

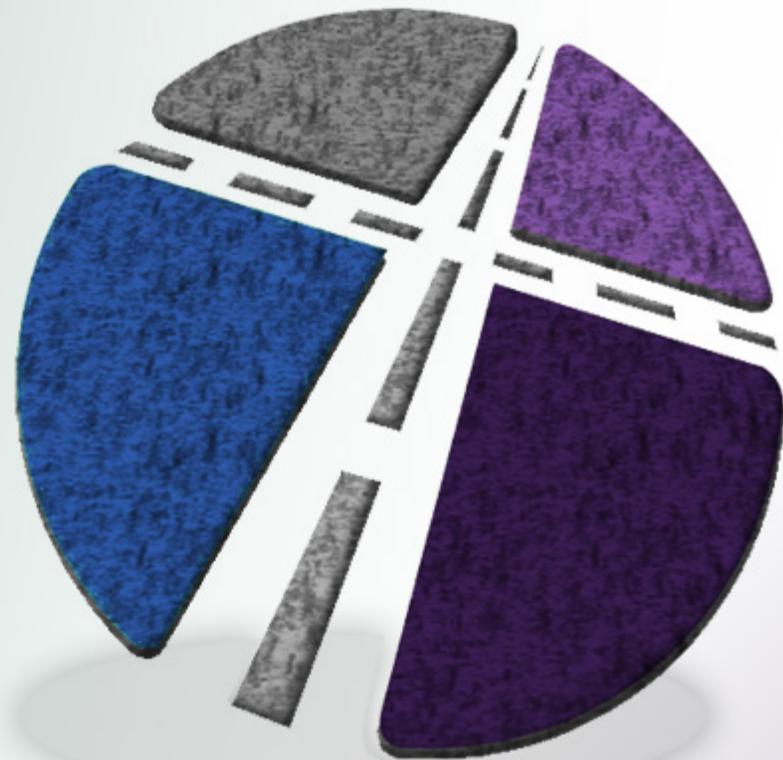


THE CANADIAN DENTAL
HYGIENISTS ASSOCIATION

L'ASSOCIATION CANADIENNE
DES HYGIÉNISTES DENTAIRE

Dental Hygiene at a Crossroads:

Knowledge Creation and
Capacity Building in
the 21st Century.



A report on
research in the field
of dental hygiene in Canada
10 June 2009

Acknowledgement

CDHA would like to thank the author of this paper, Judi Varga-Toth, the research workshop planning committee (Dr. Joanne Clovis, Judy Lux, and Dr. Susanne Sunell), key informants (Erica Di Ruggiero, Dr. John Gilbert, Dr. Ed Putnins, Salme Lavigne), workshop participants (Dr. Cindy Amyot, Dr. Joanne Clovis, Sandy Cobban, Bonnie Craig, Brenda Currie, Dr. Laura Dempster, Leeann Donnelly, Marilyn Goulding, Dr. Louanne Keenan, Barbara Long, Dr. Kerstin Ohrn, and Dr. Susanne Sunell), CDHA staff (Judy Lux and Dr. Susan Ziebarth) and other stakeholders.

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Executive summary

Dental hygiene has had a long and an important history in Canada, and has evolved over the past half a century and more from a new occupation to a growing and respected profession. While there have been, and continue to be challenges, the Canadian Dental Hygienists Association (CDHA) represents a health care profession that has tremendous potential to contribute to the health and well being of all Canadians.

In the 21st century, it is clear that achieving health and well being for the entire population requires a broad and collaborative approach ranging from effective health promotion and prevention strategies to accessible, appropriate, and timely treatments and interventions. Canada is a nation committed to providing its citizens with high quality, affordable, and accessible health care. In order to achieve this goal, federal, provincial and territorial governments must continue to work together with the whole range of stakeholders affected, including un- and under-served populations, health care providers, policy makers and elected representatives. Dental hygienists are part of the spectrum of health care providers who contribute to the health and well being of Canadians.

Dental hygiene was developed to address health promotion and prevention needs in oral health to allow dentists to focus on treating cases of dental disease. Today, dental hygienists have over 100 years of experience and expertise in oral health promotion and prevention of oral disease. A strong and growing profession, nationally and internationally, dental hygienists are poised and ready to strengthen their contribution to the oral health and well being of all Canadians.

As with all health care disciplines, current and solid research in dental hygiene is essential to ensure that all approaches, strategies, and interventions are based on the best scientific evidence possible. As a maturing profession, dental hygiene must strengthen and broaden its research base to ground its growth in a strong foundation. CDHA, in its role as the national voice of dental hygienists, is leading the way in building a strong research culture within the profession to contribute to the knowledge base in oral health in Canada.

After a lengthy consultative and collaborative process, CDHA has confirmed the importance of thirteen key themes that must be pursued in the 21st century to improve the oral health and well being of Canadians:

- population health
- prevention
- health literacy
- evidence of an oral-systemic link
- the unique contribution of dental hygiene to oral health and research in oral health
- vulnerable or high priority populations
- access issues
- technology
- researchers in dental hygiene
- evidence based practice
- health human resources
- the public health system in oral health
- the educational credentialing system for dental hygiene in Canada

These themes are critical to responding effectively to the challenges of oral health in Canada today. The Canadian Oral Health Strategy (COHS), launched in 2005, serves as a national framework for moving forward in meeting key challenges including the higher disease rates among vulnerable populations, the lack of access to oral health care for many individuals, the very limited availability of oral health promotion initiatives, the low awareness of the links between oral health and general health among most Canadians, and the difficulties and obstacles in recruiting oral health professionals into research, academics, and public health.

The themes identified by CDHA outline the unique contribution of the dental hygiene profession to resolving the issues and meeting the challenges outlined in the COHS. By using the COHS framework as the foundation for its work, CDHA can ground its work in a broad national initiative and join all oral health care professionals in working together to meet the oral health needs of all Canadians.

By supporting research within these thirteen themes, CDHA and the broader dental hygiene community will contribute significantly to the development of new knowledge, policies, and practices that will improve the health and well being of all Canadians. By encouraging and sustaining innovative new partnerships and collaboration at the national, provincial and academic level, CDHA will enhance the research capacity of the profession. By continuing to involve dental hygiene stakeholders in the national conversation about research and expanding communication strategies that emphasise the benefits of research in all aspects of clinical and educational practice, CDHA will ensure a greater uptake of and commitment to research across the profession.

This report is but a beginning. CDHA's Research Advisory Committee will develop an action plan for knowledge creation and capacity building for dental hygiene to strengthen and guide the profession in this century.

Introduction

Health and health care have been high on the agenda in Canada for decades, and never more so than in the early 21st century. Canada's health care system is the envy of many nations, touted as an example to be emulated by many around the world. However, raging debates about access, wait times, quality of care, and high costs have made health care a central issue in elections at both federal, and provincial or territorial levels, and ranks very high in the priorities of Canadians. Furthermore, there is growing recognition that these debates have framed the issues too narrowly. Good health depends on a wide variety of factors, including oral health. According to the World Health Organization (WHO) the "Promotion of oral health is a cost-effective strategy to reduce the burden of oral disease and maintain oral health and quality of life. It is also an integral part of health promotion in general, as oral health is a determinant of general health and quality of life."¹ Using this broad understanding of health, the aim of health care systems and services ought to be the promotion of physical, social and mental well being for all citizens.

The purpose of this paper is to cast some light on the role that oral health research has played, can play, and must play in contributing to the overall health and well being of Canadians. This paper hopes to answer two important questions:

1. How can dental hygiene research contribute to the health of Canadians?
2. What will it take to enhance research capacity and uptake within the dental hygiene profession in Canada in the 21st century?

By using a "research lens" or focus this paper examines the evolving and increasingly important role dental hygiene plays in promoting oral health and the overall well being of Canadians. The paper places this role within the framework of the wider context of health trends in Canada that have impact on the profession in setting the stage for an updated and strategic research agenda.

Oral health

It is clear that the contribution to health and well being of all parts of the body are important and equal attention needs to be paid to all of them as each part contributes to the overall picture of health in an individual or in a population. Patently the mouth and all its components are part of our bodies. Oral health is not only important to appearance and sense of well being, but also to overall health.² Oral health means more than healthy teeth and the absence of disease. It involves the ability of individuals to carry out essential functions such as eating and speaking as well as to contribute fully to society.³

Former US Surgeon General David Satcher, in his *Oral Health in America: A Report of the Surgeon General*, articulated an important principle. “You cannot be healthy without oral health. Oral health and general health should not be interpreted as separate entities. Oral health is a critical component of health and must be included in the provision of health care and the design of community programs.”³ The WHO goes further to say that oral health is part of total health and *essential* to quality of life.⁴

The reality in some industrialised countries continues to be that oral health and, with it, oral health care, have been marginalized and left outside the tent of such publicly funded health systems as Medicare in Canada.

In Canada, the oral health of Canadians is not addressed under the Canada Health Act, and therefore oral health services are not provided to citizens through Medicare but rather remain, for the most part, in the private sector and to a much lesser extent in public health. Access to most oral health services occurs through private insurance plans and coverage is uneven at best. The exceptions to this are the services provided through the First Nations and Inuit Health Branch (FNIHB), to Canada’s aboriginal population as they do provide oral health services, and also oversee public oral health programs for this population.

Prevention and promotion: global perspectives

In addition to the importance of recognizing the place of oral health in overall health strategies and, indeed, of bringing oral health into the health care debates in Canada, it is essential to broaden the Canadian approach to oral health beyond that of treatment of dental disease. While Canada has had some public health focus on prevention, in particular the FNIHB Children's Oral Health Initiative, there have been significant cuts to public oral health programs over the past 10 years. The WHO Global Oral Health Programme clearly articulates that a new strategy of disease *prevention* and *promotion* of health is consistent with their overall strategies for global health.⁴ The Pan American Health Organization (PAHO) also subscribes to this approach. In their 2006 *Proposed 10-Year Regional Health Plan on Oral Health* they say that "disease prevention is the cornerstone of PAHO's oral health policy for the Region of the Americas."

In light of the evolving changes in approach to health, health care and oral health in particular, and the global perspective provided by the WHO and PAHO, it is timely to review the place of dental hygiene in achieving health and oral health for all. The profession and practice of dental hygiene has had a lengthy and an important role to play in the oral health of North Americans.

Dental hygiene: where it all began

The recognition of the importance of oral health to overall health and well being has been evolving gradually since the early 19th century. Early dental practitioners focused mainly on treating tooth decay and gum disease as they presented themselves in clients. Canadians were responsible for the world's very first legislative act governing dentistry in 1867 in Ontario. Their main concern at the time was regulating dentists to protect the public from poorly trained or self acclaimed dentists, and in ensuring consistent, appropriate, and effective dental treatment. At the same time in the United States, there was a growing recognition of the importance of prevention and the promotion of appropriate oral health practices. While dentists were kept busy dealing with high levels of tooth decay and gum disease, it was clear that the public needed access to guidance and support to maintain good oral health.

