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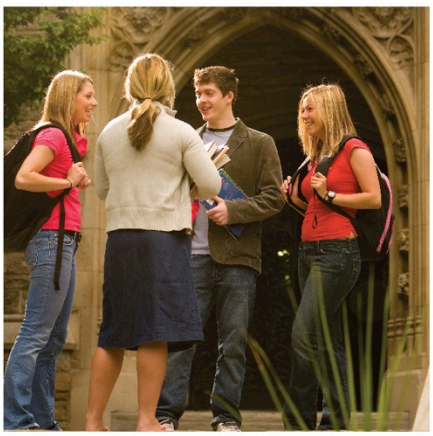
McMaster HEALTH FORUM

IDENTIFYING THE EFFECTS OF AND APPROACHES TO INTEGRATING ORAL-HEALTH SERVICES IN HEALTH SYSTEMS

RAPID SYNTHESIS (30-DAY RESPONSE)



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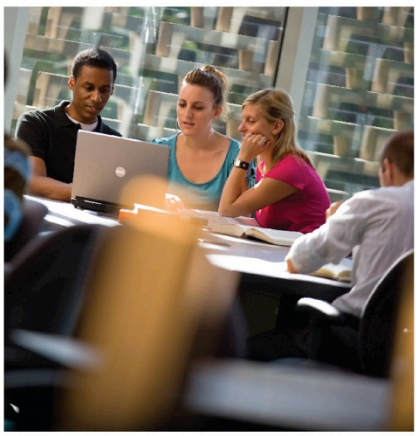

EVIDENCE >> INSIGHT >> ACTION

Rapid Synthesis:
Identifying the Effects of and Approaches to Integrating Oral-health Services in Health Systems

25 July 2016

McMaster Health Forum

For concerned citizens and influential thinkers and doers, the McMaster Health Forum strives to be a leading hub for improving health outcomes through collective problem solving. Operating at regional/provincial levels and at national levels, the Forum harnesses information, convenes stakeholders, and prepares action-oriented leaders to meet pressing health issues creatively. The Forum acts as an agent of change by empowering stakeholders to set agendas, take well-considered actions, and communicate the rationale for actions effectively.

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Timeline

Rapid syntheses can be requested in a three-, 10- or 30-business day timeframe. This synthesis was prepared over a 30-business day timeframe. An overview of what can be provided and what cannot be provided in each of the different timelines is provided on McMaster Health Forum's Rapid Response program webpage.

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Conflict of interest

The authors declare that they have no professional or commercial interests relevant to the rapid synthesis. The funder played no role in the identification, selection, assessment, synthesis or presentation of the research evidence profiled in the rapid synthesis.

Merit review

The rapid synthesis was reviewed by a small number of policymakers, stakeholders and researchers in order to ensure its scientific rigour and system relevance.

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KEY MESSAGES

Question

- What are the effects of and approaches to integrating oral-health services in health systems?

Why the issue is important

- Oral health is important for the overall well-being of children and adults, and poor oral health has been linked to other diseases and serious health conditions such as respiratory infections, cardiovascular diseases, diabetes and poor nutritional status.
- Ontario provides public coverage for a limited scope of dental services, including surgical-dental services delivered in hospital under the Ontario Health Insurance Plan (OHIP) (e.g., dental and diagnostic consultations, reconstructive procedures, and cleft lip and cleft palate surgery), as well as some services that are covered through three publicly funded programs (Healthy Smiles Ontario, Ontario Works and the Ontario Disability Support program) targeted to low-income children and families and/or those with disabilities.
- Given the limited scope of dental and other oral-health services included in publicly-funded programs, most Ontarians need to pay for these services either through private insurance (which may not provide full coverage) and/or out-of-pocket, which poses a significant barrier for many to access the dental services they need.

What we found

- We identified a total of 37 relevant documents addressing some aspect of the question, including four systematic reviews, seven single studies, two economic evaluations, and 24 program and system descriptions outlining approaches related to integrated oral-health services.
- From the research evidence about effects of integrating oral-health services, we found:
  - limited literature on the integration of oral-health services in various settings (e.g., long-term care homes, community clinics, educational institutions) found a range of positive outcomes such as improvement in accessibility of oral-health services and oral health disease prevention, as well as increased awareness of the value of oral care as part in interprofessional care teams; and
  - suggestions on how to integrate oral health into other health services, including: 1) integrating oral health within interprofessional education and school health policies; and 2) engaging stakeholders to discuss integrating oral-health professionals in health teams, and into health services and programs.

- We identified several approaches to integrating oral-health services in health system governance, financial and delivery arrangements.
  - One study identified Canadian stakeholder's perspectives and recommendations for improving oral-health services, and key recommendations included: 1) a recognition of oral health (including preventative oral-health services) as a component of general health; 2) using alternative delivery sites (e.g., community health centres) to reach more people; 3) strengthening regulations to support integration of oral-health services; and 4) the need for further educational training for dentists to treat patients with disabilities or mental illness.
  - Some of the most common governance levers for integrating oral-health services include: 1) organizing oral-health services at the local level; 2) regulating dental professionals' training and licensure requirements; and 3) determining and revising the scope of practice for dentists.
  - For financial arrangements, approaches to supporting integrated oral-health services include: 1) providing free dental services for children, youth, and to specific groups (e.g., individuals with disabilities, low-income families); 2) providing cost-sharing mechanisms for citizens who do not qualify for financial support; 3) implementing caps on patient contributions as part of cost-sharing mechanisms; and 4) providing compulsory health insurance to cover some oral-health services.
  - For delivery arrangements, approaches to supporting integration focused on: 1) providing early prevention and interventions for children and youth; 2) expanding oral-health services into community-based clinics; 3) increasing the number of dental hygienists in independent practice settings; and 4) incorporating dental professionals in primary-care teams.

QUESTION

What are the effects of and approaches to integrating oral-health services in health systems?

