

Oral health care for children – a call for action

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Abstract

Oral health is a fundamental component of overall health. All children and youth should have access to preventive and treatment-based dental care. Canadian children continue to have a high rate of dental disease, and this burden of illness is disproportionately represented by children of lower socioeconomic status, those in Aboriginal communities and new immigrants. In Canada, the proportion of public funding for dental care has been decreasing. This financial pressure has most affected low-income families, who are also less likely to have dental insurance. Publicly funded provincial/territorial dental plans for Canadian children are limited and show significant variability in their coverage. There is sound evidence that preventive dental visits improve oral health and reduce later costs, and good evidence that fluoridation therapy decreases the rate of dental caries, particularly in high-risk populations. Paediatricians and family physicians play an important role in identifying children at high risk for dental disease and in advocating for more comprehensive and universal dental care for children.

Key Words: Aboriginal communities; Early childhood caries; Fluoride; Immigrants; Oral health; Prevention; Public health policy; Social determinants

Oral health is an integral part of the overall health of children. This statement evaluates the current status of paediatric dental health in Canada, including:

- The structure and economic basis of Canada's dental care delivery system,
- Existing disparities in access to oral health care, and
- Areas where advocacy for children's oral health is most needed.

As a call to action, this statement provides direction and strategies for developing more comprehensive, accessible public dental health policy for Canadian children and youth.

Background

Dental health can affect the functional, psychological and social dimensions of a child's well-being. Oral pain has devastating effects on children, including lost sleep, poor growth, behavioural problems and poor learning.^{[1][4]} Developmentally crucial processes of communication, socialization and self-esteem are also affected by poor dental health.^[1] Dental problems are associated with a substantial reduction in school attendance and in parental working days.^{[4][5]} There is also recent evidence linking oral disease to other health problems, such as low birth weight,^{[6][8]} preterm delivery^[6] and iron deficiency.^[9]

Dental decay in children is an important public health issue. The United States (U.S.) Centers for Disease Control and Prevention report that tooth decay is the most common chronic childhood disease, five times more common than asthma in children five to 17 years of age.^[10] A 2010 Canadian Health Measures Survey reported that 57% of Canadian children six to 11 years of age have had a cavity, with an average of 2.5 teeth affected by decay.^[11] Caries rates are increasing among children two to four years of age.^[12]

Early childhood caries (ECC) is defined as the presence of one or more decayed, missing (due to caries) or filled tooth surfaces in any primary tooth in a preschool-aged child.^[13] In urban areas of Canada, the prevalence of ECC in preschool children is 6% to 8%,^[1] but in some disadvantaged Indigenous communities, the prevalence of decay exceeds 90%.^[14] Advanced forms of ECC frequently necessitate rehabilitative surgery under general anesthesia; this is the most common surgical procedure performed in preschool children at most paediatric Canadian hospitals.^[15]

The U.S. acknowledged their own oral health crisis in a landmark surgeon general's report in 2000,^[10] and since that time, dental care has been identified as the most prevalent unmet health need of children in the U.S.^[16] and has been

the focus of much research and policy development. Oral health has traditionally received low priority in public policy discussions in Canada,^[17] and was not included in the final Romanow Commission report on the *Future of Health Care in Canada* in 2002.^[18] Several steps have been taken nationally since then – the establishment of the Office of the Chief Dental Officer,^[19] the development of the Canadian Oral Health Strategy,^[20] and the Canadian Academy of Health Sciences commission on oral health access^[21] – but much work still needs to be done.

Outline of Canada's dental delivery system

Historically, because dental care has not been considered integral to health care, it is not subject to the tenets of the Canada Health Act (CHA): that is, publicly administered, universal, portable, accessible and comprehensive.^[23] In contrast to physician and hospital-based services that are mainly publicly funded, Canadians are largely responsible for financing their own dental care.

Canadians pay for dental care in four different ways: through third-party insurance (employment-related dental coverage); through private dental insurance; by paying directly out-of-pocket; or through government-subsidized programs (eg, First Nations Non-insured Health Benefits [NIHB] or Veterans' Affairs).