To address this need, Dr. Alfred Fones, the “father of dental hygiene” developed the concept of prevention specialists, calling them “dental hygienist” to reflect the importance given to cleanliness. He opened the first school of dental hygiene in 1913. From its beginnings, dental hygiene was focused on the twin goals of oral health promotion and prevention of dental decay and disease. This focus has remained ever since and has taken on added urgency and importance in the 21st century given the increasing evidence of the connection between oral health and chronic disease.

Dental hygiene in Canada: brief retrospective

In Canada, the impetus for providing dental hygiene services came from the public health sector in the 1940s. Gradually dental hygiene was legally recognized across the country between 1947 and 1968.⁵ The Canadian Dental Association (CDA) through its Council on Education was instrumental in the development of dental hygiene education programs, beginning in 1951 at the University of Toronto. This first program was followed over the next decade by several others in Alberta, Nova Scotia, Manitoba and British Columbia. Eventually, following American successes, dental hygiene programs were also established in community colleges. Currently dental hygiene education in Canada is offered through some universities as a bachelor’s degree program, occasionally with a diploma exit option, and through community colleges and private institutions as a diploma program.

There are no graduate programs in dental hygiene at this time, however many dental hygienists pursue master’s level education in other related disciplines. The most common choices for graduate work included Master of Education, Master of Arts in Education, and Master of Science (through faculties of dentistry). More recently Master of Public Health and Master of Public and Population Health are gaining popularity as are Master of Health Administration and Master of Epidemiology.

Dental hygiene graduates saw a need to create a national connection and voice for their profession and, in 1964, formed the Canadian Dental Hygienists Association (CDHA). CDHA is the only national not for profit organization that represents the voice and vision of dental hygienists in Canada. There are approximately 19,385 dental hygienists in Canada. CDHA serves dental hygienists in supporting their efforts to provide high quality accessible care to Canadians.

As the collective voice of dental hygiene in Canada, CDHA contributes to the health of the public by leading the development of national positions and encouraging standards related to dental hygiene practice, education, research and regulation. CDHA is dedicated to the principle that all Canadians should have access to quality preventive oral health services provided by dental hygienists. CDHA seeks input from and dialogue with government and consumers to enable it to serve more effectively both its members and the Canadian public. CDHA also supports collaborative practice wherein a partnership exists between dental hygienists and other healthcare professionals participating in the delivery of comprehensive oral care.

Support for research and education in dental hygiene in Canada

As with any other health profession, research is critical to the profession of dental hygiene. Timely, accurate and relevant research is essential to guide the growth and development of dental hygiene and to ensure that practices and policies are evidence based, and support the goals of good health for all Canadians.

CDHA has always recognized the importance of education and research as two interlinked approaches to evidence based practice. To further the goals of providing high quality education and research, CDHA initiated a Scholarship Fund in 1969. The scope of this fund was expanded, through the efforts of CDHA, to include the support of dental hygiene education and research, with the transformation of the Fund into CDHA Endowment Fund. To better serve the research and educational objectives of the dental hygiene profession, the Canadian Foundation for Dental Hygiene Research and Education (CFDHRE) was established in 2004.

The remainder of this paper explores the issues raised in the introduction with the objectives of:

- situating dental hygiene within the context of the overall health of Canadians
- emphasizing the role of dental hygiene as central to the twin objectives of health promotion and disease prevention
- making the case for the expansion of dental hygiene within the health care spectrum and for inclusion in the debates currently underway in Canada on access and improving the overall effectiveness of the health system
- outlining the role that research can and should play in enhancing dental hygiene's contribution to the health and well being of all Canadians

Context / background

From occupation to health profession and beyond

Since the establishment of the first dental hygiene education programs in Canada, the number of dental hygienists has grown substantially. Today there are nearly 20,000 dental hygienists in Canada. CDHA represents approximately 13,000 of them as members of the national organization. Dental hygiene practice as initially conceived and implemented in North America involved dental hygienists, essentially women with some education and training, working in a collaborative role within a team led by a dentist. Dental hygiene was first recognized as an occupation in Ontario in 1948 followed by all other provinces and territories by the end of 1968.⁵ Since the 1960s, the field of dental hygiene has grown significantly and evolved into a regulated health profession in all geographical areas in Canada. Beginning with Quebec in 1974 and followed by Alberta, Ontario, British Columbia, Saskatchewan, Manitoba, Nova Scotia and New Brunswick, dental hygiene became self regulating such that currently only Prince Edward Island, Newfoundland and Labrador are not self regulated. Efforts are underway in each of these jurisdictions to achieve self regulation. In the three territories, dental hygienists are governed under their territorial governments through a federal agreement.⁶

As part of the new paradigm of self regulation, the regulatory colleges were required to have a code of ethics and many adopted or adapted the code developed by the Canadian Dental Hygienists Association (CDHA). CDHA had developed the first code of ethics for dental hygiene in Canada in 1992 and revised it in 2002.⁷ Following self regulation, the oral health system changed and the majority of dental hygienists can now establish private businesses. Another step in the professionalization of dental hygiene came in 1996 with the establishment of the National Dental Hygiene Certification Board (NDHCB). Currently five provinces require dental hygienists to pass the NDHCB-developed National Dental Hygiene Certification Examination as prerequisite to practise.⁷

Dental hygiene education in Canada

The educational opportunities for dental hygiene practice have also changed over the years. Initially dental hygiene education was located within the university setting, beginning with the University of Toronto in 1951. Four other university based programs came into being in the 1960s. These offered diploma level programs, generally of two years in duration. These programs were unable to evolve into full baccalaureate degree programs due in large part to resistance from the dental profession.⁶ As the community college system expanded, these university based diploma programs were transferred to the college level in Ontario and British Columbia, where the majority of them have remained since. Ironically, after this shift took place, degree completion programs were made available at the university level in the 1970s and beyond.

The current picture of education in dental hygiene is characterized by wide diversity. Programs range from two to four years at the college or university level or, more recently in private school settings. The entry-to-practice credential in all provinces is currently at the diploma level. CDHA, in 2000, passed a policy statement supporting the bachelor's degree as the entry-to-practice credential for all students beginning their studies in the 2005–2006 academic year.⁸ CDHA has a new draft education policy statement that includes a call for bachelor's, master's and doctorate programs.⁹

CDHA, as the only national body representing the profession of dental hygiene, has been very active over the years in promoting the professionalization of dental hygiene to ensure the highest quality of care for Canadians. In order to ensure the continual improvement of dental hygiene practice through an increase in evidence based approaches and to support the self regulatory activities of the profession, CDHA and dental hygiene educators and stakeholders continue to recognize the central importance of research to the profession. Effective, relevant, and current research is critically important to ensure the best quality services, including enhancing client safety and creating and implementing innovative interventions.

Dental hygiene research in Canada

The 1980s were a watershed decade for dental hygiene research in Canada, and indeed in the world. In recognition of the growing importance of research to the emerging profession of dental hygiene, CDHA submitted a brief to the Health Services Review Commission in 1980 in which they recommended that “further research be conducted concerning dental care delivery systems in Canada.”¹⁰ This was closely followed by the first conference on dental hygiene research in the world, held in Winnipeg in 1982, and by gathering a small but important group of researchers, consultants, and dental hygienists from Canada and the United States. In 1988, CDHA published a national survey of dental hygienists, and Health and Welfare Canada published a report, “The Practice of Dental Hygiene in Canada: Description, Guidelines and Recommendations”. The latter report called for further research in many areas including epidemiology, prevention, cost effectiveness, human resource configurations in dental health care and innovations in delivery systems.

The following decade brought more milestones in dental hygiene research. A symposium on Clinical Dental Hygiene (1990) and a North American Research Conference (1993) were held with a significant focus on research. In 1993, CDHA created a Council on Education and Research, which offered the first research grant to members in 1995. The Canadian Fund for Dental Education and the Dentistry Canada Fund in 1994 were established to support research endeavours in the field of oral health.

CDHA has provided a forum for the publication of dental hygiene research, including international research, for the last forty-two years. The inaugural edition of *Probe* was published in 1966, and in 2004 the journal’s name was changed to the *Canadian Journal of Dental Hygiene*. This journal is indexed in the Cumulative Index of Nursing and Allied Health Literature (CINAHL).

More recently CDHA submitted briefs to the Romanow Commission, to Senator Kirby and the House Standing Committee on Finance, calling for increased research in and funding for oral health in Canada. CDHA also works together with Research Canada, and their approximately 90 members, to advocate for Canadians to maintain and improve their health by ensuring that Canada is a world leader in research.

In 2003, CDHA hosted a National Dental Hygiene Research Agenda Workshop to produce its first Dental Hygiene Research Agenda. The resultant Dental Hygiene Research Agenda¹¹ provided the foundation for increasing the capacity for research within the dental hygiene profession and the uptake of research findings in the practice of dental hygiene across the country.

The Dental Hygiene Research Agenda (2003)

This first initiative to define the scope and priorities for dental hygiene research was an important step in building a research culture within the dental hygiene profession. The Dental Hygiene Research Agenda (hereafter referred to as the Agenda) situated dental hygiene research within the Canadian Institutes for Health Research's (CIHR) four pillars of research (biomedical; clinical; health services; and social, cultural, environmental, population health), identified and described the fit between dental hygiene research and the historical approach within oral health research, recognized the opportunities and challenges to research in dental hygiene and identified recommendations for specific areas of research.

Guiding principles for research

The guiding principles for research in dental hygiene, as identified by the Agenda are:

- Ethical issues underpin all areas, and ethical conduct is the first consideration
- Acceptable evidence from research includes both qualitative and quantitative approaches
- Interprofessional and intersectoral partnerships are preferred
- Cultural and linguistic sensitivity are requisite
- Participatory research is essential for the empowerment of individuals and communities

In identifying specific areas for further research, the Agenda clearly shifted the focus away from the traditional biomedical research emphasis towards the other three pillars supported by CIHR. This shift in emphasis was consistent with changing patterns in CIHR funding since 2000. The CIHR funding pattern demonstrated strong investment in non biomedical research, and thus situated dental hygiene research efforts in a growth sector.

Recommendations

In addition to the identification of priority areas for research in dental hygiene, the Agenda also provided concrete recommendations to CDHA with respect to research in the profession. Three priorities were outlined to provide direction for research efforts:

1. Increase research capacity
2. Improve knowledge dissemination
3. Foster new partnerships

For each of these priorities a series of specific strategies were recommended to guide the efforts of CDHA on behalf of the dental hygiene research community.