WHY THE ISSUE IS IMPORTANT

Oral health is important for the overall well-being of children and adults, and poor oral health has been linked to other diseases and serious health conditions such as respiratory infections, cardiovascular diseases, diabetes and poor nutritional status.(1)

Ontario provides public coverage for a limited scope of oral-health services. This includes surgical-dental services delivered in hospital under the Ontario Health Insurance Plan (OHIP) (e.g., dental and diagnostic consultations, reconstructive procedures, and cleft lip and cleft palate surgery), as well as some services that are covered through three publicly funded programs targeted to low-income children and families, and/or those with disabilities (Healthy Smiles Ontario, Ontario Works and the Ontario Disability Support program).(1)

Given the limited scope of dental and other oral-health services included in OHIP, most Ontarians need to pay for these services either through private insurance (which may not provide full coverage) and/or out-of-pocket, which poses a significant barrier for many to access the dental services they need.

In this rapid synthesis requested by the Ontario Association of Public Health Dentistry, we sought to identify the effects of and approaches to integrating oral-health services in health systems.

Box 1: Background to the rapid synthesis

This rapid synthesis mobilizes both global and local research evidence about a question submitted to the McMaster Health Forum's Rapid Response program. Whenever possible, the rapid synthesis summarizes research evidence drawn from systematic reviews of the research literature and occasionally from single research studies. A systematic review is a summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select and appraise research studies, and to synthesize data from the included studies. The rapid synthesis does not contain recommendations, which would have required the authors to make judgments based on their personal values and preferences.

Rapid syntheses can be requested in a three-, 10- or 30-business-day timeframe. An overview of what can be provided and what cannot be provided in each of these timelines is provided on the McMaster Health Forum's Rapid Response program webpage (http://www.mcmasterhealthforum.org/policymakers/rapid-response-program)

This rapid synthesis was prepared over a 30-business day timeframe and involved four steps:

1) submission of a question from a health system policymaker or stakeholder (in this case, the Ontario Association of Public Health Dentistry);
2) identifying, selecting, appraising and synthesizing relevant research evidence about the question;
3) drafting the rapid synthesis in such a way as to present concisely and in accessible language the research evidence; and
4) finalizing the rapid synthesis based on the input of at least two merit reviewers.

WHAT WE FOUND

We identified a total of 37 relevant documents addressing some aspect of the question, including four systematic reviews,(2-5) two economic evaluations,(6;7) seven single studies,(8-14) and 24 program and system descriptions outlining approaches related to integrated oral-health services.(1;15-37) We provide more details about each systematic review and the single studies in Appendix 1 and 2, respectively. While the included systematic reviews do not directly address the question, they provide some insights to the current evidence of oral health in relation to health system governance, financial and delivery arrangements. The single studies provide evidence about current programs that integrate oral health into other health services and programs, and the economic evaluations evidence about the cost-effectiveness of dental care. The program and system descriptions provide insight from other jurisdictions about approaches to integrating oral-health services in their health systems. Four reviews (38-41) and two single studies (42;43) that were initially included in the synthesis were subsequently excluded given that they had little relevance to the question. To provide additional insight, we provide an overview of approaches that have been recommended in Canadian provinces or territories related to integrating oral-health services into their respective health systems (see Table 2).

Given the limited amount of evidence about effects of integrating oral-health services in health systems, we present key findings from the reviews, single studies and program and system descriptions below in sections related to governance, financial and delivery arrangements. Within each section we first outline evidence about effects of approaches, followed a description of approaches to integration of oral-health services that have been recommended or used in other jurisdictions.

Box 2: Identification, selection and synthesis of research evidence

We identified research evidence (systematic reviews and primary studies) by searching (in June 2016) Health Systems Evidence (www.healthsystemsevidence.org), the Cochrane Library (for systematic reviews and economic evaluations), HealthEvidence and PubMed. We searched Health Systems Evidence by combining oral AND dentist in the open search field and limiting the results to review-derived products (evidence briefs and overviews of reviews), systematic reviews, economic evaluations and costing studies, health reform descriptions, and policy documents from Ontario and Canada. For the Cochrane Library we searched for dentistry AND oral health. In HealthEvidence, we searched for reviews categorized under the 'settings' filter for both 'healthcare' and 'dentist'. Lastly, we searched PubMed using the following combination of search terms: (oral health OR oral care OR dentist* OR dental) AND (patient-centred OR patient centred OR patient-centered OR patient centered OR integrated OR package of care) AND (Canada OR UK OR England). We included England in the search scope given that it is an example of a country where dental care has been integrated in the health system.

The results from the searches were assessed by one reviewer for inclusion. A document was included if it fit within the scope of the questions posed for the rapid synthesis.

For each review we included in the synthesis, we documented the focus of the review, key findings, last year the literature was searched (as an indicator of how recently it was conducted), methodological quality using the AMSTAR quality appraisal tool (see the Appendix for more detail), and the proportion of the included studies that were conducted in Canada. For primary research (if included), we documented the focus of the study, methods used, a description of the sample, the jurisdiction(s) studied, key features of the intervention, and key findings. We then used this extracted information to develop a synthesis of the key findings from the included reviews and primary studies.

Findings related to health system governance, financial and delivery arrangements that could be used for integrating oral-health services

Governance arrangements

We did not identify any systematic reviews that directly addressed oral-health services in the context of governance arrangements that can be used to support integration in health systems. However, we identified one recent medium-quality review with evidence regarding the effectiveness of continuing professional development for dentists on learning, behaviour or patient outcomes. The review found that continuing professional development for dentists increased the use of dental care services by patients. However, the review concluded that due to limited evidence, it is difficult to draw conclusions about the effects of continuing professional development for dentists on patient outcomes.(3)

In addition to these findings, one of the included program and system descriptions outlined strategies identified from dental directors and consultants for how to integrate oral health into other health services and programs. These strategies involved:

- including oral health within interprofessional education;
- collaborating with educational departments and other health professionals on school health policies and programs for oral health;
- advocating for health teams to include oral-health services;
- engaging dental stakeholder organizations with other professionals to discuss integrating oral health in other health services and programs.(29)

As detailed in Table 1, other key governance arrangements that could be used to support integration or oral-health services in health systems include:

- organizing oral healthcare at the state or regional level (e.g. Australia, Denmark, Sweden, United States), or at the level of municipalities or local county councils in which the private dental professionals work (e.g., Denmark, Sweden);

- regulating dental professionals' training and licensure requirements (e.g., National Registration and Accreditation Scheme in Australia, the General Dental Council in England, the Federal Council of Dentistry in Brazil); and
- identifying different scopes of practice for dentists (e.g., The National Health Service (NHS) in England categorizes dentists into four groups: providers that own private practices, providers who deliver dental services, performer, or providing performer).

