Family Medicine and Community Health
REVIEW

A paradigm shift in models of oral health care: An example and a call to action

Bradley Christian, Martin Hall, Rachel Martin

Abstract

The consequences of oral disease are wide-ranging and can have a major impact on an individual's and that person's family's quality of life. A range of factors interact to determine a person's oral and general health. Such factors can be biological, social, economic, political, cultural, or environmental, in addition to knowledge, attitudes and behaviors. Traditional models of oral health care, however, have generally ignored these factors and instead have focused on the treatment and management of existing pathology (tertiary prevention/downstream approach). This has had no effect on the rate of hospitalization or the inequitable distribution of dental diseases. To reduce the prevalence and severity of oral diseases at the individual and population levels, holistic evidence-informed prevention-based health-promoting models of care that focus on upstream determinants of health are required. The Oral Health Program at North Richmond Community Health in the state of Victoria, Australia, has developed an innovative model of oral health care based on the following principles: health promotion, disease prevention, risk-based access to care, client- and family-centered care, team-based provision of care, multidisciplinary care, and innovation. Evaluation of this approach is currently being conducted to study the sustainability of such a model under the current public dental service funding model.

Keywords: Delivery of health care; health promotion; oral health; dental health services; dentistry

Oral Health, North Richmond Community Health Limited, Richmond, VIC 3121, Australia

CORRESPONDING AUTHOR:
Dr. Bradley Christian, BDS, MDSc (Hons)
Research Fellow, Oral Health, North Richmond Community Health Limited, 23 Lennox Street, Richmond, VIC 3121, Australia
Tel.: +61-9418-9825
Fax: +61-9428-2269
E-mail: bradleyc@nrch.com.au

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Introduction

Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial well-being [1]. The consequences of oral disease are wide-ranging and can have a major impact on an individual's and that person's family's quality of life. Pain, infection, and tooth loss are the most common consequences of oral disease, which can cause difficulties with chewing and swallowing, as well as speech, sleep, and productivity. There can also be significant impacts on self-esteem, psychological and social well-being, employment, interpersonal relations, and quality of life. Poor oral health has also been linked to a range of conditions including cardiovascular disease, diabetes, stroke, kidney disease, and respiratory infections [2, 3].

Recent Australian data show that nearly half of young children (6-year-old) have caries in their deciduous (baby) teeth, with approximately 62% of this decay being untreated. For older children (12-year-old), 39% have caries, of which approximately 52% is untreated [4]. Recent hospital admission data in Victoria highlight that for 0–14-year-old children, treatment for dental extractions and restorations is second to treatment of asthma as the most common cause of hospital admission for children [5]. Vulnerable populations such as people from low socioeconomic and disadvantaged backgrounds, Aboriginal and Torres Strait Islanders, refugee and asylum seekers, pregnant women, the elderly, and people with complex special needs have higher levels of oral disease and poorer overall health [3, 6, 7]. The Healthy Mouths, Healthy Lives National Oral Health Plan identified the importance of good oral health in all population groups within Australia.

Models of care

In this article 'model of care' is defined as a multifaceted concept, which broadly defines the way health services are delivered. It outlines best-practice care and services for a person, population group, or patient cohort as they progress through the stages of a condition, injury, or event [8]. The particular model of care at a health care service can significantly impact on both the client accessing the services and the service provider. A model of care's outcomes can be related to domains such as client health outcomes, service accessibility, service quality, service economics, organization policy, workforce structure, and sustainability. Given this range of outcomes, a best-practice model of care will need a multipronged approach to positively address the various domains. Models of care which encompass prevention and seek to address the broader determinants of oral health outcomes will have the most potential to reduce the inequitable social gradient in oral health [9]. Such models need to be continually evaluated, evolving, adapting to circumstances and new evidence, and be able to operate in the various domains, stated previously. Evaluations of models of care should be ongoing as there is often very limited evidence on which to make decisions, and as such policy and economics heavily influence the direction of new approaches.