Contributions and gaps

This Agenda document proved to be useful to many stakeholders within the dental hygiene profession. It was used by educational programs, professors and students alike, to inform their research approaches. It also provided a solid framework for both CDHA and CFDHRE, giving them priorities and avenues for action. It was agreed at the time of the development of the Agenda that it would be revisited as changes in the field made it necessary and timely. More specifically the document's conclusion states, "A review of [the] Agenda within the next decade will set the stage for updating dental hygiene research priorities and plans."¹¹

Given the rapid and widespread changes that have occurred in the field of oral health and oral health care since 2003, CDHA felt it was timely to revisit the Agenda and assess the progress that had been made over the five years since the original document was written. In 2008, CDHA convened a two-day meeting of key national and international stakeholders in dental hygiene with the objective of reviewing the Agenda and charting a course for the dental hygiene profession in Canada in the 21st century. An action plan, based on this work, will be developed by the Research Advisory Committee of CDHA in 2009.

The objectives of the two-day meeting were to provide feedback to CDHA on increasing research capacity in the dental hygiene profession in Canada, improving knowledge translation, exchange, dissemination and uptake and fostering new partnerships. The insights and contributions of the participants of this meeting are included throughout this document.

In order to move forward with a national research plan meeting participants agreed that further investigation was deemed important to lay a solid foundation. A survey or scan of dental hygiene stakeholders is essential to get a clear picture of the profession: who are the dental hygienist involved in research, where are they, what are they researching and where are they publishing? How many dental hygienists go on to doctoral studies and in what field, given there are no masters or doctoral programs in dental hygiene in Canada at this time?

Dental hygiene professionals also need to be better informed about the importance of research and supported in undertaking research and utilizing research evidence to inform their evolving practices. Given the relative newness of research in the dental hygiene profession and the limited awareness of its importance, more attention needs to be paid to communicating with dental hygienists about oral health research.

In updating the Agenda, participants reconfirmed the Guiding Principles for research; in particular, the need for participatory research was strengthened. A new guiding principle was added to the list, emphasising the importance of focusing on high priority or vulnerable populations. These two principles are intimately related as research is not complete until it has been returned to the community as a useful tool, and research with and about specific populations needs participatory approaches to be useful and meaningful.

Health and oral health systems in Canada

Health care

Health care in Canada is a perennial issue of primary concern among Canadians. In the last few years the environment and such environmental issues as climate change have also risen to the top of the list of Canadians' concerns. Politicians and governments at all levels in Canada try to reflect the health care concerns of their constituents in their budgetary and spending decisions. While the overall trend in public spending for social programs has been cost reductions, public spending on health care has increased, usually beyond levels attributable to inflation and population growth. The increase in health care spending has not, however, silenced calls for more spending in many areas of health care delivery, including oral health.

Trends in health care

There are a number of key trends affecting health care in Canada that are also relevant to oral health care:

Population aging

The aging of the “baby boom” population cohort combined with declining fertility rates (from replacement level of 2.1 births /woman to less than 1.5 births/woman today, with further declines predicted) has a number of implications for health care in Canada. Canada's labour force is aging, with the ratio of younger to older workers continuing to decline.

In 2001, 98 per cent of dental hygienists and dental therapists in Canada were female compared with 46 per cent of the general Canadian workforce. Overall, according to census data, the dental hygienist and dental therapist workforce in Canada is also aging. In 2001, the average age of dental hygienists and dental therapists in Canada was 36 years compared with 33 years in 1991. However, these workers still tend to be younger than the Canadian workforce in general.¹²

Overall population aging also has consequences for the types of illnesses and conditions presented to the health care system. The incidence of chronic conditions requiring ongoing and complex care is increasing (including mental health conditions such as dementia), many of which require increased access to oral health services and increased skills in dealing with older, potentially challenging clients. A concrete example is the treatment of clients with Alzheimer's disease in long term care facilities.

Because of Canada's aging population, oral health providers will see new patterns of need. A 1990 study estimated that 80 per cent of the institutionalized older population wear at least one denture, and 40 per cent have some teeth. A 1997 study involving volunteer subjects over the age of 50 showed that 78.6 per cent of the subjects had teeth and 39.9 per cent wore some type of denture. A direct comparison cannot be made between these data, but they may indicate a reversal in trends. Oral health providers will be required to address significant changes in treatment needs and respond appropriately to achieve the proposed goals for health care intervention.¹³ Another aspect of the growth in ageing clients is the increasing vulnerability of these clients to infections. As such, infection control will be a growing concern for dental hygienists in the coming years. Clients in long term care facilities tend to be medically compromised, and will have higher rates of functional dependence.

Health human resources

A dominant issue within health care is health human resources across health care professions and the health care labour force. While some see shortages of workers as cyclical as the supply system for health care workers adjusts to demand, others see current shortages of physicians, nurses and other workers having longer term impacts. This is as a consequence of aging of the population and the overall work force, and of the difficulties faced by organizations and institutions in recruiting sufficient numbers into education and training programs.

Furthermore, some health professionals are moving to other countries after graduation, in particular to the United States. And although shortages of health care workers are the accepted reality, the numbers of health care providers have been increasing relative to the increase of the Canadian population.

There is no shortage of dental hygienists (and dental therapists) in Canada according to the 2007 CIHI report *Distribution and Internal Migration of Canada's Dental Hygienist and Dental Therapist Workforce*.¹² This report indicates that the number of dental hygienists and dental therapists has grown considerably between 1991 and 2001, in most provinces the growth was in the double-digits. There is, however, no broad consensus yet on the ideal model of health human resources or health care delivery for Canada thus making projections is a difficult and imprecise endeavour.

A recent survey of youth in Canada found that only about 10 per cent of them were interested in a health care profession. Of these, 70 per cent wanted to be a physician and 75 per cent were female. Youth expectations of work place conditions include flexibility for demands outside of work (e.g. family and children), flexible working arrangements such as telecommuting and the availability of part time options, and at least four weeks of annual vacation. This will have an impact on the dental hygiene profession in the coming years.

Work stress among health care providers is a growing concern. In an analysis of Statistics Canada health reports for 2003, there was clearly good news for dental hygiene as a profession.¹⁴ In ranking nine selected professions, dental hygienists experienced the lowest levels of stress in their work places. The highest degree of stress was experienced by head nurses and supervisors (67%), medical lab technicians (64%) and specialist physicians (64%). In contrast only 29% of physiotherapists reported high stress and only 19% of dental hygienists did so. It would seem the majority of dental hygienists are finding their workloads and workplaces satisfactory in comparison to other health professions in Canada.

Diversity and multiculturalism

Statistics Canada's recent release of 2006 census data shows that over 16 per cent of the Canadian population are visible minorities. The growth of the visible minority population is due largely to the increasing number of recent immigrants (landed immigrants who came to Canada up to five years prior to a given census year) who were from non European countries.¹⁵ This trend is only going to accelerate over the next decade and more. In its population projections for the year 2017 (the year Canada celebrates 150 years since Confederation), Statistics Canada predicts that fully one in five Canadians will be visible minorities and over 50 per cent of the population of Toronto and Vancouver will be visible minorities.¹⁶

Given that this growth is driven by immigration, the importance of cultural and linguistic sensitivity, and the need to adapt to the expectations and needs of an increasingly diverse population, will affect the dental hygiene profession more acutely over the next decade. As the diversity of the Canadian population increases as a result of years of immigration and settlement, a major challenge for health care is accommodating and representing that diversity in the health care workplace.

As well, aboriginal peoples, people with disabilities and recent immigrants are diversity groups of priority concern given the health disparities of vulnerable populations. These groups have particular health issues to be addressed, and physical, language and cultural barriers to be overcome in delivering and obtaining health care. Statistics show that aboriginal peoples, immigrants and people living with low income have the greatest oral health needs and indicate a clear need to focus on both meeting the needs of diverse populations and addressing these needs in culturally and linguistically appropriate ways, including increasing the number of diverse dental hygienists in the workforce.

Health care governance, decision making, and teamwork

The enormity and complexity of issues involved in delivering health care services to Canadians are compounded by the complexities of health care governance and decision making in Canada. Funding for health care services is from a combination of public funds from all levels of government, and private funds from individuals through workplace benefits and private incomes.

Government funders increasingly demand that accountability and performance measures be attached to their contributions, but information systems to support that measurement are still not adequately developed. Progress has been slow, for example, on individual electronic health records that could effectively and comprehensively capture client conditions and their interactions with the health care system. There are also challenges to integrating private records, held in such private offices as dentist and dental hygienists' offices, with a public information system.

It is apparent that leadership and collaboration are required, at all levels of government and within the public and private health care sectors, to solve the issues facing the health care system. At the same time, flexibility is sought at the local level of health service delivery where human and financial resources are often constrained.

The promotion of teamwork and interprofessional collaboration in health care delivery is seen as an effective way to improve patient care and safety, and more effectively deploy health care personnel and resources. Current education models, the self regulation of health care professions, professional “turf” protection, remuneration models, and the limits of legislative and regulatory frameworks for the delivery of health care services are but some of the many challenges facing the development of teamwork and, indeed, of interprofessional approaches to both health services delivery and research in the health field.

In particular for oral health care providers, there are important issues with respect to their relationship to the publicly funded system. Currently the vast majority of dentists and dental hygienists work in the private health care system. Less than 10 per cent of dental hygienists are employed in public health roles and settings. This presents both opportunities and challenges for the growth of the profession. Owing to the relatively small number of dental hygienists employed by the public sector, there is room for significant growth. However, given the ongoing financial crunch within the Canadian public health care system, there is likely to be some reluctance to creating new public health positions in dental hygiene.

Evidence based practice

Over the past decade or more there has been an increased focus on “evidence-based” practice in many disciplines within the health care spectrum. Evidence based practice (EBP) means integrating practitioner expertise with the best available external evidence from research.¹⁷

The relevance of this trend is clear for dental hygiene. As dental hygiene responds to the increased need for quality oral health services, dental hygienists seek quality research findings on which to base their practice decisions.¹⁸ The challenge, however, is that there is relatively little research produced by and for dental hygienists at this time in Canada.

