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Nursing Best Practice Guideline
Shaping the Future of Nursing

Oral Health:
Nursing Assessment and Interventions

RNAO
Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers autorisés de l'Ontario
NURSING BEST PRACTICE GUIDELINES PROGRAM

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NURSING BEST PRACTICE GUIDELINES PROGRAM

Greetings from Doris Grinspun
Executive Director
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It is with great excitement that the Registered Nurses' Association of Ontario (RNAO) presents this guideline, *Oral Health: Nursing Assessment and Interventions* to the health care community. Evidence-based practice supports the excellence in service that nurses are committed to delivering in our day-to-day practice. RNAO is delighted to provide this key resource to you.

RNAO offers its heartfelt thanks to the many individuals and institutions that are making our vision for Nursing Best Practice Guidelines (BPGs) a reality: the Government of Ontario for recognizing our ability to lead the program and providing multi-year funding: Irmajean Bajnok, Director, RNAO International Affairs and Best Practice Guidelines (IABPG) Programs, for her expertise and leadership in advancing the production of the BPGs; each and every Team Leader involved, and for this BPG in particular – Toba Miller – for her superb stewardship, commitment and, above all, exquisite expertise. Also thanks to Heather McConnell, Associate Director, IABPG Program, who provided the coordination and worked intensely to see this BPG move from concept to reality. A special thanks to the BPG Panel – we respect and value your expertise and volunteer work. To all, we could not have done this without you!

The nursing community, with its commitment and passion for excellence in nursing care, is providing the knowledge and countless hours essential to the development, implementation, evaluation and revision of each guideline. Employers have responded enthusiastically by nominating best practice champions, implementating and evaluating the guidelines and working towards a culture of evidence-based practice.

Successful uptake of these guidelines requires a concerted effort from nurse clinicians and their health care colleagues from other disciplines, from nurse educators in academic and practice settings and from employers. After lodging these guidelines into their minds and hearts, knowledgeable and skillful nurses and nursing students need healthy and supportive work environments to help bring these guidelines to practice actions.

We ask that you share this guideline with members of the interdisciplinary team as there is much to learn from one another. Together, we can ensure that the public receives the best possible care every time they come in contact with us. Let's make them the real winners in this important effort!

Doris Grinspun, RN, MScN, PhD(c), O. ONT.
Executive Director
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Oral Health: Nursing Assessment and Interventions

Disclaimer

These guidelines are not binding on nurses or the organizations that employ them. The use of these guidelines should be flexible based on individual needs and local circumstances. They neither constitute a liability nor discharge from liability. While every effort has been made to ensure the accuracy of the contents at the time of publication, neither the authors nor the Registered Nurses' Association of Ontario (RNAO) give any guarantee as to the accuracy of the information contained in them nor accept any liability, with respect to loss, damage, injury or expense arising from any such errors or omission in the contents of this work.

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Stakeholder Acknowledgement

Stakeholders representing diverse perspectives, both nationally and internationally, were solicited for their feedback. The Registered Nurses' Association of Ontario wish to acknowledge the following individuals/groups for providing feedback and their contribution to the development of this nursing best practice guideline:

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In order to ensure that there were a range of opportunities to gather the perspectives of the client, family and caregiver in relation to oral health, several focus groups were held in various sites in Ontario. The RNAO would like to acknowledge those that participated and provided their feedback.

a) Focus Group – Long-term care

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b) Focus Group – Mental Health

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How to Use This Document

This nursing best practice guideline is a comprehensive document providing resources necessary for the support of evidence-based nursing practice. The document should be reviewed and then applied to both specific needs of the organization or practice setting/environment, and to meet the needs and wishes of the client. This guideline should not be applied in a "cookbook" fashion, but used as a tool to assist in decision-making for individualized client care, and in ensuring that appropriate structures and supports are in place to provide the best possible care.

Nurses, other health care professionals and administrators who are leading and facilitating practice changes will find this document valuable for the development of policies, procedures, protocols, educational programs, assessment and documentation tools. It is recommended that this guideline be used as a resource tool. Nurses providing direct client care will benefit from reviewing the recommendations, the evidence in support of the recommendations, and the process that was used to develop the guidelines.

It is highly recommended that practice settings/environments adapt these guidelines in formats that would be user-friendly for daily use. This guideline has some suggested formats for such local adaptation and tailoring.

Organizations wishing to use the guideline may decide to do so in a number of ways:

- Assess current nursing and health care practices using the recommendations in the guideline.
- Identify recommendations that will address identified needs or gaps in services.
- Systematically develop a plan to implement the recommendations using associated tools and resources.

The Registered Nurses' Association of Ontario (RNAO) is interested in hearing how you have implemented this guideline. Please contact us to share your story. Implementation resources will be made available through the RNAO website to assist individuals and organizations to implement best practice guidelines.

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Summary of Recommendations

RECOMMENDATION	*LEVEL OF EVIDENCE
Practice Recommendations	
1. Nurses should be aware of their personal oral hygiene beliefs and practices, as these may influence the care they provide to their clients.	III
2. As part of their client admission assessment, nurses obtain an oral health history that includes oral hygiene beliefs, practices and current state of oral health.	IV
3. Nurses use a standardized, valid and reliable oral assessment tool to perform their initial and ongoing oral assessment.	III
4. Oral health status information is regularly reviewed with all members of the health care team to monitor client progress and facilitate the development of an individualized plan of care.	IV
5. Nurses provide, supervise, remind or cue oral care for clients at least twice daily, on a routine basis. This includes clients who: ■ have diminished health status; ■ have a decreased level of consciousness; and ■ who have teeth (dentate) or do not have teeth (edentate).	IV
6. Nurses provide or supervise the provision of oral care for clients at risk for aspiration.	III
7. Nurses provide ongoing education to the client and/or family members regarding oral care.	III
8. Nurses are knowledgeable of oral hygiene products and their applications as they pertain to their specific client populations.	IV
9. Nurses are aware of treatments and medications that impact on the oral health of clients.	IV
10. Nurses use appropriate techniques when providing oral care to clients.	IV
11. Nurses advocate for referral for those clients who require consultation with an oral health professional (e.g. dental hygienist, denturist, dentist).	IV
12. Nurses ensure that all oral health-related history, assessment and care be documented.	IV
Educational Recommendations	
13. Nurses require appropriate oral health knowledge and skills acquired through entry-level nursing education programs, workplace orientation programs and ongoing professional development opportunities.	IV
14. Nurses who provide oral hygiene care to their clients, either directly or indirectly, must participate in, and complete, appropriate oral hygiene education and training.	IV

RECOMMENDATION	*LEVEL OF EVIDENCE
Organization and Policy Recommendations	
15. Health care organizations develop oral health care policies and programs that recognize the components of oral health assessment, oral hygiene care and treatment are integral to quality client care.	IV
16. Health care organizations develop partnerships and increase capacity among providers to deliver collaborative practice models that improve the oral health care they provide to their clients.	IV
17. Health care organizations implement continuing education opportunities for nurses and support them to complete oral hygiene education and training that is applicable to their health care setting.	IV
18. Health care organizations develop oral hygiene care standards that are based on the best available evidence and ensure they are implemented and monitored as part of the organization's commitment to providing quality oral health care and services.	III
19. Organizations should encourage and offer support, including time and resources, for nurses to participate in oral hygiene research to assist in better understanding the issues related to oral hygiene care provision in various health care settings.	IV
20. Oral hygiene care is monitored and evaluated as part of the organization's quality management program, utilizing a variety of quantitative and qualitative approaches.	IV
21. Organizations develop a plan for implementation of best practice guideline recommendations that include: ■ An assessment of organizational readiness and barriers/facilitators. ■ Involvement of all members (whether in a direct or indirect supportive function) who will contribute to the implementation process. ■ Ongoing opportunities for discussion and education to reinforce the importance of best practices. ■ Dedication of a qualified individual to provide the support needed for the education and implementation process. ■ Ongoing opportunities for discussion and education to reinforce the importance of best practices. ■ Opportunities for reflection on personal and organizational experience in implementing guidelines. ■ Strategies for sustainability.	IV

* Please refer to page 12 for details regarding the interpretation of evidence.

Interpretation of Evidence

Level of Evidence

Ia	Evidence obtained from meta-analysis of randomized controlled trials.
Ib	Evidence obtained from at least one randomized controlled trial.
IIa	Evidence obtained from at least one well-designed controlled study without randomization.
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study, without randomization.
III	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
IV	Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

Responsibility for Guideline Development

The Registered Nurses' Association of Ontario (RNAO), with funding from the Government of Ontario, has embarked on a multi-year project of nursing best practice guideline development, pilot implementation, evaluation, dissemination and support of uptake. One of the areas of emphasis is on nursing interventions related to oral health assessment and management in those populations with special needs. This guideline was developed by a panel of nurses and other health professionals convened by the RNAO, conducting its work independent of any bias or influence from the Ontario Government.

Purpose and Scope

Best practice guidelines are systematically developed statements to assist practitioners' and clients' decisions about appropriate health care (Field & Lohr, 1990). This best practice guideline aims to assist nurses working in diverse practice settings provide evidence-based oral health care to adults with special needs. Within the scope of this guideline, those with special needs may include older adults, those who are medically compromised, intellectually challenged, physically challenged, and/or have severe and persistent mental illness. Many may be frail or dependent upon caregivers to help with their activities of daily living. These adults may live in the community or may be in institutions. It should be noted that children have special assessment needs related to developmental stages that are beyond the scope of this guideline.

The guideline will focus on specific vulnerable populations over the age of 18 years (those who need assistance to meet their oral hygiene needs) and will address:

- assessment of oral health (incorporating screening);
- assessment of current oral hygiene practices; and
- interventions (incorporating care plan development).

The goal of this document is to provide nurses with recommendations, based on the best available evidence, to support the provision of oral hygiene care to adults with special needs.

The clinical questions to be addressed by the guideline include:

- What are the risk factors associated with poor oral hygiene?
- What are the current attitudes and beliefs of nurses providing oral hygiene care?
- What are the optimal oral hygiene interventions for oral health in vulnerable populations?

This guideline contains recommendations for Registered Nurses (RNs) and Registered Practical Nurses (RPNs) on best nursing practices in the area of vulnerable adults requiring assistance with their oral hygiene care. It is intended for nurses who are not necessarily experts in this area of practice who work in a variety of practice settings across the continuum of care**.** It is acknowledged that the individual competencies of nurses varies between nurses and across categories of nursing professionals, and are based on knowledge, skills, attitudes, critical analysis and decision-making that are enhanced over time by experience and education. It is expected that individual nurses will perform only those aspects of oral hygiene interventions for which they have received appropriate education and experience, and that they will seek appropriate consultation in instances where the client's care needs surpass their ability to act independently.

It is acknowledged that effective health care depends on a coordinated interdisciplinary approach incorporating ongoing communication between health professionals and clients /families.

Development Process

In July of 2006, a panel of nurses, oral health professionals (including registered dental hygienists and a dentist) and speech-language pathologists with expertise in the management of oral hygiene care from a range of practice settings was convened under the auspices of the RNAO. The panel discussed the purpose of their work, and came to consensus on the scope of the best practice guideline. Subsequently, a search of the literature for clinical practice guidelines, systematic reviews, relevant research studies and other types of evidence was conducted. See Appendix A for details of the search strategy and outcomes.

Several international guidelines have reviewed the evidence related to oral hygiene, and it was determined that a critical appraisal of these existing guidelines would serve to inform the development of this guideline. A total of three clinical practice guidelines on the topic of oral hygiene were identified that met the following initial inclusion criteria:

- published in English;
- developed in 2002 or later;
- strictly on the topic of oral hygiene;
- evidence-based; and
- the guideline is available and accessible for retrieval.

Members of the development panel critically appraised these three guidelines using the *Appraisal of Guidelines for Research and Evaluation Instrument* (AGREE Collaboration, 2001). As all met the requirements of the AGREE review, a decision was made to work with all three of these guidelines to inform the guideline development process. These were:

- Research Dissemination Core (2002). *Oral hygiene care for functionally dependent and cognitively impaired older adults.* Iowa City (IA): University of Iowa Gerontological Nursing Interventions Research Center.
- Rubenstein, E.B., Peterson, D.E., Schubert, M., Keefe, D., McGuire, D., Epstein, J., Elting, L.S., Fox, P.C., Cooksley, C. & Sonis, S.T. (2004). Clinical practice guidelines for the prevention and treatment of cancer therapy-induced oral and gastrointestinal mucositis. *Cancer Journal, 100*(S9), pg. 2026-2046.
- Singapore Ministry of Health (2004). *Nursing Management of Oral Hygiene.* Singapore: Singapore Ministry of Health.

The panel members divided into subgroups to undergo specific activities using the short-listed guidelines, evidence summaries, studies and other literature for the purpose of drafting recommendations for nursing assessment and interventions. This process resulted in the development of practice, education, and organization and policy recommendations. The panel members as a whole reviewed the first draft of recommendations, discussed gaps, reviewed the evidence and came to consensus on a final set of recommendations.

A draft was submitted to a set of external stakeholders for review and feedback; an acknowledgement of these reviewers is provided at the front of this document. Stakeholders represented various health care professional groups, clients and families, as well as professional associations. External stakeholders were provided with specific questions for comment, and the opportunity to give overall feedback and general impressions. In addition, client and family focus groups in long-term care and mental health were conducted to gather feedback and input to inform the guideline development process.

The feedback from stakeholders was compiled and reviewed by the development panel; discussion and consensus resulted in revisions to the draft document prior to publication. An acknowledgement of the focus group members and stakeholder reviewers is provided at the front of this document.

Definition of Terms

Client: A client is a person with whom the nurse is engaged in a therapeutic relationship. In most circumstances, the client is an individual but may also include family members and/or substitute decision-makers (College of Nurses of Ontario, 2005).

Clinical Practice Guidelines or Best Practice Guidelines: Systematically developed statements to assist practitioner and client decisions about appropriate health care for specific clinical (practice) circumstances (Field & Lohr, 1990).

Consensus: A process for making policy decisions, not a scientific method for creating new knowledge. Consensus development makes the best use of available information, be that scientific data or the collective wisdom of the participants (Black et al., 1999).

Education Recommendations: Statements of educational requirements and educational approaches/strategies for the introduction, implementation and sustainability of the best practice guideline.

Oral Health: The optimal state of the mouth and normal functioning of the oral cavity without evidence of disease.

Oral Hygiene: Oral hygiene is the practice of keeping the mouth clean and healthy by brushing and flossing to prevent tooth decay and gum disease.

Organization and Policy Recommendations: Statements of conditions required for a practice setting that enables the successful implementation of the best practice guideline. The conditions for success are largely the responsibility of the organization, although they may have implications for policy at a broader government or societal level.

Practice Recommendations: Statements of best practice directed at the practice of health care professionals that are ideally evidence-based.

Randomized Controlled Trials: Clinical trials that involve at least one test treatment and one control treatment, concurrent enrollment and follow-up of the test- and control-treated groups, and in which the treatments to be administered are selected by a random process.

Stakeholder: An individual, group or organization with a vested interest in the decisions and actions of organizations who may attempt to influence decisions and actions (Baker et al., 1999). Stakeholders include all individuals or groups who will be directly or indirectly affected by the change or solution to the problem.

Systematic Review: An application of a rigorous scientific approach to the preparation of a review article (National Health and Medical Research Centre, 1998). Systematic reviews establish where the effects of health care are consistent and research results can be applied across populations, settings and differences in treatment (e.g. dose), and where effects may vary significantly. The use of explicit, systematic methods in reviews limits bias (systematic errors) and reduces chance effects, thus providing more reliable results upon which to draw conclusions and make decisions (Alderson, Green & Higgins, 2004).

Background Context

Significance of Oral Hygiene on Health

It is an expectation by both clients and families that when entering a health care provider's office, hospital, long-term facility or receiving care within the home, that the individual's health care needs will be met; however, there is evidence that oral health care is not addressed to the same level as other care needs (Frenkel, Harvey & Needs, 2002).

Research has consistently indicated that oral health has a significant impact on quality of life (Almomani, Brown & Williams, 2006; Chalmers, Carter & Spencer, 2002; Petersen, Bourgeois, Ogawa, Estupinan-Day & Ndiaye, 2005; Sheiham, 2005; Watt, 2005). Good oral health enables individuals to communicate effectively, to eat and enjoy a variety of foods (Watt, 2005). Additionally, poor oral health affects the ability to sleep well, especially in the presence of pain, and impacts on a person's perception of self – both their self-esteem and self-confidence. Petersen of the World Health Organization, (2005), states "oral diseases such as dental caries, periodontal disease, tooth loss, oral mucosal lesions and oropharyngeal cancers human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) – related oral disease and orodental trauma are major public health problems worldwide" (p.661). The relationship between oral health problems and specific medical conditions is being substantiated by evidence from clinical, epidemiological and laboratory studies. "Oral organisms have been linked to infections of the endocardium, meninges, mediastinum, vertebrae, hepatobilary system and prosthetic joints" (Shay, 2002, p. 1215). In addition, oral pain can have an economic impact on society through time away from work, lost productivity and increased health care expenditures (Watt, 2005).

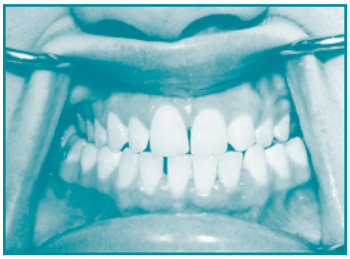
Medical/Dental Interface

The emerging association between periodontal disease and systemic disease is a new area of research with important implications for overall client health. The literature reports a link between oral health and systemic disease. Salomon & Xiaozhe (2003) states that conditions such as cardiovascular disease, diabetes, respiratory diseases and adverse pregnancy outcomes can be linked to oral health status. In a systematic review, Chalmers (2003) reports, "dentate status, tooth loss and tempromandibular disorders are associated with hearing loss. An increased number of missing teeth have been associated with coronary heart disease. Periodontal diseases have been associated with cardiovascular diseases, atherosclerosis, sub-clinical lower artery disease, stroke/cerebrovascular disease, metabolic/lipid disorders and obesity" (p.4). Periodontal disease is emerging as a significant risk factor in the metabolic syndrome (heart disease, diabetes, and stroke) (Chalmers, 2003).

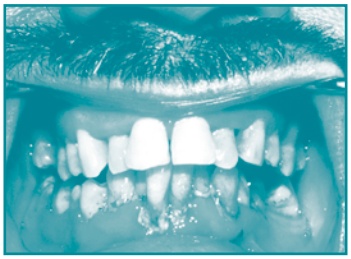
Periodontal diseases (periodontitis and gingivitis) are multifactoral diseases with bacterial infiltration as an essential component. Bacterial infection of the supporting structures of the teeth elicits an inflammatory response. This chronic infection and inflammation of the gums establishes a systemic burden via the blood stream of bacterial pathogens, bacterial antigens, endotoxins and inflammatory cytokines. Elevated inflammatory cytokines, in particular C-reactive protein (CRP), destabilizes atherosclerotic plaques and contributes to a prothrombic state. Dr Steven Offenbacker, member of the American Academy of Periodontology states that "periodontal disease needs to be considered as a major contributor to increased levels of CRP by the medical community" adding "previous studies reported that inflammatory effects from periodontal disease could cause bacterial byproducts to enter the bloodstream and trigger the liver to make proteins such as CRP that inflame arteries. The effects may cause blood clots that contribute to clogged arteries leading to heart attacks and strokes" (American Academy of Periodontology, 2004).