Financial arrangements

One recent high-quality systematic review,(2) one single study,(13) and one economic evaluation (6) were identified that focused on the financial arrangements related to integrating oral-health services in health systems. The systematic review evaluated the effects of different methods of remuneration on the behaviour of dentists and found that the fee-for-service model was associated with an increase in clinical activity. The same review also found that dentists that were being paid under a capitation model performed fewer clinical activities or performed them at a later stage when compared to dentists working under the fee-for-service model. The review concluded that there is little evidence regarding the cost-effectiveness of the different remuneration methods.(2)

The single study was conducted in Ontario from 2001 to 2011. The study retrospectively extracted data from both IntelliHealth Ontario and the Medical Services database, which contain all claims submitted by providers that were approved by the Ontario Health Insurance Plan (OHIP). The study found that 208,375 visits per year were made to physicians for oral health-related diagnoses in Ontario. Eight of the nine diagnostic codes reported in the study were within the scope of dental practice. The study estimated that the cost for minor and intermediate assessments range from $21.70 to $33.70 per visit, which translates to $50 million to $78 million during the study period. The authors indicated that these findings suggest a need for further policy discussions, as these funds could have been used to expand public oral-health services and programs for vulnerable populations in Ontario.(13)

The economic evaluation was conducted in Quebec and found that a mixed program (a mix of publicly-funded clinics and private clinics) and a public program (provided in schools and paid for by a public health payer) that provide preventive dental care for children had a mean cost of $179. In contrast, the study found that a private program (i.e. private clinics and paid by health insurance) had a mean cost of $220. Also, it was found that the mixed public-private and the exclusively public program were more effective as they resulted in fewer pit and fissure resealing and restoration procedures.(6)

Six program and system descriptions provided insight related to financial arrangements and oral-health services Canada (30;31;33;34) and Ontario.(1;26) Two national reports indicated that 17.3% of the population avoided visiting a dentist in the last 12 months due to the associated oral care costs.(30;34) A report about the oral-health status of Inuit communities found that very few Inuit reported on dental care costs as a barrier to dental visits.(31) Another report focused on the oral-health status of First Nations communities, and indicated that 45.7% of those living in remote communities found transportation costs as a barrier to dental treatment outside of their communities. The authors indicated that availability and accessibility may be contributing factors to the utilization of oral-health services for First Nations communities.(33) A report from Ontario indicated that only 1.3% of oral-health services and programs are publicly funded, leaving 68% of Ontarians paying for oral-health services through private health insurance, and the remaining 30.7% paying out-of-pocket. This level of public funding for oral-health services puts Ontario as having the lowest rate of public funding for dental care in Canada.(26) The sixth program and system description also indicated that 68% of Ontarians reported having dental insurance. This may lead to inequitable access to oral-health services and in oral-health outcomes given that almost one-third of Ontarians have to pay out-of-pocket for oral healthcare (with many likely facing financial barriers to be able to pay).(1)

Other jurisdictions have developed financial mechanisms to offset the cost of oral-health services for their citizens. The details related to these approaches are available in Table 1 below. Notable approaches from different countries include:

- providing free dental services for children and youth (e.g., Australia, through the Child Dental Benefit Scheme, Denmark, which provides preventive and curative dental service for people under 18 years of age, Sweden, which provides dental service for people under 19 years of age, England, which provides dental services for people under 18 years of age, or under 19 if they are enrolled in full-time education, and France, which provides preventive dental services at six, nine, 12, 15, and 18 years of age);
- providing free coverage of dental services to specific groups (e.g., Denmark, for individuals with disabilities and older adults, England, for pregnant or nursing mothers and those on welfare benefits, the United States, for low-income families through Medicaid);
- implementing cost-sharing mechanisms for citizens who do not qualify for financial support (e.g., Denmark and France, for those 18 years old and older, England, for three levels or "charging bands" of NHS dental treatment, and Sweden, which provides dental-care vouchers for preventive care or a "high-cost protection scheme" that reimburses 50% to 85% of other dental services);
- introducing a cap on patient contributions as part of cost-sharing for dental care services (e.g., Australia and Sweden); and
- providing compulsory health insurance for the population, which covers some oral-health services (e.g., France, which provides Statutory Health Insurance).

Delivery arrangements

We identified two systematic reviews (4;5) and one economic evaluation (7) that provide evidence related to how delivery arrangements could be used to inform efforts to support integration of oral-health services in health systems. One recent medium-quality review focused on the utilization of oral-health services by both children and adults and provided by non-dental practitioners. The review found that individuals visit family physicians for oral-health services instead of oral healthcare providers due to pain severity, lack of access to oral healthcare, and financial barriers such as lack of dental insurance or cost of oral healthcare.(4) The same review found that patients were generally prescribed medication for their pain or were referred to a dentist, but patient health outcomes as a result of these care pathways were not reported.(4) The second review, which was recent and of medium quality, found that there is a lack of oral health literature focused on coordination and integration of oral health into other health services.(5)

The economic evaluation was conducted in the United States and compared annual dental assessments to no assessments with regards to number of dental caries and associated incremental costs. The evaluation reported an increase in dental caries and an incremental cost of US$73 per carious surface (approximately C$80.58 based on an average currency exchange of .9059 per C$1 at the time of the publication in 2014) when no assessment was provided as compared to annual dental assessment.(7)