Access issues

Access to timely, adequate and appropriate care is a central issue in health care in Canada. It has been estimated that nearly 1 in 3 Canadians has little or no access to primary health care services in Canada. These individuals are generally in remote, rural, and northern parts of Canada, but they also include vulnerable groups in urban settings (e.g. aboriginal peoples, immigrants, low income people, the homeless and street youth). Canadians in urban areas are better served, but many do not have a family physician and need to rely on walk in clinics and the hospitals' emergency rooms. Access to oral health care is even less adequate. Nonexistent or totally inadequate access to treatment, prevention and oral health promotion services is common in rural, remote, and northern areas as well as for particular populations such as the residents of inner cities, aboriginal people, and new immigrants.¹⁹

CDHA, as the national voice of Canadian dental hygienists, has recognized the critical importance of addressing access issues for nearly two decades. In 1992, CDHA developed a set of guiding principles for the management of dental hygiene care. In this document they address access issues explicitly by stating, "Every Canadian is entitled to access comprehensive oral health care. The dental hygiene profession promotes access to affordable oral health care through alternative practice arrangements and non-traditional work settings."²⁰ They have continued to advocate for equitable and appropriate access for all Canadians, and in a more recent document they reiterate:

There is a need to move beyond [piecemeal improvements] to create a public oral health system that includes a comprehensive plan for human resources, legislation, research, and employers' health plans. This oral health system must address the unequal access of individuals in marginalized subgroups in society. The oral health system must be recognized as an integral component of the general health system.²¹

Public and private provision of services

Access and wait time issues currently fuel another ongoing debate about health care services in Canada—who should pay for the provision of health care services? The public portion of total health care spending has been declining over the years. As a proportion of total oral health care expenditures, publicly funded oral health care has decreased from 5.8 per cent in 1999 to a low of 4.9 per cent in 2006.²² Figures from 2005 indicate Canada has the second lowest per capita *public* oral health expenditures of all OECD countries (Canada 4.6%, Germany 68%, and France 36%).²³

Some health care stakeholders insist that cash strapped governments with multiple spending priorities will have to embrace increased private provision of services, providing patients with a greater array of choices. The caveat, of course, is that the client has to also have the ability to pay for the services, costs of which can be beyond the ability of many low income and middle income Canadians.

While the Canada Health Act stipulates that “public provision” of health care services is required, oral health care has not been covered by the Act, although it was originally designed to include such care. Between the time when the first Medicare Act was designed and its implementation, dentists successfully lobbied to have dental care removed as they felt it interfered with their private business approach. Oral health care providers work in large majority in the private sector. Most dentists operate as independent business owners, employing a team of oral health care providers including dental hygienists. At the same time as there is growing debate with respect to the pros and cons of increased privatization there is an increasing recognition that oral health poses a special challenge, in particular with respect to access.

Historically, oral health has been divided between a large private sector providing oral health care through dental offices and a small oral public health sector operating within the public health system and generally providing health promotion and prevention services with some treatment oriented service to specific populations such as children, aboriginal peoples and those living in poverty. As mentioned above, the oral public health sector has suffered from significant cutbacks over the past ten years.²⁴

Another area of particular concern for oral health care provision is the movement of some private health plans for retirees away from providing dental coverage.²⁵ This move is placing a larger financial burden on seniors as well as leaving them vulnerable to poor health outcomes through lack of appropriate oral health care.

Telemedicine and teledentistry

Advanced digital communications equipment has contributed to the creation of telemedicine and teledentistry (the use of telecommunications technology for diagnosis and patient care when the provider and client are separated by distance). The use of teledentistry approaches to increase opportunities for education and increase access for clients in rural, remote and northern regions is neither well understood nor well studied in Canada. However, there is growing use of telemedicine across the country and it is to be expected that there will be similar growth in the oral health field, thereby influencing dental hygiene practice in the future.²⁶

Cost containment

Although it was noted above that funding for health care services has grown faster than inflation and population growth, cost containment in the delivery of health care services is still an overarching goal. One measure of the “success” of government cost containment in health care is that the proportion of gross domestic product (GDP) devoted to health care spending in Canada has been relatively constant over the last decade or more at approximately 10 per cent of GDP. However, by other measures, cost containment has been anything but successful, as growing and dramatic gaps in access are making clear.

There is still ongoing pressure, however, to contain and even reduce the cost of health care delivery, while still providing adequate, accessible and effective health care services. There is a need for alternative service delivery models that would provide high quality care at a lower cost. In the health care field, there is a growing recognition that nurse practitioners may be able to provide a broad array of health services at lower cost than physicians, thereby making more physicians available to meet needs they are best placed to meet.

In pursuit of cost effectiveness within the field of oral health, alternative delivery models, with dental hygienists playing a central role, may be more cost effective than other models. More specifically, given dental hygiene's focus on health promotion and prevention of dental decay and disease, their services can have beneficial financial impact by preventing the need for future costly restorative work in addition to costing less than for similar services to be provided by a dentist.

In this context, there are both opportunities and challenges for dental hygiene practice. In a 2002 report, *The Political Economy of Dental Hygiene in Canada*, Dr. Pran Manga found some important evidence for cost effectiveness related to dental hygiene services. The report has three observations about the potential impact of legislative changes allowing independent practice for dental hygienists:

- Lower costs for patients due to the competition resulting from the new regulatory dispensation
- More experimentation and innovation in cost effective oral health care delivery systems
- The overall costs for patients will be lowered with direct access to dental hygienists²⁷

Further and current research must be undertaken to examine all aspects of cost effectiveness as these initial observations need to be validated and expanded. There are significant opportunities for the expansion of public health dental hygienists working on a salary and offering health promotion and preventive services that can lead to savings due to reduced reliance on treatment and urgent interventions. There is also opportunity to examine the potential costs of including dental hygiene services in the publicly funded system in contrast to the savings generated from decreased incidence of dental decay and disease. There is, however, likely to be great resistance to the inclusion of oral health in the publicly funded or public health system due to the competing demands already present within the financially strained public system.

Technology

Technology continues to develop at a pace that the health care system is unable to effectively absorb. This is generally due to the cost of acquisition and operation of any new technology entering the marketplace. More sophisticated and innovative technologies are at the leading edge of their field when released to users, and also at their highest price point.

The adoption of new technology is driven by the marketing arms of equipment producers; by the desire of health care professionals to make more efficient, effective and accurate diagnoses and treatments; by the desire of health care administrators to bestow “competitive advantage” on their organization or institution, enabling continuation, or even increases of funding; and by consumers who want the “best” diagnosis and care that they see the new technology providing.

Changes in technology have consequences for the practice of oral health care and dental hygiene. The enhancements, for example, of ultrasonic instrument technologies, are considered a major advance in the administration of dental hygiene services.²⁸ Also, the use of new technologies in autofluorescence for oral cancer screening such as Vizilite™ or VELscope™ highlights the importance of considering technological change when looking at the future of dental hygiene education and research. Oral health care professionals have much to offer and to learn with respect to new technologies and further research in this area will bring benefits to both the oral health field and the broader health sector.

Oral health

There has been a great deal of progress made in oral health throughout the world and in Canada. However, according to a 2006 WHO report, Canada ranks poorly with respect to the incidence of decayed, missing or filled teeth (DMFT). DMFT is used as a measure of dental health. Based on Canadian data from 1994-1995, Canada ranks 21st among twenty-three countries in the OECD with respect to the prevalence of DMFT.²⁹ Canada also has the second lowest per capita public oral health expenditures of all OECD countries.³⁰

The incidence of dental decay and disease has been reduced for large portions of the general population. However, certain subsets of the population continue to suffer from much worse oral health outcomes than the average Canadian. These vulnerable groups include aboriginal Canadians, immigrants, people living with low income, seniors, people with mental illness and those with disabilities.

In recognition of the importance of oral health and the growing evidence of links between oral health status and several chronic conditions including diabetes, cardiovascular disease, respiratory disease and pre term deliveries, the federal government established the Office of the Chief Dental Officer of Canada in 2004 and, in 2005, Canada developed its first national oral health strategy.

Oral health disparities are large and growing in Canada. According to the COHS, the highest dental decay rates are among low income people, recent immigrants, aboriginal peoples, and those with compromised health conditions. Studies have shown that people on the lower end of the economic scale have decay rates and treatment needs that are 2.5–3 times that of people in the higher income levels. Studies also show that aboriginal children have five times the decay rates of the Canadian population. And it is precisely these people who have the least, and often no, access to oral health services; in part due to affordability and in part due to the lack of oral health professionals in their communities. Given the exclusion of oral health care services from Medicare, vulnerable populations have very limited access to preventive or curative services to address their greater needs.

As a case in point, Health Canada, FNIHB, provides funding for oral health services for First Nations and Inuit peoples. Although the program is needs based, many individuals live in communities where no oral health professionals are located and FNIHB does not currently pay dental hygienists directly. Another obstacle to such direct compensation for dental hygiene services is legislative. There is a need for legislative change in the territories, in line with what most provinces have enacted, to allow for self-initiation, permitting dental hygienists to work independently of dentists. Until such time as these two issues are resolved dental hygienists will not be able to deliver services in communities where their services are urgently needed.

Trends in oral health care

Within the broader context described in the earlier parts of this paper, oral health care is gaining increasing recognition as a critically important contributor to the overall health and well being of populations both in Canada and globally. However, at the same time as there is growing evidence of the links between oral health and general health outcomes and recognition of the need to improve the oral health status of significant subsets of the population, there has been a reduction in funding for oral health care in Canada.

There is now increasing access to oral health care, through private services, for Canadians with the financial ability or insurance coverage to take advantage, due to the new dental hygiene legislation in most provinces. However, funding for public health has not been reinstated since the cuts that were made about a decade ago. Ontario has been an exception to this trend and in fact there has been a new commitment to invest in oral health services for low income individuals in the province.

Change in oral health care needs

According to a study by Dr. Pran Manga of the University of Ottawa, there has been a shift in oral health care needs in Canada over the past decade. “Broad changes in oral health care needs have been recognized for a long time. In brief, the demand for restorations has decreased over time and is relatively inelastic, but the demand for preventive care has been expanding.”²⁷

This trend has had a significant impact on oral health care practices in Canada and has led to a large increase in the number of allied dental professionals (including dental hygienists), working in dental offices. In fact, according to the study by Dr. Manga, “96 per cent of visits to dentists involve non-restorative care; fewer than 50 per cent are mainly for restorative care.” In other words, the majority of the work of dental offices is done by dental professionals other than dentists.