Sixty-two per cent of Canadians have private dental insurance (personal or employment-granted), 6% have public insurance and 32% have no dental insurance.^[11] The group most marginalized by the current dental care system are the lowest income families (also known as the 'working poor').^{[24][27]} Fifty per cent of Canadians in the lower income bracket do not have dental insurance.^[11] This population has the least access to dental care and bears the greatest burden of untreated disease.^[26]

Currently, most publicly delivered paediatric dental programs in Canada include only emergency or basic treatment, and cover only limited care for recipients of financial assistance or for children in low-income families. The comprehensiveness of these programs differs significantly among provinces and territories in terms of the types of services covered, age restrictions and limits on the frequency of dental visits (Table 1).^[28]

In Canada, publicly funded dental services tend to have a lower reimbursement scale than private coverage (eg, 50% to 60% of Ontario Dental Association fee guide rates). One American study showed that discrepancies between public and private reimbursement rates can lead to public patients not being accepted as readily by all dentists.^[29]

Economic trends in Canadian oral health care

While dental health is one of the most costly diseases in Canada, comparable to cancer and cardiovascular disease, its public financing is disproportionately low.^[1] Among Organi-

sation for Economic Co-operation and Development nations, Canada ranks second-last in the public financing of dental care.^[30] Publicly funded dental care currently amounts to only 4.9% of total dental expenditures,^[31] down from 7.7% in 1995, and decreasing from a peak of 20% in the early 1980s.^[32] Publicly funded dental care ranges from a low of 1.5% in Ontario to 77% in Nunavut.^[33] The Canadian government's per capita public expenditure on dental treatment has increased from \$11.00 in 1975 to just \$19.54 in 2010, whereas private sector spending has almost tripled over the same period (from \$135 to \$379 per capita).^[34]

The budgetary share for dental care in low-income families has increased steadily since the 1980s, reflecting the general decrease in public financing for oral health care and increasing costs of treatment. This trend suggests that for low-income Canadian families, dental care has become even more difficult to access.^[32]

However, despite decreasing public investment, Canadians do value and support the idea of publicly financed dental care.^[35]

Paediatric preventive health care: The evidence

ECC is a multifactorial chronic disease influenced by biomedical factors (diet, bacteria, host) and by the social determinants of health. Inappropriate infant feeding practices (eg, frequent, prolonged bottle-feeding and excessive juice consumption) are an important factor in ECC development. The caries process is controllable through a combination of community, professional and individual measures, such as promoting proper feeding, improving diet, water fluoridation, increasing the use of topical fluorides and dental sealants by primary health care providers, and using fluoride toothpaste.^[36]

Water fluoridation is a major, cost-effective public health achievement and the most effective measure to prevent caries,^[36] yet only 45.1% of community water supplies in Canada are fluoridated. Seventy-six per cent of Ontario's population has access to fluoridated water, compared to only 1.5% in Newfoundland and Labrador.^[37]

There is irrefutable evidence that using topical fluorides in children reduces caries rates,^{[38][40]} including a recent Cochrane review on fluoride varnish.^[38] Evidence-based guidelines recommend a biannual varnish application regimen for high-risk populations, including First Nations children.^[39] Regular use of fluoride mouth rinses have been shown to reduce tooth decay in older children, regardless of other fluoride sources.^[40] The Canadian Dental Association endorses water fluoridation and topical fluoride use.^[41]

Developing dental caries is a nonclassic infectious disease process.^[13] The vertical transmission of *Streptococcus mutans*

(the organism most associated with ECC) from caregiver to infant is well documented.^[42] Horizontal transmission has also been shown in child care settings.^[43] There is evidence that the window for infectivity of *S. mutans* in children occurs early in infancy, between 19 and 31 months of age.^[42] Since modifying the caregiver's dental flora prior to infant colonization can significantly impact the child's caries rate, early intervention and timely caregiver counselling are important oral health promotion strategies.^[44]