In a recent treatment intervention study, Taylor et al. (2006) demonstrated that with full mouth tooth extraction which eliminated periodontitis, lower systemic inflammatory and thrombotic markers of cardiovascular risk were achieved. Shay (2002) describes "the total area of inflamed epithelial lining of periodontal pockets in individuals with full dentition may exceed a surface area of 25 cm^2" (p.1221) (this can be visualized as approximately half the size of a credit card). This open tissue is at considerable risk for the complications of infection.

Figure 1: Healthy Oral Cavity and Severe Periodontal Disease



Healthy oral cavity



Severe Periodontal disease

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Dr. David Clark, BSc, DDS, MSc, FAAOP, FRCDC
Faculty of Dentistry, University of Toronto

Over the past two decades the prevalence of diabetes has increased 30 to 40%, and there is a bidirectional association between glycemic control and periodontal disease (Ghezzi & Ship, 2000). Grossi et al. (1997) report that the effective treatment of periodontal infection and reduction of periodontal inflammation is associated with reduction in levels of glycated (glycolated) hemoglobin. It is therefore recommended that control of periodontal infections should be an important part of the overall management of those with diabetes mellitus (Grossi et al., 1997). The association between oral health and diabetic control was further documented through research conducted by Engebretson et al. (2004) who found that poor glycemic control was associated with elevated levels of gingival crevicular fluid (GCF) interleukin-1 beta (1L-1 beta). Increased blood sugar levels cause inflammation in the gum tissue that may lead to increased destruction, independent of bacterial load. Current research indicates that poor oral health is a prominent factor in a number of other illnesses.

Potential Impact of Moderate to Severe Periodontitis on the Body

- Adverse Pregnancy Outcomes: 4-7 times greater risk
- Chronic Respiratory Disease: 2-5 times greater risk
- Coronary Artery Disease: 2 times greater risk
- Diabetes: 2-4 times greater risk
- Stroke: 2 times greater risk

(Proceedings of the Periodontal-Systemic Connection: A State-of-the-Science Symposium. 2001. Annals of Periodontology, 6(1), 1-224.)

Vulnerable Populations

The greatest burden of oral disease is to disadvantaged and poor population groups, both in developing, and developed countries (Petersen et al., 2005). Loeppeky and Sigal (2007) have identified people with special needs who are in most need of meticulous oral hygiene: "physical, developmental, mental, sensory, behavioural, cognitive or emotional impairment or a condition that requires medical management, health care interventions or use of specialized services or programs" (p.915).

Residents of Long-Term Care Homes and/or Persons with Dementia

Canada's population is aging quickly and according to new population projections the elderly (60-years-of-age and older) will outnumber those under eighteen in 10 years. According to Health Canada's report *Canada's Aging Population* (2002), the proportion of elderly in the overall population has gone from one in 20 in 1921, to one in eight in 2001. As "baby boomers" age (born between 1946 and 1965), the elderly population is expected to reach 6.7 million in 2021, and 9.2 million in 2041 (nearly one in four Canadians). In fact, the growth of the elderly population will account for close to half of the growth of the overall Canadian population in the next four decades.

The generation prior to the baby boomers predominantly lost most of their teeth, and the use of dentures was very common. Baby boomers and subsequent generations have had the benefit of access to preventative and restorative dental care throughout their lives, and people are retaining their teeth longer. This next cohort of elderly is better educated, are more aware of the importance of maintaining oral health, and expects comprehensive services from health care providers. Ghezzi, (2000), explains "this concept of compression of morbidity requires aggressive application of preventive health measures. If oral health can be maintained across a person's lifespan, this will contribute to improved quality of life and successful aging" (p.295). However, this population will be entering into a time in their life that is often associated with impaired self-care. The combination of impaired self-care and greater tooth retention will increase their risk for dental and periodontal diseases.

"Aspiration of oropharyngeal (including periodontal) pathogens is the dominant cause of nursing home-acquired pneumonia; factors reflecting poor oral health strongly correlate with increased risk of developing aspiration pneumonia" (Shay, 2002, p.1215). Nursing home-acquired pneumonia is the leading cause of death from infection in long-term care home residents, and is the second most common cause for hospitalization (Oh, Weintraub & Dhanani, 2004; Shay, 2002). Not brushing the teeth or not receiving adequate oral hygiene care significantly increases oral bacteria in the saliva that residents swallow and may aspirate. Reduced salivary flow, a common side effect of many medications, increases the concentration of bacteria in the saliva, and if the saliva is aspirated, or more likely mixed with food or fluids, up to 100 million bacteria per ml could enter the lungs. A resident with dysphagia is more likely to aspirate in quantities that may far exceed 1 ml (Langmore et al., 1998). " Poor oral hygiene, plaque accretion and compromised host defense that accompany periodontal breakdown also provide conditions favourable for proliferation and subsequent aspiration of orally incubated pulmonary pathogens" (Shay, 2002, p.1219). Inflammation of the gums is caused by bacterial plaque. In older people, inflammation forms faster in response to plaque and responds more slowly when plaque is removed (Shay, 2002), hence the importance of regular plaque control through oral hygiene measures.

Along with the increasing elderly population, the number of persons suffering from dementia continues to rise in Canada. Alzheimer's Disease is the most common form of dementia, and accounts for 64% of all dementias. Alzheimer's is a progressive, degenerative disease of the brain that causes thinking and memory to become seriously impaired. Dementia is a syndrome consisting of a number of symptoms that include loss of memory, judgment and reasoning, and changes in mood, behaviour and communication abilities. In 2007 an estimated 97,000 Canadians developed Alzheimer's or a related disease; an estimated 450,000 Canadians over 65-years-of-age have Alzheimer's or a related disease. By 2011, new cases of dementia are expected to reach 111,430 per year. Almost half of those with dementia live in the community, while half live in long-term care homes (Alzheimer's Society, 2007).

Dementia is a significant impairment and poses a particular challenge for caregivers due to behavioural changes and decreased levels of cooperation. In her research with the dementia population, Chalmers (2003), found that "participants with dementia had significantly higher experiences of oral diseases and conditions at baseline and at one year compared with patients without dementia" (p.16). Additionally, her findings indicated that plaque scores after one year were significantly higher for clients in care settings.

Persons with Mental Illness

Persons with psychiatric illnesses, including those with schizophrenia, schizoaffective disorder, depression and bipolar disorder may have their oral health compromised, not only by the illness, but also from the medications used to treat the illness. These medications can cause a range of oral complications and side effects, with tooth decay, periodontal diseases and xerostomia being encountered most frequently (Almomani et al. 2006). Side effects of psychotropic medications may include tardive dyskinesia, which impedes mobility of the limbs, and therefore, the ability to effectively brush the teeth.

Several factors contribute to the poor oral health of the person with mental illness:

- The negative symptoms of schizophrenia, which may include apathy and avolition, decrease a person's interest in attending to oral hygiene (Almomani et al. 2006; Jolly, 1991).
- Cognitive deficits associated with schizophrenia and schizoaffective disorder can interfere with attention, memory, concentration and problem-solving skills.
- Some medications used in the treatment of both schizophrenia and depression have an anticholinergic effect resulting in xerostomia. This hypo-salivation can result in rapid tooth decay and periodontal disease.
- Many people with psychiatric illness have limited finances which adversely impacts on their nutritional status and the ability to access treatment in the community (Almomani et al. 2006).
- Those with bipolar disorder exhibit one of the highest rates of associated substance abuse among all the major psychiatric illness (Clark, 2003).

In addition to the physical effects of prescription medications, substance abuse including alcohol, cocaine, heroin and marijuana also can lead to gingivitis or tooth loss (Bailes, 1998). Further, "Meth Mouth" a condition from the use of crystal methamphetamines results in a very rapid decay rate. Klassen (2006) confirms that the level of decay that would normally take years to occur instead happens over a period of months.

Major depression is characterized by mood disturbances that can affect a person's interest or pleasure in daily activities of life. Depression is often accompanied by self-care deficits including oral hygiene practices. In bipolar illness, mood fluctuates between periods of depression and elation, both exhibiting lack of proper attention to oral hygiene

Almomani et al. (2006) cites a study by Barnes et al. (1988), which reported that a prime need for people with psychiatric disorders included "prophylaxis, calculus removal and periodontal therapy" (p.274). It is further reported (Hede, 1995 cited in Almomani et al., 2006) that only 55% of people with psychiatric disorders engaged in regular tooth brushing. A study by Velasco and Bullon (1999) found the need for oral hygiene instruction among the hospitalized dentate psychiatric population was determined to be 91.5% and for prophylactic dental care was 77.3%. This client population often suffers from poor self-esteem and is stigmatized within the community; poor oral hygiene stigmatizes this population further.

Challenged Individuals

A) Physically and Mentally Challenged Individuals

The Surgeon's General's report on oral health indicates that individuals with mental retardation or with other developmental disabilities, including Down's Syndrome and Cerebral Palsy, have significantly higher rates of poor oral hygiene and an increased need for periodontal treatment than the general population (Glassman & Miller, 2003). It has been proposed that an exaggerated immune-inflammatory response occurs in people with Down's Syndrome (Chicon, Crawford & Grimm, 1998).

B) Stroke Survivor

Hospitalized survivors of acute stroke experience numerous sources of stress that can adversely affect oral health (Heart and Stroke Foundation, 2006). These stressors include medications that cause dry mouth, decreased alertness, cognitive and perceptual changes, neglect, depression, paralysis resulting in immobility, dysphagia, apraxia, visual changes, mouth breathing and dehydration (Heart and Stroke Foundation, 2006). Dysphagia is strongly associated with aspiration pneumonia, a pulmonary infection caused by the entry of foreign substances and/or bacteria into the lungs. Some stroke survivors do not regain consciousness, which may complicate the provision of care.

C) Individuals with Limited Dexterity

The ability to provide ones' own oral care may be impacted by variety of causes including, but not limited to, arthritic conditions, neurological diseases and amputations. Special consideration of these individuals will be required in the provision of oral care, and can be determined during the assessment of the individual. Planning for care should include an interdisciplinary approach.

Intensive (Critical) Care

The patient in the intensive care unit (ICU) poses unique challenges for the nurse. An increased cause of morbidity and mortality among patients in the ICU is nosocomial infections and ventilator-acquired pneumonia (VAP). In Canada, nosocomial pneumonia may be the second most common type of infection acquired in hospital (Lux, 2007). Gingival and dental antiseptic decontamination significantly decreases the oropharyngeal colonization by aerobic pathogens in ventilated patients (Founrier et al, 2005). Findings that colonization of dental plaque could play a significant role in the occurrence of respiratory nosocomial infections in ICU ventilated patients have been supported by other studies (Fourrier et al, 2005).

Often, the patient is admitted to care with good oral health, and it becomes the responsibility of the ICU nurse to maintain that oral status while addressing the challenge of providing care under extremely difficult circumstances. Providing care to an unconscious patient, one who is on a ventilator or one who cannot swallow requires special attention to prevent aspiration pneumonia. Preventing oral disease in those who may require a long convalescence or who may become permanently compromised is a challenge for nursing care.

Table 1: Oral signs and symptoms associated with patient stressors in the intensive care setting

Stressor	Signs	Symptoms
Mechanical ventilation and oxygen therapy		
Dry Mouth	■ Dry, red mucosa and depapilated, lobulated or fissured tongue ■ Dry, cracked lips ■ Build up of debris in mouth	■ Burning sensation ■ Dryness ■ Difficulty swallowing
Drug Therapy		
Immunosupression Change in Flora	■ White plaques and inflammation associated with Candida albicans, herpetic ulcers, halitosis	■ Pain or discomfort ■ Halitosis
Xerostomia	■ Decreased salivary flow ■ Dry, red mucosa and depapilated, lobulated or fissured tongue ■ Dry, cracked lips ■ Build up of debris in mouth	■ Burning sensation ■ Dryness ■ Difficulty swallowing
Therapeutic dehydration		
Xerostomia	■ See above	■ See above

Jones, 2005 (p.7)

Clients Receiving Chemotherapy or Radiotherapy

Mucositis is a painful complication of chemotherapy and/or radiotherapy, and good oral hygiene protocols are important. Mucositis requires effective oral hygiene and a multi-disciplinary approach to management. Infection of the gums prior to chemo or radiotherapy is a potential compounding factor and therefore, when vulnerable populations are scheduled to have chemotherapy or radiotherapy, it is imperative that prior to this treatment they have good oral health. Neutropenic patients with mucositis have an increased risk for potentially life-threatening infections, as well as for prolonged hospital stays. Standard care of oral mucositis is based on effective oral hygiene, appropriate analgesia, infection management and parenteral nutrition when needed; few other approaches have been shown to be effective (Peterson & Cariello, 2004).

Barriers to Achieving Optimal Oral Health

The majority of caregivers, regardless of their category, have not been educated on how to care for the oral hygiene of residents in long-term care (Chung, Mojon & Budtz-Jorgensen, 2000). Sumi et al. (2001) investigated oral care practices among caregivers in Japanese nursing homes and found that 99% of staff desired the development and dissemination of simple oral care equipment, while 97% wanted training in oral care. Chalmers (2003) asserts that realistic, creative and practical strategies need to be developed and promoted for caregivers in long-term care. It has also been reported in the literature that oral hygiene promotion involves any combination of education, organizational, economic and environmental supports for behaviour conducive to oral health (Croxson, 1993 as cited in Choo 1999).

Staff attitudes concerning oral health care are a significant barrier to optimal care. In a study by Wardh et al., 2000 (as cited in Sumi et al. 2001), it was found that oral care was considered to be the most undesirable task among caregivers. Why is oral hygiene care such an unpleasant task? Some evidence supports the belief that the oral cavity is a very private body part and health care providers are reluctant to perform care for this reason. Perhaps it is because nurses feel ill-equipped to provide such care due to a lack of education in this area, or perhaps oral hygiene is not being given the importance it deserves, especially when competing with the numerous care needs of clients (Chung et al. 2000; Paulsson, Soderfelt, Nederfors, Frindlund, 2002). Several studies have shown that health care providers are not receiving adequate oral health education, support from management or interdisciplinary integration to implement a comprehensive oral health care strategy. (Wardh et al., 2000)

In addition to lack of education and staff attitudes, there are several myths associated with the elderly in relation to oral health. These include:

1) the elderly are set in their ways and are not likely to change their practices or beliefs about oral hygiene;
2) the elderly do not benefit from activities aimed at promoting health;
3) the elderly are not co-operative and are difficult to work with;
4) changes in practices have only a small impact on longevity and physical health and well-being; and
5) the costs out weigh the benefits (Chalmers, 2003).

In addition to economic reasons or other physical health concerns, many older persons ignore oral pain because they may believe that tooth loss is an inevitable part of the aging process" (Randolph, Ostir & Marleides, 2001).
Tooth loss and oral pain are *not* an inevitable product of aging, nor is decreased salivary flow and the problems associated with it. "Flow from the parotid, submandibular and minor salivary glands remains largely unaffected in healthy persons, regardless of age (Shay, 2002, p. 1216).

Interdisciplinary Approach

A wide range of disciplines can be called upon to assist in the provision of care in various care settings. This interdisciplinary team can include the nurse, physician, occupational therapists and speech language pathologists in addition to dental hygienists, denturists and dentists. It is also recognized that unregulated health care providers, families and clients do provide care and should be included in this team approach.

Research has shown that an interdisciplinary approach to oral health care improves knowledge, awareness and moves oral health practices closer to best practice (Fallon, et al, 2006). Dental hygienists' services are relatively inexpensive and easily delivered within organizations. It was estimated that the cost in one hospital to prevent nosocomial pneumonia was less than 10% of the cost associated with treating a single case (Lux, 2007). Chalmers and Pearson (2005) concur with previous studies, stating that a multi-faceted approach to implementation, one that draws on a range of different sources of knowledge and implementation strategies to bring about change, is more effective than a single intervention approach.

The president of the Canadian Dental Association, Dr. Wayne Halstrom, (2007), stated that preventing oral disease among vulnerable groups is socially desirable and will make economic sense for Canada's publicly funded health care system. He urged the medical and dental professionals to work together to encourage the evolving Canadian health care system to "put the mouth back in the body" (p.145).

Education

To create an oral health strategy, education and skill development are necessary. The clinical research evaluating the effectiveness of education in oral health care has demonstrated a positive change in attitude and behaviour. In Sweden, oral health assessments of 170 residents' plaque levels and oral mucosal conditions were significantly improved after implementation of an oral health screening protocol teamed with care provider oral health education program (Chalmers, Carter & Spencer, 2004). Another trial reported improved oral mucosal health and reduced candidal colonization to dentures and oral mucosa in institutionalized older adults who received a comprehensive care provider and professional oral hygiene care protocol (Chalmers, 2004).

Education must enhance knowledge levels, change behaviours and shift attitudes. The current system of oral care education for nurses and unregulated care providers are inadequate to meet client's needs. Caregivers reported that the topic of oral health care is inadequately covered, nor given sufficiently high priority in educational programs (Sumi et al, 2001). Nurses have identified a need for additional foundational and ongoing education and specifically, more practical education regarding oral hygiene and the provision of care (Jones, Newton & Bower, 2004; Paulsson et al, 2002). There is also a recognized need for increased collaboration with the dental service for standards of oral care, including documentation. Evidence on the use of assessment tools by care givers to evaluate long-term care residents oral health demonstrated that successful assessment of residents by nursing staff requires appropriate training by a dental professional (Chalmers et al., 2004). Inadequate education and oral health knowledge in nursing practice must be addressed in order to change behaviour.

Through a greater understanding of the oral cavity and current knowledge from the dental community, caregivers will appreciate the need for oral care and see it as a priority. Oral hygiene education needs to be reinforced through ongoing learning activities to ensure sustained behaviour change and to keep abreast of the developments within the field. This also ensures that new health care providers joining the organization are brought into the culture of the workplace. Axelson et al, 1991 as cited in Paulson, Neterfors and Frindlund (1999) found that the nursing personnel's view of oral care depended on the knowledge, commitment and enthusiasm on the part of administration.

Health care professionals' anxiety about their own oral hygiene and health may adversely impact the care and advice they provide to clients (Preston, Punekar & Gosney, 2000). Preston et al. (2000) reports that deficiencies in care giver knowledge appear to be associated with their own anxiety about visiting a dentist.
Canada is a multicultural community that employs caregivers from diverse ethnic and cultural backgrounds. Along with cultural differences, education varies from country to country and therefore oral hygiene advice may reflect cultural norms, rather than be evidence-based

Skill development is an important aspect in the provision of oral care. The oral cavity is not always easy to access. Sumi et al. (2001) noted that oral hygiene is often performed in a narrow field of view or in an uncomfortable position, which indicates the urgency of standardizing and systematizing oral care to relieve the strain on caregivers. Along with performing skills effectively with the least strain to the provider, consideration must also be given to infection control measures. Skill development must also address proper techniques with acceptable products to prevent harm to clients.