Six studies provided evidence related to how delivery arrangements could be used to support integration of oral-health services in health systems, and they evaluated integration of oral-health services within the scope of nursing practice,(8) long-term care,(9;10) provision of care in a not-for-profit community dental clinic,(11) and provided stakeholder perspectives and recommendations for integrating oral-health services.(12;14) Five of these six studies were conducted in Canada with two in Ontario,(9;10) one in British Columbia,(11) one in Saskatchewan,(8) and one with a national focus.(12)

The study that assessed integration of oral health into pediatric nursing practice was conducted in Saskatchewan. The study found that nurses receiving training from a dentistry faculty member on procedures related to pediatric oral health and collaborated with dentists, resulted in positive patient outcomes including accessibility of healthcare, establishing pathways of care, overcoming dental financial barriers for patients, and oral-health disease prevention. The authors suggest that nurses are strategically positioned to create partnerships between nursing and dentistry in order to further improve patient outcomes.(8)

Two studies focused on the integration of dental services in long-term care in Ontario. One cross-sectional study in three long-term care homes found that when compared to homes that had either a fee-for-service hygienist or a dentist who provided oral care once a week, the long-term care home with a full-time dental team had the best available oral hygiene services and reduced accessibility issues for residents. However, the authors indicated that the costs associated with providing this model of oral healthcare might pose a barrier to other long-term care homes. The authors concluded that the provision of oral-health services among the long-term care homes varied widely due to oral healthcare policies, funding and management.(9) The second study conducted a case study focused on implementing oral care practices and policy into long-term care. The intervention included educational resources and organizational guidelines to improve the delivery of daily mouth care to long-term care residents over a 12-month period. The study found an increased awareness of oral care program uptake, advocacy from physician leaders, and a provincial forum that identified policies. The authors indicated that delivery of oral care in long-term care could be achieved through an integrated approach that includes education, healthcare providers and managers.(10)

Another case study assessed not-for-profit community dental clinics in British Columbia, which served 23,679 patients from 2007 to 2008. The study outlined that these clinics were primarily subsidized by a local health authority, paid by the provincial government or by charitable donations. The study reported that the main priority for these clinics was to integrate oral-health services with other health and social services. An example of this was provided in the context of one of the clinics introducing a computer-based medical and dental software system, which linked the dental clinics to an on-site pharmacy. Unfortunately, the authors indicated that the effect of integrated oral services on patient outcomes was not reported.(11)

The remaining two studies were conducted in Canada and the United Kingdom, and reported on perspectives and recommendations for improving oral-health services. The study conducted in Canada sent a questionnaire to 200 social service agencies, ministries of health, community services, local health authorities, Health Canada, dental insurance companies, and dental professional organizations (e.g., dentists, dental hygienists, denturists and dental therapists). Several themes emerged from the 91 completed surveys, which included:

- a recognition of oral health as a component of general health (including preventative oral-health services);
- using alternative delivery sites (i.e., community health centres) to reach more people;
- strengthening regulations to support the integration of oral-health services; and
- providing further educational training for dentists (e.g., providing care for patients with physical disabilities or mental illness).(12)

The second study assessed the responses from dental students on "team experience", "integrated care" and "NHS dentistry" in the United Kingdom. The study reported positive experiences from dental students when collaborating with dental nurses and dental hygiene therapy students, as it enabled them to understand the scope of practice and value of working with other qualified healthcare professionals.(14)

Additionally, program and system descriptions outlined potential approaches to the delivery arrangements of oral-health services in Canada. These approaches included:

- creating alternative service settings for oral healthcare such as community health centres, institutions and long-term care;(30;31)
- delivering preventive oral healthcare for children in non-dental settings and dental offices (e.g. school-based oral-health programs);(30) and
- developing outreach or mobile oral healthcare (e.g., on-site services for older adults in long-term care and First Nations communities).(30)

In addition, two provincial reports indicated potential steps for enhancing the accessibility and cost-effectiveness of oral-health services. One report indicated that the lack of quality data about oral-health services contributes to the lack of understanding about the relationship between oral health and overall health.(27) The authors identified Local Health Integration Networks as a potential facilitator in the planning

and integration of oral-health services into the health system, with several access points in the community (e.g., Aboriginal Health Access Centres, Family Health Teams and Community Care Access Centres) being potential mechanisms for supporting delivery of such services. In another report for the Ontario Ministry of Health and Long-Term Care, the authors provided four main recommendations:

1) review the current policies and mechanisms to ensure that all Ontarians have access to fluoridated drinking water;
2) further review of how publicly funded oral-health programs and services for Ontarians are monitored and evaluated;
3) better integrate low-income oral services with the rest of the healthcare system in Ontario; and
4) improve access to oral-health services for First Nations in Ontario.(1)

Other jurisdictions have developed approaches to the delivery arrangements of oral-health services. The details related to these approaches are available in Table 1 below, and key examples of delivery arrangements include:

- focusing on prevention and early intervention for children and youth (e.g., Australia, Denmark and France for school-based oral-health programs);
- expanding oral-health services into community-based clinics (e.g., Australia and United States);
- increasing the number of dental hygienists in independent practice settings (e.g., Australia, Sweden and the United States);
- incorporating dentists and allied dental professionals in family health teams into primary-care settings (e.g., Brazil)
- reviewing current opportunities to integrate primary and dental healthcare (e.g., the United States); and
- utilizing a two-tier system for oral-health services (e.g., England for the two types of NHS primary care)

Table 1: Approaches that could be used as part of efforts to integrate oral-health services in the health system

