler

## **Nova Scotia - Provincial, Regional, Community**

- ◆— Atlantic Blue Cross - Pauline Sutow
- ◆— Nova Scotia Provincial Health Council - John Dow

## **Canada - Federal**

### **Governmental**

- ◆— Health Canada – Don Davis

### **Non-governmental**

- ◆— Canadian Cancer Society - Cheryl Moyer
- ◆— Canadian Dental Association - Linda Teteruk
- ◆— Canadian Prenatal Nutrition Program - Suzanne Johnson
- ◆— Dentistry Canada Fund - Richard Munroe
- ◆— National Clearinghouse on Tobacco and Health

## **United States**

- ◆— American Dental Association
- ◆— Tobacco-Free Kids - Washington, DC - Danny MacGoldrich

## **APPENDIX 2**

### **Community Dental Health Programs in British Columbia, 2001**

Prepared by:

Maureen Smith.

Community Dental and Tobacco Programs,  
South Fraser Health Region.

The goal of Community Dental Health Programs in British Columbia is to reduce the incidence of oral disease in our communities and promote oral health as a part of total health goals. Our focus is on prevention, education, and providing assistance to families in accessing dental care. The principles of health promotion and community development are fundamental to our approach. Our programs are client-centred and our clients are seen as equal partners in their own health care decisions. Our role is that of facilitator rather than “expert.”

Programs and services vary from region to region depending on the priorities of the area and the availability of staff and funding. However, most of the health regions in the province provide core programs for Kindergarten children, persons with mental handicaps, and high-risk infants and preschoolers. Other services, such as those in long term care facilities and secondary schools are available on a less frequent basis.

The following identifies some of the activities that may be provided in a health region. Programs are organized in population health groupings.

#### **Infants/Prenatal**

- Participating in high risk prenatal and parenting programs such as the *Pregnancy Outreach Program*, *Nobody's Perfect*, women's groups, perinatal groups and parenting teen programs at secondary schools
- Promoting breast-feeding, healthy nutrition and safe comforting practices
- Conducting Early Childhood Caries prevention programs at immunization clinics, "well baby" visits, pharmacies, via telephone contact with parents, and in physician's and dentist's offices

#### **Preschools and Daycares**

- Training for early childhood education students
- Conducting daycare instructor workshops and updates
- Making dental “play and learn” kits and videos available on loan
- Providing dental information packages for all newly licensed daycares

#### **Community Care Facilities**

- Assisting facility administrators to set up oral care policies and to meet licensing requirements
- Providing oral assessment and referral services
- Training for care aids and nursing staff
- Assisting residents in accessing care
- Linking dentists and dental hygienists with facilities
- Consulting to Mental Health Group Homes

## Dental Health Services Community Living

- Presenting educational sessions and coordinating services for individuals, support workers, family, dental personnel, and others
- Providing assessments and referrals
- Providing clinical services in client's home, dental office or hospital, as required

## Elementary School Programs

- Promoting good oral practices and healthy eating
- Offering dental presentations and visual dental checks (screening) for Kindergarten children, those new to the province and others on referral
- Lending the "Play and Learn" dental kits and videos for children ages 5-8
- Participating in Health Fairs
- Assisting families in accessing treatment via programs such as:
  - The UBC Faculty of Dentistry program for children in need of dental treatment
  - "Healthy Kids, BC Benefits" program for children under 19 years of age
  - "Save-A-Smile" program
- Assisting families who require extra help when there is a language barrier, the need for general anesthetic, or a lack of understanding on how to apply for MSP coverage or Premium Assistance,
- Working with other professionals such as the school nurse, nutritionist, counselor and multicultural worker on school based projects
- treatment clinic for Vancouver children only

## Secondary School Program

- Coordinating the confidential self-referral program for students with unmet dental needs
- Presenting lessons and screening checks for students in *English as a Second Language* classes, *Family Studies*, *Career and Personal Planning* classes and for *Children with Special Needs*.
- Cooperating in work experience programs
- Supporting smoking prevention and cessation programs
- Participating in health fairs, career days, and poster displays

## Community

- Counseling for families regarding healthy dental practices
- Attending *Neighbourhood Houses* and *Family Places* drop in centres
- Helping families to access dental resources in the community
- Presenting workshops for seniors' wellness groups

## Research and Evaluation

- Engaging in ongoing "Action Research" to improve own professional practices
- Compiling and analyzing school screening data on an annual basis for trends and issues
- Participating in specific community-based research projects, for example:
  - Twelve Month Early Childhood Caries Intervention Project
  - Fluoride Rinse Program
  - Prevalence Rates for Smokeless Tobacco