External Factors

Tooth loss is linked to socio-demographic and behavioural characteristics (Randolph et al., 2001). Women, older persons and those with a lower socio-economic status present with more tooth loss, either complete or partial. Also linked to tooth loss and/or gingivitis is smoking, substance abuse including alcohol, marijuana and cocaine (Bailes, 1998; Randolph et al, 2001).

The relationship between tobacco and general health is well documented, but the relationship between tobacco and oral health must also be considered. Smoking has significant effects on the oral cavity, including oral cancers and pre-cancers, increased severity and extent of periodontal diseases, and poor wound healing (FDI/WHO, 2005). Up to one half of all adult cases of periodontitis are linked directly to tobacco use and when health care providers advocate for smoking cessation programs, they are advocating for better oral health.

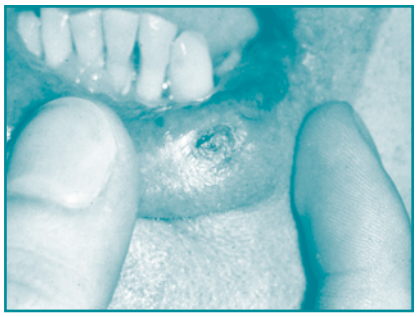
Table 2: Tobacco Induced and Associated Conditions

FDI/WHO, 2005

Oral Cancer: (see photo 1)

- Lesion on lower lip[1]
- Squamous cell carcinoma

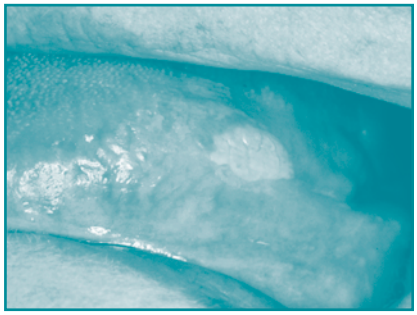
1



Leukoplakia (lesions which are potentially malignant) (see photo 2):

- Nodular Leukoplakia
- Verrucous Leukoplakia
- Speckled Leukoplakia
- Erythroplakia
- White lesion (Leukoplakia), lateral surface of the tongue[2]
  Dx, Squamous cell carcinoma

2



Oral mucosal conditions:

- Smoker's palate
- Smoker's melanosis

Tobacco associated effects on teeth and supporting tissues:

- Periodontal diseases
- Premature tooth loss
- Acute Necrotising Ulcerative Gingivitis
- Staining

* Photos reproduced with permission: Dr. David Clark, BSc, DDS, MSc, FAAOP, FRCDC, Faculty of Dentistry, University of Toronto.

Sustainability

Organizations must show their commitment to quality oral hygiene care by implementing oral hygiene care standards that can be achieved at local, provincial and national levels. Oral care standardization with well-defined protocols will help ensure sustainability. There is a need for protocols that maintain simplicity, care that can be completed efficiently, safety for both client and caregiver, and universality (effective when provided by different caregivers).

The Canadian Oral Health Strategy (Federal, Provincial & Territorial Dental Directors, 2005) is a blueprint to improving oral health and guiding oral health initiatives, yet it does not set standards. This strategy looks at establishing a baseline of current oral health, setting targets, developing strategies to improve and maintain oral health and developing a system of measurement and monitoring so that individual provinces, regions and organizations can compare themselves.

Summary

As a powerful force within the health care system, nurses are encouraged to act in a health promotion capacity to advocate for reforms that will provide access for all persons to good oral health care. Diseases of the oral cavity not only compromise the functions of the oral cavity, but also compromise the function of many other body systems.

The RNAO recognizes the importance of this area of health promotion, and through this guideline delivers evidence to support the practices of nurses delivering oral hygiene care. The diverse members of this guideline development panel strongly believe that the availability of appropriate equipment, educational opportunities and skills training in oral hygiene delivery will empower nurses to advocate on behalf of their clients, and to provide optimal oral health care.

Practice Recommendations

The following recommendations, based on the best available evidence, support the provision of oral hygiene care to adults with special needs. Refer to Appendix C for an Algorithm that summarizes the Practice Recommendations.

Focus group feedback was incorporated into this document as *"Comments from our clients"* within the discussion of evidence, as appropriate.

Recommendation 1

Nurses should be aware of their personal oral hygiene beliefs and practices, as these may influence the care they provide to their clients.

Level III

Discussion of Evidence

In order to begin the process of quality oral care, self-awareness is crucial (Croxson, 1993). Attitudes towards oral health are influenced by personal experiences (Frenkel et al, 2002). Therefore, a nurse's personal oral hygiene beliefs and practices can affect the oral health care and advice given to their clients (Wardh et al, 2000).

Recommendation 2

As part of their client admission assessment, nurses obtain an oral health history that includes oral hygiene beliefs, practices and current state of oral health.

Level IV

Discussion of Evidence

The choice of an approach to assist with an oral health history is client and setting-specific. To ensure that the oral health needs of the client are met and maintained, the first step is to complete a thorough assessment upon admission (Chalmers & Pearson, 2005; Pearson, 2004). Oral assessment should take place on the first meeting with the client as evidence suggests that pre-intervention assessment can reduce both the incidence and severity of oral complications (Miller & Kearney, 2001), especially in the oncology client. Challenges may arise as this assessment relies on the client's ability to communicate and co-operate with assessment (Chalmers & Pearson, 2005; Pearson, 2004).

This oral health history should identify oral hygiene beliefs and practices so that a plan for care can be developed which will mimic or augment that person's routine. The care provider must determine if the client is able to tend to oral hygiene independently and if not, to what extent interventions are needed. These interventions may include "reminding, assisting, providing or palliative" care (Johnson & Chalmers, 2002).

Refer to Appendix D for suggested questions to consider when assessing oral hygiene beliefs, practices and current state of health. Please note these are suggested questions only, and not a validated tool.

Comments from our clients

When asked whether they believed questions about oral hygiene are an important part of their health history:

"…Yes, I think with depression I don't really take care of myself the way that I should, and I really don't think about brushing my teeth."

"…Of course, because teeth tell a lot about you. If you have clean teeth, people look at you one way, and if you have dirty teeth they look at you different. When you have bad breath, no one likes to talk to you."

"…I have a sensitive tooth and if you give me something sweet it kills me. I remember one time being sick and the nurse gave me medicine that was syrup and that killed. I spit the medicine out."

"…it wouldn't bother me [if nurses asked], but they need to tell me why they are asking."

"..in all the times I've been to the hospital, no one has ever asked me about my teeth."

Recommendation 3

Nurses use a standardized, valid and reliable oral assessment tool to perform their initial and ongoing oral assessment.

Level IV

Discussion of Evidence

Oral hygiene should be looked upon as an integral component of total care to a client (Sumi et al, 2001). A client's oral status should be assessed on a regular basis, and in a routine and methodical manner. Oral health assessments and screening can be conducted by educated nurses and caregivers, as appropriate, to monitor oral health, to evaluate oral hygiene care interventions, to initiate dental visits when required and to assist with individual oral hygiene care planning (Pearson & Chalmers, 2004).

Utilizing an established oral assessment tool objectively and reproducibly classifies and measures the oral cavity in clients. Ideally, the tool chosen should be objective, validated and reproducible across all clinical situations (Rubenstein et al, 2004). The scale should have inter-rater reliability, should be easy to perform, should be simple to understand and easily adaptable for use in multiple clinical settings. Numerous assessment tools are available (Atchison & Dolan, 1990; Bauer, 2001; Burke & Wilson, 1995; Calabrese, Friedman, Rose & Jones, 1999; Berger & Petersen, 1988; Fitch, Munro, Glass, Pellegrini, 1999; Jenkins, 1989; Kayser-Jones, Bird, Paul, Long & Schell, 1995; MacEntee & Wyatt, 1999; Roberts, 2000; Thai, Schuman & Davidson, 1997); however, very few of these tools have been validated through repeated randomized clinical trials. Many oral assessment tools have been developed primarily for research purposes or for assessment of particular client populations. When selecting a screening/assessment tool the type of facility, the client population and staff mix should be considered. Instruments to be used should be setting and client-specific.

The nursing oral health assessment should identify those clients at risk for development of oral problems such as stomatitis, mucositis and periodontal diseases. Nursing oral health assessments should be completed on all clients as part of a routine, systematic assessment (e.g. oral health assessments should be completed on admission, during routine monitoring and documented on the client's health record).

Examples of oral health assessment tools include:

- Oral Assessment Guide (OAG) (Eilers, 1988)
  - Validated in oncology patients in multiple clinical trials, HIV patients, elderly rehab patients, psychiatric patients and rehab patients.

- Revised Oral Assessment Guide (ROAG) (Andersson, Halberg & Renvert, 2002)
  - Used in three small studies of geriatric rehab patients.

- Brief Oral Health Status Examination (BOHSE) (Kayser-Jones, 1995)
  - Validated in long-term care and residential care settings; can be used with cognitively impaired clients.

- Oral Health Assessment Tool (OHAT) (Chalmers et al, 2004 modified from Kayser-Jones, 1995)
  - Validated in Austrailian long-term care facilities in a single trial.

- THROAT (Dickinson, Watkins & Leathley, 2001)
  - Developed and tested for use in elderly hospitalized patients in a single trial.

- Mucosal Plaque Index (MPS) (Henriksen, Ambjornsen & Axell, 1999)
  - Measures mucosal and plaque indices (valid for when to refer to a dental hygienist).

- National Cancer Institute (NCI) Scale (WHO, 1997)
  - NCI more commonly used in clinical trials.
  - Focuses on the assessment of mucositis.

- World Health Organization (WHO) Grading Scale (WHO, 1997)
  - WHO has been validated in clinical trials, and is a commonly used tool in oncology practice.
  - Focuses on the assessment of treatment induced mucositis.

Refer to Appendix E for additional information regarding the tools listed above.

Comments from our clients

When asked if it was important to them to have a nurse look inside their mouth to determine the state of health:

"…As long as I was told why they were looking into my mouth I guess it would be okay. When I have a sore throat the doctor looks into my mouth, so if there was a good reason…."

"…I think now that I know how important it is I would feel better if she did it…."

"…does that mean that everyone would get asked the same questions? Then it would be better…."

Recommendation 4

Oral health status information is regularly reviewed with all members of the health care team to monitor client progress and facilitate the development of an individualized plan of care.

Level IV

Discussion of Evidence

It is important that health care is provided with a focus on the principles of client-centred care (RNAO, 2006), and that care is individualized to meet the person's individual goals and needs (Freer, 2000; Jones, Brown & Volicer, 2000). One very useful tool to guide the delivery of care to a client is the individual plan of care. The care plan identifies client needs and sets out the level of services and care needed to meet those objectives (Fallon et al., 2006). The care plan addresses all needs of the client including, but not limited to, communication, nutrition, hygiene, mobility and social interaction. The care plan identifies: problems determined during the initial assessment; client-centred goals as they relate to the identified problems including achievable outcomes; and interventions or strategies aimed at achieving the desired goals. When regularly reviewed and updated, the care plan can provide accurate, relevant and consistent communication between all care providers (Fallon et al, 2006; Freer, 2000). Refer to Appendix F for examples of oral hygiene care plans.

Comments from our clients

When asked if they had ever been referred to a dental hygienist, dentist or denturist by a nurse, or if they had oral health concerns that were not being addressed:

"…No. It would be nice though, because I don't go to a dentist because I don't have enough money."

"…I can't afford to go to a dentist so maybe the nurse could look in my mouth instead."

"…I smoke so I have stains on my teeth. That looks awful, but I don't know how to get them off."

"…I brush my teeth when I have the energy, but I don't know if I'm doing it right..."

Refer to Appendix N regarding resources for financial supports in reference to "Comments from our Clients".

Recommendation 5

Nurses provide, supervise, remind or cue oral care for clients at least twice daily, on a routine basis. This includes clients who:

- **have diminished health status;**
- **have a decreased level of consciousness; and**
- **who have teeth (dentate) or do not have teeth (edentate).**

Level IV

Discussion of Evidence

Dental plaque is the primary contributor to bacteria growth that contributes to such conditions such as gingivitis, dental caries, periodontal conditions, xerostomia or halitosis. Most oral infections in patients originate from their own oral flora (The Royal Free Hampstead NHS Trust, 2000). The literature also supports that oral complications may be due to various illnesses (The Royal Free Hampstead NHS Trust, 2000). To decrease dental plaque build up on the surface of the teeth or mucosa, regular oral hygiene care is required. It becomes an important role of nurses to promote or provide effective oral care to those clients with special needs (Jolly, 1991).

Oral care is a fundamental nursing activity and an important aspect of client care. Nurses play an important role in providing effective oral care and promotion of oral hygiene (Satku, 2004). Brushing teeth twice daily is considered a social norm; however, this recommendation is in direct relationship to controlling the accumulation of plaque biofilm and halitosis (Darby & Walsh 2003). Pneumonia, fevers and death from pneumonia "significantly decreased" in dentate as well as edentulous clients who received oral care (Yoneyama et al., 2002). A soft bristle toothbrush is the most effective tool for plaque removal, even for edentulous clients who need to have their oral mucosa and tongue gently brushed (Jones et al., 2004).

Unconscious or intubated clients should receive oral care every two to four hours, and as required (Schleder, 2003). Intubated clients should also be assessed to determine the need for removal of oropharyngeal secretions frequently, as well as prior to repositioning the tube or deflation of the endotracheal cuff (Schleder, 2003).

Halitosis (bad breath) is a common problem, predominantly affecting adults. Most cases of halitosis result from microbial putrefaction within the oral cavity, and sulphide compounds have been indicated as the main cause of the odour (Rosenberg et al., 1991). The most effective management of halitosis in most cases is simple, regular oral cleaning with a toothbrush (Scully, Porter & Greenman, 1994). It is generally recommended that tooth brushing occur in the morning after a period of sleep and again at night prior to going to bed (Darby & Walsh, 2003). Frequency of tooth brushing is dependent on the unpredictable rate of plaque biofilm accumulation and contributing factors such as smoking, dietary intake, systemic disease, compromised immune systems or an individual's dexterity (Darby & Walsh, 2003). To clean bacterial deposits from around the gums, a "dip and brush" method should be used, dipping a small headed, soft toothbrush in an antimicrobial rinse, usually chlorhexidine (personal communication, Lynda McKeown, April 3, 2008).

Whenever possible, clients should perform their own oral care. In situations where clients have decreased level of consciousness or have special needs, caregivers should incorporate oral hygiene procedures into the care (Jolly, 2001). An RCT conducted by Almomani, et al. (2006) found that the oral health of people with serious mental illness can be improved with a combination of education and instruction, along with a reminder (cuing) system.

Taking into consideration the client's medical history, oral care should continue to be provided even when gingival bleeding is evident. If the bleeding is uncontrolled and persistent, a referral to a dental care professional should be made (Fourrier et al, 2005)

Document care provided

Comments from our clients

When asked if it would be useful to have someone remind them to brush their teeth, or to supervise while they brush their teeth:

"…Yes, stickies [notes] on the door or on the mirror would be good."

"….when I'm sick I don't even think of taking care of myself or of brushing my teeth."

"…sometimes my arm is so heavy that I have to hold it up to brush my teeth, so I say, why bother?"

"…there's nothing wrong with reminders."

"….it would be embarrassing to have someone doing it for you."

Recommendation 6

Nurses provide or supervise the provision of oral care for clients at risk for aspiration.

Level III

Discussion of Evidence

Aspiration is defined as the inhalation of oropharyngeal or gastric contents into the larynx and lower respiratory tract, while aspiration pneumonia is a result of the inhalation of oropharyngeal secretions that are colonized by pathogenic bacteria (Marik, 2001). Aspiration pneumonia is one of the main causes of morbidity and mortality among intubated and ventilated patients, as well as the elderly who are in nursing homes or who are hospitalized (Sumi et al., 2001). Within 48 hours of admission to hospital, the composition of oral flora changes in critically ill patients (Munro, Grap, Jablonski & Boyle, 2004). Normal flora (which is concentrated in dental plaque) resides in the oropharynx. Antibiotics or other mechanisms change normal flora. Bacterial binding sites are susceptible to colonization by gram-negative bacteria. Once the oropharynx is colonized with gram-negative bacteria, these organisms can be aspirated.

Those clients experiencing: dysphagia (difficulty swallowing, including stroke related dysphagia); being bedridden in a prone position; reduced respiratory status (intubated on a ventilator); prolonged bolus holding; poor head/trunk control; dependence for feeding; poor oral hygiene; high levels of tooth decay; dependence for oral care; past history of aspiration and inability to manage their own secretions (i.e. excessive drooling) are all at an increased risk for aspiration (Chalmers et al., 2002). Forty-one percent of subjects who developed aspiration pneumonia were dependent for feeding and oral care (Langmore et al., 1998). Providing oral care (by ensuring the oral cavity is clear of debris and organisms) before meals reduces the risk of developing aspiration pneumonia (Yoneyama et al., 2002).

Risk factors associated with oropharyngeal colonization include (McNeill, 2000):

- Acidosis
- Age
- Alcohol abuse
- Decreased level of consciousness
- Chronic Obstructive Pulmonary Disease (COPD)
- Dental status
- Dependence for oral care
- Diabetes mellitus
- Endotracheal intubation
- Malnutrition
- Medications
- Nasogastric (NG) tube and Percutaneous Endoscopically-guided Gastrostomy (PEG) tube feeding
- Severity of illness
- Smoking
- Stroke/dysphagia
- Xerostomia.

Poor oral care can result in oropharyngeal colonization (Marik, 2001). Suction should be used when providing oral care to clients that have low levels of consciousness, for those that are NPO (no food or drink by mouth) and for those clients who cannot tolerate thin fluids. There is limited scientific evidence as to the efficacy of suction toothbrushes; however, clinical experience supports their use. Research in this area is ongoing,

Refer to Appendix G for oral hygiene products appropriate for those at risk for aspiration.

Recommendation 7

Nurses provide ongoing education to the client and/or family members regarding oral care.

Level III

Discussion of Evidence

Education of the client is an important first step in achieving adherence with oral hygiene practices as it involves the client in his/her own care, promotes a positive self-image and fosters independence. Nurses are well positioned within the health care team to support opportunities for interdisciplinary client education and to advocate for access to a range of health professionals. Involving the family assures that appropriate supervision and cuing occurs for the client (Jolly, 1991).

Oral care may be overlooked in those who are not at their optimal level of well-being. Emphasis on oral care generally decreases with the increasing dependency of clients (Johnson & Chalmers, 2002). It becomes important to disseminate knowledge related to the interrelationship of oral health to general health among clients and health care professionals. It also is important to ensure behaviour management strategies for specific client populations are in place to successfully implement and sustain optimal oral health among clients with special needs (Pearson & Chalmers, 2004).

Rubenstein et al. (2004) recommend the use of oral care protocols that include client education in an attempt to reduce the severity of mucositis from chemotherapy or radiation therapy. In this context, client education refers to comprehensive, theory-based, educational approaches that prepare individuals for medical procedures, including what to expect in terms of adverse effects, and how to cope (psychoeducational strategies).