Jurisdiction	Governance arrangements	Financial arrangements	Delivery arrangements
Australia (15;16)	• State and territory governments responsible for dental care • Dentists and allied dental professionals are regulated under National Registration and Accreditation Scheme (NRAS)	• Mixed public and private dental model • Most dental care expenses paid by private insurance or out-of-pocket payments • Child Dental Benefits provides basic dental services capped at AU $1,000 per child over two consecutive calendar years • Cap on cost-sharing for dental care services	• Some state governments have school oral-health programs, or community-based clinics, or a combination • The dental workforce includes dentist, dental hygienists, prosthetics, specialists, therapists, dentists, and oral-health therapists
Brazil (17;18)	• United Health System provides comprehensive and universal access to oral-health services • Dentists and allied dental professionals are regulated under The Federal Council of Dentistry	• Mixed public and private dental model	• Dentists and dental hygienists are included in family health teams (e.g., physicians, nurses, dietitians) • The dental workforce includes dentists, dental hygienists, dental assistant, dental technician, and dental technician assistant
Denmark (16;19;20)	• Regions own, manage and finance the majority of dental care • Municipalities are responsible for providing municipal dental care (e.g., children's dentists and home dental services) • Dentists are regulated under the Danish Health and Medicine Authority	• Mixed public and private dental model • 70.5% of the total dental expenditure are out-of-pocket payments • Preventive and curative dental services fully covered for children under 18 years old, individuals with disabilities, and older adults • Cost-sharing for those 18 years old and older between the patient and Danish Dental Association	• Dental health is provided in schools for children and adolescents (e.g., comprehensive clinical oral care and prevention) organized by municipalities • The dental workforce includes dentists, dental hygienists, dental technicians, and clinical dental technicians • Dental hygienists can work independently in their own dental hygiene offices
France (16-18;20;21)	• Dentists are regulated under the Ordre National des Chirugiens-Dentistes	• Mixed public and private dental model • Statutory Health Insurance covers some oral-health services • Cost-sharing for most dental treatments • Preventive dental services fully covered at ages six, nine, 12, 15, and 18	• Oral-health prevention sessions are provided at primary schools • The dental workforce includes dentists, dental assistants and dental technicians

Sweden (16;18;20;22)	• Dental care is provided by the Public Dental Service (PDS) • County councils responsible for local planning of dental care	• Mixed public and private dental model • PDS provides free dental care for people up to 19 years of age • Adults (aged 20 to 75 or older) can receive subsidized dental care (e.g., dental care voucher for preventive care, or a "high-cost protection scheme" that reimburses 50% to 85% of other dental services), or receive care from dentists in private practice for preventive care • Cap on cost-sharing for dental care services	• Dental workforce includes dental hygienists, dental technicians, and orthodontic auxiliaries • Dental hygienists can work independently in their own dental hygiene offices • Preventive dental care provided to children and adolescents in schools or child healthcare centres
UK (England) (16-18;20;23)	• Dentists are regulated under the General Dental Council • General dental services (GDS) provided by dentists are categorized into four groups: provider (i.e., dental practice owner), provider only (i.e., deliver dental services), performer (i.e., they work for a provider only or providing performer), and providing performer	• Mixed public and private dental model • Cost-sharing for most dental treatments • Dental services fully covered for specific groups (e.g., children under 18 years of age, pregnant or nursing mothers, those on welfare benefits, and those less than 19 years of age who are also in full-time education) • Private dental treatment is paid directly by the patient on a fee-for-service basis or through private insurance plan	• Three main types of NHS primary care dentistry includes: general dental service (e.g., for majority of patients), community dental services (e.g., patients with severe physical disabilities or mental illness), and independent practices • The dental workforce includes dentists, dental hygienists, dental therapists, orthodontic therapists, dental technicians, and clinical dental technicians
United States (17;18;24)	• Each state government has a dental professional regulatory board	• Most dental care expenses are paid by private insurance or paid out-of-pocket • 6% of dental care is funded through public agencies, most of which is to fund the Medicaid program for low-income families • Medicare only pays for a small fraction of dental care for older adults (65 and older) when it is linked to the treatment of a medical problem • Dental care services in community-based clinics are paid using a sliding-scale fee	• Some states (n=35) allow dental hygienists to practise independently in their own dental hygiene offices • The dental workforce includes dentists, dental hygienists, dental assistants, denturists, and dental laboratory technicians • Integration of dental care into primary care is being explored in some communities

Table 2: Recent provincial/territorial and national oral-health recommendations

Jurisdiction	Title	Date	Key recommendations
British Columbia	Healthy Smiles for Life: BC's First Nations and Aboriginal Oral Health Strategy (25)	2014	• Provide school-age preventive services and community-based preventive services • Explore alternate dental care delivery models and coordinate dental staff to support access to oral healthcare and basic restorative services • Explore opportunities to coordinate the different skill sets of dental professionals • Strengthen community capacity to support oral health and develop partnerships with key community members (e.g., primary-care providers)
Alberta	Oral Health Action Plan (37)	2016	• Identified seven core functions essential to addressing the oral health of Albertans: oral-health surveillance, evidence-based dentistry, standardized prevention and treatment services, strong oral-health partnerships, monitoring and evaluation of initiatives, responding to emerging issues, and oral-health advocacy. • Provide dental treatment to low-income children, adults and northern Alberta communities without private dental insurance or government-funded dental benefits • Expand the number of healthcare providers and facilities receiving training for daily oral hygiene in continuing care
Saskatchewan	No report identified	Not applicable	• No recommendations identified
Manitoba	No report identified	Not applicable	• No recommendations identified
Ontario	Report on Access to Dental Care and Oral Health Inequalities in Ontario (26)	2012	• Reduce access barriers to oral health for marginalized populations, low-income, the uninsured, young adults, and those with lower education attainment
	Ontario Ministry of Health and Long-Term Care. Oral health – More than just cavities: A report by Ontario's Chief Medical Officer of Health (1)	2012	• Review the current policies and mechanisms to ensure that all Ontarians have access to fluoridated drinking water • Review of how publicly funded oral-health programs and services for Ontarians are monitored and evaluated • Integrate oral services for low-income population with the rest of the healthcare system in Ontario • Improve access to oral-health services for First Nations people in Ontario
	Review of Oral-health services in Ontario (27)	2014	• Emphasizes the increasing trend of dental hygienists practising independently in rural and remote communities • Highlights a need for the delivery of timely and accessible cost-effective oral-health services • Identifies Local Health Integration Networks as a potential facilitator in the planning and integration of oral-health services into the health system, with several access points in the community (e.g., Aboriginal Health Access Centres, Family Health Teams and Community Care