Children with a history of ECC are at increased risk for future dental decay in their permanent teeth.^[45] Children who had an early preventive dental visit were more likely to use preventive services subsequently and to incur lower dental-related costs over time.^{[46][47]}

Disparities in oral health and access to dental care

Much of the burden of dental disease is concentrated in disadvantaged individuals: low-income families, Aboriginal children, new immigrants, and children with special health care needs. In addition to having higher levels of dental disease, these marginalized populations often have limited or no access to oral health care.^[26]

Like general health, oral health is strongly influenced by socioeconomic status. One Canadian study demonstrated that children from the lowest income families have decay rates that are 2.5 times those of children from higher income families.^[48] Another study found that the probability of receiving any dental care over the course of a year increases markedly and independently with dental insurance, household income and level of education.^[49] Higher income Canadians were three times more likely to visit a dentist than the lowest income group.^[50] Although insurance coverage reduced the gap, insured persons in lower income groups or with low educational attainment were not as likely as persons with higher income to have seen a dentist in the past year, demonstrating the important effect of these social determinants on access to oral health care.^[50]

The 'working poor' are especially vulnerable because their employment status often renders them ineligible for dental care under publicly funded programs, while the jobs they hold seldom offer employment-related health insurance. Working people with constrained incomes have competing needs, such as food, clothing and housing, and may regard dental visits as a luxury.^[24] Dental bills may even threaten food security in this group.^[51]

In one Nova Scotia study, giving children access to a universal, publicly financed dental insurance program still did not eliminate disparities in caries rates based on socioeconomic status.^[52] This finding suggests that disparities in oral health

status cannot be reduced solely through universal access to dental care, and that efforts need to be directed toward understanding the broader social and behavioural determinants of oral health.

The oral health of Canadian Aboriginal children is a public health crisis.^{[14][53]} Indigenous populations in Canada face financial, geographical and sociocultural barriers to obtaining dental care. The prevalence and rates of caries in Aboriginal children are substantially higher than in the general paediatric population,^{[54][59]} with decayed, missing or filled teeth (DMFT) scores ranging as high as 13.7 (maximum score of 20) among some northern Manitoba First Nations^[58] and ECC rates in the 50% to 97% range.^[59] Although this disparity is most apparent for children in remote First Nations and Inuit communities, it is also evident among Aboriginal children in urban centres.^[14] First Nations children in northern communities have inordinately high rates of surgical restoration therapy.^[60] Unfortunately, only one in three children younger than four years of age with NIHB coverage have a yearly dental visit,^[14] likely due in part to the lack of dental specialists in many communities.

Several studies have confirmed the disparities between new Canadian children and their Canadian-born peers, both in terms of oral health status and the use of dental services.^{[61][63]} Many immigrant children have come from countries without dental care. On arrival to Canada, immigrants encounter language and cultural barriers, an unfamiliar health care system, and lack of financial resources that can further impede access to appropriate dental care.^[61]

Poor oral health is common among children with special health care needs.^[16] Access to dental care for this population may be precluded by cost, distance from a tertiary paediatric centre, and the shortage of paediatric dentists trained in the care of medically complex children. Delays in access to oral care for children with special health care needs can result in postponing bone marrow and organ transplant or other critical surgeries.^[26]

Publicly funded dental programs for children and youth

Dental benefits fall under provincial/territorial jurisdiction.^{[28][32]} Children in low-income families (whether on social assistance or not) are typically granted some level of support for accessing dental services. There are often further targeted provisions in legislation concerning children with disabilities or children in foster care. Programs vary widely in terms of coverage and tend to focus on treatment-based (as opposed to preventive) care (Table 1). Note that Table 1 does not include coverage for children whose families are on income assistance, for whom all provinces/territories make some provision.