Cichon et al. (1998) conducted a clinical intervention study that explored the effect of oral hygiene care (provided by a dental hygienist) and education on oral health in those with Down's Syndrome. They found that this approach was effective in improving the gingival condition, reducing probing depth and affected the subgingival environment and its microflora in this client population.

Research conducted by Hede (1995) with 240 dentate psychiatric clients indicated that oral health education directed specifically towards those persons with schizophrenia and personality disorders should be an integral part of *Activities of Daily Living* training. Velasco & Bullon (1999) concluded through their research with 565 psychiatric patients in Spain that 91.5% required oral hygiene instruction.

Almomani et al. (2006) reported the results from a randomized controlled trial that suggests that the oral health/hygiene of people with psychiatric disabilities can be improved with education, instructions and reminders.

Comments from our clients

When asked if they believed it is important that the client and family receive ongoing education in the hospital and the community:

"…yes, both should have the education because they're there to help when you're sick."

"…the more information given the better."

"…the family should know. I can't really explain it to them. It's better for them to hear it all first hand from the source."

"…nurses are the appropriate people to teach us about how to brush our teeth. Most of us can't afford to go to a dentist or get our teeth cleaned. We see nurses most often."

Recommendation 8

Nurses are knowledgeable of oral hygiene products and their applications as they pertain to their specific client populations.

Level IV

Discussion of Evidence

All clients' tooth/dentures, tongue and oral mucosal surfaces are to be cared for using the appropriate oral care products. A toothbrush is the most common product used in preventing periodontal disease (Assadoorian, 2006); however, nurses should be aware of the many other products that exist to address oral care needs such as moisture loss from lips and mucosa, dry mouth (xerostomia), dysphagia and, intubation. The enhancement of nurse's knowledge related to oral hygiene products and their use is an opportunity for interdisciplinary collaboration. Refer to Recommendation 14 regarding the content of education programs to support evidence-based oral care.

Appendix G provides an overview of selected oral hygiene products.

Comments from our clients

When asked if nurses should know what products to use, how to use them and to teach the client about these products:

"…it would be helpful to have someone to ask about things we hear about."

"…I don't know enough about the different products, like what toothpaste is best for me."

"….I can't afford to go to the dentist so I need somewhere to get information because I don't know all this stuff."

"…the nurse is the right person to ask because she has the expertise and not everyone goes to the dentist."

"…it is important to know what to use so that you don't hurt your mouth."

"…if the nurse asks, then it prompts me to ask."

Recommendation 9

Nurses are aware of treatments and medications that impact on the oral health of clients.

Level IV

Discussion of Evidence

The nurse must be aware of the potential oral side effects of the medications that the client is taking. Adverse drug reactions disclosed in drug monographs often include oral side effects. The most common medication adverse effect is on the saliva, such as the subjective complaint of dry mouth (xerostomia) and the alteration of salivary flow (hyposalivation). Other oral side effects include abnormal homeostasis, soft tissue lesions, reactions, taste changes, altered host resistance, gingival enlargement, burning oral

sensations, increased caries due to high sugar content in the medications, involuntary oral movements and alveolar bone alterations. These signs and symptoms may appear concurrently, and the risk of oral adverse effects increase with polypharmacy (Shinkai, Hatch, Schnidt & Sartori, 2006).

Clients using certain types of inhalation devices often develop oral candidiasis. Clients receiving medication for chronic diseases may be at greater risk for developing tooth decay when they are using sweetened medications. Sugar is frequently a part of liquid medications, cough drops, vitamins, antacid tablets and antifungal agents. Some medications may result in altered taste – leaving a bitter or metallic taste in the mouth – including cardiovascular agents, central nervous system stimulants, nonsteroidal and anti-inflammatory drugs, respiratory inhalants and smoking cessation products (American Dental Association, 2005). Medication adverse effects can also impact on oral health in an indirect way (e.g. there is a significant risk of the serious condition tardive dyskinesia developing as a side effect of common antipsychotics). The physical challenges of living with tardive dyskinesia may impact on an individual's ability to perform oral hygiene care independently.

Mucositis is a painful complication of chemotherapy and radiotherapy, and good oral hygiene protocols are important in reducing the severity of this adverse effect of these treatments (Rubenstein et al., 2004). Effective oral hygiene and a multi-disciplinary approach to management are essential to quality cancer care. Nurses have a role in advocating for oral health assessment prior to the initiation of chemotherapy or radiation therapy, when appropriate, in order to improve client outcomes. Nurses working in this specialty area of practice may wish to consult with guidelines specifically on this topic (e.g. Rubenstein et al., 2004).

Refer to Appendix H for a list of medications that impact on oral hygiene and oral health.

Comments from our clients

When asked if they had ever experienced side effects from medications that made it difficult to maintain oral hygiene:

"…when I was on clozapine I would drool a lot. It bothered me but no one told me about it."

"…meds make me have a very dry mouth. If it's dry it gets sore…"

"…Sometimes I feel like stopping meds because having a dry mouth is a pain in the ass… you have cotton mouth and then your lips stick to your teeth and you can't speak right… you get so self-conscious."

"…and she [the nurse] could tell you what to expect so you don't get frustrated and want to quit taking your meds…"

Recommendation 10

Nurses use appropriate techniques when providing oral care to clients.

Level IV

Document care provided

Discussion of Evidence

Assessment of the mouth prior to the provision of oral care is essential; the use of direct light (such as that provided by a flashlight) to assess the oral cavity allows for greater visualization. Numerous tooth-brushing techniques exist with no one method being clearly superior to another (Assadoorian, 2006). Brushing the teeth systematically and thoroughly, using a technique that is suitable for the individual client, is important.

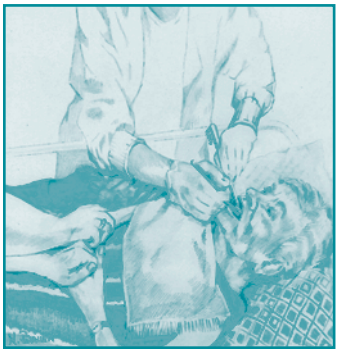
Appropriate care for dentures is needed as they too accumulate plaque and harbor harmful bacteria that can cause disease (Sumi, Nakamora & Michiwaki, 2002)

Appropriate technique includes behaviour management strategies for specific client populations, such as those with cognitive impairment, which will help to support the successful implementation and sustainability of optimal oral health among those with special needs (Pearson & Chalmers, 2004). For comprehensive resources related to caring for clients with delirium, depression or dementia, refer to the RNAO guidelines *Screening for Delirium, Dementia and Depression in Older Adults* (2003) and *Caregiving Strategies for Older Adults with Delirium, Dementia and Depression* (2004).

Using an ergonomic approach in terms of client and nurse positioning during the provision of oral care is an important consideration for effectiveness of the care provided and the safety of the client and nurse. Proper positioning of the client in bed or chair can prevent injury to the client (example, prevention of aspiration) and the nurse (muscle strain).

The educational resource *Oral Care for Residents with Dementia (DVD)* provides an overview of approaches for providing oral care to those with dementia, emphasizing safe and effective ergonomics. Refer to Appendix L for additional information and resources.

Examples of Technique and Body Positioning in the Provision of Oral Care:



Client in bed:
"two toothbrush" technique

Client standing:
"hand-over-hand" technique

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Nancy Bauer, RN, Hon. BA, Hon. Bus. Admin., E.T.

Refer to Appendix I (Denture Care), Appendix J (Tooth Brushing Techniques) and Appendix K (Approaches to Care) for additional details regarding techniques to support the provision of oral care.

Safety First!

- The health care organization's infection control policies and procedures must be followed.
- Apply evidence-based measures, professional judgment and risk reduction principles in the provision of care. (College of Nurses of Ontario, 2005)
- Safe care provision includes ergonomics, infection control and appropriate equipment.

Recommendation 11

Nurses advocate for referral for those clients who require consultation with an oral health professional (e.g. dental hygienist, denturist, dentist).

Level IV

Discussion of Evidence

The nurse, during the initial assessment and during regular oral care, will continually observe for changes in the oral cavity that would necessitate a referral to an oral health professional. It is important to recognize that a team approach including a dentist, dental hygienist, dental assistant and other trained staff will help in the provision of care to individuals with disabling physical, mental, sensory and cognitive abilities (Jolly, 2001). In their research with psychiatric clients, Velasco and Bullon (1999) found that this client population had "extensive dental disease" (pg. 16), adding that persons with advanced mental illness are often anxious and uncooperative. Preventive measures are best performed by "dentists and dental hygienists properly trained to provide oral treatment for psychiatric clients in collaboration with the psychiatric staff" (pg. 16). For definitions regarding scope of practice for oral health professionals, please refer to Appendix B.

Before surgery, clients should have an assessment and any dental work done to decrease the chance of infection (ADA, 2007). Research now shows that there is a potential link between oral disease and other health problems such as diabetes, heart disease and stroke (CDA, 2007).

Nurses should also note that tobacco users are at an increased risk of developing oral cancer and lesions, and should consult with a dentist or dental hygienist regularly (CDA, 2007). Tobacco is a major cause of tooth loss in adults through gum disease (ADA, 2007). Clients who abuse drugs and/or alcohol are at increased risk of fracturing teeth, and are at risk of dental problems due to neglect (ADA 2007).

Long time use of methamphetamine (MA) has been associated with severe MA induced caries (JCDA, Vol. #71, 2005). The client should provide a list of all medications to the dental professional, as these may affect oral health status.

Refer to Recommendation 16 for a discussion of evidence to support partnerships to facilitate access to care, and to Appendix M for resources related to financial assistance.

Although not a comprehensive listing of indicators for a referral, examples include:

- Aggressive behaviour out of character with the individual
- Bad breath
- Bleeding during brushing or during oral care
- Broken or loose fillings
- Calculus deposits
- Chipped or worn teeth or cracked dentures or partials
- Discolouring of the teeth or tongue
- Excessive dry mouth
- Excessive tooth grinding
- Jaw pain
- Loose or ill fitting dentures
- Loose teeth
- Pain on brushing or stated tooth pain
- Refusal of dental care
- Sensitivity to hot or cold
- Sores or lesions in the oral cavity
- Swollen gums
- Visible decay

Adapted from Chalmers et al., 2004; Kaiser-Jones et al., 1995

Recommendation 12

Nurses ensure that all oral health-related history, assessment and care be documented.

Level IV

Ensure comprehensive documentation of all care provided

Discussion of Evidence

Communication is vital in the delivery of the care that clients are provided, and thorough documentation is a key communication strategy between members of the multi-disciplinary team. Clear, concise documentation is an integral part of safe and effective nursing practice (College of Nurses of Ontario, 2005) and allows for members of the health care team to provide safe, effective care and treatment. Further, this documentation also forms a permanent and reliable record of the client's health and information. The College of Nurses of Ontario has developed practice standards requiring nurses to document and to maintain records including the minimal expectations regarding what components are to be included in the health record. Clear, comprehensive and accurate documentation is a record of the judgment and critical thinking used in professional practice and provides an account of nursing's unique contribution to health care (CNO, 2005).

Within the scope of this guideline, documentation will include recording in the client's health record all information reflective of equipment and supplies being used. The initial health history documentation should include, but not be limited to, the following:

- oral health history;
- oral health assessment; and
- oral health practices.

Oral health history documentation includes:
- identification of oral health beliefs and practices;
- identification of the client's oral health routine; and
- whether the client has their own teeth or dentures (full or partial)

Oral health assessment documentation includes:
- physical assessment of the oral cavity;
- the ability of the client to tend to oral hygiene independently; and
- identification of interventions required for the client to meet their oral hygiene needs (e.g. reminding, assisting, cuing or the provision of total care).

Oral health practices documentation includes:
- type of equipment used for oral care; and
- frequency of oral care.

Refer to Appendix E for oral health assessment tools and Appendix F for sample care plans.

Education Recommendations

Recommendation 13

Nurses require appropriate oral health knowledge and skills acquired through entry-level nursing education programs, workplace orientation programs and ongoing professional development opportunities.

Level IV

Discussion of Evidence

Caregivers reported that the topic of oral care is inadequately covered and not given sufficiently high educational priority (Longhurst, 1998; Sumi et al., 2001). When questioned, more than half of ICU nurses reported that they required initial or further training in oral care (Jones et al., 2004). In addition to facility orientation and entry-level nursing programs, oral health and hygiene education needs to be repeated through ongoing learning activities to achieve a lasting effect (Paulsson, Soderfeldt, Fridlund & Nederfors, 2001). Oral hygiene care education, even when delivered at a modest cost, can enhance nurses' and other health care providers' knowledge, attitudes and practice (Frenkel, Harvey & Newcombe, 2001). Even one education session of only four hours has been shown to have a positive influence on nurses' conceptions and knowledge of oral health (Paulsson, 2001). Education that develops knowledge and skill in oral hygiene care will assist nurses in being more aware of their oral hygiene practices and beliefs, as these may have an impact on the care they provide to clients (see Recommendation 1).

For additional discussion regarding organizational support for oral health education, please refer to Organization and Policy Recommendation 17.

Recommendation 14

Nurses who provide oral hygiene care to their clients, either directly or indirectly, must participate in, and complete, appropriate oral hygiene education and training.

Level IV

Oral hygiene education should address the following content areas, at minimum:

- anatomy and physiology of the oral cavity;
- pathology of the oral cavity such as oral cancer, angular chelitis of lips or herpes zoster;
- normal aging of the oral cavity;
- periodontal disease process and the systemic implications such as diabetes, heart disease and stroke;
- valid and reliable oral assessment tools and protocols;
- assessment of the oral cavity;
- adverse side effects from medications (e.g. xerostomia) or other treatments such as chemotherapy or
- radiation (e.g. mucositis);
- roles of the multi-disciplinary team in relation to oral care;
- referral criteria to the physician, dental hygienist, denturist or dentist;
- availability of resources for dental hygiene, denturist or dental consult;
- appropriate oral care products;
- appropriate oral care techniques and infection control considerations;

- appropriate denture care techniques and hands-on demonstrations;
- cultural traditions and beliefs (care providers and clients);
- educational support to client/family; and
- preventative measures to support clients' healthy lifestyle changes and promote empowerment of the individual.

Discussion of Evidence

Opportunities for ongoing education to support knowledge transfer, uptake and sustainability are a key implementation strategy. Educational content should focus on the factors that influence quality oral hygiene. Education should include enhancement of knowledge, skills and attitudes. Skill development is a fundamental outcome in order to achieve appropriate oral care. Sumi et al., (2001) noted that visualizing the oral cavity in a narrow field of view or using an uncomfortable posture does not promote appropriate oral hygiene. Learning to perform proper techniques is essential for good oral hygiene care. Refer to the Practice Recommendations for discussion regarding the skills required to support optimal oral hygiene care, and to Organization and Policy Recommendation 17 for a discussion regarding organizational support for oral health education.

Facilitating changes to caregivers' behaviours and shifting of attitudes are also important. Cultural traditions and beliefs can influence not only the advice caregivers provide, but also oral hygiene practices. Many health care professionals and unregulated health care providers have their own anxieties about dental care. Their anxiety about their own oral hygiene and health may adversely impact the advice they provide to clients (Preston, et al.). Not valuing the importance of oral care and/or viewing oral care as unpleasant, are associated with the provision of poor quality oral care (Furr, Binkley, McCurren & Carrico, 2004; Wardh et al, 2000). Refer to Recommendation 1 for a discussion related to personal beliefs and practices related to oral care.

Refer to Appendix L for professional dental association websites and other resources.

Organization and Policy Recommendations

Policy and Programming

Recommendation 15

Health care organizations develop oral health care policies and programs that recognize that the components of oral health assessment, oral hygiene care and treatment are integral to quality client care.

Level IV

Discussion of Evidence

Oral health programs are most successful when adapted to both the client population and health care setting. The health care organization should implement best practices that are appropriate and acceptable in supporting oral hygiene care while addressing such issues as dementia, mental health, advocacy, client-centeredness, restraints, behavioural management, infection control, nutrition, communication, consent and cultural sensitivity. The oral health policy should be consistent with the organizational culture, philosophical values and communication patterns. The World Health Organization (2003) provides a framework for policies in oral health for organizations and policy-makers. In the U.S. Surgeon General's Report *Oral Health in America* (US Department of Health and Human Services [DHHS], 2000), the Surgeon General called for action to "reconnect the mouth to the rest of the body in health policies and programs".

Implementing the role of an oral hygiene champion, resource nurse or specially trained health care provider as part of a comprehensive oral hygiene program to promote improvements in oral hygiene care (e.g. conducting oral health assessments on admission; determining oral care plans with client-centered interventions; monitoring for their effectiveness) is a powerful approach in maintaining a high level of oral care and promoting effective communication between nursing and oral health care professionals (Wardh, Halberg, Berggren, Andersson & Sorensen, 2003). Organizations are encouraged to have specially trained nurses and health care providers who become responsible and accountable for oral hygiene care provision (Pearson & Chalmers, 2004).

Coordination of Oral Health Care with Oral Health Care Professionals and Services

Recommendation 16

Health care organizations develop partnerships and increase capacity among providers to deliver collaborative practice models that improve the oral health care they provide to their clients.

Level IV

Discussion of Evidence

In Canada, oral health care accounts for 7% of all health care expenditures. This is the second highest diagnostic category of expenditure in the nation, second only to cardiovascular disease (Seniors Oral Health Callaboration [SOHC], 2005). Unfortunately, many feel that oral health has low priority and is a conflicting priority within health care organizations. The World Health Organization *Oral Health Report* (2003) supports cost-effective interventions and strengthening intersectoral collaboration that is sustainable and reduces inequities. For many reasons, access to oral health care can be difficult. This results in clients being unable to access necessary care and they are left untreated, continuing in pain or discomfort, and at risk for associated health complications, impairment of function and reduced quality of life.

Solutions can be found through shared approaches that support the effective use of expertise and efficient use of resources to maximize the oral health care benefits to the client. Multidisciplinary approaches to improving oral health care can improve knowledge and awareness and move oral care practices in facilities closer to best practice (Fallon, 2006). Studies suggest that oral health care providers in addition to dentists (e.g. dental hygienists, denturists) need to be part of the solution. Research also shows that treatment should be combined with prevention strategies such as good oral hygiene and having a full dental team available that would allow for the most comprehensive services offered and avoid situations requiring crisis management (Pearson & Chalmers, 2004; SOHC, 2005).

Education and Training

Recommendation 17

Health care organizations implement continuing education opportunities for nurses, and support them to complete oral hygiene education and training that is applicable to their health care setting.

Level III

Discussion of Evidence

For some health care clients, the nurse may be the first health professional to identify oral hygiene care concerns or an oral health issue requiring further attention. The inadequacy of health care provider training and their continuing workplace training in oral hygiene care is well documented in the literature (Fallon, 2006; Frenkel, 2001; Frenkel, 2002; Nichol, 2005; Pearson & Chalmers, 2004; Wardh, 2003). It is important that oral health continuing education and training is provided to nurses and other health care providers so that oral health assessment and screening becomes part of nursing and personal care. It is important for nurses to understand the effects of oral health on overall health (SOHC, 2006).