			Access Centres) being potential mechanisms for supporting delivery of such services • Identifies the need for opportunities to strengthen collaboration among oral-health providers and other health services providers
Quebec	Plan d'action de santé dentaire publique 2005-2012 (36)	2006	• This report was not reviewed because it was only available in French
New Brunswick	No report identified	Not applicable	• No recommendations identified
Nova Scotia	Nova Scotia: Oral Health Review (35)	2008	• No recommendations identified, but stakeholders indicated a need for guidance, leadership and expertise in oral health in the provincial government, through either a 'shared part-time dental consultant' position or a 'full-time dental consultant position', which would assume responsibility for oral-health issues that are presently managed by the Chief Public Health Officer
Prince Edward Island	No report identified	Not applicable	• No recommendations identified
Newfoundland & Labrador	No report identified	Not applicable	• No recommendations identified
Yukon	No report identified	Not applicable	• No recommendations identified
Northwest Territories	Brushing up on Oral Health in the Northwest Territories (28)	2014	• Restructure oral-health services to an integrated care approach (e.g., oral health in health and wellness programs) • Explore the use of oral-health teams and new ways of remunerating oral-health providers to incentivize evidence-based care
Nunavut	Healthy Teeth, Healthy Lives: Inuit Oral Health Action Plan (32)	2013	• Identified eight primary actions to address oral-health disparity: strengthen leadership, link oral health to overall health, increase prevention, improve treatment, engage and mobilize parents and caregivers, engage and mobilize adolescents, increase the number of Inuit oral-health service providers, and improve use and access to nutritional food. • Expand the access to oral-health services for pregnant women, particularly when they are awaiting delivery, to encourage lifestyle changes • Build a partnership with the Canadian Dental Association and the Canadian Dental Hygienists Association to help promote prevention among the Inuit community • Engage universities and training institutions for dental and dental hygiene students to learn about oral-health promotion from northern communities
Canada	A Canadian Oral Health Framework (29)	2014	• Emphasizes that oral health should be included as a key part of overall health • Identifies strategies for oral-health integration such as including within inter-professional education, collaborating with educational departments and other health professionals, and engaging dental stakeholder organizations with other professions

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APPENDICES

The following tables provide detailed information about the systematic reviews and primary studies identified in the rapid synthesis. The ensuing information was extracted from the following sources:

- systematic reviews - the focus of the review, key findings, last year the literature was searched and the proportion of studies conducted in Canada; and
- primary studies - the focus of the study, methods used, study sample, jurisdiction studied, key features of the intervention and the study findings (based on the outcomes reported in the study).

For the appendix table providing details about the systematic reviews, the fourth column presents a rating of the overall quality of each review. The quality of each review has been assessed using AMSTAR (A MeaSurement Tool to Assess Reviews), which rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial or governance arrangements within health systems. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered "high scores." A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7 (Suppl1):S8).

All of the information provided in the appendix tables was taken into account by the authors in describing the findings in the rapid synthesis.

Appendix 1: Summary of findings from systematic reviews about oral health in relation to health system governance, financial and delivery arrangements

Health System Arrangement	Focus of systematic review	Key findings	Year of last search/ publication date	AMSTAR (quality) rating	Proportion of studies that were conducted in Canada
Governance	Effect of continuing dental professional development on learning, behaviour or patient outcomes (3)	The review identified the effectiveness of continuing professional development (CPD) for dentists in primary care (i.e. dentists practising in the dental office) on learning, behaviour or patient outcomes. Five of the 10 studies focused on patient outcomes and found positive but not statistically significance in terms of increased use of dental care service. Due to the limited studies, it is difficult to draw conclusions on CPD on patient outcomes.	Not reported	7/10 (AMSTAR rating from McMaster Health Forum)	0/10
Financial	Effects of different methods of remuneration on the behaviour of primary care dentists (2)	Two low-quality studies examined the effects of different methods of remuneration on the behaviour of dentists. One study reported an increase in clinical activity (i.e., examination, oral hygiene instruction, scaling and polishing, periodontal treatment) related to fee-for-service payments. However, it is not possible to determine whether fee-for-service had an impact on patient outcomes, The second study compared the impact of capitation payments (i.e., payment based on the number and type of patients) and fee-for-service payments on primary care dentists' clinical activity. The study reported that dentists restored carious teeth at a later stage and carried out fewer fillings and extractions than fee-for-service. The authors indicated that financial incentives within the remuneration systems might produce changes to clinical activity by dentists. Overall, there is limited evidence regarding the cost-effectiveness of the different remuneration methods. Further research is needed to determine the effect of remuneration on patient outcomes.	2013	11/11 (AMSTAR rating from McMaster Health Forum)	0/2
Delivery	Utilizing oral-health services provided by non-dental health practitioners in developed countries	The review reported that both children and adults utilize non-dental health practitioners in the management of oral healthcare. A total of 25 studies reported on the use of non-dental health practitioners (i.e., emergency department medical staff, family physicians, and pharmacists) for oral health problems. Two of	2014	5/9 (AMSTAR rating from McMaster Health	3/43