Traditional models of oral health care

A range of factors interact to determine a person's oral and general health. Such factors can be biological, social, economic, political, cultural, or environmental, in addition to knowledge, attitudes, and behaviors [10, 11]. Traditional models of oral health care, however, have generally ignored the above-stated determinants and instead have focused on the treatment and management of existing diseases (tertiary prevention/downstream approach). This has had no effect on the rate of hospitalization or the inequitable distribution of dental diseases [12–15]. An example in the oral health sphere is the conventional practice for caries management, where a reliance on surgical intervention (drilling and filling) is informed more by opinion derived from subjective experience among practicing clinicians than by current evidence on the caries process [16]. An analysis of epidemiologic studies on (1) diagnosis, (2) lesion incidence and progression rates of dental caries, (3) noninvasive primary and secondary preventive strategies, and (4) social determinants of health, and laboratory studies into the (1) biology, (2) chemistry, and (3) physics of lesion progression and regression indicates that timely intervention by nonsurgical treatment modes could avoid the need for most restorative dentistry (fillings) [17, 18]. However, Australian data from 2003–2004 show that restorative treatment continues to be common practice for managing caries, including for noncavitated lesions [19]. Nadanovsky and Sheiham [15] showed that dental services explained only about 3% of the differences in the change in 12-year-old caries levels across several countries. Socioeconomic factors had the largest impact independent of the use of fluoridated toothpaste. Thus, with the traditional model of oral health care, oral diseases and inequalities in health will continue to be prevalent and may even increase.

Paradigm shift in models of oral health care

In contemporary times, changing service needs, workforce deficiencies, and an outcome-based approach have created an urgent need for new approaches to both the delivery and the types of oral health care provided in the community. The need for flexible, evidence-based and client-centered models of care has been identified by some health services as being important to improving client oral health, and the efficiency

and effectiveness of service delivery. In response to a broader understanding of the social determinants of health and well-being, and the critical importance of prevention and oral health promotion to health outcomes, innovative evidence-informed models of care are being developed and tested. These new models will require efficient, effective, and sustainable integration of population-based health promotion and disease prevention strategies along with, but with a reduced emphasis on, treatment-oriented clinical interventions. They will also need to include strategies for early detection and disease identification, and be based on the principles of minimal intervention dentistry (MID). The concept of MID came about in the late 1980s, for several reasons: (1) the dramatic decline in caries rates; (2) the evidence to support fluoridation and widespread use of fluoride toothpaste and other fluoride vehicles; (3) failure of restorations – repeated restoration cycles; and (d) new evidence on the caries process and associated factors – progression, regression, bacterial biofilm (plaque), and saliva. The guiding principles of MID are (1) early caries detection and risk assessment, (2) remineralization of demineralized enamel and dentine; (3) optimal caries preventive measures; (4) minimally invasive operative interventions; and (5) repair rather than replacement of restorations [20]. In its earlier form, MID was focused very much on the clinical aspects of disease management; however, in contemporary times, in recognition of the social, cultural, economic, and environmental influences on oral health, the concept of MID has become enmeshed in health promotion principles [21] – thus the new terminology 'health-promoting models of oral health care.' Risk assessment, a component of MID, is important for several reasons: it prioritizes access to care on the basis of risk; it helps identify particular risk factors for the disease and thus supports targeted, effective, and efficient disease management (including patient recall times); and it helps patients understand their risk of developing disease and associated factors, which empowers them to make informed decisions and take actions to reduce risk. Several caries risk assessment tools are currently available, and the evidence to support the reliability, validity, and implementation of these tools in everyday practice is being generated through research and evaluation studies [22].

The following section provides information on an evidence-informed innovative prevention-based health-promoting model of oral health care, which was developed and is being implemented at North Richmond Community Health (NRCH) in Victoria, Australia.

An example: the North Richmond prevention-based model of oral health care

NRCH has been providing quality community health services since 1974. The organization's vision is to be an innovative organization, responsive to and supportive of community needs and aspirations: open to change and challenges. NRCH currently operates more than 15 health service programs, administers an annual budget of $8 million, and employs a committed staff group of more than 100 people [23].

The oral health program (NRCH-OH) employs 40 staff and operates with a clinical team consisting of oral health educators, dental and oral health therapists, hygienists, prosthetists, dentists, and a specialist dentist. NRCH-OH operates over three sites and two mobile outreach programs. The infrastructure at the Richmond site includes a modern seven-chair clinic and two portable chairs used for outreach. The NRCH-OH program aims to improve oral health of clients by moving away from the traditional treatment/disease-focused care, toward a more holistic health promotion–based model of care. This is in recognition of the fact that people's health and health-related behaviors are intricately associated with their social, cultural, economic, demographic, and political environments. The NRCH-OH model of oral health care is strongly aligned with the health promotion priority action areas as determined by the Ottawa Charter [24]. The guiding principles of the NRCH-OH model of oral health care, to achieve positive oral health outcomes for clients, staff, and the organization, are as follows:

A. ***Health promotion based on the themes of the Ottawa Charter.*** The Ottawa Charter health promotion themes ensure a holistic approach to improving the health of individuals, communities, and populations. The themes are as follows:
   - Reorienting health services. The role of the health sector must move increasingly in a health promotion direction, beyond its responsibility for providing clinical and curative services. Health services need to embrace an expanded mandate which is sensitive

to and respects cultural needs. This mandate should support the needs of individuals and communities for a healthier life, and open channels between the health sector and broader social, political, economic, and physical environmental components.

- Developing personal skills. Enabling people to learn throughout life, to prepare themselves for all of its stages, and to cope with chronic illness and injuries is essential. This has to be facilitated in school, home, work, and community settings.
- Strengthening community action. At the heart of this process is the empowerment of communities – their ownership and control of their own endeavors and destinies.
- Create supportive environments. Our societies are complex and interrelated. Health cannot be separated from other goals. The inextricable links between people and their environment constitutes the basis for a socioecological approach to health.
- Build healthy public policy. It is coordinated action that leads to health, income, and social policies that foster greater equity.

B. Prevention. The NRCH-OH model of oral health care incorporates two concepts of disease prevention: (1) the individual-focused traditional concept of primary, secondary, and tertiary prevention of disease; and (2) the concept of prevention which aims to understand the broader environment people live in and how this influences oral health (population health approach).

C. Risk-based access (both disease and social). Classifying and prioritizing clients on the basis of their risk of oral diseases. Risk profiles for individual clients and their families are assigned on the basis of their current disease profile and indicators of their social, economic, cultural, and physical status.

D. Client- and family-centered approach to care. This ensures that clients feel safe, respected, and empowered as partners in decision making regarding their oral health management. Clients are empowered to make informed decisions regarding their health and treatment options in consultation with the oral health provider. The family-centered approach to health care recognizes that health is intricately related to various aspects of an individual's daily life, and that family/community-level intervention is required to create supportive environments to facilitate effective and sustainable changes in healthy behavior and health outcomes.

E. Partnership- and dental team–based care. Efficient use of the whole team, avoiding duplication of roles within the dental team (dentists, therapists, hygienists, and assistants having clearly defined complementary roles) and a greater role of dental assistants in both prevention and the client experience.

F. Multidisciplinary. Recognizing that oral health is but one aspect of general health and that it shares common risk factors for diseases with general health [25], so working in partnership with other health services within and external to NRCH such as nutrition, diabetes, and smoking cessation services.

G. Innovative use of staff and resources. Constant evaluation, reassessment, and preparedness to change and evolve. Identification of individual talents, support for professional development, and creating career pathways for enhancement of skills and job satisfaction.

Prevention requires a long-term view and is fundamentally different from the treatment-based approach that most clients and staff have been accustomed to. There will always be factors beyond the clients' control; however, facilitating increased dental awareness and oral hygiene practice may help improve not only the clients' oral health but also their general health. Empowering and supporting clients to make simple dietary changes or to use fluoride toothpaste twice a day to brush their teeth are effective actions in producing improvements in oral and general health. However, to move a treatment-based program funded to fix teeth (traditional model of care) to a model based on health promotion and disease prevention is a major challenge. Robust and ongoing evaluation of this approach to study its ability to exist and be sustainable under the current funding formulation is required.

Conclusion

Oral health and healthy behavior is determined by the complex action and interaction of social, economic, demographic, political, and environmental factors at various levels (individual,

family, community, etc.). Traditionally, models of oral health care have focused on downstream drivers of health, without much success, and as a result, oral diseases continue to be highly prevalent in the population. In addition, most traditional oral health care practices are determined by expert opinion (lowest form of evidence) rather than through scientific enquiry. To reduce the prevalence and severity of oral diseases at the individual and population levels, holistic evidence-informed prevention-based models of care that focus on upstream determinants of health are required. The challenges associated with changing to an evidence-informed model of oral health care will be significant, particularly since most dental practitioners and clients view mechanical (drilling and filling), technology-based, disease-focused and expert opinion–driven care as being best-practice dentistry. However, with innovative and passionate clinicians, supportive professional and academic leadership, and a commitment to improve oral health, steady progress toward this change can be achieved.

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Conflict of interest

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