Oral health is integral and essential to general health and is a determinant factor for quality of life (WHO, 2003). Several studies have shown that nurses whose organizations have implemented oral hygiene care education and hands-on training can successfully assess and screen oral hygiene health status, identify the need for referral to oral health professionals, better develop and implement client-centred oral care plans, and have produced significant improvement in clients' oral health. Annual updates of health education are necessary in order to maintain the beneficial effects of oral health care education. Organizations need to facilitate nurses attending, and also completing, continuing education opportunities that have multiple modules or courses.

Refer to Recommendation 14 for details regarding the components of a comprehensive educational program.

Standards

Recommendation 18

Health care organizations develop oral hygiene care standards that are based on the best available evidence and ensure they are implemented and monitored as part of the organization's commitment to providing quality oral health care and services.

Level III

Discussion of Evidence

Many call for standards for oral care. In Ontario, the Ministry of Health and Long-Term Care recently revised the coordination of dental care services standards within the Long-Term Care Homes Program Manual. The Manual presents the Government's standards for long-term care homes' care, programs,

services and expectations criteria (Ontario Ministry of Health [MOH], 2006). However, the revised dental care standards are minimal and mandate that the home must have a mouth care policy that includes assessment, referral, education, consent, interventions and coordination with dental services from a dental professional for annual dental assessment and treatment plus emergency treatment components.

Organizations show commitment and accountability to quality oral hygiene care by implementing oral hygiene care standards. The lack of oral hygiene care standards can be viewed as a barrier to achieving and maintaining optimum oral health of people utilizing health care services, especially when they are unable to meet their own oral hygiene care needs. The implementation of standards can be accomplished on a local, provincial or national level.

The College of Nurses of Ontario (CNO) establishes practice standards and guidelines that assist nurses in providing safe, effective and ethical care. Nurses in Ontario are legally obliged to practice in accordance with these standards (CNO, 2004). Nurses consider oral health care an important and obvious, but often neglected, part of nursing practice (Paulsson, 1999). However, the CNO does not currently have a standard or guideline specific to the oral hygiene care practice for nurses. It has been suggested that lobbying efforts ought to focus on having oral health criteria integrated into the national health services accreditation program (SOHC, 2005). Accreditation Canada guides health care organizations to reach standards of excellence. Organizations that participate in the accreditation programs benefit from a thorough assessment that leads to an action plan for improving every aspect of the health care and services they deliver (Canadian Council on Health Services Accreditation [CCHSA], 2006). In evaluating the quality of oral hygiene care and service they provide organizations would be able to accurately measure their clinical and operational performance, assess their strengths and areas for improvement, and compare themselves to other similar health care organizations (i.e. benchmarking).

The Canadian Oral Health Strategy (2005) is a blueprint to improving oral health and guiding oral health initiatives. It does not set standards but it is looking at establishing a baseline of current oral health, setting targets, developing strategies to improve and maintain oral health and developing a system of measurement and monitoring so that individual provinces, regions and organizations could compare themselves. The Seniors Oral Health Collaboration in Nova Scotia (2005), although specific to seniors, similarly recommends the development, implementation, monitoring and evaluation of standards for oral health care.

The World Health Organization has been continuously working to improve the oral health of people worldwide (WHO, 2003). Oral health is integral and essential to general health and is a determinant factor for quality of life. They acknowledge that opportunities exist within health care settings for health care providers to expand oral health care promotion, prevention and practices. Translating the oral health care knowledge and experiences into action is seen as necessary, urgent and complex and therefore should be on the agenda of policy makers. The WHO's *Policy Framework for the WHO Oral Health Programme* is primarily designed to encourage health policy-makers to set standards for oral health on key parameters (WHO, 2003).

Depending on the health care setting, standards may include the following elements:

- care and services provision
- oral health in relation to pain, dental caries, periodontal disease, oral mucosal diseases, salivary gland disorders, tooth loss, functional disorders, infectious diseases, oropharyngeal cancer, oral manifestations of HIV infection, trauma, craniofacial anomalies

- interdisciplinary oral health care provision;
- financial/funding issues;
- access issues;
- networking, partnering, collaboration;
- sharing resources;
- evaluation, monitoring of performance;
- oral health information systems;
- promotion of oral health care initiatives such as "new models"; and
- oral health care research

The development of specific and measurable standards can be assisted by government and associations.

Research

Recommendation 19

Organizations should encourage and offer support, including time and resources, for nurses to participate in oral hygiene research to better assist in better understanding the issues related to oral hygiene care provision in various health care settings.

Level IV

Discussion of Evidence

According to the Surgeon General's Report on Oral Health of America (2000) "…oral health and general health should not be interpreted as separate entities", yet the health of the mouth and oral cavity has long been seen as something separate from the rest of the human body. Recent studies regarding the association of dental plaque, oral microbial flora and periodontal disease on systemic health (Lavigne, 2004) have generated considerable interest in further interdisciplinary research and the expansion of oral disease prevention and health promotion knowledge and practice through community programmes and in health care settings (World Health Organization [WHO], 2006).

The Canadian Oral Health Strategy (2005) report of the federal, provincial and territorial dental directors called for more support for oral health research from governments, health organizations and individuals, lending further support for the need for interdisciplinary research. In addition, the Canadian Dental Hygienists Association supports an interdisciplinary approach to research related to oral hygiene in their research agenda (CDHA, 2003). Given that oral health has the potential to be influenced by nursing interventions, nurses have an integral role to play in any interdisciplinary research (Lee et al., 2001; Munro, Grap, Jablonski & Boyle, 2006).

Evaluation – Outcomes

Recommendation 20

Oral hygiene care is monitored and evaluated as part of the organization's quality management program, utilizing a variety of quantitative and qualitative approaches.

Level IV

Discussion of Evidence

The purpose of evaluation is to provide information on the effectiveness of a program or intervention so as to optimize the outcomes, efficiency and quality of health care (Fink, 2005). Long-term maintenance and improvement in the oral health status of clients is the intended outcome of good oral hygiene care, and

outcome measures act as indicators in assessing the effects of the intervention at short, intermediate and/or long-term stages (Petersen & Kwan, 2004).

Qualitative evaluations collect data through in-person interviews, direct observations and review of written documents. These evaluations aim to provide personalized information on the dynamics of a program and participants' perceptions of the program's outcomes and impact. Qualitative methods are used to complement other quantitative methods of gathering data (Fink, 2005).

The use of valid and reliable oral health assessment tools such as the brief oral health status examination – BOHSE (Kayser-Jones et al, 1995) or the Oral Health Assessment Tool OHAT (Chalmers et al., 2004) – for oral health screening will support the quantitative component of the evaluation process. It will enable the collection of baseline data and support consistent data comparisons during the evaluation phases. Refer to Appendix E for a range of validated tools.

There is ample support in the literature regarding the effectiveness of monitoring and regular audits. In a study from the United Kingdom, the use of oral care feedback mechanisms resulted in improved removal of plaque and increased staff motivation (Schafer, Nicholson, Gerritson, Wright, Gillian & Hall, 2003). In another study, the authors concluded that routine audits of oral hygiene care documentation will ensure that oral care is both consistent and in line with best practice (Kinley & Brennan, 2004). Please refer to page 50 of the guideline for some suggested monitoring and evaluation indicators.

Recommendation 21

Organizations develop a plan for implementation of best practice guideline recommendations that include:

- **An assessment of organizational readiness and barriers/faciliators**
- **Involvement of all members (whether in a direct, or indirect supportive function) who will contribute to the implementation process**
- **Ongoing opportunities for discussion and education to reinforce the importance of best practices**
- **Dedication of a qualified individual to provide the support needed for the education and implementation process**
- **Ongoing opportunities for discussion and education to reinforce the importance of best practices**
- **Opportunities for reflection on personal and organizational experience in implementing guidelines**
- **Strategies for sustainability.**

Level IV

Discussion of Evidence

Organizations must ensure that all health care professionals involved in providing oral hygiene care work in an environment that allows them to practice according to the guidelines, and that they have access to appropriate assessment tools and equipment. Commitment to supporting the nurse's role in oral hygiene care requires a healthy work environment. Guideline implementation may be supported by:

- a critical mass of nurses educated and supported in guideline implementation;
- care delivery systems and adequate staffing that support the nurses' ability to implement these guidelines; and
- a sustained commitment to evidence-based practice in caring for those needing assistance with maintaining oral hygiene.

For effective teamwork to take place, all team members need to feel valued within the team.

A critical initial step in the implementation of guidelines must be the formal adoption of the guidelines. Organizations need to consider how to formally incorporate the recommendations to be adopted into their policy and procedure structure (Graham, Harrison, Brouwers, Davies, & Dunn, 2002). An example of such a formal adoption would be the establishment of a policy and procedure regarding the frequency of oral health assessments. This initial step paves the way for general acceptance and integration of the guideline into such systems as the quality management process.

A commitment to monitoring the impact of the implementation of the *Oral Health: Nursing Assessment and Interventions* best practice guideline is a key step that must not be omitted if there is to be an evaluation of the impact of the efforts associated with implementation. It is suggested that each recommendation to be adopted be described in measurable terms, and that the health care team be involved in the evaluation and quality monitoring processes. A suggested list of evaluation indicators can be found on page 50.

New initiatives, such as the implementation of a best practice guideline, require strong leadership from nurses who are able to transform the evidence-based recommendations into useful tools that will assist in directing practice. In this regard, RNAO (through a panel of nurses, researchers and administrators) has developed the *Toolkit: Implementation of Clinical Practice Guidelines* (2002) based on available evidence, theoretical perspectives and consensus. The *Toolkit* is recommended for guiding the implementation of the RNAO best practice guideline *Oral Health: Nursing Assessment and Interventions.* Appendix N provides a description of the *Toolkit.*

Research Gaps and Future Implications

The development panel, in reviewing the evidence for the development of this guideline, has identified several gaps in the research literature related to oral hygiene care provided by nurses.

Organizations and nurses should participate in oral hygiene research that assists in better understanding oral hygiene care provision and issues in various health care settings. Recommendations for areas of oral health research include:

- frail older adults with/without dementia in community and long-term care homes and their oral health care needs;
- access to oral health care services;
- assessment and provision of oral health care by nurses;
- cost analysis for the impact of oral care; and
- the effectiveness of suction toothbrushes.

The above list, although in no way exhaustive, is an attempt to identify and prioritize the research gaps in this area. Some of the recommendations in this guideline are based on evidence gained from qualitative or quantitative research, while others are based on consensus or expert opinion. Further substantive research is required in some areas to validate the expert opinion and impact knowledge that will lead to improved practice and outcomes related to oral hygiene.

Evaluation and Monitoring of Guideline

Organizations implementing the recommendations in this nursing best practice guideline are advised to consider how the implementation and its impact will be monitored and evaluated. The following table, based on a framework outlined in the RNAO *Toolkit: Implementation of Clinical Practice Guidelines* (2002), illustrates some specific indicators for monitoring and evaluation of the guideline *Oral Health: Nursing Assessment and Interventions.*

Level of Indicator	Structure	Process	Outcome
	To evaluate the supports available in the organization that allow for nurses to participate in oral hygiene care.	To evaluate changes in practice that lead towards improved oral hygiene care.	To evaluate the impact of implementing the recommendations.
System	■ Oral hygiene education is included in the nursing curriculum in entry-level programs.		■ Nursing research focused on oral hygiene care and related factors. ■ Funded oral health research in health care settings.

Level of Indicator	Structure	Process	Outcome
Organization	■ Review of best practice guideline recommendations by organizational committee(s) responsible for policies/procedures.	■ Modifications to policies/procedures consistent with the recommendations of the best practice guideline.	■ Organization's quality management program demonstrates quality monitoring and reviews of its oral health and oral hygiene care through: • data collection and statistical analysis; • auditing processes • use of valid, reliable oral health assessment tools; • satisfaction determination; • equipment and supplies usage and requirements; • annual reports; and • accreditation
	■ Access to appropriate oral hygiene products at the point of client care.	■ Processes are in place to ensure equipment and products used for oral hygiene care meets evidence-based standards.	■ All staff and clients utilize appropriate products and equipment in the provision of oral hygiene care.
Nurse	■ Availability of educational opportunities for nurses related to oral hygiene care within the organization's workplace orientation program, and ongoing professional development opportunities.	■ Percentage of nurses attending and completing educational sessions regarding oral hygiene care.	■ Nurses display increased knowledge and ability to perform or supervise oral hygiene care.
	■ Evaluation structures are in place to monitor effectiveness of education programs for nurses.	■ Nurses self-assessed knowledge of: • components of an oral health history; • use of a validated oral assessment tool; • appropriate oral care technique; and • oral hygiene products and their application.	■ Documented evidence in client's health record reflects nursing assessment/intervention related to oral hygiene care.
Client	■ Availability of client education opportunities and resources related to oral hygiene care.	■ Percentage of clients receiving/participating in educational opportunities.	■ Clients demonstrate knowledge of the need for routine oral hygiene care. ■ Clients have improved oral hygiene.
Financial Costs	■ Provision of adequate financial and human resources for guideline implementation.		■ Optimal investment of resources related to oral hygiene care.

Implementation Strategies

The RNAO and the guideline development panel have compiled a list of implementation strategies to assist health care organizations or health care disciplines that are interested in implementing this guideline. A summary of these strategies follows:

- Have at least one dedicated person such as an advanced practice nurse or a clinical resource nurse who will provide support, clinical expertise and leadership. The individual should also have good interpersonal, facilitation and project management skills.

- Conduct an organizational needs assessment related to oral hygiene to identify current knowledge base and further educational requirements.

- Initial needs assessment may include an analysis approach, survey and questionnaire, group format approaches (e.g. focus groups), and critical incidents.

- Establish a steering committee comprised of key stakeholders and interdisciplinary members committed to lead the change initiative. Identify short- and long-term goals. Keep a work plan to track activities, responsibilities and timelines.

- Create a vision to help direct the change effort and develop strategies for achieving and sustaining the vision.

- Program design should include:
  - target population;
  - goals and objectives;
  - outcome measures;
  - required resources (human resources, facilities, equipment); and
  - evaluation activities.

- Design educational sessions and ongoing support for implementation. The education sessions may consist of presentations, facilitator's guide, handouts and case studies. Binders, posters and pocket cards may be used as ongoing reminders of the training. Plan education sessions that are interactive, include problem solving, address issues of immediate concern and offer opportunities to practice new skills (Davies & Edwards, 2004).

- Provide organizational support such as having the structures in place to facilitate the implementation. For example, hiring replacement staff so participants in education sessions will not be distracted by concerns about work and having an organizational philosophy that reflects the value of best practices through policies and procedures. Develop new assessment and documentation tools (Davies & Edwards, 2004).

- Identify and support designated best practice champions on each unit to promote and support implementation. Celebrate milestones and achievements, acknowledging work well done (Davies & Edwards, 2004).

- Organizations implementing this guideline should adopt a range of self-learning, group learning, mentorship and reinforcement strategies that will, over time, build the knowledge and confidence of nurses in implementing this guideline.

- Beyond skilled nurses, the infrastructure required to implement this guideline includes access to specialized equipment and treatment materials. Orientation of the staff to the use of specific products and technologies must be provided and regular refresher training planned.

- Teamwork, collaborative assessment and treatment planning with the client, family and interdisciplinary team are beneficial in implementing guidelines successfully. Referral should be made as necessary to services or resources in the community or within the organization.

In addition to the strategies mentioned above, the RNAO has developed resources that are available on the website. A toolkit for implementing guidelines can be helpful if used appropriately. A brief description about this toolkit can be found in Appendix N. A full version of the document in pdf format is also available at the RNAO website, www.rnao.org/bestpractices.

Process for Update and Review of Guideline

The RNAO proposes to update this best practice guideline as follows:

1. Each nursing best practice guideline will be reviewed by a team of specialists (Review Team) in the topic area every three years following the last set of revisions.
2. During the three-year period between development and revision, RNAO program staff will regularly monitor for new systematic reviews and randomized controlled trials and other relevant literature in the field.
3. Based on the results of the monitor, program staff will recommend an earlier revision period. Appropriate consultation with a team of members comprising original panel members and other specialists in the field will help inform the decision to review and revise the guidelines earlier than the three-year milestone.
4. Three months prior to the three year review milestone, the program staff will commence the planning of the review process by:
   a. Inviting specialists in the field to participate in the Review Team. The Review Team will be comprised of members from the original panel as well as other recommended specialists.
   b. Compiling feedback received, questions encountered during the dissemination phase as well as other comments and experiences of implementation sites.
   c. Compiling new clinical practice guidelines in the field, systematic reviews, meta-analysis papers, technical reviews, randomized controlled trial research and other relevant literature.
   e. Developing detailed work plan with target dates and deliverables.

The revised guideline will undergo dissemination based on established structures and processes.

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Appendix A: Search Strategy for Existing Evidence

The search strategy utilized during the development of this guideline focused on two key areas. One was the identification of clinical practice guidelines published on the topic of oral hygiene care, and the second was to identify systematic reviews and primary studies published in this area from 1995 to 2006.

STEP 1 – DATABASE Search

A database search for existing evidence related to oral hygiene management was conducted by a university health sciences library. An initial search of the MEDLINE, Embase, CINAHL, Web of Science, Scholars Portal and Scopus databases for guidelines, reviews and studies published from 1995 to 2006 was conducted in August 2006. This search was structured to answer the following questions:

- What are the risk factors associated with poor oral hygiene?
- What are the current attitudes and beliefs of nurses providing oral hygiene care?
- What are the optimal oral hygiene interventions for oral health in vulnerable populations?

STEP 2 – Structured Website Search

One individual searched an established list of websites for content related to the topic area in April 2006. This list of sites, reviewed and updated in March 2006, was compiled based on existing knowledge of evidence-based practice websites, known guideline developers, and recommendations from the literature. Presence or absence of guidelines was noted for each site searched as well as date searched. The websites at times did not house guidelines, but directed to another website or source for guideline retrieval. Guidelines were either downloaded if full versions were available or were ordered by phone/email.