	(4)	the 25 studies indicated pharmacists were most frequently approached for tooth injury or toothache pain. Three studies reported that individuals sought medical staff or family physicians for oral-health services instead of an oral healthcare provider due to pain severity, lack of a source of dental care, financial barriers, and cost of dental care. Patients were generally prescribed with pain medication or referred to a dentist. Patient health outcomes were not reported.		Forum's Impact Lab)	
	Assessment of patient-centred care in general dental practice (5)	Three qualitative studies were identified that described key features of patient-centered care within dentistry. One study conducted in Canada reported the key aspects of successful delivery of dental care to patients including: 1) understanding patients' social context; 2) taking time and showing empathy; 3) avoiding moralistic attitudes; 4) overcoming social distances; and 5) favouring direct contact with patients. None of the three studies discussed patient satisfaction, oral-health promotion, or physical comfort. The authors noted that oral-health literature lacked an emphasis on co-ordination and integration of oral health into other health services. None of the three studies were based in general dental practice and none sought the views of patients. The systematic review reveals a lack of understanding of patient-centred care within dentistry. There is poor evidence to support the use of the current patient-reported outcome measures as indicators of patient-centeredness.	2014	6/9 (AMSTAR rating from McMaster Health Forum)	1/3

Appendix 2: Summary of findings from primary studies about current programs that integrate oral health into other health services and programs

Health System Arrangement	Focus of study	Study characteristics	Sample description	Key features of the intervention(s)	Key findings
Governance	No relevant studies were identified for this health system arrangement				
Financial	Cost-effectiveness of a simulated universal publicly funded sealants application program (6)	*Publication date:* 2010 *Jurisdiction studied:* Quebec, Canada *Methods used:* economic evaluation using a virtual population of 8-year-old children that was monitored over a time span of 10 years. The incremental cost per child without decay was computed	Virtual population of 8-year-old children that were monitored over a time span of 10 years	A simulated Markov model was built to analyze the occurrence of cavities and costs under the different probabilistic occurrences of events. A 10-year time span was chosen, with the model validated by dental professionals: two public health dentists and two general dentists practising in private clinics.	The evaluation used a Markov model to assess three interventions: a mixed program (i.e., a mix of publicly funded clinics and private clinics), a private program (i.e., private clinics and paid by health insurance), and a public program (i.e., performed in schools and funded by public health payer). Over the 10-year span, the estimated effectiveness would amount to 60,792 children without decay in the mixed situation, 64,672 children in the private situation, and 65,626 children in the school situation. The average cost per child without decay was $179 for the mixed and the school program, and $220 for the private program. The evaluation reported that the school program was dominant over the private program as it was less costly and more effective (i.e., fewer retention of sealants, and fewer rate of resealing and restoration). Overall, a universal school-based program was more cost-effective than private practice.
	Clinical effectiveness and cost-effectiveness of routine dental checks (7)	*Publication date:* 2003 *Jurisdiction studied:* United Kingdom *Methods used:* Economic evaluation of 3-, 6-, 12-, 18, 24- and 36-month dental check recall	The age of the study populations ranged from three years to >65 years. The majority of studies considered permanent dentition; four considered	Access to dental check and the frequency of dental check.	Only one formal cost-effectiveness analysis was assessed and reported an incremental cost of US$73 per carious surface when comparing 12-month dental assessment to no assessment. Further analysis is needed on the role of dental check and its effectiveness in oral diseases. Five impact studies reported that less frequent dental checks were associated with reduced assessment and

		policies	deciduous dentition, and three considered mixed dentition and permanent dentition		treatment, with little evidence of an adverse impact on dental health.
Delivery	Integrating oral health into pediatric nursing practice (8)	*Publication date:* 2015 *Jurisdiction studied:* Midwestern Canada *Methods used:* nursing students conducted oral-health assessments for 78 hours. Nursing students received training from a dentistry faculty member or a public health oral-health hygienist on procedures related to pediatric oral healthcare	Seven nursing students were placed in one of three designated urban schools (one elementary and two secondary). The elementary schools had students aged five to13 years and the high school students were aged 14 to 19. The schools were selected from core, inner city neighbourhoods in Midwestern Canada	The oral-health assessment conducted by the nurses included a family health history and questions related to dental hygiene (i.e., dental coverage, frequency in dental visits). Additionally, an oral-health physical assessment is conducted, which is followed by dental advice for home care. Dentists facilitated decision-making and follow-up procedures as needed. Each student was assessed based on a prioritization system, which includes: 1) student has urgent oral-health needs; 2) student has some problem areas and needs close monitoring; and 3) the student has seen a dentist in the last year.	On average, the nursing students assessed 35 students for 78 hours and completed a follow-up with at least one health issue for 50-60% of these students. Positive patient outcomes included accessibility of healthcare, establishing pathways of care, overcoming financial barriers, and oral-health disease prevention. The authors indicated that nurses are strategically positioned to promote oral health by using an oral-health assessment tool, and creating partnerships between nursing and dentistry.

	Exploring the number of visits to physicians for oral health-related complaints in Ontario, Canada (13)	*Publication date:* 2015 *Jurisdiction studied:* Ontario, Canada *Methods used:* A retrospective secondary data analysis of health system utilization in Ontario was conducted for visits to physicians for oral health-related diagnosis	Data for all OHIP approved billing claims were accessed over 11 fiscal years (2001-2011)	Data were extracted from IntelliHealth Ontario, a repository that contains clinical and administrative data collected from various sectors in the Ontario healthcare system. Data was additionally accessed from the Medical Services database, which contains all OHIP approved billing claims submitted by providers. Rates were stratified into three age groups, 0-19, 20-64, and 65 years and above.	Approximately 208,375 visits per year, with an average of 1,298/100,000 persons were made to physicians for oral health-related diagnoses in Ontario. Eight of the nine diagnostic codes reported in the study are within the scope of dental practice. The authors noted that the substantial number of visits to physicians for oral health-related issues indicate a significant waste of public funds for patient care, as providers do not have the appropriate training, skills and tools for oral-health treatment. The study estimated that minor assessments and intermediate assessments range from $21.70 to $33.70 per visit, which translate to OHIP billings ranging from $50 million to $78 million during this study period. The authors indicated that there were no means to validate the accuracy of the diagnosis in the Medical Service database and the data did not include community health centres.
	Implementing oral care practices and policy into long-term care (10)	*Publication date:* 2014 *Jurisdiction studied:* Ontario, Canada *Methods used:* A case study design with a qualitative approach examining individual, organizational and system factors for the implementation of daily oral care in three long-term care (LTC) facilities	Three LTC residences that are under the same health authority, and included personal care providers, nurse managers, and directors of care	The oral care program intervention included education, resources, and organizational guidelines to improve the delivery of daily mouth care to LTC residents over a 12-month period. A research coordinator and a dental hygienist visited each site at six-week intervals to introduce or modify components.	Following intervention components (i.e., educational handouts, promotion posters, education sessions, oral care toolkits, validated oral-health assessment), the study reported increased awareness, program uptake, advocacy from physician leaders, and a provincial forum that identified priorities for policy. The study reported that delivery of daily oral care in LTC could be achieved through an integrated approach that includes education, healthcare providers and managers, and provision of resources.