Acknowledgement of links between oral health and overall health

A very positive trend in oral health and health care has been the increasing recognition of the important links between oral health status and overall health outcomes. According to the Federal Provincial Territorial Dental Directors (FPTDD), in their submission to the Romanow Commission, it should be realized that when considering oral health as a part of general health:

- Dental decay and periodontal disease (gum disease) are infectious diseases
- Most oral/dental disease is preventable
- Safe, easy and effective preventive measures are available for preventing dental diseases
- Early Childhood Tooth Decay (ECTD—a profound type of tooth decay with early onset and rapid progression) affects significant numbers of young children—between 5 per cent and 60 per cent of the young child population, depending on which segment of population is surveyed
- There are linkages between ECTD and Failure to Thrive (FTT), problem eating, poor sleep and poor behaviour
- The majority of general anaesthetics performed in hospitals for preschool children are for treatment of dental decay
- There are linkages between periodontal disease and preterm low birth weight babies, cardiovascular disease, strokes, diabetes and respiratory disorders in seniors in long-term care facilities and critical care hospital settings. There are linkages between poor oral health, and malnutrition and involuntary weight loss in seniors
- There are also suspected linkages between poor oral health and depression in the elderly³¹

Furthermore, despite the fact that tooth decay or early childhood caries (ECC) in young children has declined for a number of years, it is now on the rise again. Although statistics in oral health status are lacking in Canada, trends in the United States and Canada are similar. In the United States, tooth decay is on the rise in preschool children, aged two to five years, and adults are reporting less access to oral health care compared to a year earlier.³² Depending on its severity, ECC may affect diet, permanent tooth formation and overall growth and development. ECC also affects behaviour, as children deal with the associated pain, suffering and facial disfiguration.

Establishment of the Office of the Chief Dental Officer

In part as recognition of the contribution of oral health to general health and issues of lack of equitable access to oral health care services, the federal government established the Office of the Chief Dental Officer in 2004 and appointed Dr. Peter Cooney as Canada's first Chief Dental Officer.

In doing so, Canada was following an international best practice given that most industrialized and many industrializing countries had such an office at a national level. The Office the Chief Dental Officer works to:

- Provide evidence based oral health perspectives on a wide range of health policy and program development issues
- Provide expert oral health advice, consultation and information
- Integrate oral health promotion with general health (wellness) initiatives
- Assist in gathering epidemiological information for program planning on federal/provincial/community levels and establish priorities for research
- Develop integrated collaborative ways of preventing and controlling oral and associated diseases
- Provide a point of contact/liaison with professional associations, provinces, academic institutions, and other non government organizations on oral health issues

Lack of access

Between 1991 and 1999 there was a decline in publicly funded dental care from 9.2 per cent to 5.8 per cent, which was consistent with a pattern over two decades of cutbacks to oral care programs for children and seniors. In a survey of oral health care stakeholders reported on in the May 2006 edition of the *Journal of the Canadian Dental Association*, nearly 77 per cent of respondents disagreed with the statement that there was good access to preventive services in Canada. Over 50 per cent of respondents disagreed with the statements that there was easy access to dentists and dental specialists.³³ While this was a small survey, it did highlight clearly that members of the oral health care professions saw access issues as being highly problematic across the country.

With respect to improving access to basic oral health services, there is a growing recognition by stakeholders that fundamental changes need to be made to the current system. The survey referred to above highlighted the following responses to the question of how to improve access to oral health care in Canada:

- By providing basic dental care under medical plans for high need groups (93%)
- By funding dental clinics within community and hospital settings (86.7%)
- By making greater use of other dental professionals, i.e. dental hygienists, dental therapists and denturists (86.4%)
- By including basic dental care (preventive care, checkups, fillings) under provincial medical plans for all citizens (78.4%)

These responses provide a good starting point for further collaboration among oral health care professionals and with their colleagues in the broader health care sector to advocate for new institutional and legislative responses to the significant barriers to accessing oral health care in Canada.

A larger study, reported on by the Commonwealth Fund, and corroborated by Statistics Canada, indicates that approximately 40 per cent of the population was unable to access oral health services due to cost.³⁴

Further indication of the recognition that access issues must be dealt with comes from the FPTDD. The FPTDD, in their submission to the Romanow Commission, recommend “that alternate dental delivery systems be explored, which improve access to prevention and treatment services for those people that the fee-for-service system does not adequately assist.”³¹

Creation of the Canadian Oral Health Strategy

Under the leadership of the FPTDD, Canada's first national Oral Health Strategy was created, based on extensive consultation and collaboration with a wide group of oral health professionals, health organizations and governments. The Canadian Oral Health Strategy (COHS) was released in 2005 and contains a blueprint for oral health in Canada to the year 2010.

The COHS position on oral health is consistent with the WHO definition of good health. To the WHO good health is not merely the absence of disease; it is also a reflection of the social and mental well being of people in a community. The COHS states:

*Oral health is a very important component of general health. Poor oral health negatively affects growth, development and learning for children, nutrition, communication, self-esteem, and various general health conditions. Poor oral health is also a large economic burden with expenditures exceeding most other health conditions.*³¹

The COHS has not, to the present time, been widely accepted as its goals and recommendations are wide ranging, implicate various levels of government, and have significant financial implications. Nevertheless its existence bodes well for the future of oral health and oral health care in Canada.

The purpose of the COHS is to raise the overall oral health of Canadians. This is done mostly through identifying inequities in the system, disparities in health and barriers to achieving optimal oral health.

The COHS identifies key challenges in the area of oral health:

- Higher disease rates are concentrated mostly in specific segments of the population: low-income Canadians, Aboriginal citizens, recent immigrants, seniors and the disabled
- There is a lack of leadership at the federal government level and some provincial and territorial levels in oral health planning, programs and evaluation
- There are limited oral health promotion activities and/or integration of oral health with other health promotion and services
- There is a low awareness among citizens and governments of the linkages between oral health and general health

- There is no standardized and consistent approach for measuring oral health.
- A significant percentage of the Canadian population has limited or no access to oral health care services
- There are difficulties in recruiting oral health professionals into careers in research, academics, public health and into specialties involving services to seniors, and disabled children and adults³¹

It must be noted with respect to the last bullet that there are fewer difficulties recruiting dental hygienists into research and academia as there are many with this preference as evidenced by the situation at the University of British Columbia. According to internal statistics at UBC, of the 70 students who completed their dental hygiene degree between 1995 and 2007, 30 per cent have pursued a graduate degree at the master's or doctoral level in Dental Science or another discipline. The barrier is the lack of specific master's or higher level programs in Dental Hygiene in Canada. With respect to work in public health, owing to ongoing cutbacks in public health, dental hygienists who worked in this area lost their positions, and there are no new positions for them at the present time. Finally, dental hygienists have been ready and willing to work with seniors and disabled individuals but have been prevented from doing so by the reluctance of dentists to sign orders allowing them to work in long term care facilities. Given that some provinces and territories (including Newfoundland and Labrador, Prince Edward Island, the Yukon, Nunavut and the North West Territories) require such "supervision" by dentists, dental hygienists in these locations have no other option but to refuse work in those settings until legislation is changed.

These identified challenges to oral health in Canada can be used as the basis for forward movement in achieving the goal of better oral health for all Canadians and can provide useful parameters for future research and collaboration.

The COHS also supports six key strategies for achieving positive results in moving towards better oral health:

1. Improved leadership role by governments
2. Integration of oral health promotion, prevention and treatment with other aspects of health care
3. Standardization of methods of monitoring oral health and the progress towards the goals of the NOHS
4. Investigation and incorporation of alternate methods of service delivery to address the needs of those who have inadequate access to care
5. Development of a human resources strategic plan
6. Improved support for oral health research³¹

The Canadian Institutes for Health Research (CIHR)

CIHR represents the major funding body for research in all health disciplines in Canada. As such, changing priorities at CIHR have a large impact on the ability of health researchers to pursue specific research priorities. CIHR's mandate is, "To excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products and a strengthened Canadian health care system."³⁵

In *Investing in Canada's Future: CIHR Blueprint for Health Research and Innovation*, a five-year strategic plan is laid out for CIHR. This strategic plan remains relevant today although we are in the last year of its intended timeframe.

In the document, five key strategic directions are identified to guide the activities of CIHR:

1. Strengthen Canada's health research communities
2. Address emerging health challenges and develop national research platforms and initiatives
3. Develop and support a balanced research agenda that includes research on disease mechanisms, disease prevention and cure and health promotion
4. Harness research to improve the health status of vulnerable populations
5. Support health innovations that contribute to a more productive health system and prosperous economy³⁶

CIHR is divided into thirteen distinct institutes. Each institute is dedicated to a specific area of focus, linking and supporting researchers pursuing common goals. Each institute embraces a range of research from fundamental bio medical and clinical research, to research on health systems, health services, health of populations, societal and cultural dimensions of health and environmental influences on health.

With respect to oral health research, the primary research institute is the Institute for Musculoskeletal Health and Arthritis (IMHA). IMHA supports research to enhance active living, mobility and movement, and oral health; and addresses causes, prevention, screening, diagnosis, treatment, support systems, and palliation for a wide range of conditions related to bones, joints, muscles, connective tissue, skin and teeth.

Other research institutes that have application to oral health include the Institute of Health Services and Policy Research (IHSPR) and Institute of Population and Public Health (IPPH). In so much as the focus of oral health research is on populations of particular concern, the Institute of Aboriginal People's Health (IAPH), Institute of Aging (IA), and Institute of Human Development, Institute of Child and Youth Health (IHDCYH) may have pertinence for oral health researchers. Finally, if the focus of research is on the connection between oral health and specific health conditions or diseases the Institutes of Circulatory and Respiratory Health (ICRH) and that of Nutrition, Metabolism and Diabetes (INMD) may have applicability.

Institute for Musculoskeletal Health and Arthritis (IMHA)

According to the CIHR web site, IMHA supports research to enhance active living, mobility and movement, and oral health; and addresses causes, prevention, screening, diagnosis, treatment, support systems, and palliation for a wide range of conditions related to bones, joints, muscles, connective tissue, skin and teeth.

The current IMHA Strategic Research Priorities are:

- Physical activity, mobility and health
- Tissue injury, repair and replacement
- Pain, disability and chronic diseases

Within these priorities, oral health research can be primarily found under the third category of pain, disability and chronic disease. The primary focus of this theme is to better understand the genetic and environmental causes, optimal treatment and elimination of pain and disability in all IMHA disease areas. A second area of significance is the need to understand the relationship between chronic diseases and conditions within IMHA's mandate (e.g. skin and bone diseases, and diseases that compromise oral health). The impact of chronic musculoskeletal, oral, and skin diseases on general health and well being is also of utmost importance.

As part of the two-day meeting convened by CDHA in April 2008, participants had a chance to hear from IMHA's Scientific Director, Dr. Jane Aubin. Dr. Aubin's presentation was timely and helpful and she saw many opportunities for increased collaboration with dental hygienists and with CDHA itself.

IMHA has a broad definition of research—from bench to bedside, population wide approaches, prevention strategies, systematic and literature reviews, knowledge development and knowledge transfer all fall under their mandate. Dental hygiene has relevance across all the strategic priorities of IMHA and there are many opportunities to think broadly about “the health challenges that are out there and what is the best way to meet them.” In particular, knowledge transfer and the importance of not only creating new knowledge but creating benefits is key to future research opportunities. The best way to maximise benefits is through enhanced partnerships, such as the recent announcement of a partnership between CIHR and the CFDHRE to fund a master's degree award.