- Agency for Healthcare Research and Quality: http://www.ahcpr.gov
- Alberta Heritage Foundation for Medical Research – Health Technology Assessment: http://www.ahfmr.ab.ca//hta
- Alberta Medical Association - Clinical Practice Guidelines: http://www.albertadoctors.org
- Bandolier Journal: http://www.jr2.ox.ac.uk/bandolier
- British Columbia Council on Clinical Practice Guidelines: http://www.hlth.gov.bc.ca/msp/protoguides/index.html
- BC Office of Health Technology Assessment: http://www.chspr.ubc.ca/
- British Medical Journal – Clinical Evidence: http://www.clinicalevidence.com/ceweb/conditions/index.jsp
- Canadian Agency for Drugs and Technologies in Health: www.cadth.ca
- Canadian Health Network: http://www.canadian-health-network.ca/
- Canadian Institute for Health Information: http://www.cihi.ca
- Centers for Disease Control and Prevention: http://www.cdc.gov
- Centre for Evidence-Based Mental Health: http://cebmh.com
- Centre for Evidence-Based Pharmacotherapy: http://www.aston.ac.uk/lhs/teaching/pharmacy/cebp
- Clinical Resource Efficiency Support Team (CREST): http://www.crestni.org.uk
- CMA Infobase: Clinical Practice Guidelines: http://mdm.ca/cpgsnew/cpgs/index.asp
- Cochrane Database of Systematic Reviews: http://www3.interscience.wiley.com/cgi-bin/mrwhome/106568753/HOME?CRETRY=1&SRETRY=0
- Commission on the Future of Health Care in Canada: http://www.hc-sc.gc.ca/english/care/romanow/hcc0381.html
- Database of Abstracts of Reviews of Effectiveness (DARE): http://www.york.ac.uk/inst/crd/darehp.htm

- European Observatory on Health Care for Chronic Conditions, World Health Organization: http://www.who.int/chp/en/
- Evidence-Based On-Call: http://www.eboncall.org
- Guidelines Advisory Committee: http://gacguidelines.ca
- Guidelines International Network: http://www.g-i-n.net
- Health-Evidence.ca: http://health-evidence.ca/default.aspx?lang=en
- Health Evidence Network, European Region, World Health Organization: http://www.euro.who.int/
- Institute for Clinical Evaluative Sciences: http://www.ices.on.ca
- Institute for Clinical Systems Improvement: http://www.icsi.org/index.asp
- Institute of Intergovernmental Relations, Queen's University: http://www.iigr.ca/iigr.php/site/browse_documents?sectioni=22
- Joanna Briggs Institute for Evidence-Based Nursing & Midwifery: http://www.joannabriggs.edu.au
- Medic8.com: http://www.medic8.com/ClinicalGuidelines.htm
- Monash University Centre for Clinical Effectiveness: http://www.med.monash.edu.au/healthservices/cce/evidence
- National Electronic Library for Health: http://www.nelh.nhs.uk/
- National Guideline Clearinghouse: http://www.guidelines.gov
- National Institute for Clinical Excellence (NICE): http://www.nice.org.uk
- National Library of Medicine Health Services/Technology Assessment Test (HSTAT): http://hstat.nlm.nih.gov/hq/Hquest/screen/HquestHome/s/64139
- New Zealand Guidelines Group: http://www.nzgg.org.nz
- NHS Centre for Reviews and Dissemination: http://www.york.ac.uk/inst/crd
- NHS National Research Register (UK focus): http://www.nrr.nhs.uk/
- NHS Nursing & Midwifery Practice Dev. Unit: http://www.nmpdu.org
- NHS R & D Health Technology Assessment Programme: http://www.hta.nhsweb.nhs.uk/htapubs.htm
- NIH Consensus Development Program: http://consensus.nih.gov/about/about.htm
- PEDro: The Physiotherapy Evidence Database: http://www.pedro.fhs.usyd.edu.au/index.html
- Royal College of General Practitioners: http://www.rcgp.org.uk
- Royal College of Nursing: http://www.rcn.org.uk/index.php
- Royal College of Physicians: http://www.rcplondon.ac.uk
- Sarah Cole Hirsh Institute – Online Journal of Issues in Nursing: http://fpb.cwru.edu/HirshInstitute
- Scottish Intercollegiate Guidelines Network: http://www.sign.ac.uk
- Society of Obstetricians and Gynecologists of Canada Clinical Practice Guidelines: http://www.sogc.medical.org/sogcnet/index_e.shtml
- SUMSearch: http://sumsearch.uthscsa.edu
- The Qualitative Report: http://www.nova.edu/ssss/QR
- TRIP Database: http://www.tripdatabase.com
- U.S. Preventive Service Task Force: http://www.ahrq.gov/clinic/uspstfix.htm
- University of California, San Francisco: http://medicine.ucsf.edu/resources/guidelines/index.html
- University of Laval – Directory of Clinical Information Websites: http://132.203.128.28/medecine
- Virginia Henderson International Nursing Library: http://www.nursinglibrary.org/Portal/main.aspx?PageID=4001

STEP 3 – Search Engine Web Search

In addition, a website search for existing practice guidelines on oral hygiene was conducted via the search engine "Google", using key search terms. One individual conducted this search, noting the results of the search, the websites reviewed, date and a summary of the results. The search results were further reviewed by a second individual who identified guidelines and literature not previously retrieved.

STEP 4 – Hand Search/Panel Contributions

Panel members were asked to review personal archives to identify guidelines not previously found through the above search strategy.

SEARCH RESULTS

The search strategy described above resulted in the retrieval of 1163 abstracts on the topic of oral hygiene. These abstracts were then screened by a research assistant in order to identify duplications and assess for inclusion/exclusion criteria. A total of 26 abstracts were identified for article retrieval, quality appraisal and data extraction.

In addition, three clinical practice guidelines were identified that met the screening criteria and were critically appraised using the *Appraisal of Guidelines for Research and Evaluation Instrument* (AGREE Collaboration, 2001).

- Research Dissemination Core (2002). *Oral hygiene care for functionally dependent and cognitively impaired older adults.* Iowa City (IA): University of Iowa Gerontological Nursing Interventions Research Center.

- Rubenstein, E.B., Peterson, D.E., Schubert, M,. Keefe, D., McGuire, D., Epstein, J., Elting, L.S., Fox, P.C., Cooksley, C. & Sonis, S.T. (2004). Clinical practice guidelines for the prevention and treatment of cancer therapy-induced oral and gastrointestinal mucositis. *Cancer Journal, 100*(S9), pg. 2026-2046.

- Singapore Ministry of Health (2004). *Nursing Management of Oral Hygiene.* Singapore: Singapore Ministry of Health.

Appendix B: Glossary of Clinical Terms

Angular Chelitis: Cracked, eroded and encrusted surfaces at the commissural folds that frequently appear in conjunction with mucosal inflammation caused by *Candida albicans* infection; may cause moderate pain (Darby & Walsh, 2003).

Aspiration: The entry of food or liquid into the airway below that muscles that produce sound, that is, the vocal cords (Heart and Stroke Foundation of Ontario, 2006).

Assessment: Collecting and analyzing subjective and objective data about a client's risk or problem, and arriving at a judgement about the client's care needs (Darby & Walsh, 2003).

Dental Hygienist: Dental hygienists are registered health professionals who specialize in preventing oral health problems and diseases (Canadian Dental Hygienists' Association website, 2002). They provide teaching to clients, family and other health professionals regarding oral hygiene care. They conduct basic exams of the teeth and gums, and may take x-rays, make dental impressions or clean, polish and apply fluoride to the teeth (CDA website, 2007).

Dentate: In dental terminology, this describes an individual having some or all of their natural teeth.

Dentist: Dentists are registered health professionals who diagnose and treat diseases, injuries and malformations of the teeth and mouth. They perform surgical procedures such as implants, tissue grafts and extractions. They also provide client education on how to care for their teeth and prevent oral disease (Retrived May, 2007 from http://www.ada.org/prof/ed/specialties/definitions.asp).

Denturist: Denturists are registered health professionals who perform a variety of intra-oral procedures and related activities pertaining to the design, construction, repair or alterations of removable dentures of the fully or partially edentulous patient (Retrieved, May, 2007, from http://www.denturists-cdo.com/about/index.cfm).

Dysphagia: A swallowing disorder associated with difficulty moving food/liquid from the mouth to the stomach (Heart and Stroke Foundation of Ontario, 2006).

Edentulous: Refers to an individual who is lacking or without teeth.

Erythemia: A red area of variable shape and size reflecting tissue inflammation, thinness and irregularity (Darby & Walsh, 2003).

Gingivitis: Inflammation of the gingival tissue with no gingival recession; characterized by inflammation and redness of the gingival tissue and bleeding upon brushing (Darby & Walsh, 2003).

Hyposalivation or Hypoptyalism: Decreased secretion of saliva (Jablonski, Munro, Grap & Elswick, 2005).

Interproximal Cleaning: Cleaning between the teeth (e.g. flossing).

Mucositis: Direct cytotoxic action of chemotherapeutic agents on the oral mucosa resulting in atrophy or thinning of the oral mucosa, erythema, and ulceration (Darby & Walsh, 2003).

Periodontitis: Inflammatory disease of the periodontium that results from the progression of gingivitis; caused by specific mircroorganisms; characterized by progressive destruction of the supporting soft tissue and bone, leading to tooth mobility and loss (Darby & Walsh, 2003).

Screening: The presumptive identification of unrecognized disease or defect by the application of tests, examinations or other procedures that can be applied rapidly (Shah, 1998).

Special Needs Dentistry: Geriatric and Special Need Dentistry

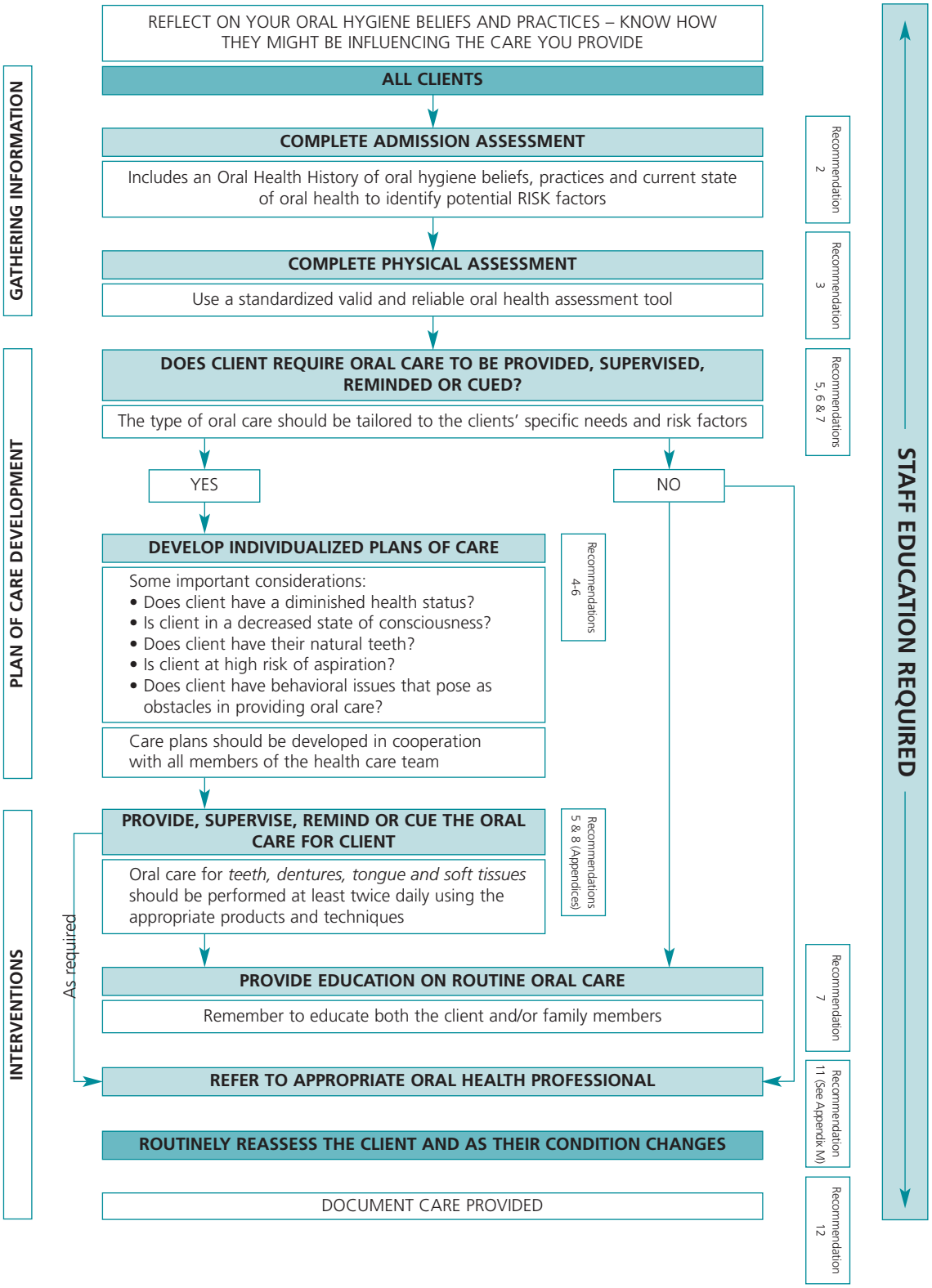
- dentistry which deals with the special knowledge, attitudes and technical skills required for the provision of oral health care for older adults and adults who are medically compromised, intellectually disabled, physically disabled and/or have chronic mental illness.
- These adults may live in the community or may be institutionalized (e.g. hospitals, nursing homes)
- Many are frail or dependent upon caregivers to help with their activities of daily living and instrumental activities of daily living.

Stomatitis: Any inflammatory disease of the oral mucosa, which may involve the buccal and labial mucosa, palate, tongue, floor of the mouth and the gingival (Jablonski, 2005).

Tardive Dyskinesia: Tardive dyskinesia is a disorder that causes involuntary movements (Medline Plus, 2008).

Xerostomia: The medical term for a dry mouth due to a lack of salvia, also know as hyposalivation.

Appendix C: Algorithm Guide to Oral Health Assessment and Interventions



Appendix D: Oral Hygiene History – Sample Questions

Please Note: These are suggested questions to assist in taking an oral hygiene history. It is not a validated tool for the assessment of the person's oral health history.

Admission Oral Hygiene History Sample Questions

Hygiene Beliefs:

Which statement best describes your beliefs regarding your teeth:

a) I expect that with proper care my teeth will last me a lifetime.
b) No big deal if I lose my teeth, most people do when they get older.
c) If I lose my teeth I can always get dentures.

Where on a scale would you place your oral health?

1	3	5
Not Important	Somewhat Important	Very Important

Personal Practices:

1. Are your teeth your natural teeth? Do you have dentures? Do you have crowns?
   If the client has dentures: Do you have partial or full dentures? Do they fit properly? How long have you had the ones you are currently using?
2. Are you having any difficulty doing your oral care?
3. How often do you brush your teeth in a day?
4. What type of toothbrush do you use?
5. What type of toothpaste do you use?
6. How often do you replace your toothbrush?
7. Do you use mouthwash?
8. Do you floss regularly?
9. Have you used tobacco products within the last six months? If so, how many cigarettes/cigars/pipes do you currently smoke a day or how much chewing tobacco do you use?
10. Do you drink caffeinated beverages?
11. How often do you visit the dentist?
12. When was the last visit to the dentist?
13. Does going to the dentist upset you?
14. Do you have difficulty chewing or swallowing?
15. Is there anything else that you do to keep your mouth healthy?

Current State of Oral Health:

1. Are you currently experiencing any problems in your mouth?
2. Are your teeth sensitive to hot or cold?
3. When was your last visit to a dentist?
4. Are you currently taking any medications?

Appendix E: Oral Health Assessment Tools

The following tools are examples of oral health assessment tools, recognizing that these instruments are setting and client specific. The interpretation of the assessment results vary from tool to tool (based on unique scoring systems, etc.); however, the results should guide decisions regarding the development of an individualized care plan and evidence-based interventions.

Oral Health Assessment Tool	Population	Reference
Oral Assessment Guide (OAG)	■ For use in acute care settings, ICU, cancer centres, rehabilitation settings	Eilers, J., Berger, A. & Petersen, M. (1988). Development, testing, and application of the oral assessment guide. *Oncology Nursing Forum. 15*(3):325-30.
Revised Oral Assessment Guide (ROAG)	■ Validated in three small studies of geriatric rehab clients	Andersson, P., Persson, L., Hallberg, I.R. & Renvert, S. (2004). Oral health problems in elderly rehabilitation patients. *International Journal of Dental Hygiene. 2*(2), 70-77.
Brief Oral Health Status Examination (BOHSE)	■ Validated in long-term care and residential care settings ■ Can be used with cognitively impaired clients	Kayser-Jones, J., Bird, W., Paul, S., Long, L. & Schell, E. (1995). An instrument to assess the oral health status of nursing home residents. *Gerontologist. 35*(6):814-24.
Oral Health Assessment Tool (OHAT) • Also know as the Modified Brief Oral Health Status Examination	■ For use in long-term care or residential care settings, and can be used with cognitively impaired clients	See Sample 1 (Page 69) Chalmers, J., King, P., Spencer, A., Wright, F. & Carter, K. (2005). The oral health assessment tool – validity and reliability. *Australian Dental Journal, 50*(3), 191-199. Chalmers, J., Johnson, V., Tang, J. & Titler, M. (2004). Evidence-based protocol: Oral hygiene care for functionally dependent and cognitively impaired older adults. *Journal of Gerontological Nursing. 30*(11), 5-12.
The Holistic and Reliable Oral Assessment Tool (THROAT)	■ Developed and tested for use in elderly hospitalized patients in a single trial.	See Sample 2 (Page 70) Dickinson, H., Watkins, C. & Leathley, M. (2001). The development of the THROAT: The holistic and reliable oral assessment tool. Clinical *Effectiveness in Nursing. 5,* 106-110.
Mucosal Plaque Index (MPS)	■ Measures only mucosal and plaque indices ■ Designed to assess oral care in groups of elderly patients/clients.	Henriksen, B., Ambjornsen, E. & Axell, T. (1999). Evaluation of a mucosal-plaque index (MPS) designed to assess oral care in groups of elderly. *Special Care Dentistry. 19*(4), 154-157.

Oral Health Assessment Tool	Population	Reference
National Cancer Institute (NCI) Scale	■ NCI is most commonly used in clinical trials ■ Scale to assess oral mucositis ■ Widely validated and extensively used.	*World Health Organization (1997). Handbook for reporting results of cancer treatment.* Author. pp.15-22.
World Health Organization (WHO) Grading Scale	■ Measures anatomical, symptomatic and functional components of oral mucositis. ■ Combines both objective mucosal changes (redness and ulceration) with functional outcomes (ability to eat) to arrive at a score. ■ The WHO Grading Scale is very frequently used in oncology clinical practice	World Health Organization (1997). *Handbook for reporting results of cancer treatment.* Author. pp.15-22.

Sample 1: Oral Health Assessment Tool (OHAT) also know as the Modified Brief Oral Health Status Examination

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Oral Health Assessment Tool for Dental Screening (modified from Kayser-Jones et al (1995) by Chalmers (2004))

Client: _____ **Completed by:** _____ **Date:** ___/___/___

Scores – *You can circle individual words as well as giving a score in each category and can write notes in the category scores column also*

Category	0 = healthy	1 = changes *	2 = unhealthy *	Category scores
Lips	smooth, pink, moist	dry, chapped, or red at corners	swelling or lump, white/red/ulcerated patch; bleeding/ulcerated at corners	
Tongue	normal, moist roughness, pink,	patchy, fissured, red, coated	patch that is red &/or white, ulcerated, swollen	
Gums and tissues	pink, moist, smooth, no bleeding	dry, shiny, rough, red, swollen, one ulcer/sore spot under dentures	swollen, bleeding, ulcers, white/red patches, generalized redness under dentures	
Saliva	moist tissues, watery and free flowing saliva	dry, sticky tissues, little saliva present, resident thinks they have a dry mouth	tissues parched and red, very little/no saliva present, saliva is thick, resident thinks they have a dry mouth	
Natural teeth Yes/No	no decayed or broken teeth/roots	1-3 decayed or broken teeth/ roots or very worn down teeth	4 + decayed or broken teeth/roots, or very worn down teeth, or less than 4 teeth	
Dentures Yes/No	no broken areas or teeth, dentures regularly worn, and named	1 broken area/ tooth or dentures only worn for 1-2 hrs daily, or dentures not named, or loose	more than 1 broken area/tooth, denture missing or not worn, loose and needs denture adhesive, or not named	
Oral cleanliness	clean and no food particles or tartar in mouth or dentures	food particles/ tartar/ plaque in 1-2 areas of the mouth or on small area of dentures or halitosis (bad breath)	food particles/tartar/plaque in most areas of the mouth or on most of dentures or severe halitosis (bad breath)	
Dental pain	no behavioral, verbal, or physical signs of dental pain	are verbal &/or behavioral signs of pain such as pulling at face, chewing lips, not eating, aggression	are physical pain signs (swelling of cheek or gum, broken teeth, ulcers), as well as verbal &/or behavioral signs (pulling at face, not eating, aggression)	

☐ * Refer person to have a dental examination by a dentist
☐ Person and/or family/guardian refuses dental treatment
☐ Complete Oral Hygiene Care Plan and start oral hygiene care interventions for person
☐ Review this person's oral health again on Date: ___/___/___

TOTAL SCORE: ____ 16

Resources are available to support the use of this tool by nurses and other care providers. An online module on the Oral Health Assessment Tool (OHAT) contains interactive practice exercises.