TABLE 1
Provincial/territorial publicly funded dental programs for children

Province/territory	Program	Eligibility	Services covered
British Columbia	Healthy Kids	Children and youth zero – 19 yrs from low-income families in receipt of premium assistance through Medical Services Plan	<ul style="list-style-type: none"> – \$1400/two years of basic dental services. – \$1000/year toward general anesthesia fees (hospital or private facility) – Emergency treatment for pain relief (beyond \$1400 limit) – No orthodontic
	Dental Benefits Program for Children and Youth in Foster Care	Children and youth in foster care covered up to \$700/year	– Basic, emergency and orthodontic care
Alberta	Alberta Child Health Benefit	Children and youth zero – 18 years of age from low-income families	Basic coverage: dental exams, cleaning, X-rays, fillings and extractions
	Family Support for Children with Disabilities	Children and youth zero – 18 years of age with a disability	Basic dental treatment, with some orthodontic care (directly related to child's disability and approved by a dental review committee) – Covers portion of costs exceeding that covered by guardian's dental insurance plan OR if guardian does not have dental insurance, costs exceeding \$250 annually
	Foster Care	Children and youth zero – 18 years of age in foster care	Basic coverage: dental exams, cleaning, X-rays, fillings and extractions
	Assured Income for the Severely Handicapped (AISH)	Children of parents with a disability who are unable to work	Basic coverage: dental exams, cleaning, X-rays, fillings and extractions
Saskatchewan	Family Health Benefits	Children zero – 18 years from low-income families	Basic coverage
	Supplementary Health Program	Foster children	Diagnostic, preventive, restorative, oral surgery
	Public Health Services Dental Clinic (Saskatoon Health Region)	Children zero – 16 years who have limited or no dental coverage	Preventive and treatment services
Manitoba	Health Services Dental Program	Children <18 years of age who have a disability or are wards of the state covered up to \$500/year	Basic diagnostic, preventive, restorative, endodontic, periodontal, prosthodontic, oral surgery services
	SMILE plus program (Winnipeg Regional Health Authority)	At-risk children in the Winnipeg region	Preventive and basic treatment services
	Healthy Smile Happy Child intersectoral partnership	At-risk infants and preschool children and their families	Oral health promotion using community development approaches

	Free First Visit Program (Manitoba Dental Association)	Children <36 months of age	Early dental screenings
Ontario	Healthy Smiles	Children and youth <18 years of age are eligible if their family's net income is < \$20,000/year – No other dental care access	Preventive and basic treatment services
	Ontario Disability Support Program (Dental Special Care Plan)	Dependent children and youth (<18 years of age) who live with a disabled parent	Basic diagnostic, preventive, restorative, endodontic, periodontal, prosthodontic, oral surgery services – General anesthesia and sedation
	Assistance for Severely Disabled Children (ASDC)	Children and youth (<18 years of age) living at home in a low-income family – Child must have a severe disability	Basic diagnostic, preventive, restorative, endodontic, periodontal, prosthodontic, oral surgery services
	Children in Need of Treatment (CINOT)	– Children and youth (<18 years of age) requiring emergency or essential dental care – Parents have no dental insurance OR cost of treatment would result in 'financial hardship' (no income verification)	– Includes diagnostic, preventive, restorative, prosthodontic, endodontic, oral surgery, and pays for adjunct services such as general anaesthesia and conscious sedation – Intended for one-time coverage; no ongoing care
Quebec	Régie de l'assurance maladie du Québec: Children's Dental Care Program	All children <10 years of age	Basic diagnostic, restorative and oral surgery – Does not include cleaning or fluoride application
		Children from low-income families	Basic diagnostic, restorative and oral surgery – >12 years of age: annual teeth cleaning – 12 – 15 years: annual fluoride application
New Brunswick	Dental care for low-income families	Children <18 years of age from low-income families	Examination, basic diagnostic, extractions and some preventive treatment – Up to a maximum of \$1000/year
Nova Scotia	MSI Children's Oral Health Program	Children <10 yrs of age – Families required to access private coverage first	Diagnostic (dental exam), preventive (one sealant application), and treatment services (fillings, fluoride application in some cases) – General anesthesia covered in hospital settings only
	Mentally Challenged Program	– Children with disability (no age limit) – Required to access private coverage first	Diagnostic, preventive, and treatment services – General anesthesia covered in hospital settings only
Prince Edward Island	Children's Dental Care Program (Treatment Services)	– Children three – 17 years of age – Annual registration fee of \$15/child to a maximum of \$35/family (waived for low-income families) – Parent pays 20% of treatment cost, unless annual income <\$30,000/year	Diagnostic and basic treatment services
	Children's Dental Care Program (Prevention)	All school-aged children 3 – 17 years of age	Oral health education, screening, scaling, topical fluoride, sealants