There are dollars set aside for seed grants on oral health disparities and there are opportunities to increase knowledge in this strategic area. The analysis of strengths, weaknesses, opportunities and threats undertaken as part of the IMHA strategic planning exercise identified oral health disparities as a key priority area. More money has been put towards research in this area, and as the IMHA budget has increased so has the available funding for oral health. Investment in oral health at IMHA is currently 15 per cent higher than in the past.

Another area of strategic importance to IMHA is a prevention agenda. There is interest in looking at ways to decrease risk and reduce contributing factors to disease rates in their areas of study. Dental hygiene, with its strong historical focus on prevention, is well positioned to take advantage of these shifts in priorities.

At IMHA, and across all the institutes of CIHR, a new emphasis on knowledge transfer and knowledge exchange will be evident in future funding priorities and new strategic plans. This new emphasis brings with it a host of new opportunities for research funding specifically focused on knowledge transfer and exchange.

International context

Although dental hygiene began, as a distinct occupation, in North America, it has now spread across the world and there are numerous countries with a large and growing dental hygiene profession. In addition to Canada and the United States, dental hygienists are now found in Europe, including the UK, Sweden, Finland, Denmark, Norway, Italy, the Netherlands, Latvia, Spain and most recently in Germany and Austria.³⁷ The profession is also growing in Australia, Israel, Japan, Korea, New Zealand and South Africa. While each nation has a unique history, legislative and regulatory environment, as well as challenges and successes, there is much in common as well. The findings of this study highlight:

Overall, characteristics of the profession were remarkably similar; most noteworthy was the scope of dental hygiene clinical practice. Regarding historical development, educational programmes and professional organization, the profession was more similar than dissimilar. Greater variation was evident regarding numbers, distribution, regulation, workforce behaviour, predominant work setting and remuneration. [To note over time] an increase in the supply of dental hygienists accompanied by a decline in their ratio to population and to dentists and a high workforce participation rate; increase in baccalaureate dental hygiene programmes, with a gradual shift from the diploma as entry-level qualification; and increase in scope of practice and professional autonomy. Including for Europe and North America in particular, a decline in mandated level of work supervision and a slight but gradual increase in independent practice.³⁷

The scope of this paper does not allow for a thorough analysis of international trends and comparisons of the dental hygiene profession. However it is important to understand the developments in many countries as there are numerous opportunities for sharing and identifying best practices across the range of issues in the field.

With respect to research in dental hygiene, it is important to note that certain countries, particularly Sweden, have experienced an increase in research capacity and the

publication of research in and on dental hygiene in recent years. This increase may be due to the fact that Sweden does have opportunities for graduate education in dental hygiene at both the master's and doctoral levels.

There is a need and an opportunity to foster further comparative research in dental hygiene to better understand and support best practices across the entire range of issues important to the profession.

Dental hygiene in Canada:—where are we today?

There have been tremendous changes within and affecting the dental hygiene profession in Canada over the past few years, many of which are outlined earlier in this paper. New opportunities have emerged and some barriers continue to constrain the profession from further maturity. Some of the changes have occurred within the educational system, others have to do with clinical practice and yet others are contextual factors within the overall health care system and the evolution of Canadian society.

One of the most important recent changes within the profession is the legislative change in nearly every province of Canada allowing dental hygienists to establish private dental hygiene practices, working with varying degrees of support or supervision from dentists. Dental hygienists will continue to work collaboratively with dentists and refer clients to dentists as need arises. Most recently, Nova Scotia (December 2007) and Manitoba (April 2008) legislated self regulation for the dental hygiene profession. These changes have promoted the growth and maturation of the dental hygiene profession and present great opportunities for the future. Private dental hygiene practices will also expand the opportunity for dental hygienists to work collaboratively with other health professionals, in alternative practice settings.

Concurrently there has been a movement towards increasing scope of practice for dental hygienists. Some provinces have taken the lead in allowing dental hygienists more responsibility for a range of procedures. There is, however, a need for increased consistency across Canada with respect to scope of practice. For some provinces, this means increasing the scope of practice to a national norm. The biggest difference in scope of practice is seen in Alberta, where dental hygienists have prescription rights (Schedule 1 drugs), can administer local anaesthesia and conscious sedation and perform reversible restorative work. There are other areas of scope of practice that differ from one province to another and CDHA, as the national body representing the profession, can offer leadership in achieving an accepted national norm.

There has been a gradual movement towards autonomy of practice for dental hygienists across the country and increasing awareness of this option for practising dental hygienists. In order to support dental hygienists and to ensure the highest quality of care and professionalism, the dental hygiene profession is urging the federal, and provincial or territorial governments to consider increasing the entry-to-practice credential in Canada to a bachelor's degree.

In 2000, CDHA released a policy brief calling for the entry-to-practice credential in Canada to become the baccalaureate. However, the prevailing economic climate in Canada and the multiplicity of demands on the public health and health care systems have prevented forward movement on the change in the entry-to-practice credential for dental hygienists as well as some other associated health workers. There has also been delay caused by a change in the process for application to have an entry-to-practice credential changed and dental hygienists, along with many other health professionals, have been waiting to see this process clarified before moving forward with a formal request.

Given the ongoing debates in Canada about the health care system and the need to move towards new models, based on deeper and broader collaboration in health care teams, there is both a need and an opportunity for dental hygienists to engage with the broader health care workforce. Oral health care and oral health care providers, because of their predominantly non publicly funded status, are sometimes constrained in their ability to participate fully in the dialogues about the future of health care in Canada. However, CDHA has been very active on behalf of the profession, and participates in numerous national health coalitions which are involved in the dialogues about the future of the health system in Canada.

Connected to both the increasing need for dental hygienists with higher qualifications and the desire for a change in the entry-to-practice credential is the growth of private dental hygiene schools across the country. This relatively recent trend began in 2000 with the opening of the Canadian Institute of Dental Hygiene (CIDH) in Hamilton, Ontario, as the first private dental hygiene program in Canada. This program was accredited by the Commission on Dental Accreditation of Canada in 2002.

Today there are 28 private schools, 26 in the province of Ontario, one in British Columbia and one in New Brunswick, offering programs in dental hygiene, ranging in duration from 66 to 84 weeks. Not all of them have applied for or received accreditation. With the rise in private schools offering shorter programs, the transition to entry-to practice as a bachelor's degree program will need to emphasize articulation agreements between colleges and universities.

In an era of growing interprofessionalism and collaboration among health care providers, dental hygienists need to be well educated and exposed to other health care disciplines to prepare them for a teamwork oriented future. Owing to their nature, private schools are isolated from other educational institutions. They often do not have their own libraries or educational resources, and are designed to move students through a large volume of material and course work quickly. These characteristics of typical private schools reduce students' time and inclination to examine research more thoroughly and reflectively, and inhibit students' ability to access broader resources or to interact with students in other health care disciplines. In addition, the ability to obtain a diploma to enter practice over such a short period of time has the potential to undermine the credibility and reputation of dental hygiene as a health care profession rather than an occupation.

In Canada today the majority of programs are at community colleges, whose mandates are not directed towards research. Dental hygienists graduate with a diploma level qualification, following an 18 month or two year program of study. Approximately 21 per cent of dental hygienists complete a bachelor's degree, of which 5% do so in Dental Hygiene and there are no master's or doctoral level programs in dental hygiene in Canada.¹² This reality poses a challenge to the profession by severely limiting the number of dental hygienists with the qualifications, experience and desire to conduct research and grow the body of knowledge in dental hygiene.

In addition to the lack of sufficient dental hygiene researchers, there is also a lack of experienced researchers with the track record to lead major research initiatives as principal investigators. Due to this relative inexperience, there is a great deal of difficulty in accessing research funds to undertake larger research projects. The lack of post graduate educational opportunities in dental hygiene also hampers the ability of the profession to nurture the future generation of educators and researchers in dental hygiene.

Dental hygiene at a crossroads – growth and opportunity

As an integral part of the oral health care spectrum and a contributor to the oral health of Canadians, dental hygiene has a key role to play in improving the oral health status of all Canadians. In order to play an effective role, dental hygiene research, priorities, policies and practices must be well integrated and consistent with the overall goals and approaches to oral health in Canada and take into consideration internationally accepted guidelines and best practices. There are considerable opportunities to enhance dental hygiene's contribution to the oral and overall health of Canadians as well as some challenges. These will be discussed in some detail in this section.

One of the most promising developments in oral health in Canada in recent years, as noted earlier, is the establishment of the first COHS in 2005. The COHS was seen as an essential instrument to enhance the oral health and well being of Canadians. It contains five main themes:

1. Oral health promotion and public awareness
2. Oral health, and oral disease and disabilities
3. Improving access to care and reducing barriers to oral health care
4. Monitoring, surveillance and research
5. Human resources³¹

Tied to these five themes are more specific goals:

1. To improve oral health promotion that addresses the determinants of health, and to foster public awareness of the importance of good oral health and the relationship between oral health and general health
2. To improve the overall oral health of Canadians
3. To improve access to oral health care services
4. To establish a country wide, standardized method of monitoring and surveillance of oral health, and to assure that oral health research is appropriately supported
5. To assure appropriate numbers, distribution and education of oral health professionals³¹

In the next section of this paper, the emerging issues, challenges and opportunities for dental hygiene research are classified using the COHS framework of five themes and goals. The thirteen “themes” of importance to the dental hygiene profession were identified through a literature review, key informant interviews and the two-day meeting of national and international stakeholders in dental hygiene held in April 2008.

Emerging issues, challenges and opportunities for dental hygiene research

As described throughout this paper, the profession of dental hygiene is changing rapidly and moving towards increasing professionalization in Canada. Dental hygienists, through their national association, CDHA, are seeking to solidify and expand their contribution to the oral health and, therefore, overall health of Canadians. At the beginning of the 21st century there are a myriad of important issues along with challenges and opportunities facing the dental hygiene profession. It is critically important for CDHA and Canadian dental hygiene stakeholders to move forward strategically in order to continue to build their capacity in support of their overall goal of contributing to the health and well being of Canadians.

At the April 2008 national meeting of dental hygiene stakeholders, participants engaged in debate and dialogue to identify the most strategic areas for increased focus and effort in moving the profession of dental hygiene forward. The thirteen themes identified are consistent with the COHS framework of themes and goals and position dental hygiene within the broader context of oral health in Canada. Each of the themes presents opportunities and challenges for dental hygiene and touch upon research, education, advocacy and partnership issues.