	Impact of integrated team care taught using a live NHS contract on the educational experience of final-year dental students (14)	*Publication date:* 2014 *Jurisdiction studied:* United Kingdom *Methods used:* A 49-item questionnaire divided into nine domains that provided both quantitative and qualitative data, which were completed anonymously by students just before qualification	Three student cohorts, 80 students in each cohort at the University of Portsmouth Dental Academy (UPDA). Data was obtained from 227 students, which represented a 95% return rate	The domains from the questionnaire included: support and communication; induction program; course book; clinical experience; tutorials; team experience and integrated care; NHS dentistry; Dental Foundation Training job applications; and accommodation and social. The study focused on domains "team experience and integrated care" and "NHS dentistry", which consisted of 13 questions.	The study reported that dental students enjoyed working with dental nurses and dental hygiene therapy students, which enabled them to understand the scope of practice of these allied professionals. The results from the questionnaire indicated that the dental students valued working as part of an integrated dental team and recognized the value of working with qualified healthcare professionals.
	Providers' perspective on community dental clinics (11)	*Publication date:* 2012 *Jurisdiction studied:* British Columbia, Canada *Methods used:* Case study design that combines quantitative program data with qualitative open-ended interviews with eight senior administrative staff	Eight senior administrative staff were selected for their knowledge of the development and operation of the clinics such as data on patients, treatments and operating costs	Program data included aggregate patient and procedural data in addition to financial reports. The interviews involved learning from the staff within the clinics, and identifying operational commonalities and differences between clinics.	The study found that not-for-profit community dental clinics were primarily subsidized by local health authority, or paid by public dental insurance or by charitable donations. During the 2007 to 2008 period, five clinics with a total of under $4 million treated 23,679 patients with oral-health services. About 43% of the patients were eligible for limited, publicly funded services; however, 32% of the patients had neither private nor public coverage for services, and the remainder of the patients had private dental insurance. The study reported that the main priority for these clinics was to integrate oral-health services with other health and social services.

					One of the clinics utilizes computer-based medical and dental software systems and linked to an on-site pharmacy. The effect of integrated oral-health services on patient outcomes was not reported. Financial barriers to oral-health programs and services were reduced as all clinics had indication that their patients were treated regardless of their ability to pay. However, financial uncertainty and sustainability of these oral-health services was a recurrent theme from the staff members. Further research is needed to determine the effects of community dental clinics on patient outcomes.
	Integrating dental services in long-term care (9)	*Publication date:* 2010 *Jurisdiction studied:* Ontario, Canada *Methods used:* A cross-sectional study in three Ontario long-term care (LTC) facilities, which included recorded observations and reflective notes during open-ended interviews. Structured questionnaires were utilized to stimulate conversation topics	Twenty residents selected from three sites that used different approaches to oral healthcare, such as fee-for-service hygienist, a dentist visit once per week, or a full-time dental team for dental screenings	A complete oral-health assessment was conducted, which included reviewing family history and intra-oral examinations, in addition to the oral-health questionnaire.	The study identified major themes, including oral hygiene, oral discomfort, general health, appearance, dental access, and denture-related issues. The study compared three facilities: 1) Facility A provided fee-for-service hygienists who attended patients at their request; 2) Facility B had a dentist present once per week who was available at the patients' request; and 3) Facility C had a full-time dental team where all patients underwent dental screenings. The LTC facility with a full-time dental team had the best available oral hygiene services; however, the financial implication for this model of care may be a barrier for other facilities. The study reports on accessibility issues for LTC facilities that did not have an on-site dentist. The provision of preventive dental care needs to be determined with further research.

	Exploring perspectives and recommendations for improving oral healthcare in Canada (12)	*Publication date:* 2004 *Jurisdiction studied:* Canada *Methods used:* A questionnaire was sent to 200 agencies, government and professional organizations. Data from the returned questionnaires were aggregated	The questionnaire was sent to: all faculties or schools of dentistry, dental hygiene, denture and dental therapy across the country; all ministries of health and social or community services for the provinces and Health Canada; all local health authorities in Canada; all dental insurance companies; and all professional organizations pertaining to dentistry. 53.2% of the respondents were from Ontario, with 55.1% identifying themselves as a government employee	Questions from the questionnaires were determined by the planning group of the Toronto Oral Health Coalition, the faculty of dentistry at the University of Toronto, and the Dental Hygiene program at George Brown College. The survey included: discussion on the positive and negative aspects of oral healthcare delivery in Canada; local developments in the past five years to improve access to oral healthcare; changes that have occurred over the past 10 years to make the system less effective; and suggestions for future improvement in oral-health programs and services.	The study reported that only 91 of the 225 (40%) sent surveys were completed and returned. Most respondents found the public programs for children and adults were generally positive, and that dentists offer good care. 77% of the respondents disagreed with the statement that preventive oral healthcare is accessible, and 55% disagreed with the statements that access to dentists and dental specialists is easy. Financial barriers for patients without private dental insurance or inadequate insurance were a recurring theme. Common themes emerged from respondents with respect to oral healthcare needs, including: a need for alternative delivery sites such as community health centres; recognition of oral health as a component of general health; regulatory issues; and further training for dentists with at-risk patients or those suffering from mental illness. Some respondents suggested delivery models to include development of grassroots coalitions and provision of preventive care.

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