	Pediatric Specialist Services Dental Program	<ul style="list-style-type: none"> – Children in medical and financial need – Annual registration fee of \$15/child 	Diagnostic, treatment and some preventive services
	Preventive orthodontic clinic	Directed at children in low-income families	Minor preventive orthodontic services
	Early Childhood Dental Initiative	15- and 18-month-old babies at Public Health immunization clinics	Screening, risk assessment by dental hygienists
Newfoundland	Children's Dental Health Program	<ul style="list-style-type: none"> – All children 0 – 12 years of age – Families required to access private coverage first – Youth 13 – 17 years of age in low-income families or on social assistance 	<p>Children's component: diagnostic, preventive periodontal, restorative services (ie, exams, cleanings, fillings, fluoride application, extractations, sealants)</p> <p>Social assistance component: exams, fillings, extractions and emergency treatment</p>
Nunavut and the Northwest Territories	Non-Insured Health Benefits Program	Registered First Nations and Inuit	Emergency, diagnostic, restorative, endodontic, periodontal, prosthodontic, oral surgery, orthodontic services
Yukon Territory	Children's Dental Health Program (Yukon Health and Social Services)	<p>Two programs:</p> <ul style="list-style-type: none"> – Preschool children – All school-aged children from kindergarten to Grade 8 (or Grade 12) depending on the place of residence 	<ul style="list-style-type: none"> – Preventive, restorative, periodontal, and oral surgery services – Emergency (accidental) not covered in school-aged children's plan

Paediatric dental extraction

Dental surgery related to ECC is the most common surgical outpatient procedure in preschool children at most paediatric and community hospitals in Canada.^[15] The costs of hospitalization and transport, and the risks of general anesthesia are significant.^[64] Unfortunately, new cavities are common within months of rehabilitation under general anesthesia. Many children require repeat surgeries because of progressive disease,^[60] particularly in First Nations populations.^[53]

The Wait Time Alliance Report Card (June 2010) compiled paediatric surgical wait-time data from 15 paediatric academic health centres. Paediatric dentistry, focusing on dental extraction surgeries, was given the poorest grade (D), reflecting the fact that only 50% to 59% of patients were treated within a medically acceptable wait-time benchmark.^[65]

Establishing a dental home

In 2005, the Canadian Dental Association issued a statement recommending a dental assessment for infants within six months of their first tooth appearing and no later than one year of age.^[66] The American Academy of Pediatrics' Section on Pediatric Dentistry's 2003 statement advocates the same timing for establishing a child's 'dental home'.^[67] The Rourke Baby Record recommends the first dental visit for children 9 to 15 months of age.^[68]

There is evidence supporting the establishment of the dental home by one year of age.^[69] The rationale focuses on early professional intervention to provide examination, risk assessment and anticipatory guidance for parents, so that disease can be prevented. Professional intervention beginning later (eg, at three to five years of age) has not been successful in preventing early oral bacterial colonization or its cariogenic effects.^[69]

Despite the Canadian Dental Association's position on the first dental visit, this recommendation has had limited uptake in the dental community,^[70] and many Canadian children continue to go without a dental assessment until they are much older.^[13]

Oral health education for primary health care providers

Because contact with a family physician or paediatrician typically occurs earlier than a child's first visit to a dentist, primary care providers play a critical role in promoting oral health in children.^[22] They must be knowledgeable about dental cariology and prevention, be able to identify children at high risk for dental disease and provide anticipatory guidance to families. Often, they must also deal with the systemic complications of untreated dental caries.