The University of Iowa/Geriatric Education
Best Practice Geriatric Oral Health Training
E-learning module: The Oral Assessment Tool (OHAT)
http://www.healthcare.uiowa.edu/igec/e-learn_lic/dentistry/default.asp

Sample 2: The Holistic and Reliable Oral Assessment Tool – THROAT

Reproduced with permission.

	Normal – 0	Mild – 1	THROAT Moderate – 2	Study NO Severe – 3	Score	Comments
1) Lips	Smooth/pink/moist	Dry/no cracks	Dry/cracks	Ulceration/sores/ bleeding		
2) Teeth	Clean	Film localized plaque over teeth	Film of plaque over teeth in moist areas	Heavy visible deposits of plaque on and between teeth		
• Dentures	Clean	Film localized plaque over teeth	Film of plaque over teeth in moist areas	Heavy visible deposits of plaque on and between teeth		
• Both	Clean	Film localized plaque over teeth	Film of plaque over teeth in moist areas	Heavy visible deposits of plaque on and between teeth		
3) Gums/Gingiva	Coral pink/moist	Mild inflammation/slight redness/slight edema	Moderate inflammation/ redness/edema/ glazing	Severe inflammation/ marked redness/ edema/ulceration/ bleeding		
4) Mucous membrane	Coral pink/moist	Mild inflammation/slight redness/slight edema	Moderate inflammation/ redness/edema/ glazing	Severe inflammation/ marked redness/ edema/ulceration/ bleeding		
5) Palate	Coral pink/moist	Mild inflammation/slight redness/slight edema	Moderate inflammation/ redness/edema/ glazing	Severe inflammation/ marked redness/ edema/ulceration/ bleeding/thick mucous patches		
6) Tongue	Pink/moist/no coating	Slight coating evident	Coating evident/cracks/ small ulcers	Thick coating/discoloured /blistered ulcerations/cracks/ bleeding		
7) Floor of mouth	Pink/moist/no coating	Slight coating evident	Coating evident/cracks/ small ulcers	Thick coating/discoloured /blistered ulcerations/cracks/ bleeding		
8) Smell	No smell	Slight smell on breath only noticed close up	Noticeable smell on breath	Strong smell on breath		
9) Saliva	Watery consistency	Slight thickening	Thick and ropy	No saliva		

Appendix F: Sample Care Plans

The following are examples of care plans that were developed to facilitate communication regarding the plan of care for individuals receiving oral health care.

Johnson, V. & Chalmers, J. (2002). Oral Hygiene Care for Functionally Dependent and Cognitively Impaired Older Adults. In M.G. Titler (Series Ed.), Series on Evidence-Based Practice for Older Adults, Iowa City: The University of Iowa Gerontological Nursing Interventions Research Center Research Translation and Dissemination Core.

For Use in the Long-term Care Setting

ORAL HYGIENE CARE PLAN ***Modified from Chalmers, 2004***

<table>
<tr><td colspan="3">Client:</td><td colspan="2">Completed by:</td><td>Date:</td></tr>
<tr><td colspan="3">Dentist:</td><td colspan="2">Phone:</td><td></td></tr>
<tr><td colspan="4">Date of last dental appointment:</td><td colspan="2">Date for next oral hygiene care plan review:</td></tr>
<tr><td rowspan="2">Assessment of Dentures:
(please circle)</td><td>Upper</td><td colspan="3">Full Partial Not worn No denture
Name on denture: Yes No</td><td>Denture cleaning: independent some assistance
fully dependent</td></tr>
<tr><td>Lower</td><td colspan="3">Full Partial Not worn No denture
Name on denture: Yes No</td><td></td></tr>
<tr><td rowspan="2">Assessment of Natural teeth:
(please circle)</td><td>Upper</td><td colspan="3">Yes No Root tips present</td><td>Teeth cleaning: independent some assistance
fully dependent</td></tr>
<tr><td>Lower</td><td colspan="3">Yes No Root tips present</td><td></td></tr>
<tr><td>Interventions for oral hygiene care
(check <u>all</u> that apply and indicate frequency as needed)</td><td colspan="4">☐ Mouth swab ☐ a.m. ☐ p.m.
☐ Electric toothbrush ☐ a.m. ☐ p.m.
☐ Suction toothbrush ☐ a.m. ☐ p.m.
☐ Regular toothbrush ☐ a.m. ☐ p.m.
☐ Use 2 toothbrushes ☐ a.m. ☐ p.m.
☐ Interproximal toothbrush / floss ☐ a.m. ☐ p.m.
☐ Regular fluoride toothpaste ☐ a.m. ☐ p.m.
☐ Do not use toothpaste
☐ Scrub denture/s with denture brush ☐ a.m. ☐ p.m.
☐ Soak denture/s over night in water with denture tablet
☐ Scrub denture bath weekly
☐ Dry mouth products as needed
☐ Fluoride varnish or other fluoride products (Rx by dentist or physician)
☐ Chlorhexidine mouth rinse (Rx by dentist or physician)
☐ Other:</td><td>Regular barriers to oral care
(check <u>all</u> that apply)</td><td>☐ Forgets to do oral hygiene care
☐ Refuses oral hygiene care
☐ Won't open mouth
☐ No compliance with directions
☐ Aggressive / kicks / hits
☐ Bites toothbrush and/or staff
☐ Can't swallow properly
☐ Can't rinse / spit
☐ Constantly grinding / chewing
☐ Head faces downwards / moves
☐ Won't take dentures out at night
☐ Dexterity or hand problems / arthritis
☐ Requires financial assistance
☐ Other:</td></tr>
</table>

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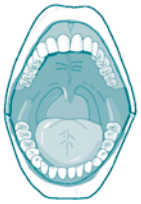
Halton Region Health Department.

For Use in the Long-term Care Setting

DAILY ORAL CARE PLAN

Client: _____ _____ Room: ____ Date: _____ Initials:___							
Natural Teeth:	❑ Upper ❑ Lower	**Dentures:**	❑ Upper ❑ Lower	**Partial Dentures:**	❑ Upper ❑ Lower	**No Teeth**	
Recommendations (Natural Teeth)				**Comments**			
❑ Oral hygiene needs improvement ❑ Brush teeth and gum line ❑ Use a dry mouth product ❑ Do not use toothpaste							
Recommendations (Dentures)							
❑ Remove dentures nightly ❑ Dentures need a vinegar soak ❑ Store dentures in room temperature water ❑ Treat for red palate/candidiasis ❑ Dentures need cleaning (daily)							
ADL							
❑ No assistance		❑ Some assistance		❑ Total care			

Appendix G: Brief Reference – Oral Hygiene Products

Remember!
Ensure all products are labeled with the client's name.

The following table is not intended to be all-inclusive, but rather provides examples for a range of practice settings of products currently utilized in the provision of oral hygiene care in a range of practice settings.

Products		Usage	Note
Toothbrushes	Manual	■ Soft bristled toothbrushes are preferred to avoid injuring the teeth and gingiva (gums) ■ Small headed toothbrushes (pediatric) may be more effective at reaching difficult areas (the shape and size of the toothbrush should be chosen to suit the patient's mouth for optimal delivery of oral care) (Darby & Walsh, 2003; [Online] Available at http://www.cda-adc.ca/en/oral_health/cfyt/dental_care/flossing_brushing.asp)	■ Toothbrushes should be replaced at least every three months ■ Place toothbrushes upright and allow to air-dry ■ All oral tissues should be brushed not just teeth. Those with dentures need to brush oral tissues with a soft brush.
	Powered	■ Oscillating, rotating powered toothbrushes can be more effective in removing plaque than traditional manual toothbrushes (Robinson, Deacon et al, 2005)	
	Suction	■ Clinical reports suggest the use of suction toothbrushes in individuals diagnosed with dysphagia or those who are intubated	
Oral Rinses	Regular	■ Alcohol-based oral rinses should be avoided for patients who experience dry-mouth ■ Compounded oral rinses should be avoided ■ Oral rinses should contain fluoride for dentate individuals	■ Fluoride is a chemical agent which remineralizes and protects teeth from demineralization (Wyatt and MacEntee, 1997) ■ Products containing fluoride (toothpastes and oral rinses) are only necessary for dentate patients
	Chlorhexidine	■ Chlorhexidine rinse or gel is an antimicrobial agent	■ Consult with pharmacist, dental team and/or physician before using this product. A prescription is required ■ Long-term use of chlorhexidine oral rinses can result in taste alterations and brown staining of oral hard tissues and dentures ■ Fluoride products should be used a minimum of two hours apart ■ Preferred concentration of product is 0.12% (without alcohol for individuals with dry mouth)

Products		Usage	Note
Foam Swabs		■ Foam swabs may be used to topically apply other products for patients who experience sensitive mucosa ■ May be used to remove surface debris, but is ineffective for plaque removal; toothbrushes are more effective in plaque removal and gingival stimulation, even when combined with water alone (Grap, Munro, Ashtioni & Bryant, 2003; Pearson & Hutton, 2002)	■ Using a toothbrush to remove debris is more effective (Pearson & Hutton, 2002) ■ Use with caution in those exhibiting reactive behaviours who are at risk of biting and swallowing/choking on swab
	Lemon glycerin	■ DO NOT use lemon and glycerin swabs	■ Lemon and glycerine swabs cause softening and erosion of the tooth enamel (Meurman, Sorvari et al., 1996)
Saliva Substitutes		■ Can facilitate chewing, swallowing, speaking and lessen night time awakenings due to dry mouth (Furumoto, Barker, Carter-Honson & Barker, 1998) ■ Medicated gum with chlorhexidine acetate/xylitol shown to reduce denture stomatitis and chelitis (Simons, Brailsford, Kidd & Beighton, 2002)	
Moisturizers		■ Water-based products are recommended over petroleum products (e.g. vaseline)	■ Water-based products hydrate the dry tissues while petroleum products primarily serve to prevent further moisture loss ■ If safe, sips of water can be the best hydrator
Tongue Cleaners		■ The tongue should be brushed or cleaned to reduce bad breath ■ Tongue scrapers or cleaners are more effective in reducing bad breath than brushing alone (Outhouse, Al-Alawi, Fedorawicz & Kennan, 2003)	
Toothpastes		■ The choice of toothpaste should depend on the individual needs of the patient/client	■ Non-foaming pastes should be used for individuals diagnosed with dysphagia or for those who cannot tolerate foam ■ Fluoridated pastes for dentate individuals. Fluoridated pastes are not required for those who are edentulous ■ Use a toothpaste for sensitive teeth if required
Interproximal Cleaning		■ Flossing will clean unexposed surfaces of the teeth that are not accessible by tooth brushing alone ■ Examples of this product include traditional string floss, floss wands, interdental stimulators, and proxabrushes	■ Patients should be reminded to floss regularly
Nystatin		■ An antifungal agent commonly prescribed to treat candidal infections	■ Consult with pharmacist, dental team and/or physician before using this product
Analgesics		■ Single agent products should be used ■ Pain resulting from oral complications should be treated systemically when local measures are ineffective	■ Compounded analgesic oral rinses should be avoided as these can delay healing of conditions such as oral mucositis

The following table illustrates the approximate wholesale price range of basic oral hygiene products as of 2007.

Product	Price Range
Toothbrushes	$0.23-$0.69
Interdental brush	$1.19
Denture brush	$1.39
Denture container	$1.19
Tongue scraper	$0.89
Dental floss (12 m)	$0.42
Lipbalm	$0.67-$0.93
Dental paste	Prices vary, depending on type of product

Appendix H: Medications That May Impact on Oral Health

Management of oral side effects from medications is an important aspect of nursing care. Oral side effects may cause client discomfort and interfere with the ability to chew, swallow and digest food. Some oral side effects put the client at risk for oral trauma, and others may lead to infection, pain and potential tooth loss.

Medication induced xerostomia results from a combination of reduced salivary flow rate and a change in the nature and quality of residual saliva. Residual saliva is more viscous, which causes food and plaque adherence to tooth surfaces, appliances, dentures and oral tissues. The pH of the mouth becomes more acidic, which puts the client at increased risk for dental caries (Darby & Walsh, 2003).

EXAMPLES OF MEDICATIONS CAUSING DRY MOUTH

The following list consists of generic (and brand names) of various medications that may cause dry mouth (xerostomia) as a side effect. Adapted from: www.laclede.com

Anorexiant
- phentermine (Adipex-P, Fastin, Ionamin, Zantryl)
- phendimetrazine (Anorex SR, Adipost, Bontril PDM)
- mazindol (Mazanor, Sanorex)

Antianxiety
- hydroxyzine (Atarax, Vistaril)
- lorazepam (Ativan)
- prazepam (Centrax)
- halazepam (Paxipam)
- oxazepam (Serax)
- diazepam (Valium)

Anticholinerigic/Antispasmodic
- atropine (Atropisol, Sal-Tropine)
- hyoscyamine (Anaspaz)
- oxybutynin (Diropan)

Anticonvulsant
- felbamate (Felbatol)
- lamotrigine (Lamictal)
- carbamazepine (Tegretol)

Antidepressant
- clomipramine (Anafranil)
- amitriptyline (Elavil)
- fluoxetine (Prozac)
- doxepin (Sinequan)

Antidiarrheal
- loperamide (Imoddium AD)
- diphenoxylate with atropine (Lomotil)

Antihistamine
- diphenhydramine (Benedryl)
- loratadine (Claritin)
- terfenadine (Seldane)

Antihypertensive
- aptopril (Capoten)
- prazosin (Minipress)
- reserpine (Serpasil)

Antiinflammatory Analgesic
- ibuprofen (Motrin)
- naproxen (Naprosyn)
- piroxicam (Feldene).

Antinauseant
- dyphenhydramine (Dramamine)
- meclizine (Antivert)

Antiparkinsonian
- biperiden (Akineton)
- trihexyphenidyl (Artane)
- benztropine mesylate (Cogentin)

Anti-Psychotic
- clozapine (Clozaril)
- lithium (Eskalith)
- haloperidol (Haldol)
- chlorpromazine (Thorazine)

Bronchodilator
- ipratropium (Atrovent)
- albuterol (Ventolin)

Decongestant
- pseudoephedrine (Sudafed)

Diuretic
- chlorothiazide (Diuril)
- furosemide (Lasix)

Muscle Relaxant
- cyclobenzaprine (Flexeril)
- orphenadrine (Norflex, Disipal)

Narcotic Analgesic
- merperidine (Demerol)
- morphine (MS Contin)

Sedative
- flurazepam (Dalmane)
- triazolam (Halcion)
- temazepam (Restoril)

In addition to xerostomia, the following is a list of common oral adverse effects of medications:

- Alterations in taste
- Atrophic mucosa
- Bleeding
- Burning mouth/tongue
- Dental caries
- Difficulty wearing appliances
- Difficulty with chewing
- Difficulty with speech
- Difficulty with swallowing
- Gingival enlargement
- Hairy tongue
- Increased periodontal disease progression
- Infection
- Mucositis/stomatitis
- Opportunistic infections (candidiasis)
- Oral ulcerations

Adapted from: Darby & Walsh, 2003

Appendix I: Denture Care

Adapted from: College of Dental Hygienists of Ontario. (2002). Oral health matters for denture wearers. www.cdho.org.

- Brush the denture(s), using a denture brush, regularly after each meal, or at least before bed to remove loose food debris, plaque and some stains. Rinsing dentures under water after meals will also remove loose food debris.
- Do not use scouring powders or other abrasive cleaners as they scratch the denture making it more susceptible to collecting debris, plaque and stain.
- Brush both the denture(s) and gums carefully. A soft toothbrush should be used for the gums. Be sure to clean and massage the gums.
- Use a separate brush for cleaning any natural teeth.
- If using a toothbrush is painful, try using a finger wrapped in a clean, damp cloth.
- Take dentures out every night, and soak them overnight. Soaking dentures loosens plaque and tartar. Removing the dentures for several hours helps to prevent gingival irritation and possible candidiasis infections.
- Soak dentures in warm water with a denture cleanser, or in a mix of warm water and vinegar 1:1 solution – (CDA, 2007). Soak dentures in warm water without vinegar if there are metal clasps on the dentures.
- After overnight soaking, rinse and brush the denture(s) as described above prior to wearing them for the day.

Denture Removal Technique

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Appendix J: Tooth Brushing Techniques

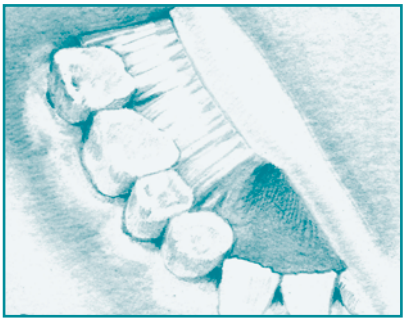
There are a multitude of tooth brushing techniques that have been developed, but no one method has been shown to be superior (Asadoorian, 2006). The technique that is described below is an example of a tooth brushing method that may be used:

Brushing outer and inner surfaces:

Place the toothbrush at the gum margin at an angel of 45°. Press the bristles against the teeth and gums softly. Move the toothbrush with small, vibratory to and from motions.

Brushing outer surfaces:

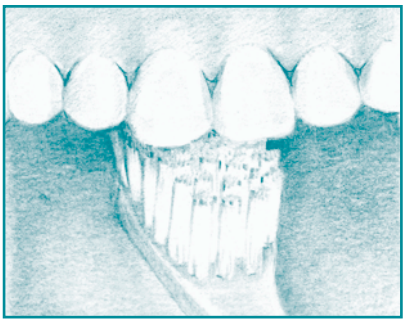
Brushing inner surfaces:



Brushing the front teeth:

For cleaning the inner surfaces of the front teeth, put the toothbrush in an upright position and place the bristles at the gum margin. Move the toothbrush in the directions from the gums to the

Brushing the front teeth:



Illustrations and instructions (for the Bass or sulcular method of brushing) adapted from:

http://www.gaba.com/teeth_care/brushing_methods.htmlg_methods.html

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Nancy Bauer, RN, Hon. BA, Hon. Bus. Admin., E.T.