- The Correlation between Dental Health and Social Economic Status



## Appendix 3

### List of Strategies

#### GENERAL STRATEGIES

1. legislate preventive health practices to insure that prevention of disease is an integral part of oral health-care in the province;
2. promote fluoride as a caries preventive strategy in community water supplies, school-based mouth rinse programs, varnishes and toothpastes;
3. Early Childhood Caries (ECC):
  - a. expand oral health-related preventive programs for parents and infants in the early post-natal period;
  - b. enhance the current initiatives in the Health Regions that identify and follow-up infants and young children at high risk to ECC;
4. integrate oral health-related educational programs with other preventive or health promotional activities at Child Health Clinics, school nursing programs, community centres, regional health clinics, Seniors' centres, long-term care facilities and traditional community gatherings;
5. encourage mothers to eliminate caries from their teeth to reduce the risk of transmitting cariogenic bacteria to their children;
6. tax specific confectionary goods and beverages to support programs directed at the adverse impact of excessive sugar consumption on health, including oral health;
7. develop consumer educational programs, *e.g.* food guides, that equip individuals of all ages and cultures to assess the validity of nutritional information in advertisements of foods, snacks and beverages, and encourage advertisements for healthy foods;
8. require the manufacturers of confectionary, soft drinks and other snacks to label their products with health warnings;
9. expand awareness of mouth-guards, helmets, car seats and other protective devices to reduce the incidence and severity of orofacial trauma;
10. promote educational programs for dental personnel that allow students to participate in the provision of oral health services to Aboriginal peoples, tobacco-users, and low-income groups;
11. provide governmental funds to assist in the development and maintenance of an internship year for new dentists to encourage the expansion of oral health services to remote localities;
12. encourage dentists, dental hygienists, certified dental assistants and denturists to address the needs of Aboriginal peoples, low-income groups and other communities who have difficulty gaining access to oral health-care, by working in partnership with the communities and other public health professionals.
13. enhance the awareness and availability of resources about oral health promotion to all health-care workers, social workers and teachers;
14. encourage The Michael Smith Foundation for Health Research to target research towards:
  - a. epidemiological data on oral health throughout the province;
  - b. outcome and impact evaluation of innovative oral health services;
  - c. strategies relating to the oral health of people who are at particular risk to oral diseases;
  - d. the role of traditional diets in promoting oral health among First Nations and other minority groups;

- e. smokeless tobacco use throughout the province.

## **ABORIGINAL PEOPLES**

1. incorporate oral health as an integral part of all programs for improving Aboriginal health;
2. explore appropriate diets and oral hygiene practices with respect to the “cultural revitalization” of First Nations people.
3. encourage First Nations people to explore and readopt traditional parenting practices;
4. facilitate access to dental services for all Aboriginal people by encouraging care-providers, consumers, insurance carriers to solve the difficulties Aboriginal people experience when seeking services to which they are entitled;
5. expand the oral health content of the “*Honouring our Health: Aboriginal Tobacco Strategy for British Columbia*”;
6. cooperate with *Health Canada’s First Nations and Inuit Health Branch* to expand the preventive and treatment activities of dentists and other dental personnel in remote communities;
7. encourage partnerships between federal and provincial governmental agencies to insure that preventive oral care is an integral part of all health-care programs administered by the First Nations.

## **LOW-INCOME GROUPS**

1. improve information for the public on accessing dental benefits through the Ministry of Social Development and Economic Security;
2. enhance the work of Health Region staff and other pilot projects that facilitate access to dental services for low income families and individuals;
3. improve communications between the Ministry of Social Development and Economic Security and dental personnel to enhance emergency and basic care for low-income groups;
4. resume negotiations between the Ministry of Social Development and Economic Security and the dentists, dental hygienists and denturists in the province to establish fair reimbursement for treatment provided to recipients of dental benefits;
5. implement school-based pilot projects to assess the practicalities of agents - such as fluoride rinses, fissure sealants, and xylitol chewing gum - for controlling caries in elementary and high schools where the risk of caries is high;
6. encourage Health Regions to support in each region the infrastructure and staff for at least one public dental clinic suitable for low-income groups, and ask local professional associations to seek volunteers willing to provide treatment at reduced fees;
7. For Residential Care:
  - a. encourage the Ministry of Social Development and Economic Security to permit direct billings of their dental plan by dental hygienists for services they provide directly to persons in residential care;

- b. amend the “Adult Care Regulations, B.C. 1997”<sup>\*</sup> to specify that a resident of an intermediate or extended care facility must be examined by a dentist within six months prior to, or within three months after, entering the facilities admission, and at least once every year thereafter;
- c. explore with the Ministry of Advanced Education, Training and Technology, the College of Dental Surgeons of B.C. and the Association of Certified Dental Assistants in B.C. the possibility of expanding the educational base of certified dental assistants in preparation for a coordinating role in preventing oral health-related problems within long-term care facilities;
- d. encourage the College of Dental Surgeons and the Association of Certified Dental Assistants in B.C. to develop a coordinating role for certified dental assistants in preventing oral health-related problems within long-term care facilities without the direct supervision of a dentist;
- e. promote the use of fair methods of remunerating dentists, dental hygienists, denturists and certified dental assistants within long-term care facilities.

### **TOBACCO-USERS**

1. consult with dentists, dental hygienists, denturists, certified dental assistants and dental therapists to develop a tobacco cessation program with appropriate oral health-related content and based on the Ministry of Health’s “*Tobacco Reduction and Control Branch programs*” and the “*BC Doctors’ Stop Smoking Project*”;
2. emphasize in the “*Tobacco Reduction and Control Branch program*” the detrimental impact of smokeless tobacco on health;
3. integrate dentists, dental hygienists, denturists, dental therapists and certified dental assistants) into the provincial tobacco-cessation/reduction program;
4. ask the College of Dental Surgeons of B.C. to include the prescription of tobacco cessation medications within the usual scope of dental practice in the province;
5. provide fair reimbursement through the Medical Services Plan and the Ministry of Social Development and Economic Security (dental benefits) to all health-care practitioners for counseling on tobacco cessation.

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<sup>\*</sup> Government of British Columbia Order in Council No. 1105. Victoria, B.C. Appended and ordered October 1st, 1997 to amend section 9 of the Adult Care Regulations.