Most surveyed paediatricians believe they have an important role to play in children's oral health issues.^{[71][72]} However,

lack of up-to-date information and knowledge, as well as the difficulty paediatricians experience in referring patients for professional dental care, are frequently cited barriers to their effectiveness.^[65] One recent Canadian survey found that nearly one-quarter of paediatricians and family physicians said they received no oral health training in medical school or residency: 79% of paediatricians and 89% of family physicians reported receiving less than three hours of oral health care training in medical school or residency. Both practitioner groups displayed poor ability to answer knowledge-based questions regarding ECC.^[72]

There are statements on preventive oral health intervention and anticipatory guidance to help paediatric primary care providers.^{[22][36][73]}

Collection and surveillance of paediatric data

Evidence-based policy and practice are essential for quality dental care. Having evidence to support particular interventions and treatments is paramount. In Canada, public dental care information systems remain poorly developed, with minimal disease surveillance and program evaluation.^[32] A system-wide strategy for collecting and analyzing data on paediatric oral health is needed to understand the full magnitude of this public health problem and to measure the effectiveness of current and future interventions. Human resource data (eg, the number, type and distribution of providers) are also lacking.^{[20][32]}

New developments

There have been several positive initiatives to improve oral health within the last decade in Canada. The Office of the Chief Dental Officer was created in October 2004, to provide expertise and advise on policy.^[19] There is no comparable leadership position to represent the dental needs of children and youth at the federal level.

The Canadian Oral Health Strategy (COHS) was developed by the Federal, Provincial/Territorial Dental Working Group in 2004, through consultation among health professionals, allied organizations and ministry representatives. Its purpose was to establish goals and strategies for oral health promotion, access and surveillance. The COHS set objectives for 2010 that included all provinces/territories having a dental program in place for children from low-income families and providing school-based preventive dental programs.^[20] Since then, most jurisdictions have made some provisions for children from low-income families, but these programs vary in terms of coverage.

The Canadian Academy of Health Sciences, an association providing expert advice in health science disciplines, has commissioned a study on improving access to oral health care for Canadians.^[21]

The Children's Oral Health Initiative, launched in 2004, was developed by Health Canada to address disparities between First Nations children living on reserve or Inuit children and the general Canadian population.^[74]

Policy development

Dental care, like health care, is an essential service, and all levels of government must commit to providing quality dental care for every young Canadian. Paediatricians are ideally positioned to advocate for programs and services to reduce disparities and promote better oral health.

The five most pressing targets for policy development are to:

1. Ensure leadership in paediatric oral health policy development at provincial/territorial and federal levels.
2. Assure provision of dental services under the Canada Health Act tenets, with special attention on marginalized populations.
3. Compile (and maintain) current data on the dental health status of children and youth.
4. Extend dental policy and programs based on evidence-based practices.
5. Ensure proper evaluation of existing programs.

Recommendations

Because paediatric oral health is a fundamental component of overall health, services and programs for dental care should be held to the same standards of accessibility, universality and comprehensiveness as other responsibilities under the Canadian Health Act. As such, the Canadian Paediatric Society recommends that provincial/territorial and federal governments:

- Ensure that all children in their respective jurisdictions be afforded equal access to basic treatment and preventive oral care, regardless of where they live or their family's socioeconomic status.
- Ensure that every child has a dental home by one year of age. (Grade B)
- Support the Canadian Paediatric Society and the Canadian Dental Association recommendations on fluoride supplementation. (Grade A)
- Create leadership positions to represent the specific interests of children and youth on oral health issues.
- Develop an ongoing surveillance system to capture key data and to reflect the state of paediatric oral health.

Prioritize research investigating evidence-based paediatric dental practices and the long-term effects of social determinants on oral health.

Note: The strength of recommendations is based on the Canadian Task Force on Preventive Health Care: www.canadiantaskforce.ca.

The CPS also recommends that:

- Child health care providers receive appropriate training and continuing education in oral health, with emphasis on early risk assessment and provision of anticipatory guidance.
- A multidisciplinary approach to paediatric oral health care be developed, involving physicians, dentists, hygienists, nurses and schools.

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