These thirteen themes are listed below and then categorised under the relevant COHS theme and goal, and describe the dental hygiene perspective on the issues at play. In its commitment to seeking and incorporating the input of numerous stakeholders into this document, key informant interviews were conducted, and consultations took place with CDHA members, and dental hygiene organizations.

Proposed CDHA research themes

1. Population health
2. Prevention
3. Health literacy
4. Evidence of oral systemic link
5. The unique contribution of dental hygiene to oral health and research in oral health
6. Vulnerable or high priority populations
7. Access issues
8. Technology
9. Researchers in dental hygiene
10. Evidence based practice
11. Health human resources
12. Public health system in oral health
13. Educational credentialing system in Canada

Oral health promotion and public awareness

COHS Goal # 1: To improve oral health promotion that addresses the determinants of health, and to foster public awareness of the importance of good oral health and the relationship between oral health and general health.

Population health

A population health approach focuses on improving the health status of a population. Action is directed at the health of an entire population, or sub population, rather than individuals.³⁸ It considers the entire range of individual and collective factors and conditions, and their interactions, that correlate with health status. Commonly referred to as the "determinants of health," these factors include:

- [Income and social status](#)
- [Social support networks](#)
- [Education](#)
- [Employment/working conditions](#)
- [Social environments](#)
- [Physical environments](#)
- [Personal health practices and coping skills](#)
- [Healthy child development](#)
- [Biology and genetic endowment](#)
- [Health services](#)
- [Gender](#)
- [Culture](#)

Over the past decade, the importance of population health approaches to improving health outcomes has grown significantly as new evidence confirms the impact of the social determinants of health on the health status of populations.

Using a population health approach to oral health is appropriate because it reflects the concerns, experiences and priorities of health service users. It allows research and action to be focused on specific subpopulations or on the entire Canadian population, both of which are essential to improving overall health outcomes across the country.

Given the ageing of the population and the significant health disparities that exist, population health approaches allow dental hygiene researchers, educators and practitioners to better assess and meet the needs of different groups of Canadians, in particular, seniors, aboriginal Canadians, and those living in poverty. Importantly, research with a population health focus must involve both early and meaningful involvement of the community itself and a commitment to sharing the results with them to ensure that the evidence finds its way into action, leading to real change and improvement in health outcomes.

While population health research is a challenging area, it is clearly an area of tremendous importance that will grow dramatically over the coming years and is consistent with WHO's Global Goals for Oral Health 2020 which directs efforts "to promoting oral health and reducing oral disease among populations with the greatest burden of such conditions and diseases."³⁹

Prevention

As with a population health approach, focusing on prevention is an important and appropriate emphasis for the dental hygiene profession. Dental hygiene was originally conceived as, and continues today to be, primarily preventive. Within the field of oral health care provision dental hygiene is the only one built around health promotion and brings this uniquely preventive focus to the health care system as a whole.

The case for prevention in any area of health care is a complex one to make as there are always many determinants of health that all interact to bring about health outcomes. It is strategically important for dental hygienists to undertake research on the preventive potential of dental hygiene practices as this "evidence" will be crucial to both improving oral health outcomes and increasing public awareness of the value of dental hygiene. As the general public begins to demand more "proof" or evidence of efficacy, dental hygiene research will be well positioned to support the profession and its goals of contributing to the health and well being of Canadians.

Going hand in hand with a population health approach, upstream preventive practices, such as those promoted by dental hygienists, are key to improving the health outcomes of high priority or vulnerable populations. Research on the impact of preventive practices and the contribution of dental hygiene to improved quality of life will also increase the body of knowledge within dental hygiene and open new possibilities for collaborative health services for vulnerable populations.

Health literacy

According to the Canadian Public Health Association's (CPHA) Expert Panel on Health Literacy, *health literacy* is defined as the ability to access, understand, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life-course. CPHA undertook a groundbreaking study of the health literacy of Canadians and their final report sounds alarm bells for those concerned with improving health outcomes of Canadians, particularly those in high priority populations. In their conclusion they state that "low health literacy is a serious and costly problem that will likely grow as the population ages and the incidence of chronic disease increases."⁴⁰

Dental hygienists, in their interactions with patients, have always been involved in assisting them in understanding ways to promote, maintain and improve their oral health. The dental hygienist has much to offer and much to learn from the emerging field of health literacy and many opportunities exist for further research into the impact of dental hygiene care on levels of oral health literacy and for new and exciting collaborations with other health practitioners concerned with increasing the health literacy of Canadians.

Oral health, and oral disease and disabilities

COHS Goal #2: To improve the overall oral health of Canadians.

Growing evidence of an oral-systemic link

According to the FPTDD, most oral/dental disease is preventable and there is evidence of a relationship between tooth decay and periodontal disease and the following conditions: failure to thrive; preterm low birth weight; cardiovascular disease; malnutrition, strokes, respiratory disorders and depression in seniors. Research has also indicated a possible relationship with diabetes. While the evidence does not yet suggest a direct cause and effect relationship, there is clearly need for more research and, in the meanwhile, active preventive measures and educational initiatives with such higher risk populations as children and seniors.

The evidence for an association between oral health and chronic conditions is in its infancy. A great deal more research needs to be conducted, and opportunities exist for dental hygiene researchers to collaborate on such projects designed to assess the impact of dental hygiene therapy on risk or severity of systemic conditions and to determine the optimal timing of such interventions. Strategic and mutually beneficial research collaborations could be implemented to study a variety of preventive interventions with a view to identifying best practices. Dental hygiene researchers with a strong background in science are needed to engage in further research on the possible links between oral disease and other diseases and conditions.

Tremendous opportunities exist for collaboration between dental hygiene researchers, other health disciplines and national associations representing various chronic conditions and diseases such as the Diabetes Association, the Heart and Stroke Foundation, the Lung Association among others.

The unique contribution of dental hygiene to oral health and to research in oral health

Dental hygiene has many unique characteristics that make it ideally suited to the emerging priorities of the 21st century. Having been created specifically to undertake health promotion and prevention activities, initially with and for children, the dental hygiene profession today has a long history and solid experience in these critical areas.

The work of dental hygienists relies on excellent communication skills, knowledge of motivational strategies, health literacy approaches, and educational rather than treatment orientations. They are ideally suited to translate research evidence for health care consumers in ways that support appropriate daily health habits and reduce such negative lifestyle choices as tobacco use and high sugar intakes. Dental hygienists have unique knowledge of biochemical science combined with behavioural science to encourage people towards a healthy lifestyle. These skills and orientations will be in high demand as Canada and the world moves towards promoting good health and preventing disease rather than treating chronic conditions that arise from poor choices and inadequate access to information and preventive services.

Dental hygiene research needs to focus on finding the evidence for positive health outcomes from dental hygiene services. There is an opportunity to study dental hygiene interventions with a view to outcomes both with respect to oral health and to broader health status. There is evidence that dental hygiene does have a positive impact and there is a case to be made for these services to be included in public health initiatives. The fact that dental hygiene has always been focused on health rather than illness further strengthens the case for public health dental hygiene in Canada.

Improving access to care and reducing barriers to oral health care

COHS Goal #3: To improve access to oral health care services.

Vulnerable or high priority populations

There is a need for an enhanced focus on marginalized or vulnerable subpopulations in Canada. The findings on health disparities and inequitable access highlight the need to find immediate solutions to the growing gap in health outcomes between the majority of Canadians, who experience good health and reasonable access to a wide range of services, and a growing minority, who carry a higher disease burden and find themselves without access to appropriate health services. This growing minority, estimated to be as high as nearly one third of Canadians, includes new immigrants and refugees, aboriginal Canadians, street youth, the homeless and under housed, isolated seniors, Canadians living in poverty including inner city residents, and most Canadians living in remote and northern regions of the country.¹⁹

In order for dental hygienists to appropriately address the oral health needs of high priority populations, research is needed with good collaboration across disciplines. There is a clear imperative to seek out partnerships with affected populations as it is key to work with service users to ensure their needs are met in ways that are culturally and linguistically appropriate, respectful, and designed with the needs and aspirations of the populations in mind. Partnering with such organizations as the Assembly of First Nations and Inuit Tapiriit Kanatami holds much promise in addressing the pressing needs for oral health care in aboriginal communities.

Dental hygienists have responded to requests for dental hygiene services on First Nations' reserves and in northern Canada. These are important opportunities for developing new relationships, and will contribute to improved oral health among those populations. There are some continuing obstacles to this collaboration as federal government regulations still do not permit direct payment of dental hygienists for these services. There is a recognized need for preventive and restorative oral health care in these communities and dental hygienists are well placed to provide such care.

Working in these regions and increasing the profile of dental hygiene will also support ongoing work to bring about legislative changes in the Northwest Territories, the Yukon, Nunavut, and Newfoundland and Labrador. The ability to practise independently and unsupervised, which new legislation would allow, will permit dental hygienists to operate more effectively in many of these regions.

Given the huge growth in literature and evidence about health disparities and lack of access, it is certainly timely to act. Dental hygiene can be part of the solution to these challenges. More research by dental hygienists working in collaboration with high priority populations, particularly on the outcomes of dental hygiene services, will provide the foundation upon which to base innovative new approaches to meeting the needs of vulnerable populations. The opportunities in this area of research are significant, and many funding agencies are allocating major funds to these high priority populations.

Dental hygienists can demonstrate their ongoing commitment to reducing the health inequities experienced by vulnerable populations (including seniors), by improving access to care through supporting entrepreneurial innovation and ensuring that public funding extends to individual dental hygienists who want to provide care to these vulnerable populations. Gaps and needs in this area of research include:

- scoping the magnitude of the oral health problems within high priority populations
- studying the potential benefits of dental hygiene interventions on these populations
- comparative, cohort and longitudinal studies, across populations, regions and countries, to paint a more accurate picture of the situation and identify potential best practices

Given that typically vulnerable populations are not served by dental hygienists, there is a great deal to be done to bring about fruitful collaborations and initiate pilot projects aimed at answering the question: how can dental hygiene services meet the oral health needs of vulnerable populations?

Access issues

Following upon the importance of focusing on vulnerable populations is the related issue of access to oral health care. While certain high priority populations have been identified as lacking access to dental hygiene and other oral health care services, many Canadians continue to have limited access because of structural and financial barriers. There is a need for preventive and restorative oral health services across larger segments of Canadian society.

In studying access issues and preparing to offer possible solutions, dental hygiene researchers must examine the impacts of self initiation on access to care to determine if this trend will contribute to better access in itself. Given the financial barriers to accessing oral health care, as it is not funded under the Medicare system, there needs to be further research into models that have proven themselves effective in improving access. These studies would benefit from international and interprovincial comparative analyses to identify best practice models. Other questions that research in this area needs to answer are:

- What are the best ways to reach populations lacking access?
- Who is the best contact?
- What methodologies work to “take action”?
- What models respond to issues of affordability?
- What models of service delivery enable effective teams that include other oral health and general health professionals?
- Do mobile services present a possible solution?