Appendix K: Approaches to Care

The following approaches to care have been adapted for those working with older adults with cognitive impairment. Nurses working with those with behaviour and/or communication problems or dementia need to consider their approach to care in order to achieve successful oral hygiene outcomes.

Behaviour/Communication/Dementia Problems

Problem	Strategy	Note
Client won't open their mouth	■ Assess ways to get oral hygiene completed. ■ Break peri-oral muscle spasms and gain access to the mouth. ■ Keep the mouth open during oral hygiene care.	■ Use a backward-bent toothbrush to break the muscle spasms. ■ Use another toothbrush or mouth-prop (e.g., Open-Wide Plus) to keep the mouth open. ■ Enlist the assistance of another caregiver. ■ Use other techniques such as rescuing, distraction, etc. ■ Try oral hygiene care at another time of day when client is more cooperative or in a different environment that is more suitable. ■ List successful strategies in the client's oral hygiene care plan.
Dentures can't be taken out or put in client's mouth	■ Assess ways to get oral hygiene care completed. ■ Assess if there is any aggressive behaviour involved. ■ Assess if there is any sign of tardive dyskinesia or other movement disorder. ■ Discuss with other caregivers who look after the client to see if they are more successful at denture care for this client and see what they do.	■ Enlist the assistance of another caregiver. ■ Consult with medical and dental professionals concerning tardive dyskinesia or other movement disorder. ■ Use other techniques such as rescuing, distraction, etc. ■ Try oral hygiene care at another time of day when client is less aggressive or in a different environment that is more suitable. ■ See if the other carers are more successful at denture care for this client and observe what they do. ■ List successful strategies in the client's oral hygiene care plan.
Patient refuses oral hygiene care	■ Assess ways to get oral hygiene care completed. ■ Assess the cause for the refusal of oral hygiene care – environmental, pain, fear.	■ Enlist the assistance of another caregiver. ■ Use task-breakdown to break all the steps of the oral hygiene care task down into small steps. ■ Use other techniques such as rescuing, distraction, etc. ■ Try oral hygiene care at another time of day when client is more cooperative or in a different environment that is more suitable. ■ List successful strategies in the client's oral hygiene care plan.
Client bites toothbrush/caregiver	■ Assess ways to get oral hygiene care completed. ■ Assess if the biting is of an aggressive origin or is a consequence of tardive dyskinesia or other movement disorder	■ Enlist the assistance of another caregiver. ■ Use other techniques such as rescuing, distraction, etc. ■ Have several toothbrushes on hand during oral hygiene care and let the client chew on one brush while the caregiver cleans with another. ■ Use a mouth-prop to kept the mouth open (e.g., Open-Wide Plus) ■ Consult with medical and dental professionals concerning tardive dyskinesia or other movement disorder. ■ List successful strategies in the client's oral hygiene care plan.

Problem	Strategy	Note
Client kicks or hits out	■ Assess ways to get oral hygiene care completed. ■ Assess the cause of the aggression.	■ Attempt oral hygiene care at a time when the client is more cooperative. ■ Use other techniques such as rescuing, distraction, etc. ■ Enlist the assistance of another caregiver. ■ List successful strategies in the client's oral hygiene care plan. ■ Enlist the assistance of another caregiver. ■ Use other techniques such as rescuing, distraction, etc. ■ List successful strategies in the client's oral hygiene care plan.
Client does not understand caregivers directions about oral hygiene care	■ Assess ways to get oral hygiene care completed.	■ Enlist the assistance of another caregiver. ■ Use other techniques such as rescuing, distraction, etc. ■ List successful strategies in the client's oral hygiene care plan.
Client cannot rinse and/or spit and swallows all liquids/toothpastes	■ Assess ways to get oral hygiene care completed. ■ Assess the client's abilities for rinsing/spitting/swallowing etc. ■ Assess the need for the use of toothpastes versus mouthrinses.	■ Consider strategies related to dry mouth, hypersalivation and swallowing problems, and list successful strategies in the client's oral hygiene care plan. ■ Enlist the assistance of another caregiver. ■ Use a suction toothbrush.
Client uses offensive language	■ Assess the cause of the offensive language. ■ Assess the feasibility of completing oral hygiene care at that time. ■ Assess ways to get oral hygiene care completed.	■ Ignore the offensive language and attempt oral hygiene care if no other signs of aggression. ■ Use other techniques, such as rescuing, distraction, etc. ■ Enlist the assistance of another caregiver. ■ Try oral hygiene care at another time of day when client is less aggressive or in a different environment that is more suitable. ■ List successful strategies in the client's oral hygiene care plan.
Client is aggressive	■ Assess the cause of the aggression. ■ Assess ways to get oral hygiene care completed.	■ Try oral hygiene care at another time of day when client is less aggressive or in a different environment that is more suitable. ■ Use other techniques such as rescuing, distraction, etc. ■ Enlist the assistance of another caregiver. ■ List successful strategies in the client's oral hygiene care plan.
Client is tired/sleepy	■ Assess ways to get oral hygiene care completed	■ Try oral hygiene care at another time of day when client is more alert. ■ Use other techniques such as rescuing, distraction, etc. ■ List successful strategies in the client's oral hygiene care plan.
Client's head faces down toward chest	■ Assess ways to get oral hygiene care completed	■ Enlist the assistance of another caregiver. ■ Do oral hygiene care as best as is possible from different positions. ■ Investigate the success of the use of different dental products such as toothbrushing, mouthrinses, spray bottles, suction toothbrushes, etc. ■ Use other techniques such as rescuing, distraction, etc. ■ List successful strategies in the client's oral hygiene care plan.

Problem	Strategy	Note
Client's head moves around constantly	■ Assess ways to get oral hygiene care completed.	■ Enlist the assistance of another caregiver. ■ Use other techniques such as rescuing, distraction, etc. ■ Do oral hygiene care as best as is possible from different positions. ■ Investigate the success of the use of different dental products such as toothbrushing, mouthrinses, spray bottles, etc. ■ If required, discuss holding the client's head gently during oral hygiene care with them and other parties involved. ■ List successful strategies in the client's oral hygiene care plan.
Client forgets to do oral hygiene care	■ Assess the best way to remind the client to do oral hygiene care.	■ Use task-breakdown to break all the steps of the oral hygiene care task down into small steps. ■ Use other techniques such as rescuing, distraction, etc. ■ Write reminder notes for the client, if helpful. ■ Ensure that the need for reminding about oral hygiene care is listed in the client's oral hygiene care plan.
Client can do some oral hygiene but not all of the tasks	■ Assess the client's abilities to do their oral hygiene care and if they need reminding or assistance during the different stages of the task	■ Use task-breakdown to break all the steps of the oral hygiene care task down into small steps. ■ Use other techniques such as rescuing, distraction, etc. ■ Write reminder notes for the client, if helpful. ■ Ensure that the parts of the oral hygiene care task that the client can do themselves are listed in their oral hygiene care plan.

Dentures and Denture-Related Oral Lesions

Problem	Strategy	Note
Dentures require cleaning	■ Physical cleaning is essential to ensure dentures are clean.	■ Physical cleaning of dentures at least once daily, or more frequently in a bowl or sink filled with water (or a washcloth placed in the bottom of the sink). Clean with denture cleaning paste and a denture brush. ■ Chemical denture cleaner tablets or pastes can be used in addition to cleaning with soap and water.
Dentures are dirty and covered in calculus (tartar)	■ Regular removal of calculus, debris and staining is essential.	■ Dentures may be soaked at night or during the day in a solution of diluted white vinegar and cold water (50:50). This applies to acrylic dentures only. ■ Dentures may need professional and chemical cleaning by a dental professional.
Denture storage container is dirty.	■ Regular sterilization of denture storage containers is required.	■ Weekly, or more frequently, physical cleaning of the denture storage container and then soaking in a solution of diluted sodium hypochlorite (bleach) for 1 hour. Clean with soap and water before using.
Dentures are not named	■ All partial and full dentures should be named.	■ Permanent naming of dentures can be done by a dental professional by inserting the name into the denture. ■ Temporary naming of dentures can be done by caregivers – very lightly sand the pink acrylic denture surface on the cheek side (not the fitting side), write on initials or name with a permanent marker or dark pencil, cover with several layers of clear nail varnish and allow to thoroughly dry. Temporary commercial kits are available from medical/dental suppliers.
Denture stomatitis the soft tissue under where the denture sits is red/inflamed/ painful/bleeding	■ Regular cleaning/sterilization of dentures.	■ Physical cleaning of dentures at least once daily, or more frequently. Removal of dentures at night whenever possible. ■ Treatment must be done in consultation with a dental professional – dentures may require sterilization in diluted sodium hypochlorite (bleach), and an antifungal medication may need to be prescribed and placed inside the denture's fitting surface.
Angular cheilitis – the corners of the mouth are red/weeping/painful	■ Treatment of fungal infection, if present. ■ Lubricating and protection of corners of mouth. ■ Attention to any denture-related problems.	■ Treatment must be done in consultation with a dental professional – antifungal cream may need to be prescribed and applied to the corners of the mouth. Apply moisturizer to corners of mouth several times daily to protect the skin. Dentures may require treatment, especially if recurring angular cheilitis persist.
An ulcer is present under the denture	■ Removal of cause of irritation to allow the soft tissue to heal.	■ Whenever possible, remove denture until ulcer is healed. Warm salt and water mouthrinses/spray bottle/saturated gauze can be applied several times daily to ulcer. ■ Use of numbing gels/ointments must be carefully monitored and is not generally advised.

Reproduced with permission: Johnson, V., & Chalmers, J. (2002). Oral Hygiene Care for Functionally Dependent and Cognitively Impaired Older Adults. In M.G. Titler (Series Ed.), Series on Evidence-Based Practice for Older Adults, Iowa City: The University of Iowa Gerontological Nursing Interventions Research Center Research Translation and Dissemination Core.

Appendix L: Website Resources

Websites for Regulatory Colleges (Ontario):

- College of Dental Hygienists of Ontario: www.cdho.org;
- College of Denturists of Ontario: www.denturists-cdo.com
- Royal College of Dental Surgeons of Ontario: www.rcdso.org;

National Associations:

- Canadian Association of Public Health Dentistry: http://www.caphd-acsdp.org/
- Canadian Dental Association: http://www.cda-adc.ca/
- Canadian Dental Hygienists Association: http://www.cdha.ca/
  CDHA Oral Care Centre:
  http://www.cdha.ca/content/oralcare_centre/oralcare_centre.asp
  - a web site designed to answer questions about dental hygiene. It provides "frequently asked questions" and "facts and tips."
- Royal College of Dentists of Canada: http://www.rcdc.ca/

Provincial Associations:

- Ontario Dental Hygienists Association: http://odha.on.ca
- Registered Nurses' Association of Ontario: http://rnao.org
  - DVD – Oral Care for Residents with Dementia
    Partnership: RNAO and Halton Region Health Department
    www.rnao.org/bestpractices

Appendix M: Sample Financial Assistance Programs and Other Resources for Dental Treatment

The following is a sample of programs that provide support for dental treatment in Ontario:

Ministry of Community and Social Services (MCSS)	
Ontario Disability Support Program (ODSP)	■ Mandatory basic dental care is provided by the Ministry of Community and Social Services to eligible ODSP recipients and their dependents (excluding dependant adults and children in receipt of Assistance for Children with Severe Disabilities (ACSD) ■ In addition to the mandatory basic dental care, MCSS provides additional dental care coverage under the Dental Special Care Plan (DSCP) to eligible ODSP recipients and children in receipt of ACSD whose disability, prescribed medications and/or prescribed medical treatment directly impacts on their oral health ■ The MCSS Schedule of Dental Services and Fees outlines the dental services, fees and procedure limits covered by the mandatory dental care benefit ■ AccertaClaim ServiCorp Inc. is the dental plan administrator for the ODSP dental benefit and for some municipalities. AccertaClaim adjudicates decisions, makes determinations and payments regarding dental benefit claims. Dentists and dental clinics in Ontario who require a copy of the MCSS Schedule of Dental Services and Fees can contact AccertaClaim directly to receive a copy
ODSP Dentures	■ Persons on ODSP who require denture treatment and who meet specified criteria as determined by Community and Social Services ■ Denture treatment as defined by the Ontario Works adults fee guide
Ontario Works	■ Municipalities may provide dental services to adult Ontario Works participants and ODSP dependant adults as a discretionary benefit under Ontario Works. ■ Any enquires regarding the coverage of the mandatory or discretionary dental care benefits or dental claims submissions should be directed to the local Ontario Works office or the dental plan administrator for the municipality
Special Assistance	■ Persons with financial need who meet specified criteria as determined by the Ministry of Community and Social Services ■ Dental services as defined by the Ontario Works adults fee guide

Accredited dental hygiene programs in Ontario:

All dental hygiene programs provide dental hygiene services to the public at minimal cost, usually around $25, which includes examination, x-rays and cleaning. This list was compiled from the Ontario Dental Hygienists Association website, and was current as of December 2007.

Algonquin College of Applied Arts & Technology

Dental Hygiene Program
1385 Woodroffe Avenue, Room J117C
Nepean, Ontario
K2G 1V8
Tel: (613) 727-4723
Web: www.algonquincollege.com/highband/swf/index.htm

APLUS Institute

Madison Centre
4950 Yonge Street,
Concourse Level, Unit 15
Toronto, Ontario
M2N 6K1
Tel: (416) 222-0500
Web: www.aplusinstitute.com

Cambrian College of Applied Arts & Technology

Dental Hygiene Program
1400 Barrydowne Road
Sudbury, Ontario
P3A 3V8
Tel: (705) 566-8101
Web: www.cambrianc.on.ca

Canadian Academy of Dental Hygiene

165 Dundas Street W
Mississauga, ON
L5B 2N6
Tel: (905) 896-2234
Web: www.canadianacademyofdentalhygiene.ca

Canadian Business College

Dental Hygiene Program
869 Yonge Street
Toronto, Ontario
M4W 2H2
Tel: (416) 961-6161
Fax: (416) 961-1616
E-mail: cbcollege@cbcollege.com
Web: www.cbcollege.com

Canadian College of Dental Health (affiliate of the Canadian Therapeutic College)

760 Brant St.
Burlington, Ontario
L7R 4B7
Tel: (905) 333-9991
Toll Free: 1-877-278-8888
Web: http://www.ccdh.ca/site/dental_program/dental_hygiene/dh_intro.html

Canadian Institute of Dental Hygiene

145 King Street E
Hamilton, ON
L8N 1B1
Tel: (877) 550-2443
Web: www.cidh.on.ca

Canadore College of Applied Arts and Technology

Dental Hygiene Program
P.O. Box 5001
100 College Drive
North Bay, Ontario
PlB 8K9
Tel: (705) 474-7600
Web: www.canadorec.on.ca

Collège Boréal
Hygiène Dentaire
21, boulevard Lasalle
Sudbury, Ontario
P3A 6B1
French Program Only
Tel: (705) 560-6673
Web: www.borealc.on.ca/

Confederation College of Applied Arts & Technology
Dental Hygiene Program
P.O. Box 398
1450 Nakina Drive
Thunder Bay, Ontario
P7C 4Wl
Tel: (807) 475-6110
Web: www.confederationc.on.ca

Durham College of Applied Arts and Technology
Dental Hygiene Program
P.O. Box 385
2000 Simcoe Street
Oshawa, Ontario
LlH 7L7
Tel: (905) 721-2000
Web: www.durhamc.on.ca

Fanshawe College of Applied Arts & Technology
Dental Hygiene Program
1460 Oxford Street East
P.O. Box 7005
London, Ontario
N5V 1W2
Tel: (519) 452-4207
Web: www.fanshawec.on.ca

George Brown College of Applied Arts and Technology
Dental Hygiene Program
Casa Loma Campus
160 Kendal Avenue
P.O. Box 1015, Station B
Toronto, Ontario
M5T 2T9
Tel: (416) 415-5000
Web: www.gbrownc.on.ca

Georgian College of Applied Arts & Technology
Dental Hygiene Program
825 Memorial Avenue
P.O. Box 2316
Orillia, Ontario
L3V 6S2
Tel: (705) 325-2740
Web: www.georcoll.on.ca/

La Cité Collégiale
Hygiène Dentaire
801, promenade de l'aviation
Ottawa, Ontario
KlK 4R3
French Program only
Tel: (613) 742-2493
Web: www.lacitec.on.ca

Niagara College
Hygiène Dentaire
P.O. Box 1005
300 Woodlawn Road
Welland, Ontario
L3B 5S2
Tel: (905) 735-2211
Web: www.niagarac.on.ca

Ontario Dental Education Institute
201 Wilson Street East
Ancaster, Ontario
L9G 2B8
Tel: (905) 304-4706
Web: www.on-dei.com

Oxford College of Arts, Business and Technology
670 Progress Ave.
Scarborough, Ontario
M1H 3A4
Tel: (416) 439-8668
Web: www.oxfordedu.ca
Email: info@oxfordedu.ca

Oxford North Toronto
10087 Yonge St.
Richmond Hill, Ontario
L4C 1T7
Tel: (905) 780-9023
Web: www.oxfordnorth.com
Email: inquiry@oxfordnorth.com

Regency Dental Hygiene Academy Inc.
481 University Ave.
Toronto, Ontario
M5G 2E9
Tel: (416) 341-0100
Fax: (416) 341-0747
Toll free: 1-866-666-0481
Web: www.regencydha.com
Email: info@regencydha.com

St. Clair College of Applied Arts and Technology
Dental Hygiene Program
2000 Talbot Road West
Windsor, Ontario
N9A 6S4
Tel: (519) 972-2727
Web: www.stclairc.on.ca

Toronto College of Dental Hygiene and Auxiliaries Inc.
300 Steeprock Drive
Toronto, Ontario
M3J 2W9
Tel: 416-423-3099
Fax: 416-423-3092
Web: www.toronto-college-dental.org

Yorkville College Dental Hygiene Program
700-94 Cumberland Street
Toronto, Ontario
M5R 1A3
Tel: (416) 929-0121
Web: http://www.yorkvillecollege.com/htmln/ProgramDentalHygiene.html

Appendix N: Description of Toolkit

Best practice guidelines can only be successfully implemented if there are: adequate planning, resources, organizational and administrative support as well as appropriate facilitation. In this light, RNAO, through a panel of nurses, researchers and administrators has developed the *Toolkit: Implementation of Clinical Practice Guidelines* based on available evidence, theoretical perspectives and consensus. The *Toolkit* is recommended for guiding the implementation of any clinical practice guideline in a health care organization.

The *Toolkit* provides step-by-step directions to individuals and groups involved in planning, coordinating and facilitating the guideline implementation. Specifically, the *Toolkit* addresses the following key steps in implementing a guideline:

Chapter 1: Selecting your Clinical Practice Guideline.
Chapter 2: Identifying, Analyzing and Engaging your Stakeholders.
Chapter 3: Assessing your Environmental Readiness.
Chapter 4: Deciding on your Implementation Strategies.
Chapter 5: Evaluating your Success.
Chapter 6: What about your Resources?

Implementing guidelines in practice that result in successful practice changes and positive clinical impact is a complex undertaking. The *Toolkit* is one key resource for managing this process. The *Toolkit* can be downloaded at www.rnao.org/bestpractices.

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