Other important areas of study in which dental hygiene researchers could make a contribution, in collaboration with other health disciplines, include: the potential of school based dental hygiene models; the links between junk food/obesity and oral health status; and the impact of mental health conditions on access to oral health care. Social workers and educators represent other disciplines outside of health care that may be ideal partners in research on access to care for vulnerable populations.

Technology

Technological innovation has an impact on all areas of health care and dental hygiene is no exception. There are interesting and promising opportunities to take advantage of new technologies and also to study their impact on other issues of relevance to dental hygiene.

There are clearly important new possibilities in education and knowledge transfer due to the availability of new technologies in the dental hygiene profession. The availability of online training programs and educational modules increases the opportunities for earning a degree in dental hygiene since there are few universities in the country offering a bachelor's degree. It also allows for international educational opportunities at reduced expense, making a degree in dental hygiene more accessible. Research into the impact of and success rate of online education in dental hygiene will support the further improvement and growth of these educational modalities.

Other ways in which technology affects the dental hygiene profession is in a clinical setting. As new technologies to enhance client care and improve client safety are introduced, such as the Periowave laser, the VelScope, the intra-oral camera among others, dental hygienists need additional training and support to successfully and appropriately use these technologies in their clinical practice. Research into the outcomes of such technologies on patient oral health and satisfaction are important to guide the adoption of such technologies.

Access to care is also affected by new technologies making teledentistry a reality. This is a relatively new field of oral health care and there are great opportunities for dental hygienists to collaborate on studies identifying the best models and uses of teledentistry to increase access for vulnerable populations in particular those living in rural, remote and northern regions.

Knowledge transfer opportunities are also increased through the use of technology and there is a need to study the relative merits of such new uses and the impacts on research dissemination and utilization in the profession.

Finally, data collection, health informatics, and electronic health records are all made possible through the introduction of new technology. The impact on patient care and on research is significant and further study on these impacts will build the dental hygiene body of knowledge and support the efforts of dental hygienists adopting best practices and evidence based decision making.

Monitoring, surveillance and research

COHS Goal #4: To establish a country wide, standardized method of monitoring and surveillance of oral health, and to ensure that oral health research is appropriately supported.

Researchers in dental hygiene

The profession of dental hygiene is evolving and the movement towards independent practice has created a significant need for dental hygiene specific research. However, given that there are only three bachelor degree programs in Canada (University of British Columbia, University of Alberta, and Dalhousie University) and no postgraduate programs in dental hygiene in Canada, the pool of researchers in dental hygiene is very small. In order to support the profession and increase the body of knowledge in dental hygiene in Canada there is a pressing need for qualified researchers. There is an urgent need to increase the availability of degree programs and graduate educational opportunities with a research focus in Canada to support a growing research agenda.

CDHA has called for a change to the entry-to-practice credential for dental hygiene in Canada to the bachelor's degree in part to address this pressing need for research and researchers in dental hygiene. There is also a clear need to advocate for accessible graduate programs in dental hygiene, to encourage more dental hygienists to pursue their education beyond the undergraduate degree level and see research as a viable and an important pursuit that will contribute significantly to the profession and to the oral health of Canadians.

Establishing new educational programs and achieving an increase in the entry-to-practice credential are medium- to-long term goals. In the short term some initiatives to build capacity in dental hygiene research include encouraging dental hygienists to pursue degree completion opportunities and research oriented courses of study at undergraduate and graduate levels; and fostering collaboration between doctoral candidates and holders of doctorates in a variety of other disciplines to work on oral health and oral health care focused projects.

Another important point to note concerns dental hygienists' involvement in large population based surveys. Dental hygienists can and should participate in these surveys as both leaders and examiners. This has already occurred in certain instances and provides excellent opportunities for further training, mentorship, and collaboration.

Evidence based practice

The importance of evidence based practice is clear across the health care sector. There is a growing expectation on the part of both governments as funders and the public as the clients that health services be based on credible and current research. Dental hygiene is no exception to this trend. The need for evidence extends from the educational curricula right through to clinical practice. There is a need for all course materials to be evidence based, and all courses in dental hygiene should provide a list of references for course content, whether the program is located at the university, college, or private school level. There is also a need for clear and accessible research findings to be made available to practitioners to support evidence based practice in clinical settings.

Given the relative “youth” of the dental hygiene profession and the limited number of researchers in the field, there are significant gaps in the literature that curtail the move towards fully evidence based, decision making and practice. Some of the areas needing research include:

- Canadian studies on the outcome of dental hygiene treatment, which could be continued with research with high priority populations
- The current model for evidence based practice is not empirically supported—the need is to identify what works and to take that to the health outcomes stage
- Cost effectiveness research: which delivery model would cost the system more, less or the same?

Human resources

COHS Goal #5: To assure appropriate numbers, distribution and education of oral health professionals.

Health human resources—how does dental hygiene fit?

One of the high priority areas for the dental hygiene profession, as with the health care system in Canada overall, is in identifying the health human resources models that would best contribute to improving access and health outcomes for all Canadians. Given that dental hygiene falls within the private practice model, whether working in association with dentists or in private practice, it will be important for such funding bodies as CIHR and HRSDC to support research into the benefits and drawbacks associated with this model of health care delivery.

In addition, research must be undertaken to look at other models of oral health care delivery in the international arena to identify potential options for improving access in Canada. Finally the impact of regulation on the ability of dental hygienists to practice without the supervision of dentists needs to be studied with a view to clarifying ways to increase opportunities for dental hygienists across the health care spectrum, including work in long term care facilities, community health centres, schools and First Nations' reserves among others.

The public health system in oral health

Dental public health is concerned with the diagnosis, prevention and control of dental diseases, and the promotion of oral health through organized community efforts. Rather than the individual, dental public health primarily serves the community as the patient, through research, health promotion, education and the administration of group dental care programs. Public health dental hygienists do serve individual clients by performing oral health screening activities.

The American Dental Hygienists' Association (ADHA) advocates for the inclusion of oral health content in existing programs to prevent disease, promote health, and solve health problems among high priority populations. According to ADHA, public health approaches consider the entire population, they focus on problems that present the largest burden within the community; concentrate resources on interventions with strong evidence of effectiveness (i.e. "the greatest good for the greatest number"); include collaboration with multiple community partners; and evaluate the impact of programs on the population's health.⁴¹ As such, dental hygiene has a role to play in the public health system.

In Canada it has been a "tough sell" to gain acceptance for the need to have public health dental hygienists working across a range of settings including schools, long term care facilities and community health centres. While a very limited number of dental hygienists work within the public health system, this is not widely recognized nor is there a move to increase numbers in a systematic and coordinated way.

There are opportunities for including dental hygiene interventions in the spectrum of public health services in Canada. In particular with the rise of new Master of Public Health programs, there is much interest and activity in public health and occasions for dialogue between health disciplines concerned with population health, health promotion, and prevention initiatives.

The educational credentialing system in Canada

For many years CDHA and dental hygiene stakeholders across Canada have been advocating a change to the entry-to-practice credential for dental hygiene. As outlined in some detail in other sections of this paper, there is a case to be made for an increase to a bachelor's degree credential as the minimum standard for dental hygiene practice in Canada.

The need for such a change is particularly pressing from a research perspective. Given the fact that the majority of dental hygienists are educated at the college level and hold a two-year diploma, and that a growing number of dental hygienists are now obtaining private school diplomas of a shorter duration, there is a lack of qualified dental hygiene researchers in Canada. In Sweden, a good example internationally, the availability and accessibility of undergraduate and graduate programs in dental hygiene contribute significantly to the number of dental hygienists holding doctorates in dental hygiene. Both within their programs of study and in their subsequent careers, these dental hygienists contribute tremendously to knowledge creation in their profession.

It is important to note that certain community colleges with dental hygiene programs are creating applied research mandates that may increase the number of dental hygienists involved in some types of research. There is also an increased emphasis on research and research methodology in “college” diploma programs that can enhance research uptake by dental hygienists in their clinical practices.

The issue of increasing the entry-to-practice credential in Canada is a vital one but one that will likely take many years to resolve. Dental hygiene educators and CDHA's Education Advisory Committee will continue to work on this issue. In the meantime, research capacity in dental hygiene will remain somewhat limited but all opportunities for growth must be pursued with vigour.

What does all this mean for dental hygiene research in Canada?

Conclusion

For dentists and other oral health care workers to successfully address the health care needs of underserved communities, as well as to enter the public policy arena, they must shift their focus away from curing oral diseases or dysfunction to guaranteeing the total well-being of an individual and group. If general and oral health services are integrated into the necessary continuum of health care, then promoting oral health means promoting overall health.⁴²

This is an exciting and challenging time for the dental hygiene profession in Canada. This paper has outlined numerous opportunities for knowledge creation and capacity building in the 21st century. Crucial among these opportunities are:

- improving public awareness and attitudes to oral health including further research and communication initiatives around the oral-systemic link
- addressing the needs of high priority populations, aboriginal Canadians, new immigrants and refugees, and those living in poverty, in remote and northern regions of the country, through prevention and population health approaches
- seeking out and working closely with all stakeholders in oral and public health in Canada, particularly the Office of the Chief Dental Officer
- focusing on health human resource issues by making the case for public health dental hygienists
- undertaking both national and comparative international research to support all of these important priorities

Research in the field of oral health, from the perspective of dental hygiene and conducted by dental hygiene researchers in collaboration with key partners and populations, will contribute significantly to the overall health and well being of Canadians. The findings of such research will increase the evidence base for high quality, effective and efficient oral health care services; it will support the modernization of Canada's approach to health and health care and will contribute to improving access to oral health services to unserved and underserved populations throughout the country.

The Canadian Dental Hygienists Association, as the national voice for dental hygienists, has a central role to play in increasing the research capacity of the profession, both in creating knowledge and in increasing uptake of the research in education and clinical practice. Through CDHA's Research Advisory Committee, CDHA can provide a solid framework, a set of key priorities, a structure and ongoing support to enhance research capacity and uptake in the profession.

Dental hygiene has a long and respected history, and has evolved from a health occupation to an emerging profession in Canada and in many countries around the world. The potential of dental hygiene to play a role in increasing access to appropriate and cost effective oral health care, and to contribute to improving oral health and general health outcomes of Canadians is still largely untapped. Dental hygienists' expertise, creativity, capacity for innovation and commitment to the health and well being of all Canadians ensures a bright future for the profession.

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